FINAL PROGRAM

18th International Conference on Computer Graphics and Interactive Techniques

SIGGRAPH · 91 LAS VEGAS

Where Advanced Technologies Inspire Tomorrow's Realities

W E L C O M E

It all began in the summer of 1989, when we started asking a talented selection of SIGGRAPH enthusiasts a very sobering question: Would you be willing to serve on the SIGGRAPH '91 conference committee?

Apparently, we selected well. These people were talented and enthusiastic, and quickly became dedicated to SIGGRAPH's success. After a few deep breaths and some careful thought, they agreed.

All of us realized, of course, that we were committing ourselves to a major investment of time and energy, but that was insignificant compared with the exciting challenge of coordinating the world's largest conference on computer graphics and interactive techniques.

Since then, the two of us have relied on the immortal advice of Satchel Paige: "Don't look back. Something might be gaining on you." We can't claim that we've outrun all the problems and occasional setbacks, but we are convinced that we'd do it all again, no regrets. Two years later, we're still excited about SIGGRAPH '91, for three main reasons:

Computer Graphics

Very few professional pursuits provide the same fascination, diversity, and sense of adventure. And we can't think of any endeavor that has done more to enhance knowledge, efficiency, and enjoyment.

You, and the Rest of the Computer Graphics Community

Where could you find a more fascinating, diverse, and adventurous group of people, from all over the world? Without you, none of this would be possible. We thank you for your vote of confidence in deciding to attend this year's conference, and we're confident that you'll find it a wise investment of your valuable time and resources.

The SIGGRAPH '91 Committee

It is impossible to imagine a better group of colleagues. We will always be grateful for the SIGGRAPH '91 committee's dedication, intelligence, imagination, and good humor.

Welcome to SIGGRAPH '91! We're glad you're here!

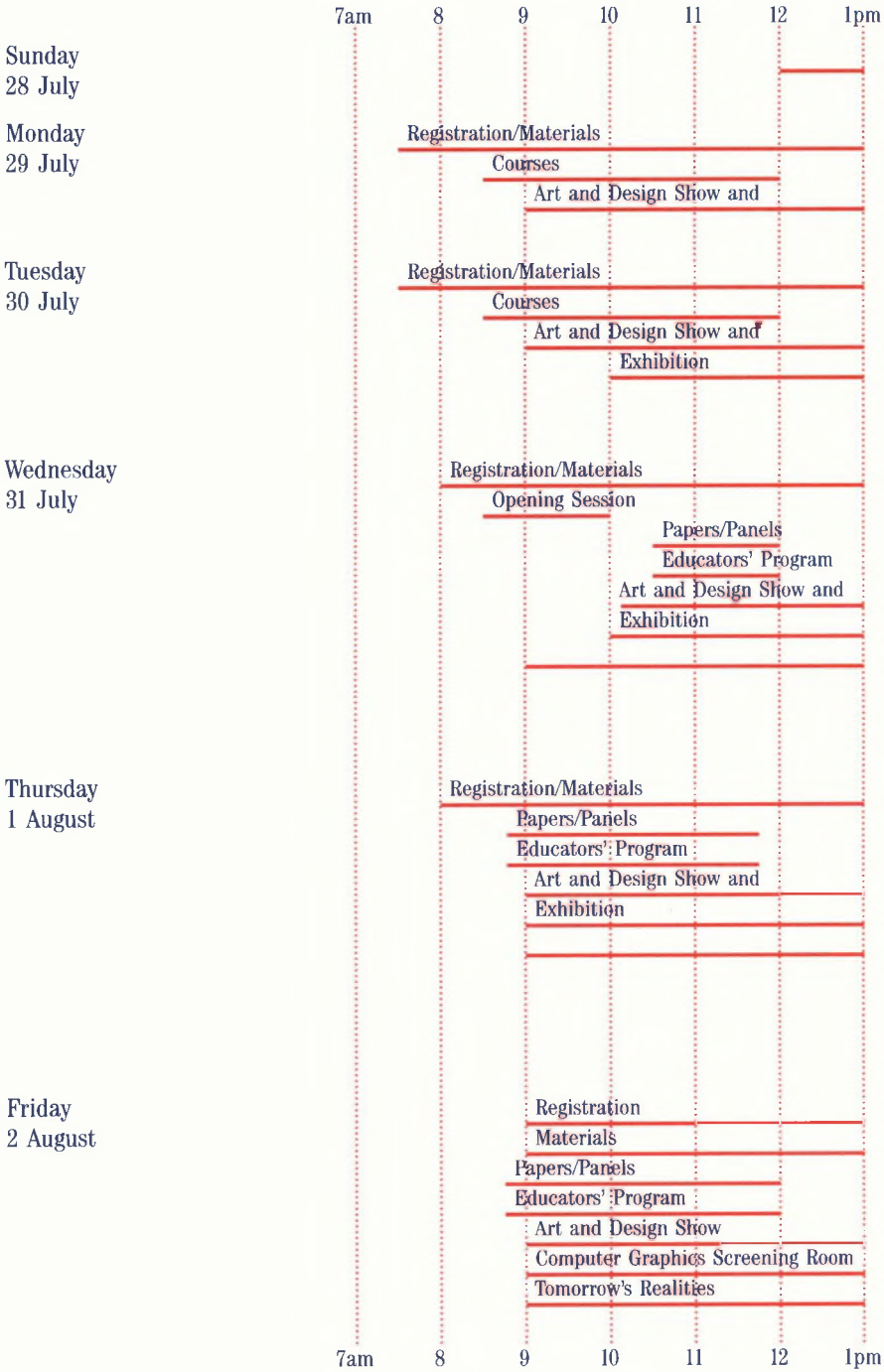
Michael Bailey
San Diego Supercomputer Center

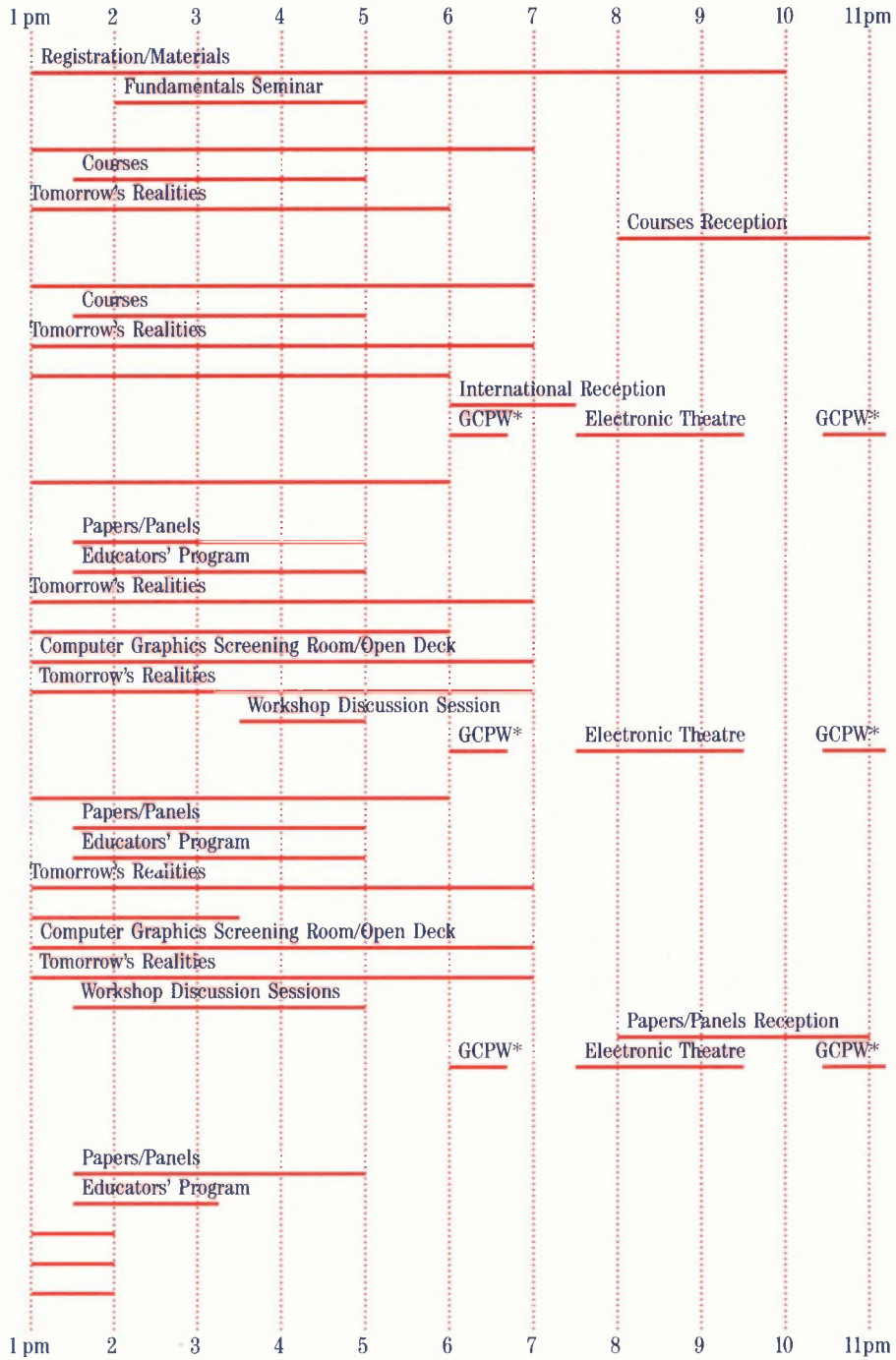
Carol Byram
Sony Computer Peripheral Products Company

SIGGRAPH '91 Co-Chairs

C O N T E N T S

SIGGRAPH '91 AT A GLANCE





*George Coates Performance Works, live multimedia performance: *Invisible Site*. See page 54.

REGISTRATION CATEGORIES

If You Register For Courses

You may attend:
Opening session
Your confirmed course(s)
Lunch on your course day(s)
Course reception
Exhibition (3 days)
Art and design show
Electronic theatre*
Tomorrow's Realities
Computer graphics screening room
Open deck
Fundamentals seminar

And you'll receive:
Notes for your course(s)
Art and design show catalog
Electronic theatre catalog
Tomorrow's Realities catalog

If You Register For Paper/Panel Sessions

You may attend:
Opening session
Paper/panel sessions
Papers/panels reception
Exhibition (3 days)
Art and design show
Electronic theatre*
Tomorrow's Realities
Computer graphics screening room
Open deck
Fundamentals seminar
Educators' program

And you'll receive:
Conference proceedings
Art and design show catalog
Electronic theatre catalog
Tomorrow's Realities catalog

If You Register For The Educators' Program

You may attend:
Opening session
Educators' program
Exhibition (3 days)
Art and design show
Tomorrow's Realities
Computer graphics screening room
Open deck
Fundamentals seminar

And you'll receive:
Educators' program proceedings

If You Register For Exhibits-Only

You may attend:
Opening session
Exhibition (3 days)
Art and design show
Tomorrow's Realities
Computer graphics screening room
Open deck
Fundamentals seminar

*Registration for courses and/or papers/panels entitles a registrant to one electronic theatre ticket, one electronic theatre catalog, one ticket for *Invisible Site*, one art and design show catalog, and one Tomorrow's Realities catalog. Badged attendees may purchase additional tickets to the electronic theatre at the conference registration desk beginning Tuesday, 30 July at 7:30 am, subject to availability. All performances contain the same material.

OPENING SESSION

Wednesday, 8:30 am–10:00 am
Las Vegas Convention Center, Hall S5

Welcome to SIGGRAPH '91

Michael Bailey
Carol Byram
SIGGRAPH '91 Co-Chairs

The co-chairs welcome all conference and exhibits-only registrants to SIGGRAPH '91.

SIGGRAPH '91 Highlights

A fast-paced compilation of video scenes from the first three days of the conference, illustrating the breadth, diversity, and excitement of SIGGRAPH '91.

The 1991 Computer Graphics Achievement Award

Presented to: James T. Kajiya

Presented by: Bertram Herzog

The annual award for significant recent contributions to computer graphics.

The 1991 Steven A. Coons Award

Presented to: Andries van Dam

Presented by: Bertram Herzog

The biennial award for work that has had long-term creative impact on the computer graphics field.

The Keynote Address

Scott McNealy
Chief Executive Officer
Sun Microsystems, Inc.

Scott McNealy reviews the challenges of significant growth in a volatile marketplace and outlines his view of the future evolution of computer graphics technology.

			Location
Introductory Monday	C1	Fundamentals and Overview of Computer Graphics	Bally's, Capitol Room
	C3	Virtual Interface Technology (Virtual Reality)	Convention Center, S26
	C5	New Media Applications in Art and Design	Bally's, Adelphi Room
	C13	Introduction to Fractals	Convention Center, N101-103
Introductory Tuesday	C4	Education of a Computer Animator	Convention Center, S27
	C10	Visualizing Multidimensional Data	Convention Center, N113-114
	C24	Generation of Three Dimensional Data for Computer Image Synthesis	Convention Center, N115-117
Intermediate Monday	C7	Introduction to Volume Visualization	Caesars, Colosseum II-III
	C9	Understanding Visual Perception and its Impact on Computer Graphics	Convention Center, N113-114
	C11	Radiosity	Caesars, Colosseum VII
	C15	PHIGS PLUS: Proposed Extension to PHIGS Graphics Standard	Convention Center, S111-113
	C17	Video Technology for Computer Graphics	Convention Center, Hall S1
	C19	Technical Evaluation of 3D Graphics Workstations	Convention Center, N109-110
	C21	The RenderMan Interface and Shading Language	Convention Center, S27
	C23	An Introduction to Physically Based Modeling	Convention Center, N115-117
	C25	Topics in the Construction, Manipulation, and Assessment of Spline Surfaces	Bally's, Rialto Room

			Location
Intermediate Tuesday	C2	Math for SIGGRAPH	Convention Center, S26
	C6	Graphic Design and the Graphical Interface in the New Media Environment	Convention Center, N109-110
	C16	X3D-PEX (PEX): Three-Dimensional Graphics in a Distributed Window System	Convention Center, S111-113
	C18	High Definition Television (HDTV) Technology	Convention Center, Hall S1
	C20	Advanced Techniques in Human Modeling, Animation, and Rendering	Bally's, Adelphi Room
	C22	Object and Constraint Paradigms for Graphics	Bally's, Rialto Room
	C26	Blossoming: The New Polar-Form Approach to Spline Curves and Surfaces	Convention Center, N101-103
Advanced Monday	C27	Photorealistic Volume Modeling and Rendering Techniques	Caesars, Colosseum V
Advanced Tuesday	C8	State of the Art in Volume Visualization	Caesars, Colosseum II-III
	C12	Frontiers in Rendering	Caesars, Colosseum V
	C14	Fractal Modeling in 3D Computer Graphics and Imaging	Caesars, Colosseum VII
	C28	Motion Synthesis, Planning, and Control	Bally's, Capitol Room

In SIGGRAPH '91 courses, computer graphics experts offer intensive, day-long instruction on a broad range of current topics. Instructors use multimedia presentations to illustrate particular computer graphics techniques and technologies.

Course descriptions begin on page 11. Locations are listed on pages 8–9, Courses At A Glance, and on a kiosk in the registration area. Courses are presented in the Las Vegas Convention Center, Bally's Casino Resort, and Caesars Palace from 8:30 am to 5:00 pm on Monday and Tuesday. Lunch is provided for course attendees.

Course notes are sold in the registration area in the Las Vegas Convention Center. Full sets of course notes are available beginning Sunday (no single course notes are sold on Sunday). Single course notes for Monday courses are available beginning Monday. Single course notes for Tuesday courses are available beginning Tuesday.

All course registrants are invited to a reception at the Wet 'n Wild water theme park Monday, 8:00 pm to 11:00 pm. Don't forget to bring your bathing suit and the courses reception ticket that is included in your registration packet.

Course Categories

Introductory

There are no prerequisites for introductory courses, but attendees should have an overall interest in computer graphics; in some cases, prior experience with computing, graphics, or basic math applications may be helpful.

Intermediate

For intermediate courses, attendees should have significant working knowledge of the subject, based on introductory courses, reading, and practical experience. Intermediate courses often organize existing knowledge into a coherent whole, to supply a model or other structure for the discipline, and supply substantial technical content and depth. Most intermediate courses cover specific topics in detail, such as algorithms, techniques, and architectures.

Advanced

Advanced courses cover narrow topics in substantial technical depth. Presentations include challenging mathematical concepts and programming examples. Based on intermediate course attendance, reading, and significant years of experience, attendees should be well-informed in the general course topic and prepared to consider advanced material.

C1

Fundamentals and Overview of Computer Graphics

Monday
Introductory

This course begins with an historical perspective of computer graphics and an introduction to the fundamental concepts, followed by the current state of the industry and important trends. Most of the course is devoted to a topics survey, emphasizing breadth of coverage rather than technical details. The guiding principle is to encourage an intuitive understanding of many concepts instead of the details of introductory issues.

Chair
Olin Lathrop
Cognivision Inc.

Lecturers
Norman Badler
University of Pennsylvania

Richard M. Fichera
Independent Consultant

Carl Machover
Machover Associates

C2

Math for SIGGRAPH

Tuesday
Intermediate

Recent SIGGRAPH papers have used more and more mathematics, but beneath the diversity of computer graphics applications lurk common abstractions, such as linear algebra. Since technical papers must focus on novel contributions, these intuitive fundamentals are easily overlooked. This course, which uses concrete examples and implementation guidance to generate insight, presents topics that support current research. The speakers are pioneers who understand the mathematical difficulties and hope to ease the path for those who attempt to follow it. The goal is for attendees to walk out thinking: "Gee, that stuff's not so difficult after all!"

Chair
Ken Shoemake
Otter Enterprises, Inc.

Lecturers
Tony DeRose
University of Washington

Michael Kass
Apple Computer, Inc.

Thomas W. Sederberg
Brigham Young University

Frances Yao
Xerox PARC

C3

Virtual Interface Technology (Virtual Reality)

Monday
Introductory

While computing capacities and speeds have increased remarkably, our ability to communicate with these information engines is still limited by inadequate interfaces between the human and the computer. This course explores advanced concepts and technologies for interfacing humans to complex machines, with a focus on virtual interfaces and their potential impact on the way we think about and with computers. Interface design principles are reviewed from psychological and technological perspectives. Virtual interface technologies are described from an historical perspective. Hardware, software, and mindware aspects of virtual interfaces are investigated and their applications postulated in the fields of medicine, education, design, interface to complex systems, and entertainment.

Chair
Thomas A. Furness III
University of Washington

Lecturers
William Bricken
University of Washington

Meredith Bricken
University of Washington

C4

Education of a Computer Animator

Tuesday
Introductory

As computer animation has gained prominence, it has become more interesting to students, artists, animators, and others wishing to enter the field. This course addresses two of their most frequently asked questions: What should I study? How do I get a job in animation? Topics include: universities that offer courses in the field, the focus of university programs, the structure of production teams, and employer requirements. Speakers discuss personal experiences and important projects that have contributed to their professional development.

Co-Chairs
Scott E. Anderson
Industrial Light and Magic

Jonathan P. Luskin
California Institute of the Arts

Lecturers
John Lasseter
Pixar

Nancy St. John
Small Prond Productions

Andries van Dam
Brown University

C5

New Media Applications in Art and Design

Monday
Introductory

As new media continue to change the way we work and the manner in which information is presented, we are faced with a continual onslaught of new terms and tools. Because the computer offers capabilities that expand communication, it is ever more important to understand the latest ideas and techniques that will inevitably alter the ways we work with information.

Designers and artists have always ordered information to create visual coherence. As these new techniques and tools enter our studios, we must use them to our advantage and define a new methodology for our work. Among the design issues that must be addressed: integrating video and audio, providing creation tools for new data types, and planning for multiple platform delivery. This course introduces the concepts of multimedia, hypermedia, artificial reality, virtual reality, and interactive technologies to artists, designers, and others interested in using these tools.

Chair
Alyce Kaprow
The New Studio

Lecturers
David Backer
Fluent Machines, Inc.

Delle Maxwell
Consultant

Kristee Rosendahl
Apple Multimedia Lab

Kathy Wilson
Bank Street College

C6

Graphic Design and the Graphical Interface in the New Media Environment

Tuesday
Intermediate

Recent interface design has firmly established the importance of visual (graphic) considerations where multimedia, hypermedia and interactive technologies are becoming commonplace. Today's point and click playback modes are evolving into increasingly "live" and responsive environments, presenting unique and complex interface design problems. This course defines the issues that are important for good graphic interface and discusses how they fit together within such a diverse system. It also establishes a methodology for communication among graphic designers, industrial designers, interface designers, software and hardware engineers, and others working on such products.

Chair
Alyce Kaprow
The New Studio

Lecturers
Delle Maxwell
Consultant

Rob Myers
Silicon Graphics Computer Systems

Bill Verplank
IDTwo

C7

Introduction to Volume Visualization

Monday
Intermediate

The last five years have seen a revolution in techniques for visualizing 3D sampled data. This course provides an overview of these new techniques, with the emphasis on algorithms and their relationship to theory, not on applications. Topics include polygonalization of volume data (marching cubes, dividing cubes), volume resampling (ray tracing, splatting, multi-pass warping), and shading and projection algorithms (the light transport integral, digital compositing, gels, clouds, shadows, textures, and other artistic devices). There is also a brief survey of workstations and commercially available software and a review of unsolved technical issues.

Chair
Marc Levoy
Stanford University

Lecturers
Pat Hanrahan
Princeton University

Wolfgang Kreuger
ART+COM

William Lorensen
General Electric Corporation

Lee Westover
Sun Microsystems, Inc.

C8

State of the Art in Volume Visualization

Tuesday
Advanced

Volume visualization is rapidly becoming one of the most important research topics in computer graphics. The emphasis in this course is on new algorithms and new approaches in volume visualization with limited application, but the potential to revolutionize our ability to visualize volume data. The course develops a theory of various topics relevant to volume visualization at an advanced level, including volume rendering of curvilinear and irregular grids (for computational fluid dynamics applications), the theory of resampling, the texel model and the theory of anisotropic scattering, volume transport theory (and visualization techniques inspired by transport), and approaches to volume rendering on massively parallel systems such as the Connection Machine.

Chair
Pat Hanrahan
Princeton University

Lecturers
James T. Kajiya
California Institute of Technology

Wolfgang Kreuger
ART+COM

Peter Schroeder
Thinking Machines Corporation

Jane Wilhelms
University of California at Santa Cruz

C9

Understanding Visual Perception and its Impact on Computer Graphics

Monday
Intermediate

Visual perception is far more complex than is normally realized. Much information present in the image formed on the retina is discarded in the perceived image. Conversely, information not present in the retinal image can be perceived (as in visual illusions). This course describes some characteristics of visual perception and shows how computer graphics algorithms might be modified to account for perceptual properties of the human visual system. It covers basic issues in the design of perceptually based image synthesis algorithms; choosing colors and patterns for effective image display; and minimizing the visibility of image synthesis artifacts. Numerous video and slide demonstrations will illustrate perceptual issues.

Chair
Brian Guenter
Georgia Institute of Technology

Lecturers
Elizabeth Davis
Georgia Institute of Technology

James Ferwerda
Cornell University

Gary Meyer
University of Oregon

Larry Thibos
Indiana University

C10

Visualizing Multidimensional Data

Tuesday
Introductory

Science and technology would be far simpler if data, like the characters in Edwin A. Abbott's *Flatland,* always stayed in two dimensions. Unfortunately, data can live in three, four, five, or any number of dimensions. Consider, for example, measurements of temperature, humidity, barometric pressure, percentage of cloud cover, solar radiation intensity, and wind speed at a particular location at noon on 100 different days. The data on these six non-spatial variables consist of 100 points in a six-dimensional space. In this course, participants peer into such six-dimensional spaces, see the configuration of points, and visualize them to understand their complex relationships.

Chair
Richard A. Becker
AT&T Bell Laboratories

Lecturers
William S. Cleveland
AT&T Bell Laboratories

William M. Shyu
AT&T Bell Laboratories

Allan R. Wilks
AT&T Bell Laboratories

C11

Radiosity

Monday
Intermediate

This course describes the radiosity method and its evolution in computer graphics during the last several years.

The standard radiosity procedure is based on methods from thermal engineering and is applicable to environments composed of ideal diffuse emitters and reflectors. It reproduces the phenomena of "color bleeding," variable shading within shadow envelopes, the effect of area light sources, and penumbra effects along shadow boundaries.

Radiosity solutions have been extended to include the effects of scattering due to a participating medium. New ray tracing form-factor algorithms allow radiosity computations for arbitrary surface geometries and simultaneously help diminish aliasing artifacts due to sampling. The techniques have now been extended to dynamic environments and specular surfaces.

Chair
Donald P. Greenberg
Cornell University

Lecturers
Michael Cohen
University of Utah

Roy Hall
Cornell University

Holly Rushmeier
Georgia Institute of Technology

Francois Sillion
Cornell University

John Wallace
3D/Eye, Inc.

C12

Frontiers in Rendering

Tuesday
Advanced

Every computer-generated image is ultimately created by a rendering program. Whether the program runs on a PC or a supercomputer, or whether it produces images overnight or in real time, the rendering algorithm is a critical visualization step, converting a mathematical scene description into a picture or animation.

This course offers a view of the future, where experts present their latest work and describe new ideas, methods, and techniques for rendering in software and hardware. They draw on sources such as wave physics and classical non-Euclidean geometry; present new ways of looking at image synthesis; and discuss current problems.

Chair
Andrew S. Glassner
Xerox PARC

Lecturers
Charlie Gunn
University of Minnesota

Eric Haines
3D/Eye, Inc.

Pat Hanrahan
Princeton University

Peter Kochevar
Digital Equipment Corporation

Don Mitchell
AT&T Bell Laboratories

C13

Introduction to Fractals

Monday
Introductory

Basic principles and applications of fractals are supported by video animations and live computer demonstrations. Topics include:

- General fractals in nature; from characterization to simulation, a visual introduction and survey from aggregation to music.
- Random fractals, including fractal dimension, statistical vs. exact self-similarity, fractional Brownian motion, and construction by displacement algorithms.
- Dynamical systems and fractals, including Mandelbrot and Julia sets and their 2D and 3D rendering, the relationship between fractals and chaos, and iterated function systems.
- Modeling, including L-systems, biologically based modeling, and developmental plant models with animation.

Chair
Dietmar Saupe
Universität Bremen

Lecturers
Heinz-Otto Peitgen
Universität Bremen

Przemyslaw Prusinkiewicz
University of Regina

Richard Voss
IBM T.J. Watson Research Center

C14

Fractal Modeling in 3D Computer Graphics and Imaging

Tuesday
Advanced

This course presents recent advances in fractal modeling for realistic image synthesis of nature, novel deterministic 3D fractal objects and fractal image compression, and advanced rendering methods developed to display these highly detailed models. Content is heterogeneous, reflecting the current state of fractal geometry.

Co-Chairs

John C. Hart
University of Illinois at Chicago

F. Kenton Musgrave
Yale University

Lecturers

Charlie Gunn
Minnesota Supercomputer Institute

Benoit B. Mandelbrot
Yale University

Alan Norton
IBM T.J. Watson Research Center

Heinz-Otto Peitgen and Deitmar Saupe
Universitat Bremen

Przemyslaw Prusinkiewicz
University of Regina

Charles Wuorinen
Pace University

C15

PHIGS PLUS: Proposed Extension to PHIGS Graphics Standard

Monday
Intermediate

PHIGS PLUS is the ANSI/ISO proposed extension to the PHIGS standard and is supported by multiple vendors as the API for providing advanced rendering and advanced primitive geometries within the PHIGS environment. This course covers the evolution, architecture, and algorithms of PHIGS PLUS; explores the impact that PHIGS PLUS may have on an application environment; and investigates considerations for applications and graphics system implementors.

Chair

Edy Henderson
Sun Microsystems, Inc.

Lecturers

Henri Gourand
Digital Equipment Corporation

Griff Hamlin
McDonnell Douglas

Eileen McGinnis
Sun Microsystems, Inc.

Mike Stapleton
Systems Simulation Ltd.

Spencer Thomas
University of Michigan

C16

X3D-PEX (PEX): Three-Dimensional Graphics in a Distributed Window System

Tuesday
Intermediate

X3D-PEX (or PEX) is an emerging multi-vendor-supported protocol extension to the X Window System for the rendering of PHIGS and PHIGS PLUS 3D graphics within windows in a distributed environment. PEX allows developers to take advantage of advanced graphics by using a standard application programming interface such as PHIGS. This course covers the evolution and architecture of PEX, explores the impact that the use of PEX might have on an application environment, and investigates considerations that should be made by application and graphics system implementors.

Chair
Marty Hess
Sun Microsystems, Inc.

Lecturers
Jeff Friedberg
Kubota Pacific Computer Inc.

Cheryl Huntington
Sun Microsystems, Inc.

C17

Video Technology for Computer Graphics

Monday
Intermediate

This course is designed to give computer graphics professionals a thorough understanding of the theory and practical application of video technology. It consists of video theory, electronic image processing and special effects, contemporary video production and post-production techniques, and examples of video art and commercial production from around the world. Topics include: scanning theory, video signals, color encoding techniques, video image compositing, special effects hardware, and compositing layering.

Chair
Dean Winkler
Post Perfect Inc.

Lecturer
Dean Winkler
Post Perfect Inc.

C18

High Definition Television (HDTV) Technology

Tuesday
Intermediate

Studio-quality HDTV equipment available today offers real-time acquisition, digital recording, processing, and display at two megapixel resolution with superb color quality. HDTV is immediately applicable to computer graphics and will become increasingly cost-effective in computing applications as the technology is adopted in advanced television systems for consumer entertainment.

This course provides technical details of the evolution, architecture, algorithms, and proposed standards for HDTV — sometimes known as high-resolution systems. It explores the interface between HDTV and computer graphics and explains the impact that HDTV will have on picture communication in general.

Chair
Charles A. Poynton
Sun Microsystems, Inc.

Lecturers
C.R. Caillouet
Caillouet Technical Services

Glenn A. Reitmeier
David Sarnoff Research Center

Laurence J. Thorpe
Sony Advanced Systems

C19

Technical Evaluation of 3D Graphics Workstations

Monday
Intermediate

Many different workstation manufacturers are claiming to have the fastest 3D graphics performance or the highest image quality. This course provides a detailed explanation of how to evaluate 3D graphics workstations and how to understand manufacturers' specifications. Topics include: 3D graphics workstation features, 3D performance measurement (using the GPC benchmarks), evaluation of wireframe and polygon image quality, and which features to expect in the future. Live demonstrations and hands-on access to 3D graphics workstations from the major workstation vendors provide additional experience and clarify the lectures.

Chair
Scott R. Nelson
Sun Microsystems, Inc.

Lecturers
Michael F. Deering
Sun Microsystems, Inc.

David Naegle
Silicon Graphics Computer Systems

Randi J. Rost
Digital Equipment Corporation

C20

Advanced Techniques in Human Modeling, Animation, and Rendering

Tuesday
Intermediate

This course discusses several important problems raised by incorporating realistic human characters in computer-generated films, including: shape creation, animation, and improving the realism of motion (not from the joint point-of-view as for robots, but in relation to the deformations of human bodies during animation).

It reviews techniques for rendering fur and hair, modeling hair-styles, and automatically constructing texture maps with properties such as "dirty" natural and skin textures. Speakers present methods for designing and animating clothes, focusing on motion of the cloth without collision detection and collision detection of the cloth with the body and itself. Finally, they present an innovative way of animating actors at a high level based on the concept of synthetic vision.

Chair
Daniel Thalmann
Swiss Federal Institute of Technology

Lecturers
Norman Badler
University of Pennsylvania

Demetri Terzopoulos
University of Toronto/Schlumberger Laboratory

Nadia Magnenat-Thalmann
University of Geneva

C21

The RenderMan Interface and Shading Language

Monday
Intermediate

The RenderMan Interface is a 3D scene description interface for realistic image synthesis. This course explores the geometric modeling interface that describes the shapes and positions of objects in a scene, and the shading language that describes the appearance characteristics of those objects. Rendering algorithms and renderer implementations are not discussed. Rather, the use of interface features is described. Many useful shading language techniques are demonstrated, and several examples of successful RenderMan images and animations are examined.

Chair
Tony Apodaca
Pixar

Lecturers
Phil Beffrey
Digital Arts

Pat Hanrahan
Princeton University

Darwyn Peachey
Pixar

Steve Upstill
Pixar

C22

Object and Constraint Paradigms for Graphics

Tuesday
Intermediate

Object-oriented techniques are appropriate for structuring complex designs in computer graphics, and graphics requirements have prompted further development of this approach. This course covers the concepts and extensions needed for the implementation of these ideas in graphics applications.

The course also compares object-oriented and classical computer graphics approaches. General techniques and solutions are demonstrated by tackling specific problems in graphics, interaction, and animation. Constraint-based techniques are explored as a useful extension of object-oriented methods, with recent progress presented.

Chair
Edwin H. Blake
Centre for Mathematics and Computer Science

Lecturers
Bjorn N. Freeman-Benson
University of Washington

Chris Laffra
Software Engineering Research Center

Peter Wisskirchen
Gesellschaft für Mathematik und Daten Verarbeitung

C23

An Introduction to Physically Based Modeling

Monday
Intermediate

Although physically based modeling is inherently a mathematical subject, the math involved needn't be any more difficult than the math underlying many other areas of computer graphics. To date, however, most discussions of the subject presuppose a specialized mathematical background that many members of the computer graphics community lack.

This course addresses the need to make the principles and methods of physically based modeling accessible to a broader computer graphics audience. It appeals to those familiar with mainstream computer graphics who understand basic computer graphics math (such as vector/matrix manipulations) but whose first-year calculus course is a dim memory.

Co-Chairs
Andrew Witkin
Carnegie Mellon University

Michael Kass
Apple Computer, Inc.

Lecturers
David Baraff
Cornell University

Alan Barr
California Institute of Technology

C24

Generation of Three-Dimensional Data for Computer Image Synthesis

Tuesday
Introductory

This course gives the participant an understanding of the issues and techniques involved in basic data generation and user interfaces for modeling systems. Techniques covered are application independent, consisting of various procedures which are easy to understand and implement. Program samples will be provided, and interactive real-time demonstrations of various techniques will be presented. This course differs from the traditional SIGGRAPH courses in CAD, geometry, and free-form surface design, as it concentrates on the more basic techniques which underlie the sophisticated approaches.

Co-Chairs
Wayne E. Carlson
The Ohio State University

Richard E. Parent
The Ohio State University

Lecturers
Kevin Weiler
Kubota Pacific Computer Inc.

Turner Whitted
Numerical Design, Ltd.

C25

Topics in the Construction, Manipulation, and Assessment of Spline Surfaces

Monday
Intermediate

This course reviews the basic principles of geometry, splines, and linear algebra; compares rational and nonrational splines; examines main surface categories such as patches, tensor products, and hierarchies; and reviews generation by sweeping, extrusion, rotation, curve-net filling, and data fitting. Surface manipulation focuses on direct control of features; hierarchical surfaces are described with their manipulation for design and animation. The construction of patches of special form and their smooth joining to surfaces is detailed. The course concludes with surface quality (continuity and curvature distribution) and its assessment and visualization.

Chair
Richard Bartels
University of Waterloo

Lecturers
Tony DeRose
University of Washington

David Forsey
University of British Columbia

David Warn
General Motors Research Laboratories

C26

Blossoming: The New Polar-Form Approach to Spline Curves and Surfaces

Tuesday
Intermediate

This course develops the geometric foundations for curve and surface design using polar forms and presents several recent results. Topics include polar forms for polynomial curves, new labels for curves and surfaces, Bézier curves and B-splines, dual functionals, knot insertion, geometric continuity of curves, universal splines, interpolation vs. approximation, quasi-interpolants, rational curves, conics, NURBS, tensor-product surfaces, triangular Bézier surfaces, geometric continuity for surfaces, B-patches, and nonrectangular B-spline surfaces. Concrete examples will illustrate the workings and benefits of the polar-form approach in design applications.

Chair
Hans-Peter Seidel
University of Waterloo

Lecturers
Phillip J. Barry
University of Minnesota

Ronald N. Goldman
Rice University

Lyle Ramshaw
DEC Systems Research Center

C27

Photo-realistic Volume Modeling and Rendering Techniques

Monday
Advanced

This course offers a state-of-the-art presentation on recently developed photo-realistic image synthesis techniques using volume modeling and rendering. It is not intended to provide techniques in visualization of 3D scientific sampled data. Topics include: an introduction to volume rendering and photo-realistic image synthesis; techniques in hypertexture for synthesis of hair, fire, fluid flow, and erosion effects; texel volume texture techniques for the rendering of furry surfaces; volume automata models for simulating growth of plants; volume tracing techniques for rendering atmospheric effects and laminar flame models; volume rendering of soft objects; and radiosity methods for volume rendering.

Chair
Masa Inakage
The Media Studio, Inc.

Lecturers
Ned Greene
Apple Computer, Inc.

James T. Kajiya
California Institute of Technology

Marc Levoy
Stanford University

Ken Perlin
New York University

Holly Rushmeier
Georgia Institute of Technology

C28

Motion Synthesis, Planning, and Control

Tuesday
Advanced

This course presents some of the most fascinating current approaches to motion synthesis problems. Simulation, control, and planning problems are addressed with the emphasis on selected hard problems and some very promising new approaches.

In the first part of the course, which presents some fundamental issues in motion synthesis, the emphasis is on collision detection and response methods for rigid as well as deformable bodies with rigid linked skeletons. The second part deals with the problem of controlling the motion of constrained linked figures. Some of the methods presented offer a new AI-based perspective. The third part of the course focuses on some planning problems related to motion synthesis. Presentations are based on the speakers' extensive experience with robot motion planning. These advanced methods of planning complex motion offer new perspectives for graphics applications.

Chair
Claude Puech
Stanford University/HP Labs

Lecturers
David Baraff
Cornell University

Jérôme P. Barraquand
Digital Equipment Corporation

Michael F. Cohen
University of Utah

Marie-Paule Gascuel
Ecole Normale Supérieure

Jean-Claude Latombe
Stanford University

Gary Ridsdale
University of Utah

Wednesday	*Las Vegas Convention Center, Hall S5*	*Las Vegas Convention Center, Hall S1*
8:30 am–10:00 am	Conference Opening Session	
10:30 am–12:00 noon	Papers: Animation	Panel: Intellectual Property Rights
1:30 pm–3:15 pm	Papers: Display of Building Interiors	Panel: Computer Graphics: More Unsolved Problems
3:30 pm–5:00 pm	Papers: Raster Techniques	Panel: Computer Graphics: More Unsolved Problems (continued)
Thursday		
8:45 am–10:15 am	Papers: Animation and Illustration Systems	Panel: Scientific Visualization on Advanced Architectures
10:30 am–12:00 noon	Papers: Filtering and Sampling	Panel: Future Directions of Visualization Software Environments
1:30 pm–3:15 pm	Papers: Illumination and Reflection	Panel: HDTV: Technologies and Directions
3:30 pm–5:00 pm	Papers: Volume Modeling	Panel: HDTV: Technologies and Directions (continued)
Friday		
8:45 am–10:15 am	Papers: Surface Modeling	Panel: Applications of Virtual Reality: Reports from the Field
10:30 am–12:00 noon	Papers: Volume Sculpting and Rendering	Panel: Applications of Virtual Reality: Reports from the Field (continued)
1:30 pm–3:15 pm	Papers: Texture and Synthesis	Panel: Managing Time in Multimedia
3:30 pm–5:00 pm	Papers: Hands and Legs	Panel: Networked Digital Video

Las Vegas Convention Center, S27	*Educators' Program, Las Vegas Convention Center, Rooms N109–N110*
	Educators' Program Overview
Panel: Graphic Design in the Nineties: New Roles, Options, and Definitions	Educators' Panel: What Next? A Provocative Look at Curriculum, Creativity, and Logistics in Teaching Artists and Designers to Use Computers
Panel: Making Virtual, Artificial, or Real Computer Art	Educators' Panel: Mars Navigator: An Interactive, Multimedia Exploration of the Red Planet
Panel: The Third Dimension: It's Not a Virtual One	Educators' Papers: Computer Graphics Education in Computer Science
Panel: Designing for New Media: Technologists and Visual Designers Working as a Team	Educators' Panel: Mathematics Education Using Computer Graphics
	Educators' Panel: Discovery Through Experimentation: Art and Educational Computing in Secondary Schools
Panel: Education Technology: Doing With Images Makes Symbols (This panel is also included in the educators' program.)	Educators' Panel: Education Technology: Doing With Images Makes Symbols (Convention Center, S27)
Panel: Semiconductor Requirements for Merging Imaging and Graphics	Educators' Panel: Computer Graphics and Architectural Design
Panel: Desperately Seeking Standards	Educators' Panel: Integrating Computer Graphics into Design Education
Panel: Object-Oriented Graphics	Educators' Papers: Issues in Computer Graphics Education

SIGGRAPH's annual conference is the preeminent international forum for scholarly papers on computer graphics and interactive techniques. Paper presentations are designed to keep the industry informed about the state of the art in computer graphics, including hardware, software, and theory.

For SIGGRAPH '91, the papers committee has reviewed over 200 submissions and selected an intriguing array of papers on current computer graphics topics, from complex graphics algorithms and geometric modeling to computer animation and beyond. These insights and broad, well-rounded perspectives on particular topics are available to conference attendees and in the conference proceedings, which will appear as a special 1991 issue of *Computer Graphics.*

Papers are presented Wednesday through Friday in the Las Vegas Convention Center, Hall S5. After each paper session, speakers and attendees are welcome to continue their discussions in the papers break-out room, N101–103, Las Vegas Convention Center.

Panel discussions provide alternative formats for presenting information on a wide range of topics related to computer graphics and interactive techniques. Participants and audiences alike have an opportunity to explain different viewpoints and exchange information in a manner that illuminates issues and promotes understanding.

Panel topics include current controversies in computer graphics, multimedia applications, emerging hardware and software concepts, and the use of new technologies in science, industry, and the arts. All panels are recorded and may be transcribed for distribution after the conference.

Panels are presented in parallel with paper presentations, Wednesday through Friday in the Las Vegas Convention Center, Hall S1 and S27. Refreshments are served during the morning and afternoon coffee breaks. After each panel session, speakers and attendees are welcome to continue their discussions in the panels break-out room, S101–102, Las Vegas Convention Center.

Papers/panels registrants are invited to a reception Thursday evening at the Caesars Palace pool area. (The pool will not be open during this event.)

Wednesday, *8:30 am–10:00 am*

Conference Opening Session

(See page 7.)

Wednesday, *10:30 am–12:00 noon*

Papers: Animation

Chair
Henry Fuchs
University of North Carolina

Animation Aerodynamics

Jakub Wejchert
European Visualization Centre

David Haumann
IBM T.J. Watson Research Center

Animated Free-form Deformation: An Interactive Animation Technique

Sabine Coquillart
Pierre Jancène
INRIA Rocquencourt

Motion Without Movement

William T. Freeman
Edward H. Adelson
MIT Media Lab

David J. Heeger
NASA Ames Research Center/Stanford University

Coping with Friction for Non-Penetrating Rigid Body Simulation

David Baraff
Cornell University

Panel: Intellectual Property Rights

The issues surrounding software patents and intellectual property rights are controversial and timely. They have a direct and important bearing on the computer graphics community (both technical and artistic) as well as the programming and end-user communities as a whole. The issues have been brought to the fore by a series of highly-publicized (and highly controversial) lawsuits in recent years involving major industry players including Xerox, Apple, Lotus, Microsoft, Hewlett-Packard, NEC, Intel, Fujitsu, and IBM over cases ranging from copyrights on microcode to the "look and feel" of graphical user interfaces. Equally important is the recent stream of patents on specific computer algorithms. Despite the publicity (or perhaps because of it), there seems to be much confusion among programmers regarding the basic principles of trade secret law, copyright, and patent law, not to mention the ultimate implications of these developments. Even within the legal community, there is considerable disagreement over specific interpretations of the law.

This panel examines software copyrights, patents, and intellectual property rights in a discussion between parties on both sides of the fence, hopefully leading to a greater understanding of the issues involved and how they will affect computer graphics practitioners.

Chair
Michel Denber
Xerox Corporation

Panelists
John P. Barlow
Electronic Frontier Foundation

Isaac Victor Kerlow
Pratt Institute

Pamela Samuelson
University of Pittsburgh

Richard M. Stallman
League for Programming Freedom

Wednesday, *1:30 pm–3:15 pm*

Papers: Display of Building Interiors

Chair
John C. Dill
Simon Fraser University

Design and Simulation of Opera Lighting and Projection Effects

Julie O'B. Dorsey
Francois X. Sillion
Donald P. Greenberg
Cornell University

Making Radiosity Usable: Automatic Preprocessing and Meshing Techniques for the Generation of Accurate Radiosity Solutions

Stephen Mann
University of Washington

Kevin P. Smith
University of California, Berkeley

Daniel R. Baum
James M. Winget
Silicon Graphics Computer Systems

Visibility Preprocessing for Interactive Walkthroughs

Seth J. Teller
Carlo H. Séquin
University of California at Berkeley

Panel: Computer Graphics: More Unsolved Problems

Where is computer graphics heading? Twenty-five years ago, Ivan Sutherland wrote a paper that sketched 10 unsolved problems in the emerging field of interactive computer graphics. This panel reviews our successes in addressing those problems and explores other current unsolved research problems, the impact of solving them, and some possible directions for solutions.

The problems include: managing complexity in rendering, modeling, and interaction; solving the rendering equation; interactively constructing constrained 3D models; achieving geometric robustness; designing a new graphics standard; developing efficient general-purpose graphics architectures; and automating the design of rich graphical environments.

Co-Chairs
Franklin Crow
Apple Computer, Inc.

Steve Feiner
Columbia University

Panelists
Alan Barr
California Institute of Technology

Frederick P. Brooks, Jr.
University of North Carolina at Chapel Hill

Stuart Card
Xerox PARC

James Clark
Silicon Graphics Computer Systems

A. Robin Forrest
University of East Anglia

Pat Hanrahan
Princeton University

Andries van Dam
Brown University

Wednesday, *1:30 pm–3:15 pm*
(continued)

Panel: Graphic Design in the Nineties: New Roles, Options, and Definitions

What is the future of graphic design? While traditional roles will continue to exist for some time, computer technology is creating new demands, options, and definitions for the design professional. The technology is both marvelous and dangerous. Through it, designers can attain new levels of freedom with the possibility of significant breakthroughs in creative thinking and problem solving. They can also become mesmerized by the cosmetic wizardry displayed on their screens, which can seduce designers and their clients into believing that effective communication is nothing more than mere visual presentation.

In addition, computer technology raises questions about the role of design and designers. How will information design and esthetic design evolve? As the value of their expertise changes, must designers become generalists or will specialty areas of design grow and even proliferate? What will the new opportunities in multimedia and interface design create and how will the print medium be affected in the next 10 years?

This panel will explore and clarify these issues in an attempt to guide designers into the technological future of their rapidly changing profession.

Chair
Doug Hesseltine
Quorum Incorporated

Panelists
Michael Cronan
Cronan Design

Joel Katz
Katz/Wheeler Design

Clement Mok
Clement Mok Design

John Waters
Waters Design Associates, Inc.

Wednesday, *3:30 pm–5:00 pm*

Paper: Raster Techniques

Chair
Richard J. Beach
Xerox PARC

Model-Based Matching and Hinting of Fonts

Roger D. Hersch
Claude Bétrisey
Swiss Federal Institute of Technology, Lausanne

Digital Halftoning with Space Filling Curves

Luiz Velho
Jonas de Miranda Gomes
IMPA — Instituto de Matemática Pura e Aplicada

Efficient Anti-aliased Rendering of 3D Linear Fractals

John C. Hart
Thomas A. DeFanti
University of Illinois at Chicago

Trichromatic Approximation for Computer Graphics Illumination Models

Carlos F. Borges
University of California at Davis

Panel: Computer Graphics: More Unsolved Problems (continued)

Panel: Making Virtual, Artificial, or Real Computer Art

This panel compares different viewpoints on the computer as a natural tool of choice for making art. It also explores how the very nature of the computer itself shapes the artistic esthetic, by changing the way in which art is both created and experienced. Whether the end result is graphic design, photo-realistic rendering, low-resolution paint system output, hypermedia user interfaces, interactive computer-controlled installations, scientific visualization, or virtual and artificial realities, more and more work is being done in the name of art. Panelists review these forms, compare their underlying similarities and differences, and discuss how artistic esthetics emerge with the use of the technology.

Chair
Gregory P. Garvey
The New England School of Art and Design

Panelists
Matt Elson
Symbolics, Inc.

Cynthia Goodman
Author and Independent Curator

Lauretta Jones
IBM T.J. Watson Research Center

Jane Veeder
San Francisco State University

Thursday, *8:45 am–10:15 am*

Papers: Animation and Illustration Systems

Chair
Andrew S. Glassner
Xerox PARC

An Object-Oriented Framework for the Integration of Interactive Animation Techniques

Robert C. Zeleznik
D. Brookshire Conner
Andries van Dam
Matthias M. Wloka
Daniel G. Aliaga
Nathan T. Huang
Philip M. Hubbard
Brian Knep
Henry E. Kaufman
John F. Hughes
Brown University

Inkwell: A 2½D Animation System

Peter C. Litwinowicz
Apple Computer, Inc.

Automated Generation of Intent-Based 3D Illustrations

Dorée Duncan Seligmann
Steve Feiner
Columbia University

Panel: Scientific Visualization on Advanced Architectures

This panel discusses the issues involved in performing scientific visualization on advanced architectures, the problems that need to be addressed when using an advanced architecture within a visualization environment, and the features that should be included in the next generation of advanced architectures. The focus is not "whiz-bang algorithms" that have been developed for a high-performance machine, but rather, the problems encountered, solutions found, and benefits realized when high-performance and/or programmable special purpose hardware is integrated into existing visualization environments.

The panel brings together researchers involved with several different visualization projects undertaken on unusual hardware architectures to enhance interaction, computation, and/or insight.

Chair
T. Todd Elvins
San Diego Supercomputer Center

Panelists
Thomas A. DeFanti
University of Illinois at Chicago

Henry Fuchs
University of North Carolina at Chapel Hill

John Fowler
Los Alamos National Laboratory

Lewis Tucker
Thinking Machines Corporation

Thursday, *8:45 am–10:15 am (continued)*

Panel: The Third Dimension: It's Not a Virtual One

Sculptors are sculptors because of a need to physicalize their work. Because their work ultimately exists as a physical entity in the real world, they envision their work in three dimensions and think deeply in 3D terms before ever considering computer-aided implementation of their designs. They find the experience of viewing 3D space through the glass front of a CRT fundamentally unsatisfying.

This session features a panel of professional sculptors, who critically discuss what has been perceived to be the SIGGRAPH philosophy of 3D modeled computer graphics and compare their design process with the approach of designers who use a 3D computer modeling system to compose pictures.

Chair

Stewart Dickson
The Post Group Digital Center

Panelists

Bruce Beasley
Sculptor

Helaman Ferguson
Sculptor

Rob Fisher
Sculptor

Frank McGuire
Sculptor

Thursday, *10:30 am–12:00 noon*

Papers: Filtering and Sampling

Chair
Edwin E. Catmull
Pixar

A New, Simple, and Efficient Anti-aliasing with Subpixel Masks

Andreas Schilling
Universität Tübingen

An Efficient Anti-aliasing Technique

Xiaolin Wu
University of Western Ontario

Unbiased Sampling Techniques for Image Synthesis

David Kirk
California Institute of Technology

James Arvo
Cornell University

Spectrally Optimal Sampling for Distributed Ray Tracing

Don P. Mitchell
AT&T Bell Laboratories

Panel: Future Directions of Visualization Software Environments

Several systems have been developed around the concepts of: applying visual languages to visualization application-building; decomposing a visualization application into separable processes (such as data analysis, geometric representation, and rendering); and finally, creating a realtime development environment where applications are created interactively. These systems have given rise to disposable applications by utilizing reusable repositories of visualization and graphics algorithms. These techniques can be connected in a visual manner to create problem-targeted applications with a short lifetime, which dramatically reduces the time devoted to problem solving.

Because of their focus, these systems blur the distinction between program visualization (the process of dynamically viewing the execution ordering of a program), visualization programming (creating visualization applications utilizing graphics libraries), and visualization prototyping (building visualization applications interactively). This panel focuses on the future directions of such systems and includes discussions on the systems-oriented components, new data analysis and visualization representation styles, and the user interface subsystem.

Chair
Craig Upson
Silicon Graphics Computer Systems

Panelists
Bob Brown
Silicon Graphics Computer Systems

Scott Dyer
The Ohio State University

Dave Kamins
Stardent Computer Inc.

John Rasure
University of New Mexico

Thursday, *10:30 am–12:00 noon (continued)*

Panel: Designing for New Media: Technologists and Visual Designers Working as a Team

The increasing complexity and highly visual nature of new media require that all kinds of designers become involved in a collaborative effort from the beginning. This panel focuses specifically on the role of the visual designer who works in these new media as a graphical problem solver. For these designers, the communicative power and esthetic integrity of new media are of primary concern and can only be realized if they become part of the creative team early on in the design process. This panel has two goals: to expose the technology community to these concerns and considerations, and to help designers establish the common language they need for effective collaboration.

Chair

Kristee Rosendahl
Apple Multimedia Lab

Panelists

Alyce Kaprow
The New Studio

David Lawrence
Independent Designer/Producer

Harry Marks
Harry Marks Productions

Dick Phillips
Los Alamos National Laboratory

Thursday, *1:30 pm–3:15 pm*

Papers: Illumination and Reflection

Chair
Robert L. Cook
Light Source Computer Images, Inc.

A Progressive Multi-Pass Method for Global Illumination

Shenchang Eric Chen
Gavin Miller
Douglass Turner
Apple Computer, Inc.

Holly E. Rushmeier
Georgia Institute of Technology

A Comprehensive Physical Model for Light Reflection

Xiao D. He
Kenneth E. Torrance
Francois X. Sillion
Donald P. Greenberg
Cornell University

A Global Illumination Solution for General Reflectance Distributions

Francois X. Sillion
James R. Arvo
Stephen H. Westin
Donald P. Greenberg
Cornell University

A Rapid Hierarchical Radiosity Algorithm

Pat Hanrahan
Princeton University

David Salzman
Equator Technologies

Larry Aupperle
Princeton University

Panel: HDTV: Technologies and Directions

High definition television (HDTV) is coming, but why are we interested? Twenty years ago, the initial motivation for HDTV was to provide higher resolution, wider aspect ratio consumer television. Now graphical interaction and presentation are important components of day-to-day computing, and high resolution computer graphics techniques have become fundamental tools for entertainment, science, and engineering. As a result, there is growing interest in the interplay among HDTV, computer graphics, and computing technologies.

This panel presents the relationship of HDTV to computer graphics and computing, the interplay among underlying technologies, the potential for standards, and current and future directions for products and applications.

Co-Chairs
Branko J. Gerovac
Digital Equipment Corporation/MIT Media Lab

John F. Mareda
Sandia National Laboratories

Panelists
Gary Demos
DemoGraFX

Hugo Gaggioni
Sony Advanced Systems

Charles A. Poynton
Sun Microsystems, Inc.

Additional panelists present the deliberations of the HDTV workshop held earlier in the week.

Thursday, *3:30 pm–5:00 pm*

Papers: Volume Modeling

Chair
Jane Wilhelms
University of California at Santa Cruz

NC Machining with G-buffer Method

Takafumi Saito
Tokiichiro Takahashi
NTT Human Interface Laboratories

Geometrically Deformed Models: A Method for Extracting Closed Geometric Models from Volume Data

James V. Miller
David E. Breen
Robert M. O'Bara
Michael J. Wozny
Rensselaer Polytechnic Institute

William E. Lorensen
General Electric Corporate Research and Development

Volumetric Shape Description of Range Data Using "Blobby Model"

Shigeru Muraki
MITI Electrotechnical Laboratory

Panel: HDTV: Technologies and Directions (continued)

Panel: Education Technology: Doing With Images Makes Symbols

Just as education has much to gain from the incorporation of computers into the learning process, so does the computer graphics community stand to profit from discoveries made in the course of educational research on the nature of the learning process, interactivity, interface design, and graphics. Thus, using computers to create environments for educating kids is an endeavor that will benefit both sides of the equation.

This panel reviews the opportunities for educators, students, and technology developers with illustrations of: virtual reality research for education; Rowland High School, which has one of the nation's most successful student animation programs; the Vivarium Project; and hacking for education.

Because of its significance, this session is being shared between panels and the educators' program.

Chair
Coco Conn
Homer & Associates

Panelists
Jay Fenton
Farallon

Dave Master
Rowland High School

Warren Robinett
University of North Carolina

Larry Yaeger
Apple Computer, Inc.

Friday, *8:45 am–10:15 am*

Papers: Surface Modeling

Chair

Alyn Rockwood
Arizona State University

Piecewise Surface Flattening for Non-Distorted Texture Mapping

Chakib Bennis
Jean-Marc Vézien
Gérard Iglésias
INRIA

Generalized Implicit Functions for Computer Graphics

Stan Sclaroff
Alex Pentland
MIT Media Lab

Convolution Surfaces

Jules Bloomenthal
Ken Shoemake
Xerox PARC

Deformable Curve and Surface Finite Elements for Free-Form Shape Design

George Celniker
Schlumberger Laboratory for Computer Science

Dave Gossard
MIT

Panel: Applications of Virtual Reality: Reports From The Field

Over the past two years, the extraordinary publicity and speculation devoted to virtual reality has concealed a little-known fact: there are a number of people actually using VR in practical applications. In order to balance and focus the current enthusiasm, it is time to bring users into the VR discussion. This panel of first-generation VR users brings the dialogue about VR technology down to earth and helps prioritize the agenda for VR researchers.

Co-Chairs

Jaron Lanier
VPL Research, Inc.

Linda Nonno
Los Alamos National Laboratory

Panelists

Joe Hale
NASA Marshall Space Flight Center

Wolfgang Krueger
Art+Com

Junji Normura
Matsushita Electric Works

Alain Guiot
Videosystem

Joseph Rosen
Dartmouth/Stanford

Alex Singer
MCA/Universal Studios

Jim Fleming
Brooks Air Force Base

Panel: Semiconductor Requirements For Merging Imaging And Graphics

This panel discusses issues relating to future trends in semiconductors for merging computer imaging and graphics, including: hardwired versus programmable approaches, special imaging and graphics processors versus general purpose processors with hardware accelerators, the need for full-motion video versus document processing in the office, whether full-motion video will be a software application or hardwired solution, and how imaging and graphics can or cannot be served by the same products. Panelists represent a variety of viewpoints on these approaches.

This panel begins where the SIGGRAPH '87 panel "A Comparison of VLSI Graphic Solutions" ended.

Chair

Jack Bresenham
Winthrop College

Panelists

Karl Guttag
Texas Instruments

Jeff Teza
Brooktree Corporation

Joseph Krauskopf
Intel Corporation

Nick England
Sun Microsystems, Inc.

Friday, *10:30 am–12:00 noon*

Papers: Volume Sculpting and Rendering

Chair
Gregory M. Nielson
Arizona State University

Sculpting: An Interactive Volumetric Modeling Technique

Tinsley A. Galyean
MIT Media Lab

John F. Hughes
Brown University

A Coherent Projection Approach for Direct Volume Rendering

Jane Wilhelms
Allen Van Gelder
University of California at Santa Cruz

Hierarchical Splatting: A Progressive Refinement Algorithm for Volume Rendering

David Laur
Pat Hanrahan
Princeton University

Panel: Applications of Virtual Reality: Reports from the Field (continued)

Panel: Desperately Seeking Standards

There is general agreement that industry standards are important, but one question remains: How should future standards be chosen? Should they be chosen by committee or should the market decide? Should committees standardize current practice or design tomorrows? How standards are formulated has great impact on their final form.

The panel consists of people who have been at the forefront of developing both committee and *de facto* standards. They assert and defend interesting propositions surrounding proprietary technology, committee standards, the open market, and prototypes.

Chair
M.W. Mantle
Pixar

Panelists
James C. King
Adobe Systems Inc.

Peter Bono
Fraunhofer Computer Graphics Research Group (USA)

Carl Bass
Ithaca Software

Eileen McGinnis
Sun Microsystems, Inc.

Friday, *1:30 pm–3:15 pm*

Papers: Texture and Synthesis

Chair
Pat Hanrahan
Princeton University

Generating Textures on Arbitrary Surfaces Using Reaction-Diffusion

Greg Turk
University of North Carolina at Chapel Hill

Reaction-Diffusion Textures

Andrew Witkin
Carnegie Mellon University

Michael Kass
Apple Computer, Inc.

Spot Noise — Texture Synthesis for Data Visualization

Jarke J. van Wijk
Netherlands Energy Research Foundation, ECN

Artificial Evolution for Computer Graphics

Karl Sims
Thinking Machines Corporation

Panel: Managing Time in Multimedia

Much attention has been focused on techniques for dealing with static (non-temporal) multimedia presentations, but methodologies for temporal, full-motion video, audio, and animated multimedia presentations have been largely ad hoc. Recently, researchers have begun a series of careful investigations to determine appropriate representations for temporal information in multimedia presentations and techniques for delivering them.

This panel assembles prominent researchers active in the areas of multimedia documents and time-based media to discuss the management of temporal multimedia information. They address: what sort of temporal information should be represented and manipulated; why temporal information should be represented declaratively or procedurally; current formalisms and representations; and the latest research in these areas.

Chair
Jonathan Rosenberg
Bellcore

Panelists
Thomas Little
Syracuse University

Roger Dannenberg
Carnegie Mellon University

Steven Newcomb
Florida State University

Bill Buxton
Xerox PARC/University of Toronto

Karon Weber
Xerox PARC

Friday, *1:30 pm–3:15 pm*
(continued)

Panel: Object-Oriented Graphics

Object-oriented programming is revolutionizing software production and marketing. Computer graphics "parts" are already appearing on the market in the form of class libraries, and developers are selecting reusable, interchangeable parts from those libraries to improve productivity. Technically, this approach shows great promise and is just beginning to be accepted by the industry.

This panel reviews applications that demonstrate the need for object-oriented graphics classes (beyond user interface toolkits). Panelists present several commercial graphics class libraries that meet these application needs and discuss graphics standardization efforts that are seriously considering the class library approach.

Chair

Nancy Knolle Craighill
Sony Corporation, AVTC

Panelists

Polly Baker
University of Illinois

Martin W. Fong
SRI International

Bob Howard
The Whitewater Group

William J. Kubitz
University of Illinois at Urbana-Champaign

Peter Wisskirchen
Gesellschaft für Mathematik und Daten Verarbeitung

Friday, *3:30 pm–5:00 pm*

Papers: Hands and Legs

Chair
Andrew Witkin
Carnegie Mellon University

Specifying Gestures by Example

Dean Rubine
Carnegie Mellon University

Computer Animation of Knowledge-Based Human Grasping

Hans Rijpkema
Michael Girard
SCAN (National Institute for Computer Animation)

Animation of Dynamic Legged Locomotion

Marc H. Raibert
MIT

Jessica K. Hodgins
IBM T.J. Watson Research Center

Interactive Behaviors for Bipedal Articulated Figures

Cary B. Phillips
Norman I. Badler
University of Pennsylvania

Panel: Networked Digital Video

The analog video era is ending. Digitization and computerization of motion video will qualitatively transform both computer and video-based applications, but video networking presents a special set of challenges.

Motion video is necessarily a real-time process, and current approaches treat the transmission of digital video as an equivalent real-time problem. This has created an impasse, because personal computers, contention-based LANs, and packet-switched WANs are notoriously poor at delivering real-time data. One solution is to implement spatial and temporal scalability in the video compression technique, allowing for dynamic tradeoffs among pixel resolution, frame rate, quality (bits/pixel), and therefore bit rate. End-to-end network protocols can take advantage of scalability to relax the real-time nature of video transmission, which in turn enables development of a new class of video applications using available network technologies.

In this panel, a taxonomy of current applications such as video mail, video-based training, and desktop video conferencing is presented according to whether the video is delivered in real time, stored and forwarded, or published, and whether the interaction is one-to-one, peer-to-peer, or one-to-many. Enabling technologies for these applications are identified with particular emphasis on the problems associated with networking video over LANs and WANs. The role of standards such as JPEG and MPEG is also considered.

Chair
David L. Nelson
Fluent Machines, Inc.

Panelists
Andrew Lippman
MIT Media Lab

Dan Heist
Protocom Corporation

Eric Hoffert
Apple Computer, Inc.

For the first time, SIGGRAPH '91 offers a full program specifically designed for computer graphics educators. Though SIGGRAPH's annual conference has always been an important resource for educators, this year's program includes papers and panels on a broad range of educational issues in the arts, computer science, engineering, and other disciplines.

Educators, students, administrators, and human resource executives in the computer graphics industry are encouraged to attend these sessions which are presented in the Las Vegas Convention Center, Rooms N109–N110, 10:30 am to 5:00 pm, Wednesday, 8:45 am to 5:00 pm Thursday, and 8:45 am to 3:15 pm Friday.

If you register for paper/panel sessions, you may also attend the educators' program.

Wednesday, *10:30 am–12:00 noon*

Educators' Program Overview

Steve Cunningham, educators' program chair, summarizes the program's development and events. Scott Owen, Chair of the ACM SIGGRAPH education committee, reviews his committee's services to the computer graphics education community.

Wednesday, *1:30 pm–3:15 pm*

Educators' Panel: What Next? A Provocative Look at Curriculum, Creativity, and Logistics in Teaching Artists and Designers to Use Computers

What next? Once you have established a computer graphics program for artists and designers, how do you:

- Develop the "hidden curriculum" (not the one that looks impressive to the chair, but the one that provides the most benefit to graduating students in the gallery or design studio)?
- Cope with the administrative problems and anticipate developments in hardware and software (or at least stay current)?
- And (perhaps the single most important and elusive topic) recognize and foster your students' creativity?

Chair

Tony Longson
CalState Los Angeles

Panelists

Paul Brown
Royal Melbourne Institute of Technology

Judith Crow
West Coast University

Brenda Laurel
Telepresence Research

Simon Penny
University of Florida

Wednesday, *3:30 pm–5:00 pm*

Educators' Panel: Mars Navigator: An Interactive, Multimedia Exploration of the Red Planet

Mars Navigator demonstrates the use of a variety of multimedia systems in the creation of an engaging, educational, and entertaining interactive experience for users of all ages and all levels of computer expertise. This panel discusses technologies and techniques required to create a 3D interactive experience, and how researchers and educators can create this kind of system.

Chair

Robert S. Wolff
Apple Computer, Inc.

Panelists

Karl Anderson
Volotta Interactive Video

Peter Hughes
University of California at Santa Cruz

Scott Stein
Apple Computer, Inc.

Tom Volotta
Volotta Interactive Video

Thursday, *8:45 am–10:15 am*

Educators' Papers: Computer Graphics Education in Computer Science

Chair
Steve Cunningham
California State University Stanislaus

Teaching a Two-Quarter Computer Graphics Sequence

G. Scott Owen
Georgia State University

Getting to the "Graphics" in a Computer Graphics Exercise

Dino Schweitzer
Linda Northrop
U.S. Air Force Academy

TUGS: A Tool for Teaching Computer Graphics

John Clevenger
California State University Sacramento

Thursday, *10:30 am–12:00 noon*

Educators' Panel: Mathematics Education Using Computer Graphics

Mathematics is a focal subject for improving education. Computer graphics helps make abstract concepts concrete and accessible, and helps motivate students to learn mathematics. This panel addresses questions about current and potential uses of interactive graphics in math education: What are the best existing examples? Are all math sub-areas amenable to graphical treatment? Which interactive techniques work best? Can guidelines be given for designing effective math courseware? What hardware/software platform is needed for the courseware of 1995 and 2000?

Chair
Steven Tanimoto
University of Washington

Panelists
Jim Blinn
California Institute of Technology

John F. Hughes
Brown University

Cleve Moler
The Math Works, Inc.

Jerry Uhl
University of Illinois

Thursday, *1:30 pm–3:15 pm*

Educators' Panel: Discovery Through Experimentation: Art and Educational Computing in Secondary Schools

High school students are demanding more than computer literacy courses. They are challenging their teachers to incorporate graphics into their specific area(s) of interest. In response, secondary schools now offer computer graphics courses which meld the arts, mathematics, and science, but facilities, equipment, and resources are limited, and students must often share computers and teach one another. This panel of secondary school educators shares examples of student work and discusses their experiences with curriculum, research, and administrative support.

Chair

Kim Abshere
Dueitt Middle School, Spring, Texas

Panelists

Dennis Crawley
Ysleta High School, El Paso, Texas

Judy Sachter
IBM Corporation

Carol Sutton
Portland Community College

Anna Ursyn
University of Wyoming

Jackie White
Los Angeles County High School for the Arts

Thursday, *3:30 pm–5:00 pm*

Educators' Panel: Education Technology: Doing With Images Makes Symbols

Just as education has much to gain from the incorporation of computers into the learning process, so does the computer graphics community stand to profit from discoveries made in the course of educational research on the nature of the learning process, interactivity, interface design, and graphics. Thus, using computers to create environments for educating kids is an endeavor that will benefit both sides of the equation. This panel reviews the opportunities for educators, students, and technology developers with illustrations of virtual reality research for education; Rowland High School, which has one of the nation's most successful student animation programs; the Vivarium Project; and hacking for education.

Because of its significance, this session is being shared between panels and the educators' program.

Chair

Coco Conn
Homer & Associates

Panelists

Jay Fenton
Farallon

Dave Master
Rowland High School

Warren Robinette
University of North Carolina

Larry Yaeger
Apple Computer, Inc.

Friday, *8:45 am–10:15 am*

Educators' Panel: Computer Graphics and Architectural Design

This panel discusses the introduction and integration of computer graphics into a design curriculum, various modeling and graphic systems that provide alternative methods for the simulation of architecture, sample student projects, and pedagogical and theoretical implications for architectural design. The panel is organized by distinct modeling and imaging techniques: simplified wireframe animation, knowledge-based computer-aided drawing, color theory and simulation techniques, and image processing.

Chair

Glenn Goldman
New Jersey Institute of Technology

Panelists

Elizabeth Bollinger
University of Houston

Richard Norman
Clemson University

James A. Turner
University of Michigan

Michael Stephen Zdepski
New Jersey Institute of Technology

Friday, *10:30 am–12:00 noon*

Educators' Panel: Integrating Computer Graphics into Design Education

The use of computer graphics in design is changing the design process and, in turn, design education. To ensure that their students are prepared for the job market, design educators must integrate computer graphics into the design curriculum. This panel brings together leaders in the field of computer-assisted industrial design (CAID) education to share their ideas and experience with design educators. The panel will be followed by an afternoon breakout discussion of issues in the use of computer graphics in design education.

Chair

Adele Newton
Alias Research Inc.

Panelists

Del Coates
San Jose State University

Hugh Dubberly
Apple Computer, Inc.

Jim Kaufman
The Ohio State University

Friday, *1:30 pm–3:15 pm*

Educators' Papers: Issues in Computer Graphics Education

Chair
Judith R. Brown
University of Iowa

Virtual Reality Learning Environments: Potentials and Challenges

Meredith Bricken
University of Washington

A Workshop on Computer Graphics for Undergraduate Faculty

G. Scott Owen and Valerie A. Miller
Georgia State University

Interdisciplinary Collaboration Case Study in Computer Graphics Education: "Venus and Milo"

Donna Cox
University of Illinois

An Engineering Graphics Curriculum Model with Multidisciplinary Implications

Michael B. McGrath
Colorado School of Mines

Gary R. Bertoline
Purdue University

Del Bowers
Arizona State University

Michael H. Pleck
University of Illinois

Mary Sadowski
Purdue University

Fundamentals Seminar

Terminology and First Principles of Computer Graphics

Sunday, 28 July
2:00 pm to 5:00 pm
Las Vegas Convention Center, S27

Again in 1991, SIGGRAPH hosts a seminar for those who wish to learn about the basic terminology of computer graphics, the salient features of graphics hardware, and the software needed to control the hardware.

Graphics hardware is presented in terms of its relation to application needs. Graphics software is discussed from a conceptual viewpoint, rather than in terms of implementation. Generic operations such as line drawing, text display, area filling, and geometric transformations are described without using programming. Particular emphasis is placed on the relationship between software techniques and applications such as engineering design, presentation graphics, CAD, graphic design, fine arts, business, statistics, simulation, and data visualization.

All SIGGRAPH '91 attendees are invited; there is no additional charge. Seminar notes will be distributed.

Lecturer
R. Daniel Bergeron
University of New Hampshire

Art and Design Show

The traditional SIGGRAPH exhibition of computer-assisted art has been expanded for 1991. This year, for the first time, the show presents works in two distinct categories, with a separate jury for each: fine arts and design.

From hundreds of submissions, the juries have selected outstanding examples of work that illustrates the influence of computer graphics technology on the visual language of art and design. The show includes 2D, 3D, dynamic, and interactive projects that explore esthetic issues and/or convey messages and images within defined communication objectives.

The SIGGRAPH '91 art and design show is on display Monday–Thursday, 9:00 am to 7:00 pm and Friday, 9:00 am to 2:00 pm, on the first floor of the Las Vegas Convention Center, S108-S110.

Admission to the art and design show and one copy of the show catalog are included with courses and/or papers/panels registration. The catalog features juried essays as well as high-quality reproductions of selected works from the show.

Exhibits-only and educators' program registrants are admitted to the art and design show but do not automatically receive a catalog. Additional catalogs are available for purchase at SIGGRAPH '91.

Electronic Theatre and Computer Graphics Screening Rooms

Artists, scientists, and producers from around the world send the best of their recent work to the annual SIGGRAPH conference, the premiere international venue for computer-generated imagery. This year's program has been assembled by the SIGGRAPH '91 electronic theatre jury for three nights of screenings on huge projection displays. The same program is shown each night, Tuesday through Thursday, 7:30 pm to 9:30 pm in the Las Vegas Convention Center, Hall S5.

As usual, the electronic theatre is expected to be a major highlight of SIGGRAPH '91. It presents exceptional achievements in computer-based film and video production for art, television, corporate communications, education, industry, motion pictures, research, and science. It also includes less traditional productions featuring stereoscopic imagery, multimedia performance, and audience participation.

One of these special productions is the world premiere of *Invisible Site* by George Coates Performance Works, a live, stereoscopic, real-time, multimedia theatrical performance. *Invisible Site* is shown Tuesday through Thursday, 6:00 pm to 6:45 pm and 10:30 pm to 11:15 pm, in the Artemus W. Ham Concert Hall at the University of Nevada Las Vegas.

Admission to one presentation of the electronic theatre and *Invisible Site* is included with courses and/or papers/panels registration (but not with exhibits only or educators' program registration). Only one ticket for each is issued per registrant. Additional tickets for all presentations may be purchased after 7:30 am Tuesday, subject to availability.

The following film and video works are presented in all three showings of the SIGGRAPH '91 electronic theatre:

Opening Sequence (stereoscopic)
Contact:
Alain Chesnais
Studio Base 2
121 Route de Bordeaux
16000 Angouleme, France
33-45-928-411
33-45-958-730 (fax)

The Ancient World Revisited
Contact:
Makoto Majima
Taisei Corporation
Design & Proposal Division
25-1, Nishi-Shinjuku
1-Chome, Shinjuku-ku
Tokyo 163 Japan
81-3-3348-1111
81-3-3345-6256 (fax)

The Astronomers
Contact:
Jeff Kleiser
6105 Mulholland Highway
Hollywood, CA 90068 USA
213-467-3563
213-467-3583 (fax)

Broadcast Designers Association Open
Contact:
Helene Plotkin
Xaos Inc.
350 Townsend Street, #101
San Francisco, CA 94107 USA
415-243-8467
415-243-9562 (fax)

Clear Mind & Kooshball
Contact:
Dobbie Schiff
MetroLight Studios, Inc.
5724 West 3rd Street, Suite 400
Los Angeles, CA 90036 USA
213-932-0400
213-932-8440 (fax)

Color Bars
Contact:
Michael Keeler
Kubota Pacific Computer
2630 Walsh Avenue
Santa Clara, CA 95051 USA
408-748-6314
408-748-6301 (fax)

Cosmological N-Body Simulations
Contact:
Peter Richards
Massachusetts Institute of Technology
Technology Licensing Office
Building E 32-300
28 Carleton Street
Cambridge, MA 02139 USA
617-253-6966
617-258-6790 (fax)

Digitaline
Contact:
Jean Francois Matteudi
Agave S.A.
67 Rue Robespierre
CAP 108
93558 Montreuil Cedex France
33-1-48-57-89-06
33-1-48-57-93-32 (fax)

Don Quichotte
Contact:
Alain J. Guiot
Videosystem
107 Rue du Fg. St. Honore
75008 Paris, France
33-1-42-56-42-33
33-1-45-63-68-35 (fax)

Echoes of the Sun (excerpt, stereoscopic)
Contact:
Fumio Sumi
Fujitsu Limited
Computer Graphics Systems Department
1-17-25, Shinkamata, Ota-Ku
Tokyo 144 Japan
81-3-3730-3229
81-3-3734-4691 (fax)

Enter the Elgin
Contact:
Pat Hunter
Alias Research, Inc.
110 Richmond Street East
Toronto, Ontario M5C 1P1 Canada
416-362-9181
416-362-0630 (fax)

Evolution of Gravity and Effective Topography on Phobos
Contact:
Wayne Lytle
Cornell National Supercomputer Facility
619 Theory Center Building
Cornell University
Ithaca, NY 14853 USA
607-254-8793
607-254-8888 (fax)

Festival (excerpt)
Contact:
Yoichiro Kawaguchi
Nippon Electronics College
1-25-4, Hyakunin cho.
Shinjuku-ku, Tokyo 169 Japan
81-3-3369-1995
81-3-3363-7685 (fax)

Fire Beast
Contact:
Ryoichiro Debuchi
Court-Setagaya-101
1-15-11, Mishyuku
Setagaya-ku
Tokyo 154 Japan
81-3-3711-5111
81-3-3711-5110 (fax)

IGT (Inter Galactic Travel)
Contact:
Masaaki Taira
3-13-6 Higashi-Shinagawa
Shinagawa-Ku, Tokyo 140 Japan
81-3-3450-8181
81-3-3471-2607 (fax)

The Invisible Man in Blind Love
Contacts:
Georges Pansu
Eurocitel
1 Quai Gabriel Peri
94340 Joinville le Pont France
33-1-4397-2525
33-1-4397-1923 (fax)

Pascal Vuong
10 Place du Theatre
92310 Sevres France
33-1-4626-7606
33-1-4293-5344 (fax)

Into the 4th Dimension (stereoscopic)
Contacts:
Gary Goddard (Executive Producer)
Landmark Entertainment Group
5200 Lankershim Boulevard
North Hollywood, CA 91601 USA
818-753-6700
818-753-6767 (fax)

Rick Harper (Producer/Director)
Harper Films, Inc.
2027 Montrose Avenue
Montrose, CA 91020 USA
818-249-2630
818-790-3305 (fax)

The Key is Light
Contact:
Becky K. Naqvi
Hewlett Packard Company MS 74
3404 East Harmony Road
Fort Collins, CO 80525 USA
303-229-4503
303-229-6649 (fax)

Leaf Magic
Contact:
Alan Norton
IBM T.J. Watson Research Center
P.O. Box 704
Yorktown Heights, NY 10598 USA
914-784-7195
914-784-6273 (fax)

Lifesavers: The Good Times Roll
Contact:
Chris Wallace
Topix Computer Graphics and
Animation Inc.
217 Richmond Street West, 2nd Floor
Toronto, Ontario M5V 1W2 Canada
416-971-7711
416-971-6188 (fax)

The Listener
Contact:
Christopher Landreth
North Carolina Supercomputing Center
P.O. Box 12889
Research Triangle Park, NC 27709 USA
919-248-1141
919-248-1101 (fax)

Lost Animals
Contact:
Jean H. Kim
NHK HD/CG New York
34-12 36th Street
Astoria, NY 11106 USA
718-361-1118
718-361-1758 (fax)

Luxo Jr. in "Light & Heavy" and "Surprise"
Contact:
Ralph Guggenheim
Pixar
1001 West Cutting Boulevard
Richmond, CA 94804 USA
415-236-4000
415-236-0388 (fax)

Magellan at Venus
Contact:
Betsy Hall
Jet Propulsion Laboratory
4800 Oak Grove Drive
M/S 168-522
Pasadena, CA 91109 USA
818-354-0225
818-393-6962 (fax)

Match Light "One Match"
Contact:
Charles Gibson
Rhythm & Hues, Inc.
910 North Sycamore Avenue
Hollywood, CA 90038 USA
213-851-6500
213-851-5505 (fax)

Maxwell's Demon
Contact:
James Duesing
ML #16
University of Cincinnati
Cincinnati, OH 45219 USA
513-556-0288
513-556-3288 (fax)

Memory of Moholy-Nagy (excerpt)
Contact:
Tamas Waliczky
H-1011 Budapest
Markovits Ivan Utca 4. V/21
Hungary
36-1-202-0061
36-1-131-5307 (fax)

NASA Ames Virtual Windtunnel
Contact:
Steve Bryson
MSTO45-1
NASA Ames Research Center
Moffett Field, CA 94035 USA
415-604-4524
415-604-3957 (fax)

Nintendo Dragon
Contact:
Jill Hunt
Angel Studios
5677 Oberlin Drive, Suite 101
San Diego, CA 92121 USA
619-452-7775
619-452-8073 (fax)

Not Knot
Contact:
Charlie Gunn
1300 South 2nd Street
Minneapolis, MN 55454 USA
612-624-5058
612-626-7131 (fax)

On The Run
Contact:
Marc Raibert
545 Technology Square
Cambridge, MA 02139 USA
617-253-2478
617-258-8682 (fax)

Operation C
Contact:
Larry Lamb
1010 South 7th Street, Suite 600
Minneapolis, MN 55415 USA
612-333-8666
612-333-9173 (fax)

PDI Morph Reel
Contact:
Deborah Giarratana
Pacific Data Images
1111 Karlstad Drive
Sunnyvale, CA 94089 USA
408-745-6755
408-745-6746 (fax)

Poems of Ernst Jandl (Gedichte V.E.)
Contact:
Eku Wand
Pixel Park GmbH
Reuchlinstrasse 10-11
W-1000 Berlin 21 Germany
49-30-344-9061
49-30-345-5493 (fax)

Primordial Dance
Contact:
Karl Sims
245 First Street
Cambridge, MA 02142 USA
617-234-1000
617-234-4444 (fax)

Reaction-Diffusion Textures
Contact:
Andrew Witkin
School of Computer Science
Carnegie Mellon University
Pittsburgh, PA 15213 USA
412-268-6244
412-681-5739 (fax)

"Terminator 2" Computer Graphics Effects
Contact:
Douglas Kay
Industrial Light and Magic
P.O. Box 2459
San Rafael, CA 94912 USA
415-258-2000
415-454-4768 (fax)

20 Begonias
Contact:
Pierre Dinouard
Laboratoire de Modelisation du CIRAD
B.P. 5035
34032 Montpellier Cedex 1 France
33-67-615-995
33-67-615-820 (fax)

un Natural Phenomena
Contact:
John Hart
Electronic Visualization Laboratory
EECS Dept. M/C 154
University of Illinois at Chicago
Chicago, IL 60680-4348 USA
312-996-3002
312-413-7585 (fax)

Virtually Yours
Contact:
Matt Elson
1401 Westwood Boulevard
Los Angeles, CA 90024 USA
213-478-0681
213-478-1346 (fax)

Visualization of Battlefield Obscurants
Contact:
Geoffrey Y. Gardner
Grumman Data Systems
MS D12-237
1000 Woodbury Road
Woodbury, NY 11797 USA
516-682-8417
516-682-8022 (fax)

Voyager
Contact:
Anne Van Ogtrop
Valkieser Group B.V.
S'Gravelandseweg odo a
1217 EW Hilversum, Holland
31-35-234-858
31-35-232-711 (fax)

Wack
Contact:
Harold Buchman
Rhythm & Hues, Inc.
910 North Sycamore Avenue
Hollywood, CA 90038 USA
213-851-6500
213-851-5505 (fax)

Wanting for Bridge
Contact:
Joan I. Staveley
OSC/ACCAD
1224 Kinnear Road
Columbus, OH 43212 USA
614-292-3274
614-292-7168 (fax)

Water Caustics
Contact:
Mark Watt
22 Rue Hegesippe-Moreau
75018 Paris, France
33-1-4387-5858
33-1-4387-6111 (fax)

Wet Science
Contact:
Helene Plotkin
Xaos Inc.
350 Townsend Street, Suite 101
San Francisco, CA 94107 USA
415-243-8467
415-243-9562 (fax)

The Works of a Landscape Painter
Contact:
Eihachiro Nakamae
Faculty of Engineering
Hiroshima University
4-1, Kagamiyama 1 Chome
Higashi-Hiroshima 724 Japan
81-8-2422-7111 (ext. 3445)
81-8-2422-7195 (fax)

Les Xons "Crac-Crac"
Contact:
Mac Guff Ligne
4 Passage de la Main d'Or
75011 Paris, France
33-1-4338-4455
33-1-4700-1014 (fax)

Audience Participation
Contact:
Loren Carpenter
Pixar
1001 West Cutting Boulevard
Richmond, CA 94804 USA
415-236-4000
415-236-0388 (fax)

Invisible Site
A live, stereoscopic, real-time, theatrical performance.
Contact:
Beau Takahara
George Coates Performance Works
110 McAllister Street
San Francisco, CA 94102 USA
415-863-8520
415-863-7939 (fax)

Computer Graphics Screening Rooms
A fascinating variety of computer-generated productions, some longer and more specialized than can be accommodated in the electronic theatre, is available free of charge to all SIGGRAPH '91 registrants in the computer graphics screening rooms. All rooms are designed for optimal large-screen projection. One room features HDTV projection. Showings are continuous Wednesday and Thursday, 9:00 am to 7:00 pm, and Friday, 9:00 am to 2:00 pm, in the Las Vegas Convention Center, S26 and S111-113.

Open Deck
The open deck provides video playback equipment for individuals who wish to share their video productions with other SIGGRAPH '91 attendees. Access to the equipment is scheduled in the electronic theatre office, S205, Las Vegas Convention Center, 702-792-3502, first-come, first-served. The open deck is available Wednesday, Thursday, and Friday.

Tomorrow's Realities

This specially-designed SIGGRAPH '91 gallery introduces attendees to the new interactive environments facilitated by dynamic interaction with advanced technologies.

Here, attendees can enter networked virtual realities, explore hypermedia documents, and review displays that reveal the breadth and depth of interactive technologies.

Virtual reality demonstrations and hypermedia exhibits are open to all SIGGRAPH '91 attendees Monday, 9:00 am to 6:00 pm; Tuesday through Thursday, 9:00 am to 7:00 pm, and Friday, 9:00 am to 2:00 pm. They are located behind the exhibition in Halls S3 and S4 of the Las Vegas Convention Center.

A fold-out guide to the Tomorrow's Realities demonstrations and displays is in the back of this program.

Virtual Reality

For the first time, SIGGRAPH '91 presents a juried selection of virtual reality applications demonstrations. These systems apply a broad range of sensory inputs and outputs, and human-machine interfaces, to create virtual worlds. Although applications are the focus, new input/output devices (such as boom-supported head-mount displays) will also be demonstrated.

Some systems enable participants to perform practical tasks such as medical simulation, scientific research, complex industrial design, or manufacturing assembly simulation. Others create alternative environments for entertainment, recreation, exercise, or fantasy. Some are designed for solo exploration. Others allow several participants to explore and collaborate in the same virtual reality simultaneously.

Hypermedia

These innovative displays merge still and dynamic images, print, and audio to create entertaining, engaging, interactive environments that encourage exploration. Their imaginative application of computer graphics technologies allows observers to interact with the material and move seamlessly from general information to specific details.

Workshops

Three topics have been selected for exploration in one- or two-day workshops at SIGGRAPH '91. The workshops are designed to be lively small group discussions of work in progress or important issues in computer graphics.

For that reason, attendance was preselected and limited to 25 people for each workshop. Position statements were submitted to the workshop organizers, who selected the most interesting, significant mix of viewpoints.

All conference attendees are invited to participate in the following discussion sessions, at which workshop deliberations will be presented:

Wednesday
Computer Graphics in the Network Environment
3:30 pm to 5:00 pm
Room N114
Las Vegas Convention Center
Contact:
David Oliver
University of Massachusetts

Thursday
Integrating Computer Graphics, Computer Vision and Image Processing in Scientific Applications
1:30 pm to 3:00 pm
Room N114
Las Vegas Convention Center
Contact:
Indranil Chakravarty
Schlumberger Laboratory for Computer Science
Ingrid Carlbom
Digital Equipment Corporation
Cambridge Research Lab

Conference attendees who are registered for papers/panels may attend the panel "HDTV: Technology and Directions" on Thursday, 1:30 pm to 5:00 pm, in the Las Vegas Convention Center, S27, to hear a report on the third workshop.

Written reports on the results from all three workshops will appear in a 1992 issue of *Computer Graphics*.

Special Interest Groups

Special interest groups are organized around particular products, topics, or problems. They are excellent forums for SIGGRAPH '91 attendees who share common interests and concerns to get to know each other and exchange ideas.

Special interest group meetings are usually informal and open to all attendees. Some are scheduled to discuss general subjects. Others convene around topics related to specific product vendors. During the conference, the list of special interest groups will grow larger and larger as attendees take advantage of the birds-of-a-feather program — an opportunity to call meetings that focus on last-minute ideas. To organize your own impromptu meeting, simply use the sign-up board in the registration area (East Hall, Las Vegas Convention Center), where late additions and revisions to the special interest groups schedule are posted.

The following special interest groups are convening during SIGGRAPH '91. For each, the person listed can provide you with additional information.

Sunday, 28 July 1991

PictureMaker Users Group (PMUG)
9:00 am–6:00 pm
Las Vegas Convention Center, Room N119
Jim Newton
415-591-8978

X3H3.6-Windowing
9:00 am–6:00 pm
Las Vegas Convention Center, Room N223
Michelle A. Montion
508-934-3623

WAVE '91 Wavefront User Group
10:00 am–10:00 pm
Caesars Palace, Augustus Room
Rhonda Sanders Olson
602-371-8880

Education Committee Art Curriculum
4:30 pm–6:30 pm
Las Vegas Convention Center, Room N230
G. Scott Owen
404-651-2245

Monday, 29 July 1991

Electronic Theatre
5:00 pm–7:00 pm
Caesars Palace, Vespesian Room
G. Scott Owen
404-651-2245

SMPTE Task Force on Digital Image Architecture
5:00 pm–7:00 pm
Las Vegas Convention Center, Room N226
David Tizcinski
508-256-6600

After Hours SIG
11:00 pm–4:00 am
Caesars Palace, Regalium Room

Tuesday, 30 July 1991

Video Toaster Users Group
11:00 am–4:00 pm
Caesars Palace, Galba Room
Lee Stranahan
818-505-1464

Silicon Graphics Visualization
4:00 pm–6:00 pm
Las Vegas Convention Center, Room N227
Crystal Van Brug
415-960-1980

Local and Distributed Storage Management Group
4:00 pm–6:30 pm
Las Vegas Convention Center, Room N118
T. Jenny Chang
303-924-6310

SMPTE Study Group on High-Quality Digital Image Compression
4:30 pm–6:30 pm
Las Vegas Convention Center, Room N223
Gary Demos
213-837-2985

PEX Interest Group
5:30 pm–7:30 pm
Las Vegas Convention Center, Room S101
Marty Hess
415-336-6374

After Hours SIG
11:00 pm–4:00 am
Caesars Palace, Regalium Room

Wednesday, 31 July 1991

Technology in Design Offices
10:30 am–12:00 noon
Las Vegas Convention Center, Room N118
Lorraine Justice
614-292-1077

Edugraphics
12:00 noon–1:00 pm
Las Vegas Convention Center, Room N119
Dennis J. Crawley
915-858-0317

YLEM: Artists Using Science and Technology
12:00 noon–1:30 pm
Las Vegas Convention Center, Room N227
Eleanor Kent
415-647-8503

Voxels and Geometry in One Image
1:00 pm–2:00 pm
Las Vegas Convention Center, Room N223
Maggie Vancik
515-472-7726

Amiga Educators Group
1:00 pm–3:00 pm
Las Vegas Convention Center, Room N228
Carol J. Sutton
503-284-9429

Omnimax Computer Animation Film
1:30 pm–3:15 pm
Las Vegas Convention Center, Room N229
Steven Churchill
619-452-6800

Graphics Performance Characterization (GPC) Committee
2:00 pm–3:00 pm
Las Vegas Convention Center, Room N116
Bob Cramblitt
919-481-4599

Molecular Graphics
2:00 pm–3:30 pm
Las Vegas Convention Center, Room N226
Michael Pique
619-554-9775

AVS Users Group
3:00 pm–6:00 pm
Las Vegas Convention Center, Room N117
Sharon Cullina
508-287-0100, ext. 549

Doré User Group
3:30 pm–5:00 pm
Las Vegas Convention Center, Room N119
Kevin Weiler
408-748-6343

Pixar Hardware and Software Users Group
4:00 pm–5:30 pm
Las Vegas Convention Center, Room N204
Sandy Staufenbiel
415-498-3284

Silicon Graphics 3D Tool Kit Developers
4:00 pm–6:00 pm
Las Vegas Convention Center, Room N115
Crystal Van Brug
415-960-1980

MOVIE.BYU User Group
5:00 pm–6:30 pm
Las Vegas Convention Center, Room N118
Kris Leavitt
801-378-2812

Sun Graphics and Visualization User Group
5:30 pm–7:00 pm
Las Vegas Convention Center, Room N227
Donna McMillan
919-469-8300

Computer Graphics Pioneers
6:00 pm–9:00 pm
Caesars Palace, Claudius Room
Ken Anderson
805-581-1184

After Hours SIG
11:00 pm–4:00 am
Caesars Palace, Regalium Room

Thursday, 1 August 1991

Graphics Education in Computer Science
10:00 am–11:00 am
Las Vegas Convention Center, Room N118
Jeffrey J. McConnell
716-888-2434

Self-Assessment Procedure in Graphics
5:00 pm–6:00 pm
Las Vegas Convention Center, Room N227
Jeffrey J. McConnell
716-888-2434

Ray Tracing
5:15 pm–6:30 pm
Las Vegas Convention Center, Room N223
Eric Haines
607-257-1381

Project "Edugraphics"
5:30 pm–6:30 pm
Las Vegas Convention Center, Room N118
Dennis Crawley
915-858-0317

SIGTSHIRT — SIGGRAPH '91 T-Shirt Contest
6:00 pm–8:00 pm
Las Vegas Convention Center, Room N119
Jock Mackinlay
415-494-4335

After Hours SIG
11:00 pm–4:00 am
Caesars Palace, Regalium Room

Friday, 2 August 1991

Industry/University Collaboration
10:00 am–12:00 Noon
Las Vegas Convention Center, Room N118
Bob Ellis
415-336-6486

Executive Committee Meeting

The ACM SIGGRAPH Executive Committee holds an open meeting on Thursday, 1 August, 5:30 pm to 7:30 pm in the Titus Room, Caesars Palace. All ACM SIGGRAPH members are invited to attend.

PEX Demonstration

At SIGGRAPH '91, for the first time, commercially available 3D graphics applications will be demonstrated on a multivendor network of systems, ranging from PEX terminals to workstations to supercomputers. (PEX is the 3D extension to the X Window System.) Several SIGGRAPH exhibitors have joined forces — as part of the MIT X Consortium — to present solutions for distributing 3D graphics applications across multiple dissimilar computing platforms using the X Window System.

Companies participating in the demonstration sponsored by the PEX Interoperability Committee include: CONVEX, Digital Equipment, Evans & Sutherland, Hewlett-Packard, IBM, Kubota, ShoGraphics, Stardent, Sun Microsystems, and Tektronix. All companies participating in the PEX demonstration will be networked on the SIGGRAPH exhibition floor, so attendees can visit any of their booths to witness this important demonstration.

Additional demonstration details and complete schedules are available from the PEX Interoperability Committee, booth 1613 (see page 100).

E X H I B I T I O N

The three-day SIGGRAPH '91 exhibition is the world's premiere showcase for displaying and seeing the very latest in computer graphics hardware, software, applications, systems, and ideas. More than 225 exhibitors are displaying their products and services to an international audience of 25,000-30,000 people from industry, government, and the arts.

The exhibition is located at the center of SIGGRAPH '91: over 110,000 square feet in the ultra-modern Las Vegas Convention Center, Halls S3 and S4. It is open to all courses, papers/panels, and educators' program registrants. Others may register for exhibits-only at the SIGGRAPH '91 registration desk. Exhibits-only registration also includes entrance to the opening session, art and design show, fundamentals seminar, and Tomorrow's Realities.

SIGGRAPH '91 exhibition dates and hours are:

Tuesday and Wednesday
10:00 am to 6:00 pm

Thursday
9:00 am to 3:30 pm

Children under 16 are not permitted to attend the exhibition.

Abekas
Booth 1044

101 Galveston Drive
Redwood City, CA 94063
415-369-5111; 415-369-4777 (fax)
Pete Mountanos
Vice President Marketing/Sales

Using Ethernet and SCSI, the A60 Digital Disk Recorder offers the perfect interface to animation computers for video transfer and machine control. The A60 provides real-time digital video recording and playback. The A72 Digital Character Generator eliminates rendering time required for creating characters and includes animation and compositing capabilities.

Academic Press
Booth 1746

1250 Sixth Avenue
San Diego, CA 92101
619-699-6741; 619-699-6715 (fax)
Alison Kent
National Exhibit Coordinator

Academic Press is a leading international publisher of research and professional-level books and journals in computer graphics. Featured titles include *Graphic Gems II, Effective Color Displays, Oriented Projective Geometry, Curves and Surfaces,* and the software package Fractal Attraction.

ACM SIGGRAPH
Hall S2

11 W. 42nd Street
New York, NY 10036
212-869-7440; 212-764-5537 (fax)

The Association for Computing Machinery's Special Interest Group on Computer Graphics is the sponsoring organization of the ACM SIGGRAPH conference. It services its 12,000 members and the computer graphics community at large with a variety of programs, including: publications; SIGGRAPH *Video Review*; educational, international, and standards activities; special projects; traveling art show; local groups; and an awards program. Visit the booth to discuss your interests with SIGGRAPH's volunteer leadership.

Acrobat Graphics Systems
Booth 2237

3 Soho Street
London, United Kingdom W1V 5FA
44-71-287-3626; 44-494-2822 (fax)
Lynwen Goldspink
Marketing Manager

Acrobat Graphics Systems introduces three exciting products to the United States at SIGGRAPH '91; MATADOR 2D animation featuring multiple animation of raster cutouts, vector shapes, and paint processing; COLOURBURST, a fully featured, fast broadcast-quality paint system with high-resolution options; and ACROBAT, our successful 3D modeling and animation system. MATADOR and COLOURBURST will be shown fully integrated with ACROBAT. All products run on the Silicon Graphics Personal Iris.

Addison-Wesley Publishing Company

Booth 623

1 Jacob Way
Reading, MA 01867
617-944-3700; 617-944-8964 (fax)
Denise Descoteaux
Product Manager, Computer Science

Addison-Wesley presents books for students and professionals. See the second edition of Foley, van Dam, Feiner, and Hughes, *Computer Graphics: Principles and Practice.* Also *Artificial Reality II* by Myron Krueger, *Computers as Theatre* by Brenda Laurel, and the first book in the ACM Press Tutorial Series, *Graphic Design for Electronic Documents and User Interfaces,* by Aaron Marcus.

Advanced Imaging Magazine

Booth 344

445 Broad Hollow Road
Melville, NY 11747
516-845-2700; 516-845-2797 (fax)
Charles Grecky
Publisher

Advanced Imaging is the one and only international magazine dedicated to the needs of the imaging professional. *Advanced Imaging* offers comprehensive monthly coverage of all the facets of electronic imaging: capture, processing, display, storage, output, and transmission of images, text, and data.

Advanced Technology Center

Booth 138

22982 Mill Creek Drive
Laguna Hills, CA 92653
714-583-9119; 714-583-9213 (fax)
Ingrid Leon
Sales Representative

The following ANSI standard graphics tools are available: GRAFPAK-GKS graphics library with ADA, C, FORTRAN, and X-Windows support; CGM-View for preview and hardcopy output of CGMs; CTS/METACHECK, the CGM conformance analyzer; GRAFPAK-CGM for producing CGM files; AdaGRAPH Ada bindings and programming services; and TRANSLATE-CGM which converts various file formats to CGM.

Alacron, Inc.

Booth 142

71 Spitbrook Road, Suite 204
Nashua, NH 03060
603-891-2750; 603-891-2745 (fax)
Cheryl L. Stevens
Sales and Marketing Specialist

Alacron, a producer of i860 AT/VME products for computation, graphics, and imaging, announces the AL860XP. The AL860XP runs at 100 MFLOPS and 50 MIPS, with 4/16 Mbytes DRAM, supporting high-resolution graphics, SCSI, and DT-Connect. Alacron is also announcing UNIX V.4 and X Windows (XII.4) for the AL860XP.

Alias Research Inc.
Booth 820

110 Richmond Street East
Toronto, Ontario, Canada M5C 1P1
416-362-9181; 416-362-0630 (fax)
Susan Anderson
Tradeshow and Events Manager

Alias exhibits Alias Designer and Alias Studio, the world's most advanced software for 3D industrial design and styling; Alias Animator and PowerAnimator, state-of-the-art software for 3D animation and special effects; Alias full-color, pre-press software for photo-retouch, page layout, and separations; and Alias Sonata, high-performance software for 3D architectural design.

Alias Research Inc., Style! Division
Booth 1607

110 Richmond Street East, 4th Floor
Toronto, Ontario, Canada M5C 1P1
416-362-9181; 416-362-0630 (fax)
Anne Christie
Style Administrator

Alias Style! Division announces a new 3D freeform sketching product for the Macintosh that represents a breakthrough in computer graphics. Alias Style! Division also presents a significant enhancement to Alias Upfront, which is rapidly being accepted as the first interactive 3D drawing tool for people who work with space and form and is available for Microsoft Windows and the Macintosh.

Alliant Computer Systems Corporation
Booth 2016

One Monarch Drive
Littleton, MA 01460
508-486-4950; 508-486-1398 (fax)
Dianne Capps
Marketing Communications Manager

Alliant Computer Systems demonstrates the FX/2800 family of RISC-based supercomputers. The FX/2800 family offers stand-alone and distributed supercomputing solutions to handle technical challenges at the scientific data center, departmental, or project level. The FX/2800 with 28 i860 processors delivers 1.12 GFLOPS (double precision) and 1148 VAX MIPS.

American Institute of Physics
Booth 130

335 East 45th Street
New York, NY 10017
212-661-9260; 212-661-2036 (fax)
Christopher Verdesi
Sales Assistant

American Institute of Physics is the publisher of *Computers in Physics,* the bimonthly magazine resource for all scientists and educators interested in numerical computation, simulation, visualization, and networking.

American Power Conversion
Booth 237

132 Fairgrounds Road
West Kingston, RI 02892
401-789-5735; 401-789-3710 (fax)
Monique Gulati
Corporate Communications Manager

American Power Conversion is a leading manufacturer of Uninterruptible Power Supplies (UPS). UPSs are designed to protect computers and other sensitive electronic equipment from the hazards of raw utility power, such as blackouts, brownouts, spikes, surges, and line noise. APC's product line ranges from 110VA, designed for the Macintosh, to 2000VA for several supermicro computers or a clustered network.

Ampex Corporation
Booth 431

401 Broadway, M/S 3-23
Redwood City, CA 94063
415-367-3436; 415-367-3106 (fax)
Steve Atkinson
DD-2 Marketing Manager

Ampex presents the TeraAccess automated cassette library: tape-based data storage for the supercomputing industry. The TeraAccess puts 6.4 terabytes of data on line, holds up to 4 TeraStore recorders, 256 D-2 cassettes, and occupies only 21 square feet of floor space. The TeraStore's tape capacity is 125 times greater than current technologies.

Analog Devices, Inc.
Booth 2040

Two Technology Way
Norwood, MA 02062
617-329-4700; 617-326-8703 (fax)
Vicki Chase
Marketing Promotions Specialist

Analog Devices is a leading manufacturer of integrated circuits for image capture, manipulation, and display, including analog/digital converters, video amplifiers, digital/analog converters, and digital signal processing devices.

Analogic Corporation, Computer Design & Applications Division
Booth 1144

8 Centennial Drive
Peabody, MA 01960
508-977-3000; 508-531-0567 (fax)
Nancy Pratti
Senior Sales and Marketing Administrator

Analogic/CDA manufactures image processors, signal processors, and data acquisition devices for DEC, SUN, HP, and VME platforms. Primary products are the DASM series of SCSI-based acquisition peripherals for busless workstations, the MSP-6C30 VME signal processor (66 MFLOPS), the MSP-D860 SCSI-based application accelerator (80 MFLOPS), and the MDP-6C30 image processor.

Apple Computer, Inc.
Booth 1007

20525 Mariani Avenue
Cupertino, CA 95014
408-996-1010; 408-974-3880 (fax)

Apple showcases the Macintosh computer, the premier personal computing platform for high-end graphics. The Macintosh provides a single-platform solution for scientific visualization, design, modeling, rendering, and animation applications, as well as unparalleled personal productivity applications, allowing individuals to address all aspects of their work.

Asaca/Shibasoku Coporation of America
Booth 832

12509 Beatrice Street
Los Angeles, CA 90066
213-827-7144; 213-306-1382 (fax)
Teresa Baker
Sales Coordinator

The Asaca system includes ADS-7800 HDTV Magneto-Optical Disk Still Store and supporting peripheral hardware which includes the AAM-800 Magneto-Optical Disk Audio File, the CM321 HDTV 32″ Color Monitor, and the CM22B6 HDTV 20″ Color Monitor.

Ascension Technology Corporation
Booth 107

P.O. Box 527
Burlington, VT 05402
802-655-7879; 802-655-5904 (fax)
Jack Scully
Vice President

Ascension markets a family of six degrees-of-freedom input and tracking devices. Its "Bird" measures the position and orientation in free space of a tiny receiver. Its "Flock of Birds" tracks multiple receivers over extended ranges. Its "Big Bird" transmitter further extends tracking, especially for virtual reality applications.

Association for Computing Machinery
Hall S2

11 West 42nd Street
New York, NY 10036
212-869-7440; 212-944-1318 (fax)

ACM is displaying its major journals, including *Transactions on Graphics* (TOG), Special Interest Group (SIG) newsletters, and conference proceedings, SIGGRAPH newsletters and conference proceedings are featured. Individuals may join ACM, SIGGRAPH, or other SIGs at the ACM booth.

Aster Publishing/CADalyst Magazine
Booth 108

859 Willamette Street
Eugene, OR 97401
503-343-1200; 503-343-3641 (fax)
John Kiesewelter
Publisher

AT&T Graphics Software Labs
Booth 817

3520 Commerce Crossing, Suite 300
Indianapolis, IN 46240
317-844-4364; 317-575-0649 (fax)
Sara Benken
Exhibits and Training Manager

AT&T Graphics Software Labs offers a variety of high-resolution, full-color software applications including: RIO, 2D design and layout software; RIO Animator, 2D animation software, TOPAS, 3D solids modeling and animation package; Sable, raster paint package; ImagePaint, image processing software; Panorama, image sequencing software; and Logo Editor, spline-based creation tool.

ATI Technologies Inc.
Booth 1449

3761 Victoria Park Avenue
Scarborough, Ontario, Canada M1W 3S2
416-756-0718; 416-756-0720 (fax)
Henry Quan
Director of Marketing

ATI Technologies displays its complete line of graphics, multimedia, and communications cards. Included are high-resolution graphics co-processors, full-color displays, and stereo sound cards.

Autodesk Multimedia Division
Booth 207

2320 Marinship Way
Sausalito, CA 94965
415-332-2344; 415-331-8093 (fax)
Kathleen Doney
Manager, Marketing Communications

Autodesk Multimedia is displaying its full range of graphic software products for personal computers including: Autodesk 3D Studio, a professional-quality, 3D modeling, rendering, and animation package; Autodesk Animator Pro, a full-featured 2D animation and paint package; and Autodesk Animation Player for windows, a tool for playing exciting 2D and 3D animations either inside a Microsoft Window or using the full screen.

AVC's Presentation Development & Delivery

Booth 344

445 Broad Hollow Road
Melville, NY 11747
516-845-2700; 516-845-2797 (fax)
Paul McGinnis
Publisher

AVC's Presentation Development & Delivery provides peer and product information to people who, for their organization or client's organization, are responsible for presentations, from concept to finished form, based in AV, computer, video, audio or combined technologies, and are responsible for the development and delivery of the required equipment and outside services.

AXA Corporation

Booth 220

17752 Mitchell, Suite C
Irvine, CA 92714
714-757-1500; 714-757-1766 (fax)
Rose Marie Menapace
Sales Administration

QuickCEL is a 2D cel animation software system, based on ATVista platform, capable of pencil drawing input, emulating the traditional studio process. AXA Water-Color is a unique paint program, running on the HiColor VGA adapters or Truevision's ATVista, Targa, or Targa+ board. Traditional environments are faithfully reproduced; artists don't have to relearn their craft.

AZTEK, Inc.

Booth 2031

15 Marconi
Irvine, CA 92718
714-770-8406; 714-770-4986 (fax)
Patricia Murphy
Assistant to the President

AZTEK is displaying a comprehensive line of professional production graphics systems. AZartist, Imagizer, and Production Manager application software are demonstrated on open-architecture 386-based hardware. A variety of optional peripheral devices offers output in the highest quality print, film, and video.

BARCO, Inc.

Booth 840

1000 Cobb Place Boulevard
Kennesaw, GA 30144
404-590-7900; 404-590-8042 (fax)

BARCO is a leading developer and manufacturer of advanced video, data and graphics visual display systems. BARCO plans to introduce the following products at SIGGRAPH '91: the Calibrator II color critical imaging monitor, the CCID 7351B LP/NP dual-scan Calibrator, the ICD 651X industrial monitor, the SCM 3346 Multidata video and data monitor, and the OCM 2846 Multidata presentation monitor. Also featured will be the BARCO 800 Retro Series Projectors.

Bit 3 Computer Corporation

Booth 1544

8120 Penn Avenue South
Minneapolis, MN 55431-1393
612-881-6955; 612-881-9674 (fax)
Jerry Medley
Sales Engineer

Bit 3 offers high speed, direct bus-to-bus interconnection adaptors for most of the popular buses and systems: IBM PC/AT, IBM PS/2 Micro Channel, IBM RISC System/6000, VMEbus, MULTIBUS I, MULTIBUS II, Sun 3, Sun 4, Sun SPARCstation, Sbus, NuBus, and DEC Q22-bus.

Brooktree Corporation

Booth 1244

9950 Barnes Canyon Road
San Diego, CA 92121
800-VIDEO IC; 619-452-1249 (fax)
Cathy Batchelor
Marketing Communications Manager

Brooktree Corporation designs, develops, and manufacturers ICs for the graphics, imaging, and ATE markets. At SIGGRAPH '91, Brooktree is showcasing the Bt484 RAMDAC, which provides workstation features for PC systems. Brooktree provides chip solutions for image capture, image processing, and image display applications.

Canon U.S.A., Inc., Graphics Systems Division

Booth 400

One Canon Plaza
Lake Success, NY 11042
516-488-6700; 516-488-6322 (fax)

CELCO, Pacific Division

Booth 620

1150 East 8th Street
Upland, CA 91786
714-985-9868; 714-982-2464 (fax)
Mitchell J. Constantine
Sales

CELCO manufactures the fastest, most reliable, ultra-high-resolution digital color film recorders available. It has incorporated over five million hours of experience over its 40-year history into its film recording products. At SIGGRAPH '91, CELCO is pleased to introduce the all new Professional series of digital color film recorders.

Chase Technologies
Booth 2236

10211 Pacific Mesa Boulevard, Suite 412
San Diego, CA 92128
619-558-3400; 619-558-1425 (fax)
Leonid Volfson
President

SoftVTR, a completely software-based animation controller, controls broadcast and industrial Sony videotape recorders through a wide range of computers. It performs all VTR functions with single-frame accuracy. Multiple VTRs can be controlled in real-time, or a "plain English" script file can be used for unattended animation recording.

CHROMATEK, INC.
Booth 607

KSP-C-1232, 100-1 Sakado
Takatsu-ku, Kawasaki-shi
Kanagawa 213, Japan
81-44-819-3477; 81-44-819-3478 (fax)
Yuji Ikushima
Director, International/Government Sales

Established in 1977 for the purpose of developing HDTV-related products, CHROMATEK is showing its Model 9120 Down Converter. Compatible with workstation scan rates between 15kHz and 128kHz, and in conjunction with extensive zoom capabilities, NTSC and all RS170A-timed signals are produced.

Commodore Business Machines, Inc.
Booth 1817

1200 Wilson Drive
West Chester, PA 19380
215-431-9100; 215-431-9465 (fax)
Christopher Kohler
Manager, Creative Media

Commodore's lineup of multimedia products includes the Amiga series of computers, CDTV, and peripheral products, which are exhibited along with a range of application solutions and technology capabilities. These systems and configurations demonstrate advanced performance applied to practical results. Special emphasis is given to video, graphics, presentation media, and interactive multimedia.

Computer Graphics World/ SIGGRAPH Show Daily
Booth 2010

One Technology Park Drive
Westford, MA 01886
508-692-0700; 508-692-0525 (fax)
Robert Holton
Publishers

Computer Graphics World is the leading international business publication covering the multibillion-dollar computer graphics market. It reaches over 180,000 decision makers and users in business, government, and educational organizations. All segments of this expanding market are covered: visual communications, graphic arts, design engineering, architectural design, science and medicine, and mapping. The *SIGGRAPH Show Daily* includes show news, conference programs and events, new products and developments, the exhibitor list, and Las Vegas entertainment opportunities.

Computer Pictures
Booth 731

25550 Hawthorne Boulevard, #314
Torrance, CA 90505
213-373-9993; 213-373-0639 (fax)
Sandra Seeger
Circulation Manager

Computer Pictures is dedicated to covering graphics applications, visual, and multimedia technologies. Emphasis is placed on the fast-growing area of microcomputer-created graphics for Fortune 1000 corporations, including marketing, architectural, engineering, publishing, medical, education, and government presentations.

Convex Computer Corporation
Booth 813

3000 Waterview Parkway
Richardson, TX 75080
214-497-4000; 214-497-4848 (fax)
Alison Peoples
Public Relations Associate

Convex, the leader in affordable supercomputing, is demonstrating a system from its C3 Series that includes the high-end C3800 family, the departmental C3400 family, and the low-cost C3200 family. Convex offers customers the broadest range of air-cooled supercomputers and the largest library of UNIX-based, third-party applications software in the industry.

Covid, Inc.
Booth 440

2400 W. 10th Place
Tempe, AZ 85281
602-966-2221; 602-966-6728 (fax)

CTX International Inc.
Booth 1823

20530 Earlgate Street
Walnut, CA 91789
714-595-6146; 714-595-6293 (fax)

CTX color monitors are produced by one of the largest display manufacturers in Taiwan. CTX products include 640x480 VGA, 1024x768 Super VGA, 1024x768 non-interlaced, 17-inch flat/square non-interlaced, and more.

Cyberware Laboratory Inc.
Booth 1923

8 Harris Court #3D
Monterey, CA 93940
408-373-1441; 408-373-3582 (fax)
David Addleman
President

Cyberware is demonstrating the latest in color 3D digitizers. A wide variety of objects may be quickly digitized into detailed geometry and color. These colored 3D surface models are proving to be valuable in animation, special effects, medicine, telecommunication, and industrial design.

Cymbolic Sciences International
Booth 126

100 Columbia, Building 200
Aliso Viejo, CA 92656
714-362-0800; 714-362-0500 (fax)
Angela Rhoads
Trade Show Coordinator

Cymbolic Sciences International (CSI) demonstrates the FIRE 1000 continuous-tone color film recording device. With resolutions of 1,270 lines per inch, and incomparable color fidelity, the FIRE 1000 film recorder is a recognized industry standard. The FIRE 1000 is currently used in the graphic arts industry for second-original output.

Dassault Electronique
Booth 246

110 E. 59th Street
New York, NY 10022
212-909-0550; 212-905-0555 (fax)
Claude Poirier
Vice President Sales

Dassault Electronique presents graphic boards solutions. The GMC is a high-resolution (up to 1600x1280) color board. The CGC has unique features: graphics and telecom (Ethernet, x25) (1024x768). Graphic and communication software under DOS, OS/2 and UNIX are available.

Diaquest, Inc.
Booth 113

1440 San Pablo Avenue
Berkeley, CA 94702
415-526-7167; 415-526-7073 (fax)
Louise R. Ledeen
Director of Marketing

Diaquest demonstrates videographic animation systems featuring single frame recording, editing, and sequential frame digitizing for broadcast television, scientific visualization, and multimedia applications. Diaquest animation control products include: board-level controllers for the PC, Macintosh, and Amiga/Toaster; the Series II, a platform-independent device; and ImageNode systems for networked environments.

Digital Arts
Booth 417

7050 Convoy Court
San Diego, CA 92111
619-541-2055; 619-541-2655 (fax)
Georgene Littlefair
Sales Manager

Digital Arts displays DGS Build, Animate, Render and DGS Paint for PCs: Digital Arts also introduces Verson 4.0, powerful animation and paint software with unlimited capability, on IrisVision and SGI's Personal Iris.

Digital Equipment Corporation
Booth 1800

146 Main Street
Maynard, MA 01754
508-493-5111; 508-493-8780 (fax)
Betty Lynch
Marketing Specialist

Digital opens a winning hand at SIGGRAPH '91 by demonstrating the capabilities of the first ACE-compatible system: the DECstation 5000/100. A variety of visualization and 3D applications, graphics workstations, color printers, and peripherals demonstrate Digital's expanding presence in the graphics market. A multimedia technology display demonstrates Digital's leadership in networked, distributed multimedia.

Digital F/X
Booth 407

755 Ravendale Drive
Mountain View, CA 94043
415-961-2800; 415-961-6990 (fax)
Beverly Burton
Marketing Coordinator

The Video F/X desktop video production system integrates all the editing functions required to produce professional quality videos from storyboarding to frame accurate A/B video editing. The Composium digital production system represents the most cost-effective digital compositing solution available. It integrates graphics creation tools and a digital library in one system operating in real-time.

Digital Micronics, Inc.
Booth 707

5674 El Camino Real, Suite P
Carlsbad, CA 92008
619-431-8301; 619-931-8516 (fax)
Chuck Youde
Vice President

Digital Micronics, Inc. brings Commodore Amiga computers into a new realm of resolution. DMI's new high-resolution graphics co-processor boards, at 1280 x 1024 resolution, give over five times the definition of standard 640 x 400 Amiga displays. Eight-bit and 24-bit graphics and a 24-bit color palette provide photo-realistic images.

Digital Review/Cahners Publishing Company

Booth 740

275 Washington Street
Newton, MA 01258
617-630-2149; 617-630-2146 (fax)
Corie Rand
Corporate Trade Show Coordinator

Digital Review, a Cahners Publication, is the weekly independent newspaper and test lab of DEC computing, serving buyers at 97 percent of DEC VAX systems in North America. Buyers depend on *Digital Review* for the latest news; in depth, hands-on product reviews and benchmarks; and DEC-market analysis.

Dimension Technologies, Inc.

Booth 2047

176 Anderson Avenue
Rochester, NY 14607
716-442-7450; 716-442-7589 (fax)

Double M Industries

Booth 2635

1520 Royston Lane
Round Rock, TX 78664
512-251-4044; 512-251-4807 (fax)

Du Pont Pixel Systems

Booth 1040

600 Eagle Run Road
Newark, DE 19702
800-542-1484; 302-733-8601 (fax)
Mike King
Marketing Manager

Du Pont Pixel, "The Visual Engineers," supply visual processing products and engineering solutions to OEMs worldwide. Du Pont Pixel has developed these solutions around the "fusion" concept, which brings together graphics, imaging, and numerics in a single product line. If you are an OEM, and you have graphics, imaging, and/or array processing needs, come talk to Du Pont Pixel.

Dynamic Graphics, Inc.

Booth 1049

1015 Atlantic Avenue
Alameda, CA 94501
415-522-0700; 415-522-5670 (fax)
Skip Pack
Product Manager

Dynamic Graphics, Inc. develops and markets workstation software used by earth scientists to model, map, visualize, and analyze surface and property data in two and three dimensions.

Eastman Kodak Company

Booth 2213

343 State Street
Rochester, NY 14650
800-44-KODAK; 716-724-9416 (fax)

Eastman Kodak Company displays thermal printing systems capable of producing photographic quality continuous-tone color hard copies from digital sources. The company features its large format printer, XL 7700, as well as its SV6510 medium-format printer. In addition, Kodak will show the new 35mm Rapid Film Scanner.

Esprit Projection Systems

Booth 626

1301 Armstrong Drive
Titusville, FL 32780
407-269-6680; 407-267-6211 (fax)

Eurographics

Booth 527

P.O. Box 16
1288 Aire-la-Ville, Switzerland
44-61-275-6158; 44-61-275-6236 (fax)
Roger J. Hubbold
Chair of Promotions Board

Eurographics is the European Association for Computer Graphics, a professional association for those working in computer graphics, human-computer interfaces, multimedia, visualization, and related areas. Services include conferences, technical workshops, courses, and publication of the *Computer Graphics Forum* journal, conference and workshop proceedings, and technical reports.

Evans & Sutherland
Booth 1807

580 Arapeen Drive
Salt Lake City, UT 84108
801-582-5847; 801-582-9413 (fax)
Pamela Donaldson
Marketing Coordinator

The Evans & Sutherland booth features the latest in both simulation and graphics technology. Visitors can see the sophistication and image quality of the ESIG-2000 low-cost image generator. CDRS industrial design software and AVS visualization tools are demonstrated on ESV high-performance graphics workstations.

Everex Systems, Inc.
Booth 644

48431 Milmont Drive
Fremont, CA 94538
415-683-2059; 415-651-0728 (fax)
Craig Sanchez
Tradeshow Coordinator

Everex Systems, Inc. offers a comprehensive line of IBM-compatible computer systems and peripherals. Everex's graphics board line includes monochrome CGA, VGA, VGA-to-television-rate video, image capture, and 8514 cards. Each Everex product is engineered with state-of-the-art technology for top performance and affordability.

Evolution Computing
Booth 849

437 S. 48th Street, #106
Tempe, AZ 85281
602-967-8633; 602-968-4325 (fax)

Extron Electronics
Booth 1644

13554 Larwin Circle
Santa Fe Springs, CA 90670
213-802-8804; 213-802-2741 (fax)
Ivan Perez
Marketing and Sales

Extron Electronics is a leading manufacturer of computer-video interfaces, switchers, and distribution amplifiers. Extron's RGB video routing products allow use of local computer displays, while simultaneously routing signals to one or more compatible presentation display products such as: data projectors, data monitors, RGB printers, or LCD projection panels. The Extron product line includes compatibility with all of today's personal computers as well as system-oriented products designed to handle the demands of high-resolution CAD/CAM computer systems.

F and S, Inc. (FSI)

Booth 2615

1019 14th Street
Columbus, GA 31901
404-324-6308; 404-324-6495 (fax)
Lisa R. Griffith
Marketing Director

Effortless, high-end quality for separations on a PC is finally here. F and S, Inc. is introducing its revolutionary software package at SIGGRAPH '91. The Kolorist package includes three modules: PreHue, a soft-proofing program; The Kolorist color correction and separations program; and Kolorist Kalibration, an alignment program between the computer and output device. The Kolorist software package is the first of its kind designed directly to the Standard Web Offset Process (SWOP).

Folsom Research

Booth 1031

526 East Bidwell Street
Folsom, CA 95630
916-983-1500; 916-983-7236 (fax)
Kiki Herbst
Marketing Manager

A leader in scan conversion technology, Folsom displays products that convert any high-resolution workstation graphics to standard television formats. Products are available for major workstations including Sun, IBM, SGI, DEC, and HP. Product features include real-time scan conversion, digital frame buffer access, video frame grab, on-board V-LAN, and support for imaging and animation software packages.

Fraunhofer Computer Graphics Research Group (USA)

Booth 2631

1527 Route 12, P.O. Box 648
Gales Ferry, CT 06335
203-464-2623; 203-464-6323 (fax)
Peter R. Bono
Managing Director

Representing a German graphics R&D institute employing over 120 professionals and 200 students, Fraunhofer's U.S. office seeks R&D contracts, performs studies, facilitates technology transfer via software licensing of its toolkits and applications, assists U.S. companies in bringing their products to Europe, and assists European companies looking for U.S. technology partners.

Gallaher Business Development Corporation

Booth 2536

7996 North Point Boulevard, Suite 101
Winston-Salem, NC 27106
John Gallaher, Jr.
President

Global Information Group/ElectroGIG
Booth 1249

Amstel 222
Amsterdam, The Netherlands 1017 AJ
31-20-6233495; 31-20-6226801 (fax)
Jeroen Loeffen
Sales Executive

ElectroGIG is the professional 3D design and animation tool for visual communication. ElectroGIG uses solid modeling and fast ray tracing to produce print and animation. ElectroGIG has an easy-to-learn interface and can be used in graphic arts, broadcast, publishing, architecture, industrial design, research, and education. At SIGGRAPH '91, ElectroGIG will be demonstrating sound and video control for multimedia applications.

Helios Systems, Division of Piiceon, Inc.
Booth 535

1996 Lundy Avenue
San Jose, CA 95131
408-432-0292; 408-452-4549 (fax)
Gordon Meyer
Director of Marketing

As a part of the Fortune 1000 Dynatech Family, Helios Systems is a leading supplier in design and manufacture of compatible workstation memory SIMM modules, VME boards, SBUS data communication boards, I/O boards, accelerator products, and SCSI disk and tape subsystems. Size, strength, stability, and service support illustrate the Helios Systems advantage.

Herstal Automation Ltd.
Booth 121

3171 W. Twelve Mile Road
Berkley, MI 48072
313-548-2001; 313-548-2010 (fax)

Hewlett-Packard Company
Booth 800

3000 Hanover Street
Palo Alto, CA 94304
415-857-1501; 415-857-5518 (fax)
Corporate Development

Hewlett-Packard's innovative products and technologies for the computer graphics market provide speed and realism based on industry standards. HP provides a wide range of computer graphics solutions including graphics workstations, peripherals, and software which address the needs of science, industry, and business. The Hewlett-Packard exhibit highlights price/performance leading RISC workstations.

Howtek, Inc.
Booth 634

21 Park Avenue
Hudson, NH 03051
603-882-5200; 603-880-3843 (fax)
Jean Vosler
Manager, Marketing Communications

Howtek exhibits its full line of color scanners, including the 400 dpi Scanmaster 3 and the 1200 dpi Scanmaster 3+, as well as the Scanmaster 35Plus 35mm slide scanner. Howtek also exhibits the 300 dpi Personal Color Scanner. Howtek color products are marketed for desktop graphic arts and electronic pre-press systems.

Hyperspeed Technologies Inc.
Booth 437

10696 Marbury Avenue
San Diego, CA 92126-2838
619-578-4893; 619-271-6717 (fax)
James R. Holly
Chief Executive Officer

Hyperspeed exhibits i860-based ISA bus desktop supercomputer boards and introduces the FB400 Frame Buffer using the Inmos G364 video controller. Hyperspeed offers DT-connect, ITI VISIONbus, and multiple-board interfaces. Software includes C, FORTRAN, real-time debug, and math libraries. Multiboard Hyperspeed systems provide Gigaflop power in your desktop environment.

IBM Corporation
Booth 1000

44 South Broadway
White Plains, NY 10601
914-288-2228; 914-288-1311 (fax)
Richard M. Buckta
Advisory Market Support Representative

IBM exhibits recently announced products complemented by demonstrations from industry business partners, sponsored university programs, and IBM Research. In keeping with its commitment to industry standards and open systems, IBM features a wide spectrum of price/performance graphics solutions to address the commercial and technical environments.

IEEE Computer Society
Booth 723

10662 Los Vaqueros Circle
Los Alamitos, CA 90720
714-821-8380; 714-821-4010 (fax)
Marian B. Tibayan
Advertising Coordinator

IEEE Computer Society, one of the most prestigious professional associations in the world, serves its members through numerous publications, conferences, and workshops. Membership information, magazines, and textbooks are on display in IEEE's booth.

Ilford Photo Corporation
Booth 2223

W 70 Century Road
Paramus, NJ 07653
201-265-6000; 201-265-8107 (fax)
Michele Lanzana
Trade Show Coordinator

Ilford displays the Ilford Digital Photo Imager, a digital color printer that produces continuous tone, photographic quality prints, overhead transparencies, and 35mm slides directly from computer-based digital input, and the Ilford Cibacopy Systems 120, a photographic color copier which produces photographic quality prints and transparencies directly from four-color originals and 35mm slides.

IMAGINA/INA
Booth 2327

4 Avenue de L'Europe
Bry-Sur-Marne, France 94366
33-149-83-26-93; 33-149-83-2185 (fax)
Pierre Henon

IMAGINA is an international event about computer graphic and special effects. It will take place 29–31 January 1992 and is organized by INA and the Festival de Television de Monte-Carlo, in collaboration with the Centre National de la Cinematographie.

IMSL, Inc.
Booth 1546

2500 City West Boulevard
Houston, TX 77042
713-782-6060; 713-782-6069 (fax)
Lidia Vogelsang
Trade Show Coordinator

IMSL's Exponent Graphics system is a significant advancement in the fields of graphics creation and FORTRAN programming, designed specifically to meet the needs of scientists, engineers, and statisticians who solve problems using FORTRAN.

Infotronic SpA
Booth 640

Viale Berbera 49
Milan, Italy 20162
39-2-6472441; 39-2-6472445 (fax)
Irene Pfenninger
Marketing Manager

Infotronic is a leading manufacturer of high-end graphics controllers for ISA, EISA, MCA, NUBUS, and Turbochannel. On display is INFO ISP, an extremely powerful 3D system with hardware shading. Featuring AutoCAD 11; graphics boards with resolutions up to 1600 x 1200 featuring extremely fast servers and drivers for XWindows 11/Rel.4 (UNIX SCO, ISC, AT&T), Presentation Manager, and MSWindows3.0.

Integrated Computer Solutions, Inc.
Booth 1820

201 Broadway
Cambridge, MA 02139
617-621-0060; 617-621-9555 (fax)

Integrated Computer Solutions, Inc. (ICS) is a leading supplier of innovative software products and services for X and Open Systems technologies. ICS products include OSF/Motif, OPEN LOOK, and the Builder Xcessory, which provides the quickest and easiest way to build OSF/Motif user interfaces. ICS provides public and private training courses, comprehensive development support, short- and long-term consulting, and produces Xhibition, a technical conference and trade show dedicated to X and Open Systems.

Intel Corporation
Booth 834

3065 Bowers Avenue
Santa Clara, CA 95052
408-765-8080
Ed Perales
Trade Show Manager

The Intel i860 supercomputing microprocessor has become the processor of choice for high-end graphics systems. Several i860 CPU-based graphics accelerators are featured at SIGGRAPH '91, along with demonstrations of DVI and i960 capabilities in graphics applications.

Intelligent Light
Booth 213

P.O. Box 65
17-01 Pollitt Drive
Fair Lawn, NJ 07410
201-794-7550; 201-794-6215 (fax)
David Riklan
Manager of Sales

Intelligent Light is a leading supplier of visualization software systems for the engineering and scientific communities. Software products on display include FIELDVIEW, the premier interactive visualization package for volumetric and fluid dynamics data; IVIEW-DORE, a portable advanced 3D graphics toolkit; and 3DV, for advanced rendering, animation, and videotape output.

Intelligent Resources Integrated Systems, Inc.
Booth 230

1626 Colonial Parkway
Inverness, IL 60067-4732
708-705-9388; 708-705-9410 (fax)
Jane Winans
Marketing Specialist

The Video Explorer brings the graphics capability, ease of use, and power of the Macintosh to video production. This powerful NuBus card enables the user to combine multiple live video sources, perform a variety of transitions and digital special effects, overlay anti-aliased graphics and text, or simply capture an image for desktop publishing. Stop by to see this product in action!

Intergraph Corporation
Booth 2200

One Madison Industrial Park
Hunstville, AL 35807-4201
205-730-2000; 205-730-6445 (fax)
Marla Sims
Marketing Support

Intergraph Corporation's products include a broad range of complementary workstations and network servers, as well as complete application-specific systems for computer-aided engineering, design, manufacturing, and publishing, plus numerous earth science applications. A Fortune 500 company, Intergraph is dedicated to developing and manufacturing interactive computer graphics systems.

IRIS Graphics, Inc.
Booth 844

Six Crosby Drive
Bedford, MA 01730
617-275-8777; 617-275-8590 (fax)
Herman Boothe
Trade Show Coordinator

IRIS Graphics demonstrates two of its continuous ink jet color printers: the large-format 3024 and the highly automated SmartJet 4012. The printers are driven by Apple Macintoshes, an IBM RISC/6000, and a Silicon Graphics 4D/25 workstation. Through April 1991, IRIS had shipped over 700 high-resolution printers worldwide.

Ithaca Software
Booth 831

1001 Marina Village Parkway
Alameda, CA 94501
415-523-5900; 415-523-2880 (fax)
Gary Wayne
Vice President of Market Development

Ithaca's HOOPS Graphics System offers a truly portable, high-level alternative to Phigs and other 3D APIs. Providing unique declarative object-oriented programming, HOOPS offers advanced programmer productivity on all major workstations and PCs with leading GUIs. HOOPS has been adopted by major software developers for their next generation products.

C. Itoh Technology, Inc.
Booth 523

2515 McCabe Way
P.O. Box 19657
Irvine, CA 92714-9657
714-660-0506; 714-757-4423 (fax)
Terry Susaki
Director of OEM Sales

A subsidiary of C. Itoh & Co. Ltd., C. Itoh Technology, Inc. is introducing its second generation of X-Terminal products, to be offered to the OEM and VAR markets in the United States. The CIT-XE family consists of four different products: a 17-inch monochrome model, a 16-inch plasma flat panel display model, a 17-inch color model, and a 21-inch color model.

Jones & Bartlett Publishers
Booth 2338

20 Park Plaza
Boston, MA 02116
617-482-3900; 617-482-4793 (fax)
Paige Larkin
Marketing

Jones and Bartlett Publishers presents a new publishing program of text books, advanced monographs, and journals as well as innovative publications on new media. See a demo of the POEM PC Publisher: 100 pages of text and color pictures on floppy disk. New and forthcoming titles are available at a 20% discount at SIGGRAPH '91.

JVC Professional Products Company
Booth 2607

41 Slater Drive
Elmood Park, NJ 07407
201-794-3900; 201-523-2077 (fax)
Ellin Everson
Manager, Advertising Sales Promotion

JVC displays its complete line of computer imaging products including the TK-F7100U high-resolution camera; the KY-15CI 3-chip high-performance camera; the single chip TK-107OU camera; the popular TK-87OU; the new 3-ccd KY-F30CI, the ideal input device for a wide range of image processing systems; and some high-quality, multi-scan monitors.

Kinesix Corporation
Booth 115

10333 Richmond Avenue, Suite 1100
Houston, TX 77042
713-953-8300; 713-953-0021 (fax)
D. Kay Faucher
Marketing & Communications Director

Sammi is an X-based Graphical User Environment (GUE) enabling users to develop real-time graphical displays for databases and applications with no programming. Unlike other GUI toolkits, Sammi completely separates graphics and event handling from the application. Sammi provides unique graphing, dynamic objects, and alarms to represent changing data.

Lasertek
Booth 423

4301 Valley View Boulevard
Las Vegas, NV 89103
702-873-1444; 702-873-8917 (fax)
Kelly Domingo
Marketing Director

Lasertek specializes in the high-tech recycling of cartridges for laser printers and PC copiers and is one of the largest firms of its type in the country. Additionally, Lasertek offers a complete line of laser printer supplies. Lasertek provides service to companies such as Boeing, Citicorp, Dun and Bradstreet, General Electric, E.G. & G., Intel, ITT, New York Life, and Orion Pictures (just to name a few).

LAZERUS
Booth 652

2821 9th Street
Berkeley, CA 94710
415-339-6263; 415-845-1237 (fax)

LAZERUS premiers supercomputer-level modular hardware for personal computers: EXPRESSWAY Fast Lane (128 MFLOPS, 64 Mbyte memory plus 16 Mbyte VRAM true-color digitizing, D to A, color palettes, real-time color processor, genlockable, DOS APX & Windows); EXPRESSWAY-Publisher (true-color, NTSC/PAL, 1280x1024 resolution, 1-32 bits/pixel); EXPRESSWAY-Accelerator (67 MFLOPS, 27 MIPS, 2-64 Mbytes memory); and SuperEXPRESSWAY (270 MFLOPS, reprogrammable hardware).

LSI Logic
Booth 2410

1551 McCarthy Boulevard
Milpitas, CA 95035
408-433-8000; 408-433-7715 (fax)
Barbara S. Werner
Trade Show Coordinator

LSI Logic's DSP Division demonstrates its new chipsets for image and video compression that conform to JPEG, MPEG and H.261 standards.

Lyon Lamb Video Animation Systems, Inc.
Booth 2023

4531 Empire Avenue
Burbank, CA 90815
818-843-4831; 818-843-6544 (fax)

Lyon Lamb will show the MiniVAS-2 animation controller and ProVAS complete animation system with built-in encoder/sync generator and will introduce MicroVAS, a new low-cost animation controller for use with desktop multimedia systems. Also showing the RTC real-time scan converter for conversion of high-resolution graphics workstation signals to broadcast-quality video.

Macro Data, Inc.
Booth 442

1000 S. Park Lane #4
Tempe, AZ 85281
602-966-2459; 602-968-5017 (fax)

Magni Systems, Inc.
Booth 2403

9500 S.W. Gemini Drive
Beaverton, OR 97005
503-626-8400; 503-626-6225 (fax)
JoAnn Waddell
Product Marketing Manager

Highlighted at SIGGRAPH '91 are Magni's professional desktop video solutions including the VGA Producer for IBM AT and PS/2 platforms. These are products for IBM PCs which offer conversion of VGA images to video. The images can be combined with external video sources to produce training and promotional videos.

Management Graphics, Inc.
Booth 600

1401 East 79th Street
Minneapolis, MN 55425
612-854-1220; 612-854-6913 (fax)
Sheri Keep
Marketing Coordinator

Management Graphics, Inc. displays Solitaire Digital Film Recorders that produce 2K, 4K, 8K, and 16K images in formats from 35mm through 8x10. The VIStar Design Workstation and MGI Networking products such as LANslide for VAX/VMS environments and the OM Network Concentrator are also on display.

Mars Microsystems, Inc.
Booth 949

Stonewood Commons
101 Bradford Road
Wexford, PA 15090
412-934-1040; 412-934-1060 (fax)
Jody L. Schwartz
Office Manager

SPARC/DOS compatible workstations, SBus controller cards and SCSI peripherals.

Maximum Strategy Inc.
Booth 2618

2185 Old Oakland Road
San Jose, CA 95131
408-456-8880; 408-456-8887 (fax)
Neal Murray
Account Manager

Maximum Stategy's field-proven enhanced RAID architecture offers the high-performance, market acceptance, and momentum for Maximum Strategy to continue as a leading supplier of RAID Storage Servers. The Maximum Strategy RAID Storage Server family is a comprehensive and expandable data storage solution for today's most demanding high-performance computing requirements.

Meckler Publishing
Booth 2044

11 Ferry Lane West
Westport, CT 06880
203-226-6967; 203-454-5840 (fax)
Marilyn Reed
Marketing Manager

Information provided for the following fields: CD-ROM; HDTV; multimedia; and virtual reality.

Megatek Corporation
Booth 2003

9645 Scranton Road
San Diego, CA 92121
619-455-5590; 619-453-7603 (fax)
Stan Zelinger
National Sales Manager

Founded in 1972, Megatek, a United Telecom/US Sprint Company, designs and manufactures high-performance graphics accelerators and subsystems on RISC computing platforms with standard UNIX environments accommodating standard graphics libraries. Megatek also provides field service and integration services for Sun and Sun-compatible hardware and software.

Micro Publishing News
Booth 2634

21150 Hawthorne Boulevard
Torrance, CA 90503
213-371-5787; 213-542-0849 (fax)
Jim Cauvoto

Microfield Graphics, Inc.
Booth 2234

9825 S.W. Sunshine Court, A1
Beaverton, OR 97005
503-626-9393; 503-641-9333 (fax)
Sharon L. Kelley
Marketing Administrator

Joining the 1280x1024 family of AT bus and Micro Channel Bus compatible products (T8, V8, and T8/2), Microfield introduces: V8V (V8 with VGA daughter card to provide full register level VGA performance) and V8/2 (four times faster than T8/2). Imagraph Corp., Microfield's subsidiary company, displays imaging and graphics display controllers, personality modules, and frame grabbers.

Midwest Litho Arts, Inc./ 3D Imaging Center

Booth 148

125 East Oakton Street
Des Plaines, IL 60018
708-296-2000; 708-296-2785 (fax)
Tim Clark
3DImager

Midwest Litho Arts, the industry leader in electronic prepress, proudly introduces the 3D Imaging Center, the world's first RenderMan service bureau. The 3D Imaging Center supplies a rendering outlet for high-resolution images and offers full prepress services, transparencies, and color output.

MINC Incorporated

Booth 1342

6755 Earl Drive
Colorado Springs, CO 80918
719-590-1155; 719-590-7330 (fax)
Jeanne Bellamy
Manager, Marketing Communications

MINC features two products: PGADesigner and PLDesigner, which provide design synthesis and optimization capability for engineers designing with FPGAs and PLDs. Powerful design description capabilities coupled with state-of-the-art software allow the design to be targeted for either FPGA or PLD technology.

Minnesota Datametrics Corporation

Booth 2144

1000 Ingerson Road
St. Paul, MN 55126-8146
612-482-7938; 612-490-9717 (fax)
Charles K. Knox
President

ImageVolumes is a 3D reconstruction software system for scientific and medical visualization. Input can be digitized image or contour data. Sophisticated editors are provided for both forms of input. Renderings make full use of the features of Silicon Graphics workstations. Morphometric functions include numbers of objects, their surface areas, and volumes.

Minolta Corporation

Booth 1740

101 Williams Drive
Ramsey, NJ 07446
201-818-3571; 201-825-4374 (fax)
John T. McCasland
Marketing Manager

Minolta displays CRT Color Analyzer, LCD Color Analyzer, Convergence Meter, photometers, colorimeters, and instrumentation to measure light and color.

MIT Press
Booth 1347

55 Hayward Street
Cambridge, MA 02142
617-253-5642; 617-253-1709 (fax)
Jim Gilbert
Exhibits Manager

In its inaugural exhibit at SIGGRAPH, The MIT Press features the exciting new journal, *Presence: Teleoperators and Virtual Environments.* Also on display is Michael Benedikt's *Cyberspace: First Steps,* which includes a new short story by William Gibson, and a wide selection of titles in computer science, artificial intelligence, and cognitive science.

Mitsubishi Electronics America — Information Systems
Booth 1626

991 Knox Street
Torrance, CA 90502
213-515-3993; 213-527-7693 (fax)

The Information Systems Division is responsible for U.S. sales, marketing, and support of color monitors, color printers, and flexible and optical disk drives. At SIGGRAPH '91, the division is demonstrating its family of photographic color printers and large-screen, high-resolution color monitors, including 37-inch models that are among the largest in the industry.

Mitsubishi Electronics America — Professional Electronics
Booth 1826

800 Cottontail Lane
Somerset, NJ 08873-6759
908-563-9889; 908-563-0713 (fax)
Robert Freedman
National Sales Manager

Mitsubishi's Professional Electronics Division markets a broad variety of high-end professional products through its dealers nationwide. Products include monochrome and color video printers, video and data projectors, monitors, and industrial VCR's. Most products incorporate Diamondscan technology, which enables them to adjust automatically to varying line and horizontal scanning rates of video, computer graphics, and medical applications.

Mitsubishi International Corporation
Booth 2220

701 Westchester Avenue
White Plains, NY 10604
914-997-4960; 914-997-4976 (fax)
Anna Dipasquale
Senior Marketing Coordinator

Mitsubishi International displays its new Shinko CHC-S445, 300 dpi, A-size, dye sublimation color printer. The CHC-S445 supports full 24-bit color and produces true continuous-tone prints for photographic quality output. Our SC-7500 color scanner with new transparency option is demonstrated with the CHC- S445 to show a complete solution for 24-bit color scanning and printing.

ModaCAD

Booth 131

1954 Cotner Avenue
Los Angeles, CA 90025
213-312-6632; 213-444-9577 (fax)
Linda Freedman
Vice President Marketing

On display are ModaCAD visualization systems for pre-production imaging and simulation in industrial design, entertainment and special effects, graphics and advertising, fashion, interiors and architecture, and more. New ModaVISION with unprecedented A.I.-based, real-time 3D modeling and rendering features stereoscopic viewing and rendering in photo-realistic detail and color. Also premiering at SIGGRAPH '91: systems on RISC-based digital workstations and Macintosh.

Montage Publishing, Inc.

Booth 731

25550 Hawthorne Boulevard, Suite 314
Torrance, CA 90505
213-373-9993; 213-373-0639 (fax)
Sandra Seeger
Circulation Manager

Montage displays *AVVideo* and *Computer Pictures,* two magazines providing a network in visual communications. *AV Video* covers production and presentation technology for the hands-on professional, and *Computer Pictures* is published for creators and producers of graphic and multimedia presentations.

Morgan Kaufmann Publishers, Inc.

Booth 238

2929 Campus Drive, Suite 260
San Mateo, CA 94403
415-578-9911; 415-578-0672 (fax)
Elizabeth Essex
Associate Product Manager

New in Morgan Kaufmann's Series in Computer Graphics is *Making Them Move: Mechanics, Control and Animation of Articulated Figures* by Norman Badler, Brian Barsky, and David Zeltzer. Also included in the series are *Geometric and Solid Modeling: An Introduction,* and *An Introduction to Splines for use in Computer Graphics and Geometric Modeling.*

Motorola Inc.

Booth 2603

6501 William Cannon Drive West
Austin, TX 78735
512-891-2039; 512-891-2947 (fax)
Jim Bates
Business Manager

Motorola features the 40 MHz (60 Mflops peak performance) DSP96002 Media Engine processor which is an IEEE-754 compliant floating point digital signal processor with a high throughput dual bus I/O structure, special graphics-oriented instructions, and On-Chip Emulation Circuitry (OnCE) that combine to make it well suited for rapid development of multimedia applications.

National Association of Desktop Publishers

Booth 2528

1260 Boylston Street
Boston, MA 02215
800-874-4113; 617-437-0014 (fax)
Michelle Sommers
Marketing Manager

The National Association of Desktop Publishers (NADTP) is the desktop publishing industry's foremost trade association. Members receive the Journal, a four-color monthly magazine that provides up-to-date information on the industry and includes a membership benefits section listing discounts on hardware, software, books, training aids, etc.

National Computer Graphics Association

Booth 2007

2722 Merrilee Drive, Suite 200
Fairfax, VA 22031-4499
800-225-NCGA; 703-560-2752 (fax)
Martha Filson
Director, Corporate Sales

In 1992, NCGA presents CAD & Engineering Workstations '92 and Business Graphics '92, the premier show for these applications, all under one roof. The event will be held 9-12 March 1992 at the Anaheim Convention Center, featuring conference sessions, hands-on sessions, shootouts, and exhibit floors uniquely focused on the latest technologies in these two major areas of computer graphics. Visit the NCGA booth for more information.

NewTek, Inc.

Booth 1440

Donetta Colbach
215 South 8th Street
Topeka, KS 66603
913-354-1146; 913-354-1584 (fax)

NewTek, Inc. displays the Video Toaster all-in-one video graphics workstation. Toaster features include: 3D animation rendering and modeling, two 24-bit frame buffers, frame grabber, broadcast encoder, 24-bit paint program, real-time digital video effects, 35ns character generator, 4-input production switcher, and color processor.

Nippon Computer Graphics Association

Booth 139

Ogawa Building, 1-2-2
Uchikanda Chiyoda-ku
Tokyo 101 Japan
81-03-3233-3475; 81-03-3233-3450 (fax)
Tomoki Hamao
Director of Planning and Development

NICOGRAPH, Japan's largest computer convention, has been offering a forum for the exchange of information on advanced graphics technology since 1982. An estimated 40,000 people will attend NICOGRAPH '91 in Tokyo, November 11-15. It is the occasion that must not be missed, especially for those who have interests in computer graphics and its markets.

Nissei Sangyo America, Ltd.

Booth 1831

800 South Street
Waltham, MA 02154
617-893-5700; 617-237-2592 (fax)
David Spillane
Sales Manager

NSA is showing its complete line of Hitachi monitors and Infotronic controller boards. Featured monitors include the new 19-inch CM2087 and the 21-inch CM2187. Both feature microprocessors, dynamic focus, and dark bulbs, and the CM2187 will support 1600x1200 resolution. Infotronic is showing its 1GX, SGX, and EISA graphics boards featuring resolutions up to 1600x1200.

Numonics Corporation

Booth 2107

101 Commerce Drive
Montgomeryville, PA 18936
215-362-2766; 215-361-0167 (fax)
Debbie Williams
Inside Sales/Marketing Assistant

Numonics Corporation is exhibiting its line of digitizing tablets, including the 1/32"-thin GridMaster digitizing mat, the GraphicMaster series, and the pressure-sensitive ZedPEN, compatible with Mac and/or PC. Numonics also manufactures the BidMate and the AccuGrid (in translucent opaque and backlighted versions).

Oce Graphics USA, Inc.

Booth 2131

385 Ravendale Drive
Mountainview, CA 94043
800-545-5445; 415-961-6152 (fax)
Ken Griffith
Western Regional Manager

Oce features true Adobe PostScript color thermal printers in A (8½" × 11") or tabloid (11" × 17") sizes. All models are Pantone certified and produce vibrant color proofs on paper and transparency film at 300 dpi resolution. Also featured is the new G5242-CAD printer for screen hard copy output for CAD renderings.

Octree Corporation

Booth 438

7337 Bollinger Road
Cupertino, CA 95014
408-257-9013; 408-257-9014 (fax)
Donald Meagher

Octree Corporation is introducing the SolidsEngine, a patented fourth-generation (direct display of solids) visualization board for Sun workstations. Using Octree methods, it renders large volumetric data sets (tens of millions of voxels containing multiple properties) combined with complex geometric objects (thousands of solid, surface, and curve primitives) at up to 5 frames/sec.

Omnicomp Graphics Corporation
Booth 1026

1734 West Sam Houston Parkway, North
Houston, TX 77043
713-464-2990; 713-827-7540 (fax)
Steven N. Smith
Systems Engineer

Omnicomp designs and manufactures high-resolution graphics display systems for PC/AT, Multibus II, VME, and Micro-channel Type 5 busses. Products include TMS34020/34082 graphics display controllers, video frame grabbers, multi-channel, true color systems, and multi-media boards. Software support includes X-Windows, OMNI*GKS, UNIX, TIGA, OMNI*PIKK, OMNI*NKS, "C," and FORTRAN.

Optibase Inc.
Booth 227

7800 Deering Avenue
Canoga Park, CA 91304
818-719-6566; 818-712-0126 (fax)
Ariel Y. Gorfung
Manager of Operations

Optibase manufactures image and audio compression/expansion and image processing boards and software. Optibase supports the following algorithms: JPEG, AADCT, LOSSLESS, and VOICE/MUSIC. Optibase boards enable the display of captured, compressed images on a VGA screen with true color emulation. Additional features include rotation, scaling, filtering, brightness and contrast control, and more.

Oxberry, Division of Cybernetics Products, Inc.
Booth 1340

180 Broad Street
Carlstadt, NJ 07072
201-935-3000; 201-935-0104 (fax)
James Aneshansley
Director of Marketing

Oxberry exhibits computer film cameras for down-loading all high- and medium-resolution, analog, and digital film recorders. These precision, bulk loading cameras are used for film production of presentation graphics from conventional slide and overhead to prepress and cinemagraphic images. Also featured are input scanning systems for pin-registered motion picture film.

Panasonic Communications & Systems Company
Booth 1426

2 Panasonic Way
Secaucus, NJ 07094
201-348-7000
David Chaiken
National Marketing Manager

Panasonic Office Automation displays a comprehensive line of high-resolution color and monochrome monitors, color thermal printers, flat bed image scanners, and computers; a family of multi-function WORM, rewritable, and CD-ROM optical disk drives; and an optical disk jukebox capable of storing 50 gigabytes of information.

Panasonic Industrial Company

Booth 1226

2 Panasonic Way
Secaucus, NJ 07094
800-848-3979

Panasonic Industrial Company markets a line of OEM products for the computer inudstry such as CRT displays, plasma displays, and printers. Products on display at SIGGRAPH '91 include the TX-2013MA, a 20-inch microprocessor-equipped, multi-scanning color monitor.

Parallax Graphics, Inc.

Booth 610

2500 Condensa Street
Santa Clara, CA 95051
408-727-2220; 408-980-5139 (fax)
Laurie Crook
Sales Administrator

Parallax introduces XVideo, a family of motion video input and output SBus products for multimedia applications under OpenWindows. XVideo supports two simultaneous, real-time video windows. Users can also record motion video directly from windows on the SPARCstation screen to a VCR. XVideo is a 24-bit frame buffer with hardware acceleration features for 8-bit pseudocolor graphics and other imaging and text operations.

PCI Publications

Booth 2145

12416 Hymeadow Street
Austin, TX 78750
512-343-9066; 512-331-3900 (fax)
Tom Clark

P.E. Photron

Booth 1240

1324 South Winchester Boulevard
Suite 103
San Jose, CA 95128
408-370-1364; 408-370-3161 (fax)
Jun Oyama
Manager

Photron is demonstrating the FSC64000ALV real-time scan converter which provides workstation users with the ability to record workstation imagery directly onto videotape, in both full and 1:1 window modes. Photron is also demonstrating the VideoGensis/24 broadcast-quality frame buffer board for the IBM RISC System/6000 workstation.

Peritek Corporation
Booth 713

5550 Redwood Road
Oakland, CA 94619
415-531-6500; 415-530-8563 (fax)
Victor Gold
Vice President, Sales

Peritek exhibits its 34020-based graphics controllers for the VMEbus, PC compatible, and DEC Q-Bus computers. Resolution ranges from 640x480 (NTSC compatible) to 1600x1280 ultra-high resolution. Eight-bit and 24-bit true color are both supported.

PEX Interoperability Committee
Booth 1613

131 Steuart Street, Suite 220
San Francisco, CA 94110
415-541-0873; 415-495-3992 (fax)
Giselle Bisson
Consultant

PEX takes X into the third dimension. Visit the PEX booth for information on the power of PEX and a map to the PEX interoperability demo: 3D graphical applications displaying interoperably on systems from CONVEX, Digital Equipment, Evans & Sutherland, Hewlett-Packard, IBM, Stardent, ShoGraphics, Sun Microsystems, and Tektronix.

Philips Semiconductors-Signetics Company
Booth 616

811 East Arques
P.O. Box 3409
Sunnyvale, CA 94088-3409
408-991-4545; 408-991-2311 (fax)
Celia Tippit
Production Systems

Meet Phixel, the virtual dog, at Signetics, along with integrated circuits for digital audio and digital video processing.

Pinnacle Systems, Inc.
Booth 1452

2380 Walsh Avenue
Santa Clara, CA 95051
408-970-9787; 408-970-9798 (fax)
Walter Werdmuller
Vice President, Sales

Pixel Magazine
Booth 2530

11 Rue de Faurbourge Poinssoniere
Paris, France 75009
33-1-4246-3010; 33-1-4247-0873 (fax)
Goel LaRoche

PixSys
Booth 2427

1727 Conestoga Street
Boulder, CO 80301
303-447-0248; 303-441-2487 (fax)
Timothy L. Feaver
C.E.O.

Accurate 3D motion tracking and 3D modeling over large volumes with PixSys' sonic and electro-optical 3D digitizers. Interactive 3D CAD software creates DXE, CADL, and IGES comparable models or tracks motion onscreen as you digitize real-world points or surfaces. Custom application software and digitizing services.

Polhemus Incorporated
Booth 737

P.O. Box 560, 1 Hercules Drive
Colchester, VT 05446
802-655-3159; 802-655-1439 (fax)
Thomas Knoflick
Manager, Business Development

Virtual reality, interactive multimedia control, and 3D digitizing are just some of the applications exhibited by Polhemus. Our 3SPACE products support a variety of computer graphics applications including graphics control, animation and visualization, simulation, CAD, and 3D modeling.

Prentice Hall
Booth 2638

College Division, College Exhibits
Englewood Cliffs, NJ 07632
201-592-2377; 201-461-8170 (fax)
Dolores Ginliano
Convention Manager

Presentation Products Magazine
Booth 1252

23410 Civic Center Way, E-10
Malibu, CA 90265
213-456-2283; 213-456-8686 (fax)
Sharla Perry
Marketing Services Manager

ProTech Marketing, Inc.
Booth 143

9600 Southern Pine Boulevard, Suite J
Charlotte, NC 28273
704-523-9500; 704-523-7651 (fax)
Don Gruno
Director of Sales and Marketing

ProTech markets copyright protection devices for PCs, minicomputers, Macintosh, and RS-232C standards. These devices prevent illegal duplication of software products through the use of unique hardware and software specifically manufactured for each software developer. The interface software supports most major languages and environments.

Provato Technologies, Inc.
Booth 420

4710 South Eastern Avenue
Los Angeles, CA 90040
213-724-6001; 213-724-6036 (fax)

Provato Technologies is exhibiting the new ProStack and ProRack line of computers especially designed for the graphics industry. The ProStack tower computers offer 12 expansion slots and large power supplies, while the ProRack line is designed for the 19-inch rack environment. Both 386 and 486 computers are available.

QMS, Inc.
Booth 603

1 Magnum Pass
Mobile, AL 36618
205-639-4400; 205-633-4866 (fax)
Sharon Eisworth
Trade Show Supervisor

QMS demonstrates its newest PostScript laser printers and color printers designed for desktop publishing, advanced word processing, and graphic arts. The printers range in speed and paper-handling capabilities to meet printing needs from single users to departments, and many offer features including automatic emulation switching and simultaneous interface operation.

Quarterdeck Office Systems
Booth 2626

150 Pico Boulevard
Santa Monica, CA 90405
213-392-9851; 213-399-3802 (fax)

Quarterdeck features award-winning DESQview 2 and DESQview 386, its multitasking, windowing DOS operating environments. Quarterdeck also features its memory managers: QEMM 386, QRAM, and Manifest, and previews its dazzling new graphics program, DESQview/X. DESQview (rated 9.1 by *InfoWorld* and voted *PC Magazine's* Editors' Choice for Best Alternative to OS/2), not only multitasks, windows, transfers data, provides menus for DOS, learns your keystrokes (macros), it does all this on 8088, 8086, 80286, and 80386 PCs.

Rainbow Technologies, Inc.
Booth 1046

9292 Jeronimo Road
Irvine, CA 92718
714-454-2100; 714-454-8557 (fax)
Karen Tacy
Marketing Coordinator

Rainbow Technologies is displaying its Software Sentinel family of software protection devices. These products are used by software developers to prevent unauthorized distribution of their software. The products attach easily to parallel printer ports and do not affect printer operation. They run under DOS, OS/2, Windows, XENIX/UNIX, and Novell Networks.

Ramtek Corporation
Booth 2217

1525 Atteberry Lane
San Jose, CA 95131-1412
408-954-2700; 408-954-0118 (fax)
Karen L. Smith
Manager, Corporate Communications

Ramtek demonstrates TERRAIN — a new remote sensing system. The convergence of database technology, image processing, and mapping into a unified spatial data system is gaining momentum. TERRAIN provides the means to easily interchange information between real world images and geographic models via a functionally comprehensive and intuitive graphic user interface.

RasterOps Corporation
Booth 240

2500 Walsh Avenue
Santa Clara, CA 95051
408-562-4200; 408-562-4065 (fax)
Carrie Coppe
Marketing Communications Specialist

RasterOps designs, develops, and markets high-performance color graphic products for the Macintosh, IBM Micro Channel, and Sun SPARCstation platforms. Stop by booth 240 for a demonstration of RasterOps' revolutionary 24-bit color video technology. Come experience the latest in "The Art & Science of Color."

Ray Dream, Inc.
Booth 1649

1804 N. Shoreline Boulevard, Suite 240
Mountain View, CA 94043
415-960-0765; 415-960-1198 (fax)
Jim Waugh
Director, Sales

Ray Dream presents: Ray Dream Designer, a 3D illustration and rendering Macintosh program for creative professionals, supporting Bezier curves, solid textures, texture mapping, and ray tracing; and JAG (Jaggies Are Gone), a new Macintosh utility that removes jagged edges from PICT and PICS files, producing pixel-perfect 8- and 24-bit images and animations with NTSC color correction.

Raytheon Company Submarine Signal Division
Booth 337

1847 West Main Road
Portsmouth, RI 02871
401-847-8000; 401-842-5200 (fax)
John A. Lorea
Marketing Manager, Production Components

Raytheon TDU Thermal Display Units record full tonal images, or then can display data in graphic or alphanumeric form. Applications for "free fall" and "flatbed" TDU recorders include surveillance, spectrum analysis, computer-generated data output display and control, sonar and radar recordings, facsimile transmission, etc. They print on paper, transparency, and plastic.

Redlake Corporation
Booth 151

15005 Concord Circle
Morgan Hill, CA 95037
408-779-6464; 408-778-6256 (fax)
Stephen Wood
Sales and Marketing Manager

Redlake, a leader in frame grabber and video overlay technologies, displays the SPECTRUM-XVA high-resolution video overlay controller, the TapeCaster VGA to video converter, and the MARS Imaging Series of ISDN-based image telecommunications hardware.

RFX Inc.
Booth 1634

910 North Sycamore Drive
Hollywood, CA 90038
213-851-6500; 213-851-5505 (fax)
Raymond Feeney
Engineer

RFX presents: a film input scanner based on a 4K by 4K, 2D, CCD array; 4K cameras for image processing; film recorders supporting 35mm, 65/70mm, 8 perf 65mm, Imax, and most other film formats; and support services for high-quality input and output devices.

RGB Spectrum
Booth 327

2550 Ninth Street
Berkeley, CA 94710
415-848-0180; 415-848-0971 (fax)
Dan O'Brien
Vice President, Sales & Marketing

The RGB/View video windowing systems display live television or other real-time video on your high-resolution computer monitor. The RGB/Videolink video scan converters transform computer graphics from any workstation or personal computer to NTSC (or PAL) video for video taping, video projection, or video transmission.

Sampo Corporation of America
Booth 1434

5550 Peachtree Industrial Boulevard
Norcross, GA 30071
404-449-6220; 404-447-1109 (fax)
Chester Kramarski
Regional Sales Manager

Sampo exhibits its own brand of monitors: 14-inch, 17-inch, 20-inch, and 21-inch high and medium resolution color display monitors; RGBI and analog input; 15-inch, 19-inch, and 24-inch high resolution monochrome display monitors with 30 to 89 KHz horizontal fixed frequency and resolutions up to 1600x1280. Also on display: 14-inch, 17-inch, 20-inch, and 21-inch multi-frequency color monitors and engineering workstations.

Scientific Computing & Automation
Booth 2431

301 Gibraltar Drive
Morris Plains, NJ 07950
201-292-5100; 201-898-9281 (fax)
Calvin Carr
Associate Publisher

Scientific Computing & Automation Magazine serves scientists and engineers in industrial, academic, and government laboratories. Feature articles demonstrate the growing use of computer technology in a wide range of laboratory settings and in a broad cross section of research projects and information management environments. Topics covered on a monthly basis include scientific visualization, graphics for scientists, graphics hardware and software, image processing and analysis, molecular simulation and modeling, presentation graphics, chemometrics, and many other high-level technical applications.

Ron Scott Inc.
Booth 2013

1000 Jackson Boulevard
Houston, TX 77006
713-529-5868; 713-529-9370 (fax)
Karla West

Ron Scott's HiRes QFX image processing, editing, and special effects software processes hi-res image files on PCs with Truevision graphics adapters and includes glow, filter, and shadow functions; editable area selection tool; pressure-sensitive brushes; scaling/rotation tools; tiling capabilities; compositing functions; brightness, contrast, and color controls; and function queueing capability.

Seiko Instruments USA, Inc.
Booth 2000

1130 Ringwood Court
San Jose, CA 95131
408-922-5950; 408-922-5840 (fax)

Seiko Instruments USA demonstrates its color printers, which produce A/B size output on paper or transparency film at 300 dpi. PostScript, video, parallel, and network models allow connection to workstations, PCs, and Macintosh. Also featured are color monitors that are compatible with graphics standards and can display resolutions of up to 1280 x 1024. The new Smart Label Printer Plus is also displayed.

SGS-THOMSON Microelectronics, Inc.
Booth 1231

1000 E. Bell Road
Phoenix, AZ 85022
602-867-6100; 602-867-6290 (fax)

SGS-THOMSON displays and demonstrates high-performance ICs for VGA and Super VGA computer graphics, and for image processing applications, including: the Color Look Up Table (CLUT ICs) pioneered by the INMOS Division, color video controllers, image coding (DCT) processors, motion estimation processors, color filters and DACs, and high-performance 32-bit enhanced RISC micro-controllers.

Sharp Electronics Corporation
Booth 445

Sharp Plaza
Mahwah, NJ 07430
201-529-8200; 201-529-8919 (fax)
Allen Maser
Trade Show and Meeting Manager

Sharp's Copier and Imaging Systems Division displays and demonstrates its line of full-color scanners: JX-100, JX-300, JX-450, and JX-600. Sharp's exhibit also features their color and laser printers, and an M.O.D. data storage system. Products are shown operating on IBM, Macintosh, and Sun workstation platforms.

Shima Seiki U.S.A., Inc.
Booth 2407

22 Abeel Road
Cranbury, NJ 08512
609-655-4788; 609-655-3989 (fax)

SGX Systems are high-resolution paint systems using two frame buffers. The main frame buffer is expandable up to 8K by 8K. The systems are designed for industrial applications such as automotive design, print graphics, and HDTV. The systems are integrated to a variety of devices relevant to these markets including Macintosh, high-resolution drum scanners and film recorders, HDTV videotape machines, and projectors.

SIGGRAPH '92

Hall S2

532 N. Cuyler
Oak Park, IL 60302-2307
708-383-3808
Maxine Brown
Conference Co-Chair
James George
Exhibits/Showcase Chair

ACM SIGGRAPH '92 will be held 26–31 July 1992 in Chicago, Illinois. For details on how you can contribute to the success of this conference, please see the SIGGRAPH '92 general information in this program or visit the SIGGRAPH '92 booth. Posters, pins, and the *Call for Participation* are also available. For conference information, call 312-644-6610. For exhibition information, call 212-752-0911.

SIGGRAPH Education Committee

Hall S2

Mathematics/Computer Science
Georgia State University
Atlanta, GA 30303
404-651-2245; 404-651-2246 (fax)
G. Scott Owen
Chair

The ACM SIGGRAPH Education Committee furthers the role of computer graphics education and computer graphics in education. The committee has several ongoing projects, including curriculum projects in art, computer science, and engineering. Other projects involve ways to support educators in graphics, such as materials development and communication with other educators.

SIGGRAPH Local Groups

Hall S2

24-50 Franklin D. Roosevelt
New York, NY 10010
212-684-7400
Scott Lang
Booth Coordinator

The SIGGRAPH local groups booth is concerned with promoting the activities and benefits of belonging to a SIGGRAPH local group. Local groups are based in cities and areas throughout the United States and the rest of the world. They hold meetings and events throughout the year. To find out about the local group nearest you, stop by.

SIGGRAPH Organization

See ACM SIGGRAPH on page 68.

SIGGRAPH Video Review

Lobby S114

SIGGRAPH Video Review Order Department
c/o 1st Priority
P.O. Box 576
Itasca, IL 60143-0576
800-523-5503 within USA
708-250-0807 outside USA
708-250-0038 (fax)

The internationally distributed SIGGRAPH *Video Review* is the premier videotape publication illustrating the latest concepts in computer graphics and interactive techniques. More than 70 issues profile artistic, commercial, educational, scientific, and application-oriented computer graphics. Issues include electronic theatre and animation screening room material from recent SIGGRAPH conferences. Special issues present the latest developments in volume visualization, "HDTV and the Quest for Virtual Reality," and software tools for visualization.

Sigma Electronics, Inc.

Booth 141

1184 Enterprise Road
East Petersburg, PA 17520
717-569-2681; 717-569-4056 (fax)
Cheryl Stauffer
Marketing Support Manager

Sigma displays wide band switching and distribution equipment for graphics applications, encoders and decoders, and video system integration.

Silicon Graphics Computer Systems

Booths 1020, 1420

2011 N. Shoreline Boulevard
Mountain View, CA 94039
415-960-1980; 415-961-0595 (fax)
Betsy Wahlquist
Public Relations Specialist

Silicon Graphics, Inc., the leading visual processing computer systems manufacturer, is showing several new products, including tools for scientific visualization, image processing, and simplified development of 3D graphics applications, along with a new low-end workstation. The Tutorium offers show attendees the chance to try out the new workstation running these new tools.

Sixty Eight Thousand Inc.

Booth 226

160 Technology Circle
Scotts Valley, CA 95066
408-438-1777; 408-438-2967 (fax)
Doug Erickson
Director of Marketing

Sixty Eight Thousand Inc. is a manufacturer of accelerated Macintosh workstations. The company has developed its own proprietary acceleration technology to ensure intelligent, integrated, long-term solutions for power-hungry Macintosh users. Service and support, as well as controlled upward compatibility with future technology, including Motorola's 68040, have been key to the company's success.

SOFTIMAGE Inc.
Booth 2026

3510 boul. St.-Laurent, Suite 214
Montreal, Quebec, Canada H2X 2V2
514-845-1636; 514-845-5676 (fax)
Elizabeth Jones
Marketing Assistant

SOFTIMAGE introduces a powerful character animation and dynamics module fully-integrated with version 2.5 of the SOFTIMAGE Creative Environment. Other new features include Wave (a method for animating solid deformations), Easy Paint, numerous enhancements, and a new openess to the software for developers. SOFTIMAGE is a leading supplier of 3D computer animation and rendering software renowned for ease-of-use, animation capabilities, and fast, high-quality rendering.

Software Security, Inc.
Booth 531

1011 High Ridge Road
Stamford, CT 06905
203-329-8870; 203-329-7428 (fax)
Jan Norman
Director of Marketing Communication

Software Security, Inc. introduces Mactivator/NET, a license management tool that controls the number of concurrent users on an AppleTalk network. Also on display are other user-transparent, patented software protection devices including the new Activator/NET for PC network control, the Activator devices for PCs, and Mactivators for Macintosh computers.

Sony Corporation
Booth 1034

3 Paragon Drive
Montvale, NJ 07645
201-930-6158; 201-930-4752 (fax)
Barbara F. Susi
Exhibits Manager

The following divisions are exhibiting in the Sony booth: Write-Once, Rewritable, Data Storage, Data Recorder, Still Image, Graphic Display Monitors, Microsystems, and Professional Video Products. Sony Corporation of America has built its reputation by leading the industrial electronics markets with the introduction of innovative products throughout the years. Stop by Booth 1034 and see.

Spatial Systems, Inc.
Booth 223

900 Middlesex Turnpike, Building 8
Billerica, MA 01821
508-670-2720; 508-670-2723 (fax)

Springer-Verlag
Booth 721

175 Fifth Avenue
New York, NY 10010
212-460-1500; 212-473-6272 (fax)
John DiStefano
Product Manager

Springer-Verlag has been publishing works from the forefront of science for nearly 150 years. It publishes over 1000 scientific and technical volumes yearly. Highlights for 1991 include: *PHIGs by Example, Dictionary of Computer Graphics Technology and Applications, Fractals & Chaos, State of the Art in Computer Graphics, Object Oriented Graphics,* and *The Algorithmic Beauty of Plants.* See us in Booth 721.

Stardent Computer
Booth 2207

521 Virginia Road
6 New England Tech Center
Concord, MA 01742
508-287-0100; 508-371-7414 (fax)
Sharon Cullina
Senior Programs Manager

Stardent features its new family of desktop visualization systems: the VISTRA 800 Series. Based on Intel's i860 architecture, VISTRA combines high-performance and exceptional imaging and visualization capabilities in a low-cost, compact system that makes visualization available to a much larger user community. Demonstrations feature Stardent's AVS, widely recognized as the industry's de facto standard visualization environment.

StereoGraphics Corporation
Booth 2021

2171-H E. Francisco Boulevard
San Rafael, CA 94901
415-459-4500; 415-459-3020 (fax)
Dennis Hale
Show Manager

StereoGraphics Corporation manufactures the "CrystalEyes" Stereoscopic 3D viewing system. This wireless, battery-operated active eyewear provides unparalleled depth perception for graphics and video presentations providing intuitive/visual information.

Strata Inc.
Booth 129

2 West St. George Boulevard, Suite 2100
St. George, UT 84770
801-628-5218; 801-628-9756 (fax)
Bob Miller
Director, Sales and Distribution

Strata presents 3D design tools for professionals. StrataVision 3D 2.0 for the Macintosh now includes animation, with object linking and metamorphosis; the enhanced modeling environment adds rulers, shaded working views, and new design tools. Rendering includes surface smoothing, raytracing, and radiosity. Add-on products include StrataTextures and StrataShapes 3D clip-art libraries.

Sun Microsystems, Inc.

Booth 1400

2550 Garcia Avenue
Mountain View, CA 94043
415-960-1300

Sun Microsystems invites you to see the latest in sophisticated yet affordable graphics systems. Sun offers a full line of graphics and visualization workstations, as well as multimedia and printing solutions. Our combination of both platforms and graphics APIs delivers the industry's most robust, integrated environment.

SunExpert Magazine

Booth 427

1330 Beacon Street
Brookline, MA 02146
617-739-7001; 617-739-7003 (fax)
Susan Sacks
Marketing Manager

SunExpert Magazine is the independent forum for open systems. It serves a specialized market of UNIX-based workstations with particular emphasis on Sun's workstations. Editorial content covers technical trends, emerging applications, and business issues. The current issue and qualification cards for a free subscription are distributed at the SunExpert booth.

SunWorld-IDG

Booth 331

80 Elm Street
Peterborough, NH 03458
603-924-0100; 603-924-8779 (fax)
Chris Anne Wheeler
Marketing Manager

SunWorld is an independent monthly journal for people who purchase and use Sun and SPARC-based systems and products. This audience has a common need for comprehensive technology articles, product evaluations, news, analyses, and commentaries that aid them in making informed decisions and keeping pace with the dynamic open systems industry.

Supercomputing '91

Booth 424

Los Alamos National Laboratory
MS B260
Los Alamos, NM 87545
505-667-1449
Raymond L. Elliott
Chair

Research, development, integration, support, and use of a supercomputing environment are the subjects of Supercomputing '91, the annual conference for the supercomputing community. The conference will be held in Albuquerque, New Mexico, 18-22 November 1991.

Supercomputing Review
Booth 2337

8445 Camino Santa Fe
San Diego, CA 92121
619-452-4242; 619-452-4224 (fax)
Tom Tabor

Symbolics, Inc.
Booth 1413

8 New England Executive Park
Burlington, MA 01803
617-221-1000; 617-221-1009 (fax)
Sheldon Liebman
Director, Graphics Marketing

Symbolics showcases its latest Unified Graphics Systems, HDPaintAmation, and XL Animation which bring high-end paint, 2D animation, and 3D animation to a full HDTV canvas. Advanced character animation tools, including rotational displacement, are also demonstrated.

Tara Visual Corporation
Booth 2113

929 Harrison Avenue
Columbus, OH 43215
614-291-2229; 614-291-2867 (fax)
Bill Gallivan
Director of Marketing

TEAC America, Inc.
Booth 145

7733 Telegraph Road
Montebello, CA 90640
213-726-0303; 213-727-7621 (fax)
David Oren
National Sales Manager

TEAC's Recordable Videodisc products are designed for a variety of computer imaging and graphics applications. Still-step recording for building up animation sequences can be achieved by using direct computer control, via RS-232C communications. TEAC also offers a variety of recording systems including color under, high band direct recording, and non-artifact R.G.B. component recording.

Tech Images
Booth 2538

11 Bis Rue de Colisee
Paris, France 75007
33-144-07-07-20; 33-146-36-22-38 (fax)
Christopher Dietrich
Publisher

Tech Images, published in France, is Europe's leading professional magazine for image processing and computer graphics, an indispensible reference for engineers, marketing specialists, technicians, and artists.

Tech-Source Inc.
Booth 631

442 South North Lake Boulevard.
Suite 1008
Altamonte Springs, FL 32701
407-830-8301; 407-339-2554 (fax)
Richard E. Bendfelt
Director of Sales

Tech-Source is announcing the new high-resolution, high-performance GXTRA 1280 S-Bus color graphics subsystem, which supports its own display and keyboard. Tech-Source is also displaying the GDS3958DB+4 2048 x 2048-resolution color controller running Prior Data Sciences' Intermaphics software on the Sony 2048 x 2048 color display.

Techexport, Inc.
Booth 117

One North Avenue
Burlington, MA 01803
617-229-6900; 617-229-7706 (fax)
Lisa J. Rigsby
Marketing Support

Techexport, Inc. provides international distribution and support for a comprehensive range of computer graphics and video products. The company serves the videographics, 3D modeling and animation, presentation graphics, pre-press, and industrial display markets with hardware, application software, and peripherals. Techexport operates through subsidiary offices in Europe and Brazil, as well as 200 resellers worldwide.

Tektronix, Inc.
Booth 1407

Wilsonville Industrial Park
Wilsonville, OR 97070
503-682-3411

Tektronix displays: the X Window Terminal family of monochrome, grayscale, and three full-color X Terminals, showcasing the PEX X Terminal, the new high-brite/high-contrast, monochrome display used with the Macintosh II; a stereoscopic display system; a new video board and software system providing studio quality digital and analog video output for Silicon Graphics, Sun, and IBM workstations; the new RGB II B-size screen printer and PhaserJet PXi, a tabloid size, RISC processor; and the level 2 PostScript plain paper printer.

Template Graphics Software
Booth 931

3510 Dunhill Street
San Diego, CA 92121
619-457-5359; 619-452-2547 (fax)
Kristy Benner
Marketing Communications Manager

Template Graphics Software is a leading worldwide supplier of graphics software tools to engineering and scientific application developers. TGS products are available across a wide range of platforms from supercomputers to personal workstations. TGS highlights its FIGARO+ software, a portable implementation of the Programmer's Hierarchical Interactive Graphics Systems standard (PHIGS).

Texas Memory Systems, Inc.
Booth 1431

11200 Westheimer Road, Suite 1000
Houston, TX 77042
713-266-3200; 713-266-0332 (fax)
Hope Marcotte
Exhibits Coordinator

Texas Memory presents the SAM-1000 Series: a high-capacity, high-throughput shared memory system with up to 8 gigabytes, 500 megabytes/sec. It interfaces to standard computers and special equipment and has an optional signal and image processing accelerator. Applications include real-time signal and image processing, data acquisition, engineering test systems, simulation, databases, medical imaging, communications, and animation.

Texnai U.S.A.
Booth 1631

No. 620, 2-1, Udagwa-cho, Sibuya-ku
Tokyo, Japan 150
81-03-3464-6927; 81-03-3476-2372 (fax)
Norie Hiraide
General Manager

Texnai U.S.A. demonstrates the Fujix Pictrography 2000, a new 24-bit digital color printer offering unparalleled color gradation, long-term image stability, and high-speed output. The printer requires no chemistry other than water. Software drivers are currently available for Macintosh, PC DOS, and UNIX workstations. Other drivers are under development.

Thomson Digital Image (TDI)
Booth 1017

1270 Avenue of the Americas, Suite 508
New York, NY 10020
212-247-1950; 212-247-1957 (fax)
Denis Schlumberger
President, TDI America

TDI demonstrates interactive, easy-to-use systems for high-end 3D modeling and animation. TDI's systems offer integrated capabilities for modeling, texturing, rendering, animation, and interfacing to popular video devices and CAD/CAM standards. Whether your application is 3D animation, industrial design, AEC, pre-press, or graphic design, TDI delivers results.

Time Arts Inc.

Booth 217

1425 Corporate Center Parkway
Santa Rosa, CA 95407
707-576-7722; 707-576-7731 (fax)
Michael Shuster
Product Marketing Manager

Time Arts demonstrates its family of professional color graphics software for a wide variety of design, video, and presentation applications. New products being introduced include color image creation and editing software for the Silicon Graphics 4D Series Workstations. Product updates being demonstrated feature OASIS 1.1 Videographics/Image Creation Software for the Macintosh and LUMENA 3.4 for the PC.

Toshiba America Consumer Products

Booth 826

1010 Johnson Drive
Buffalo Grove, IL 60089
708-541-9400; 708-541-1927 (fax)

Trix Company, Ltd.

Booth 2630

1 Kandamatsunaga
Chiyoda, Tokyo, Japan 101
81-03-3251-1961; 81-03-3251-6929 (fax)
Hitoshi Takamizawa
President

The TR8001 is a high-performance graphics accelerator board specifically designed for AutoCAD. Incorporating a RISC processor IDT79R3051 of R3000 architecture, the TR8001 achieves high speed, high performance, and low cost.

Truevision

Booth 1013

7340 Shadeland Station
Indianapolis, IN 46256
317-841-0332; 317-576-7700 (fax)
Karen Graver
Marketing Coordinator

Truevision, manufacturer of the award winning TARGA series videographics boards, demonstrates its latest multimedia/video applications. Products featured include the TARGA+ videographics card for IBM PC, XT, AT, and compatibles, and the NuVista+ videographics board for the Macintosh II. Also, Truevision introduces VideoMaker+, video production software for the TARGA+. Several third-party vendors demonstrate their Truevision compatible products.

2Film Technologies Inc.
Booth 2637

37 Kodiak Crescent, Unit 6
Downsview, Ontario, Canada M3J 3E5
416-636-4444; 416-636-4454 (fax)
Frank Squizzato
President

2Film Technologies introduces the "F2FR" (file-to-film recorder). The F2FR is the first color PostScript-compatible film recorder complete with software interface for PCX, GIF, TIFF, CUT, CGM, and DXE file formats.

Uniras, Inc.
Booth 613

5429 Lyndon B. Johnson Freeway
Suite 650
Dallas, TX 75240
214-980-1600; 214-991-1860 (fax)
Bobbie Horton
Executive Assistant

Uniras, Inc. is featuring agX/Toolmaster, the first suite of high-level graphics tools specifically designed for the X Windows environment. agX/Toolmaster allows the application developer to easily integrate visualization and presentation techniques into X-based graphics applications. Also being demonstrated is UNIGRAPH+2000, an interactive point and click and command language visualization and presentation system for scientists and engineers. Both products are available on platforms ranging from supercomputers to workstations.

University of Lowell
Booth 1437

One University Avenue
Lowell, MA 01854
508-934-2630; 508-458-8289 (fax)
Frank Drake
Research Manager

The University of Lowell exhibits software and hardware in the areas of: image processing (Image Kernel System, Optical Character Recognition); computer graphics (TIGA, X Window System); joint university/industry technology developments; user interface tools (OSF/MOTIF); multimedia environments and applications; and visualization.

Univision Technologies, Inc.
Booth 110

Three Burlington Woods
Burlington, MA 01803
617-221-6700; 617-221-6777 (fax)
Bonnie Pietragallo
Corporate Communications Manager

Univision Technologies designs and develops ultra-high-resolution display controllers for IBM PC/AT, VME, and Sun Microsystems. Images from 1280x1024 up to 2048x2048 can be displayed on screen. Featured products include: the Scorpion 16G-dual VGA display controller with real-time frame grabber, featuring non-destructive overlays; The Chameleon true color frame grabber providing real-time video capture; and the Piranha display controller featuring Texas Instruments 34020 and TMS34082 co-processor.

UNIXWorld Magazine
Booth 2613

444 Castro Street
Mountain View, CA 94041
415-940-1500; 415-967-1257 (fax)
Kari Smith
Tradeshow Coordinator

UNIXWorld is directed to the Open Systems Computing market, covering systems integration and design topics for OEM's, VAR's, and volume end-users. Editorial content focuses on UNIX-based networks, workstations, multi-user systems, software, and associated peripherals. Articles provide industry news, market analysis, in-depth product reviews, and tutorials for programming and business applications.

Vertigo Technology Inc.
Booth 326

Suite 1010, 1030 West George Street
Vancouver, British Columbia
V6E 2Y3 Canada
604-879-5052; 604-879-5019 (fax)
Erin Neely
Marketing Coordinator

VICOM Systems, Inc.
Booth 1813

46107 Lansing Parkway
Fremont, CA 94538
415-498-3284; 415-498-3225 (fax)
Sandy Staufenbiel

VICOM Systems, Inc. is a leading manufacturer of high-performance image processing and graphic arts hardware and software transparently accelerating imaging applications in the open systems environment. Demonstrations include a variety of customer applications in the areas of remote sensing, medical imaging, and commercial arts. VICOM's Pixar Image Computer and Electronic Light Table will be displaying the proposed HDTV formats.

Video Systems Magazine
Booth 2045

9221 Quivira Road
Overland Park, KS 66215
913-541-6665; 913-541-6697 (fax)
Tom Brick
Marketing Director

Video Systems is published monthly for qualified persons involved in production, distribution, and presentation of professional video communications who have authority for purchasing production and presentation equipment and services.

Videomedia
Booth 1417

211 Weddell Drive
Sunnyvale, CA 94089
408-745-1700; 408-745-6721 (fax)
Stan Sult
National Product Manager

Videomedia exhibits its multimedia, animation, and video editing products. The V-LAN Universal Control Network provides frame accurate control of 31 video devices from any computer. PACE is a V-LAN compatible animation controller for your desktop. Auto-PICT software puts .PICS and .PICT files out to videotape and digitizes frames of video. Animation+ is a computer animation plus video editing system.

Viewpoint Animation Engineering
Booth 1248

8524 Highway 6 North 3D
Houston, TX 77095
713-550-3388; 713-550-3305 (fax)
John W. Wright
President

Viewpoint creates and sells render-ready 3D objects (also referred to as Dataware, 3D datasets, 3D symbol libraries, 3D Clip-Art, etc.). Using over five different 3D digitizing systems and most of the major 3D modeling and animation software, Viewpoint can digitize anything. On display is a library of technically accurate 3D objects which includes over 250 vehicles, aircraft, military objects, animals, spaceships, human anatomy, people, furniture, motorcycles, trees, etc.

VisionBase, Inc.
Booth 338

380 Foothill Road
Bridgewater, NJ 08807
908-218-0900; 908-707-1454 (fax)
Kevin Moran
Director Sales and Marketing

Zephyr is a powerful, user-customizable image database management system. It runs under both DOS and WINDOWS, and is fully networkable. Zephyr supports Truevision TARGA, VGA, and Super VGA displays, as well as TIFF, GIF, PCX, and TGA file formats. ANIMAZ is multimedia software for corporate presentations, training, videotape production, and advertising.

Visionetics International Corporation
Booth 2147

21311 Hawthorne Boulevard, Suite 235
Torrance, CA 90503
213-316-7940; 213-543-2117 (fax)
George C. Fang
Vice President

Video-to-computer and computer-to-video products are Visionetics' specialty. The company is displaying VIGA-16, a real-time frame grabber that is Targa compatible; VGALink, a VGA overlay board that mixes video and computer output for recording to video; and VIGA-VGA, a super VGA graphics card with video output capabilities.

Visualization Technologies, VT Inc.
Booth 2617

23500 Mercantile Road
Cleveland, OH 44122
216-831-6782; 216-831-3444 (fax)

Vital Images, Inc.
Booth 2423

505 North 4th Street
Fairfield, IA 52556
515-472-7726; 515-472-1661 (fax)
Carl Kowalski
Vice President of Sales & Marketing

VoxelView is a turnkey volume visualization software system designed to interactively manipulate, display, and analyze 3D data in a wide variety of application areas including microscopy, medical imaging, geosciences, non-destructive testing, molecular modeling, and computational fluid dynamics. Currently supported hardware platforms include Silicon Graphics, IBM (RS/6000), and Apple Macintosh.

VITec (Visual Information Technologies, Incorporated)
Booth 410

3460 Lotus Drive
Plano, TX 75075
214-596-5600; 214-867-4489 (fax)
Bill Morris
Communications Manager

VITec displays its high-end line of image processing hardware and software products including the VITec-50, VITec-60, and VITec-60/GS image computers, and PICES, the industry's first portable and programable imaging API. VITec products work with most major UNIX-based workstations.

VPL Research Inc.
Booth 1617

656 Bair Island Road, 3rd Floor
Redwood City, CA 94063
415-361-1710; 415-361-1845 (fax)
David Benman
Sales Engineer

VPL Research is the leading developer of virtual reality software and hardware systems. New products from VPL in 1991 include the higher performance RB2 Model 2 Virtual Reality System, a complete one- or two-user virtual reality development system; two EyePhone models including a high resolution EyePhone HRX, and the Spatial Tracking System. New software tools allow for translation of three-dimensional databases, realistic rendering, and fast virtual reality animation. Other VPL products include the AudioSphere, a three-dimensional sound spatialization system, the DataGlove, and the DataSuit.

Wacom, Inc.
Booth 203

Park 80 West, Plaza II
Saddle Brook, NJ 07662
201-265-4226; 201-265-4722 (fax)
Joseph Coyne
Vice President Marketing

Wacom's award-winning family of graphic tablets has added a new dimension to the world of computer graphics. Its cordless, pressure-sensitive stylus translates manual pressure into line width, spray density, color change, and other special effects. Use this feather-light stylus to paint, draw, trace, point, open, and close — all at a natural speed. Wacom tablets are available in sizes 6″ x 9″, 12″ x 12″, 12″ x 18″, and 18″x 25″.

Wasatch Computer Technology
Booth 123

123 E.200 South
Salt Lake City, UT 84111
801-575-8043; 801-575-8075 (fax)
Mary Ware
Marketing

Wasatch presents the Wasatch Portfolio, a comprehensive graphic design and illustration software package for the production of presentation graphics, slides, overhead transparencies, print, and video. It utilizes the full power of 80386/80486 computers and high resolution for exceptional performance from a personal computer. The system is compatible with many input and output devices.

Wavefront Technologies, Inc.
Booth 807

530 E. Montecito Street
Santa Barbara, CA 93103
805-962-8117; 805-963-0410 (fax)
Catriona Gaeta
Marketing Communications Coordinator

Wavefront Technologies, Inc. is the world's leading supplier of 3D computer graphics, visualization, animation, simulation, and rendering software. Its fully-integrated family of products, The Visualizer Series, is being used by over 1,000 customers worldwide in such diverse areas as manufacturing, architecture, engineering, aerospace, broadcasting, and scientific research.

WaveTracer, Inc.
Booth 1920

289 Great Road
Acton, MA 01720
508-635-9000; 508-635-9777 (fax)
Robert Utzschneider
Vice President of Product Marketing

WaveTracer provides advanced software and hardware tools used for solving and visualizing complex problems in the physical sciences, image processing, mathematics, and other areas. These tools include: The Data Transport Computer, a 3D massively parallel computer; pre-programmed software solution tools; multiC, a multidimensional, parallel software development environment; and volume visualization tools. The DTC supports very high-performance pixel-and voxel-based visualization for the study of 2D/3D data fields and volumes.

Western Data Corporation
Booth 524

15510-A Rockfield Boulevard
Irvine, CA 92718
714-768-3345; 714-768-5262 (fax)
Kevin D. Bull
Vice President

Western Data Corporation (Est. 1978) is a distributor and systems integrator for high-end computer graphics peripherals specializing in high-speed, high-resolution; color hard copy, slide and video devices. WDC provides installation, training, and on-site maintenance on all of its products.

John Wiley & Sons, Inc.
Booth 537

605 Third Avenue
New York, NY 10158-0012
212-850-6000; 212-850-6088 (fax)
Kimberly Walsh
Assistant Marketing Manager

John Wiley & Sons is a publisher of professional, reference and trade books, and journals in computer science including *Illustrating Computer Documentation* by William Horton and *Writing Better Computer User Documentation* by R. John Brockmann.

Winsted Corporation
Booth 637

10901 Hampshire Avenue South
Minneapolis, MN 55438-2351
612-944-8556; 612-944-1546 (fax)
Gerald R. Hoska
Vice President

Winsted presents a complete production center with dual keyboards and roll-up rack mount electronic cabinet. This production center is part of a full line of integrated system furniture that is designed for graphics and video applications. Keyboards adjust up and down, tilt, and pull out for user efficiency and convenience. They provide 72 inches of table top work space, and dual keyboards offer convenient left- or right-hand operation. A rack mount cabinet is available in 14-inch and 19½-inch rack space options.

Wolfram Research, Inc.
Booth 1646

100 Trade Center Drive
Champaign, IL 61820
217-398-0700; 217-398-0747 (fax)
Maury Kendall
Events Coordinator

Mathematica is both an interactive calculation tool and a programming language. Its numerical capabilites include arbitrary precision arithmetic and matrix manipulation and it can manipulate formulae directly in algebraic form. Mathematica can also generate 2D plots, contour plots, shaded color, and 3D pictures, as well as sound. It runs on Apollo, DEC, Data General, Hewlett-Packard, MIPS, 386-based MS DOS, Macintosh, NeXT, SGI, Sony, and Sun computers. Version 2.0 of Mathematica was announced in January 1991.

Workstation News
Booth 2628

9390 Research Boulevard, Suite II-300
Austin, TX 78759
512-343-9066; 512-345-1935 (fax)
Donna Holderbaum
Advertising Manager

Workstation News is the computer world's only monthly source of comprehensive information on workstation news and products. Judged 1990's best computer magazine (less than 50,000 circulation) by the Computer Press Association. Other publications include: *Netware Solutions, Access to WANG, DG Review,* and *Uni-Review* for Unisys users.

Xaos Tools
Booth 1517

350 Townsend Street
San Francisco, CA 94107
415-243-8467; 415-243-9562 (fax)
Matt Brocchini
Product Manager

Xaos Tools introduces nTITLE! Xaos Tools is the software affiliate of Xaos Inc., the high-end San Francisco-based animation facility. nTITLE, running on Silicon Graphics workstations, provides low cost, fast and easy, top quality text generation and text animation capabilities for slide, print, and video.

XRS, X-Ray Scanner Corporation
Booth 2623

4030 Spencer Street #101
Torrance, CA 90503
213-214-1900; 213-214-1474 (fax)

Yamashita Engineering Manufacture, Inc.

Booth 1640

C/O YEM America, Inc.
19951 Mariner Avenue, #200
Torrance, CA 90503
213-793-1288; 213-371-5108 (fax)
Minoru Ohkubo
Vice President of YEM America, Inc.

YEM introduces the new wide-range, super real-time auto scan converter, CVS-980, and New Converter for converting from computer graphics to HDTV format. Also on display is CVS-910, a PC-level conversion, and ENC-3000 genlock color encoder.

Yarc Systems Corporation

Booth 244

27489 W. Agoura Road
Agoura Hills, CA 91301
818-889-4388; 818-889-2658 (fax)
Thomas Holmes
Marketing

Yarc Systems demonstrates its advanced line of high-performance AMD 29050 RISC co-processor systems, ATSprinter, NUSprinter, MacRageous, and ATM. These systems deliver supercomputing performance to the PC/AT, Macintosh II, and PS/2 personal computers. Yarc features software from Digital Arts, Systems Soft's SHADE, and Software Construction's X-Script.

Booth	Animation Systems
1044	Abekas
2237	Acrobat Graphics Systems
820	Alias Research Inc.
2016	Alliant Computer Systems Corporation
431	Ampex Corporation
1007	Apple Computer, Inc.
817	AT&T Graphics Software Labs
207	Autodesk Multimedia Division
220	AXA Corporation
2236	Chase Technologies
607	Chromatek, Inc.
1817	Commodore Business Machines, Inc.
113	Diaquest, Inc.
417	Digital Arts
1800	Digital Equipment Corporation
1040	Du Pont Pixel Systems
2631	Fraunhofer Computer Graphics Research Group (USA)
1249	Global Information/ElectroGIG
800	Hewlett-Packard Company
437	Hyperspeed Technologies Inc.
1000	IBM Corporation
213	Intelligent Light
230	Intelligent Resources
2200	Intergraph Corporation
652	LAZERUS
148	Midwest Litho Arts
131	ModaCAD
1440	NewTek, Inc.
1026	Omnicomp Graphics
1426	Panasonic Communications & Systems Company
1240	P.E. Photron
2427	Pixys
2026	SOFTIMAGE Inc.
2207	Stardent Computer
129	Strata Inc.
1413	Symbolics, Inc.
145	TEAC America, Inc.
117	Techexport, Inc.
1407	Tektronix, Inc.
1017	Thomson Digital Image (TDI)
217	Time Arts Inc.
1013	Truevision
1417	Videomedia
1248	Viewpoint Animation Engineering
338	VisionBase, Inc.
1617	VPL Research Inc.
807	Wavefront Technologies, Inc.
524	Western Data Corporation
244	Yarc Systems Corporation

Booth	Business Graphics Software
1007	Apple Computer, Inc.
817	AT&T Graphics Software Labs
207	Autodesk Multimedia Division
2031	AZTEK, Inc.
1817	Commodore Business Machines, Inc.
246	Dassault Electronique
1800	Digital Equipment Corporation
2213	Eastman Kodak Company
800	Hewlett-Packard Company
2200	Intergraph Corporation
115	Kinesix Corporation
600	Management Graphics, Inc.
131	ModaCAD
129	Strata Inc.
117	Techexport, Inc.
1631	Texnai Inc.
1013	Truevision
338	VisionBase, Inc.
123	Wasatch Computer Technology
524	Western Data Corporation
807	Wavefront Technologies, Inc.

Booth	CAD/CAM/CAE/CIM/Robotics
138	Advanced Technology Center
820	Alias Research Inc.
1607	Alias Research Inc., Style! Division

207	Autodesk Multimedia Division
1800	Digital Equipment Corporation
1040	Du Pont Pixel Systems
1031	Folsom Research, Inc.
2631	Fraunhofer Computer Graphics Research Group (USA)
437	Hyperspeed Technologies Inc.
1000	IBM Corporation
640	Infotronic SpA
2200	Intergraph Corporation
831	Ithaca Software
2607	JVC Professional Products Company
115	Kinesix Corporation
652	LAZERUS
1362	MINC Incorporated
131	ModaCAD
2131	Oce Graphics USA, Inc.
1026	Omnicomp Graphics
1226	Panasonic Industrial Company
713	Peritek Corporation
2427	Pixsys
767	Polhemus Incorporated
1434	Sampo Corporation of America
2207	Stardent Computer Inc.
2021	StereoGraphics Corporation
129	Strata Inc.
1400	Sun Microsystems, Inc.
145	TEAC America, Inc.
1407	Tektronix, Inc.
1017	Thomson Digital Image (TDI)
1013	Truevision
1417	Videomedia
1248	Viewpoint Animation Engineering
1617	VPL Research Inc.

Booth Communications

1144	Analogic Corporation, Computer Design & Applications
817	AT&T Graphics Software Labs
1544	Bit 3 Computer Corporation
246	Dassault Electronique
535	Helios Systems, Division of Piiceon, Inc.
523	C. Itoh Technology, Inc.
2603	Motorola, Inc.
616	Philips Semiconductors-Signetics Company
1407	Tektronix, Inc.
1431	Texas Memory Systems, Inc.
1437	University of Lowell

Booth Computer-Video Interfacing

1044	Abekas
2237	Acrobat Graphics Systems
2040	Analog Devices, Inc.
1007	Apple Computer, Inc.
832	Asaca/Shibasoku Corporation of America
817	AT&T Graphics Software Labs
220	AXA Corporation
1244	Brooktree Corporation
2236	Chase Technologies
607	Chromatek, Inc.
1817	Commodore Business Machines, Inc.
113	Diaquest, Inc.
1800	Digital Equipment Corporation
2213	Eastman Kodak Company
644	Everex Systems, Inc.
1644	Extron Electronics
1031	Folsom Research, Inc.
2631	Fraunhofer Computer Graphics Research Group (USA)
1249	Global Information/ElectroGIG
437	Hyperspeed Technologies Inc.
1000	IBM Corporation
640	Infotronic SpA
2440	Intelligent Resources
2200	Intergraph Corporation
523	C. Itoh Technology, Inc.
2607	JVC Professional Products Company
2410	LSI Logic
2403	Magni Systems, Inc.

148	Midwest Litho Arts
1440	NewTek, Inc.
1026	Omnicomp Graphics
1426	Panasonic Communications & Systems Company
1240	P.E. Photron
713	Peritek Corporation
616	Philips Semiconductors-Signetics Company
151	Redlake Corporation
1634	RFX Inc.
327	RGB Spectrum
1400	Sun Microsystems, Inc.
1413	Symbolics, Inc.
145	TEAC America, Inc.
117	Techexport, Inc.
1407	Tektronix, Inc.
1431	Texas Memory Systems, Inc.
1017	Thomson Digital Image (TDI)
1013	Truevision
1437	University of Lowell
1417	Videomedia
2147	Visionetics International Corporation
524	Western Data Corporation
1640	Yamashita Engineering Manufacture, Inc.

Booth	Consultants
2631	Fraunhofer Computer Graphics Research Group (USA)
1026	Omnicomp Graphics
117	Techexport, Inc.
1248	Viewpoint Animation Engineering

Booth	Desktop Computers
1817	Commodore Business Machines, Inc.
246	Dassault Electronique
1800	Digital Equipment Corporation
644	Everex Systems, Inc.
800	Hewlett-Packard Company
437	Hyperspeed Technologies Inc.
1000	IBM Corporation
834	Intel Corporation
2200	Intergraph Corporation
949	Mars Microsystems
148	Midwest Litho Arts
1426	Panasonic Communications & Systems Company
2207	Stardent Computer Inc.
1400	Sun Microsystems, Inc.
117	Techexport, Inc.

Booth	Desktop Publishing
138	Advanced Technology Center
1007	Apple Computer, Inc.
1449	ATI Technologies Inc.
1800	Digital Equipment Corporation
407	Digital F/X, Inc.
2615	F and S, Incorporated
634	Howtek, Inc.
640	Infotronic SpA
2200	Intergraph Corporation
844	IRIS Graphics, Inc.
2607	JVC Professional Products Company
148	Midwest Litho Arts
2220	Mitsubishi International Corporation
131	ModaCAD
2528	National Association of Desktop Publishers
1226	Panasonic Industrial Company
603	QMS, Inc.
1434	Sampo Corporation of America
445	Sharp Electronics Corporation
129	Strata Inc.
1400	Sun Microsystems, Inc.
145	TEAC America, Inc.
117	Techexport, Inc.
1407	Tektronix, Inc.
1631	Texnai Inc.
110	Univision Technologies, Inc.

1248	Viewpoint Animation Engineering
524	Western Data Corporation
244	YARC Systems Corporation

Booth	Disk/Tape Storage Systems/ Subsystems
1044	Abekas
2016	Alliant Computer Systems Corporation
832	Asaca/Shibasoku Corporation of America
800	Hewlett-Packard Company
640	Infotronic SpA
2618	Maximum Strategy, Inc.
1426	Panasonic Communications & Systems Company
226	Sixty Eight Thousand, Inc.
1400	Sun Microsystems, Inc.

Booth	Electronic Publishing
138	Advanced Technology Center
820	Alias Research Inc.
1007	Apple Computer, Inc.
1800	Digital Equipment Corporation
1040	Du Pont Pixel Systems
2615	F and S, Incorporated
2631	Fraunhofer Computer Graphics Research Group (USA)
634	Howtek, Inc.
640	Infotronic SpA
2200	Intergraph Corporation
844	IRIS Graphics, Inc.
2607	JVC Professional Products Company
652	LAZERUS
2044	Meckler
148	Midwest Litho Arts
2528	National Association of Desktop Publishers
226	Optibase Inc.
603	QMS, Inc.
226	Sixty Eight Thousand, Inc.
1400	Sun Microsystems, Inc.
1407	Tektronix, Inc.
1017	Thomson Digital Image (TDI)
1417	Videomedia
410	VITec

Booth	Encoders/Decoders
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1244	Brooktree Corporation
607	Chromatek, Inc.
1440	NewTek, Inc.
713	Peritek Corporation
616	Philips Semiconductors-Signetics Company
327	RGB Spectrum
141	Sigma Electronics, Inc.
117	Techexport, Inc.
1013	Truevision
524	Western Data Corporation

Booth	Engineering Workstations
1007	Apple Computer, Inc.
607	Chromatek, Inc.
1800	Digital Equipment Corporation
1040	Du Pont Pixel Systems
1807	Evans & Sutherland
535	Helios Systems, Division of Piiceon, Inc.
800	Hewlett-Packard Company
437	Hyperspeed Technologies Inc.
1000	IBM Corporation
640	Infotronic SpA
834	Intel Corporation
213	Intelligent Light
2200	Intergraph Corporation
523	C. Itoh Technology, Inc.
949	Mars Microsystems, Inc.
2603	Motorola, Inc.
1026	Omnicomp Graphics
1226	Panasonic Industrial Company
713	Peritek Corporation
2217	Ramtek Corporation
1434	Sampo Corporation of America

1020, 1420	Silicon Graphics
226	Sixty Eight Thousand, Inc.
1400	Sun Microsystems, Inc.
1413	Symbolics, Inc.
145	TEAC America, Inc.
1017	Thomson Digital Image (TDI)
637	Winsted Corporation

Booth	Ergonomics
226	Sixty Eight Thousand, Inc.
637	Winsted Corporation

Booth	GIS & Mapping
138	Advanced Technology Center
126	Cymbolic Sciences International
1040	Du Pont Pixel Systems
1049	Dynamic Graphics, Inc.
800	Hewlett-Packard Company
2200	Intergraph Corporation
844	IRIS Graphics, Inc.
831	Ithaca Software
1026	Omnicomp Graphics
227	Optibase Inc.
713	Peritek Corporation
2217	Ramtek Corporation
2021	StereoGraphics Corporation
1400	Sun Microsystems, Inc.
145	TEAC America, Inc.
110	Univision Technologies, Inc.
410	VITec

Booth	Graphic Digitizers & Tablets
2031	AZTEK, Inc.
1923	Cyberware Laboratory Inc.
2107	Numonics Corporation
616	Philips Semiconductors-Signetics Company
2427	Pixsys
737	Polhemus Incorporated
117	Techexport, Inc.
1248	Viewpoint Animation Engineering
203	Wacom, Inc.

Booth	Graphic Displays & Monitors
1007	Apple Computer, Inc.
832	Asaca/Shibasoku Corporation of America
1449	ATI Technologies Inc.
2031	AZTEK, Inc.
607	Chromatek, Inc.
1823	CTX International Inc.
246	Dassault Electronique
1800	Digital Equipment Corporation
1040	Du Pont Pixel Systems
644	Everex Systems, Inc.
1000	IBM Corporation
640	Infotronic SpA
523	C. Itoh Technology, Inc.
2403	Magni Systems, Inc.
1426	Panasonic Communications & Systems Company
1226	Panasonic Industrial Company
713	Peritek Corporation
616	Philips Semiconductors-Signetics Company
240	RasterOps Corporation
1434	Sampo Corporation of America
1034	Sony Corporation of America
117	Techexport, Inc.
1407	Tektronix, Inc.
110	Univision Technologies, Inc.

Booth	Graphics Arts Systems
820	Alias Research Inc.
1007	Apple Computer, Inc.
817	AT&T Graphics Software Labs
207	Autodesk Multimedia Division
220	AXA Corporation
2031	AZTEK, Inc.
113	Diaquest, Inc.
417	Digital Arts
1800	Digital Equipment Corporation
1040	Du Pont Pixel Systems
2615	F and S, Incorporated

2223	Ilford Photo Corporation
640	Infotronic SpA
2200	Intergraph Corporation
844	IRIS Graphics, Inc.
600	Management Graphics, Inc.
131	ModaCAD
1440	NewTek, Inc.
227	Optibase Inc.
1649	Ray Dream, Inc.
445	Sharp Electronics Corporation
2407	Shima Seiki U.S.A., Inc.
226	Sixty Eight Thousand, Inc.
1413	Symbolics, Inc.
145	TEAC America, Inc.
117	Techexport, Inc.
1017	Thomson Digital Image (TDI)
217	Time Arts Inc.
1013	Truevision
1248	Viewpoint Animation Engineering
123	Wasatch Computer Technology
807	Wavefront Technologies, Inc.

Booth	Graphics Standards Packages
1007	Apple Computer, Inc.
2031	AZTEK, Inc.
246	Dassault Electronique
1800	Digital Equipment Corporation
2631	Fraunhofer Computer Graphics Research Group (USA)
800	Hewlett-Packard Company
1000	IBM Corporation
2200	Intergraph Corporation
831	Ithaca Software
115	Kinesix Corporation
1026	Omnicomp Graphics
713	Peritek Corporation
1613	PEX Interoperability Committee
2207	Stardent Computer Inc.
1400	Sun Microsystems, Inc.
931	Template Graphics Software
1437	University of Lowell

Booth	Graphics Terminals
832	Asaca/Shibasoku Corporation of America
2031	AZTEK, Inc.
246	Dassault Electronique
1800	Digital Equipment Corporation
800	Hewlett-Packard Company
1000	IBM Corporation
640	Infotronic SpA
523	C. Itoh Technology, Inc.
2200	Intergraph Corporation
1426	Panasonic Communications & Systems Company
1226	Panasonic Industrial Company
2207	Stardent Computer Inc.
117	Techexport
1407	Tektronix, Inc.

Booth	Hard Copy; Photographs/Slides
620	CELCO, Pacific Division
126	Cymbolic Sciences International
1800	Digital Equipment Corporation
2213	Eastman Kodak Company
2615	F and S, Incorporated
1000	IBM Corporation
2223	Ilford Photo Corporation
844	IRIS Graphics, Inc.
600	Management Graphics, Inc.
148	Midwest Litho Arts
1426	Panasonic Communications & Systems Company
603	QMS, Inc.
445	Sharp Electronics Corporation
117	Techexport, Inc.
1631	Texnai Inc.
2637	2Film Technologies
524	Western Data Corporation

Booth	HDTV
820	Alias Research Inc.
2040	Analog Devices, Inc.

832	Asaca/Shibasoku Corporation of America
607	Chromatek, Inc.
1040	Du Pont Pixel Systems
2631	Fraunhofer Computer Graphics Research Group (USA)
1249	Global Information/ElectroGIG
844	IRIS Graphics, Inc.
2044	Meckler
713	Peritek Corporation
2407	Shima Seiki U.S.A., Inc.
1413	Symbolics, Inc.
1431	Texas Memory Systems, Inc.
1017	Thomson Digital Image (TDI)
1640	Yamashita Engineering Manufacture, Inc.

Booth	High Performance Graphics Processors
142	Alacron, Inc.
1144	Analogic Corporation, Computer Design & Applications
1007	Apple Computer, Inc.
832	Asaca/Shibasoku Corporation of America
1449	ATI Technologies Inc.
2031	AZTEK, Inc.
1800	Digital Equipment Corporation
407	Digital F/X, Inc.
1040	Du Pont Pixel Systems
644	Everex Systems, Inc.
800	Hewlett-Packard Company
437	Hyperspeed Technologies Inc.
1000	IBM Corporation
2223	Ilford Photo Corporation
640	Infotronic SpA
834	Intel Corporation
652	LAZERUS
2410	LSI Logic
2003	Megatek Corporation
2234	Microfield Graphics, Inc.
1831	Nissei Sangyo America, Ltd.
549	Octree Corporation
1026	Omnicomp Graphics
227	Optibase Inc.
610	Parallax Graphics, Inc.
713	Peritek Corporation
226	Sixty Eight Thousand, Inc.
1400	Sun Microsystems, Inc.
1413	Symbolics, Inc.
117	Techexport, Inc.
1920	WaveTracer, Inc.

Booth	High Resolution Graphic Display Systems
142	Alacron, Inc.
2040	Analog Devices, Inc.
1144	Analogic Corporation, Computer Design & Applications
832	Asaca/Shibasoku Corporation of America
220	AXA Corporation
2031	AZTEK, Inc.
607	Chromatek, Inc.
1800	Digital Equipment Corporation
1040	Du Pont Pixel Systems
1807	Evans & Sutherland
800	Hewlett-Packard Company
437	Hyperspeed Technologies Inc.
1000	IBM Corporation
640	Infotronic SpA
2200	Intergraph Corporation
523	C. Itoh Technology, Inc.
652	LAZERUS
2234	Microfield Graphics, Inc.
1826	Mitsubishi Electronics America-Professional Electronics
1831	Nissei Sangyo America, Ltd.
1026	Omnicomp Graphics
1426	Panasonic Communications & Systems Company
1226	Panasonic Industrial Company
713	Peritek Corporation
240	RasterOps Corporation

337	Raytheon Company Submarine Signal Division
1434	Sampo Corporation of America
226	Sixty Eight Thousand, Inc.
1034	Sony Corporation of America
2207	Stardent Computer Inc.
1400	Sun Microsystems, Inc.
117	Techexport, Inc.
1407	Tektronix, Inc.
1013	Truevision
1437	University of Lowell

Booth	Hypermedia/Multimedia
1607	Alias Research Inc., Style! Division
1007	Apple Computer, Inc.
832	Asaca/Shibasoku Corporation of America
817	AT&T Graphics Software Labs
1449	ATI Technologies Inc.
207	Autodesk Multimedia Division
220	AXA Corporation
1817	Commodore Business Machines, Inc.
113	Diaquest, Inc.
1800	Digital Equipment Corporation
1031	Folsom Research, Inc.
2631	Fraunhofer Computer Graphics Research Group (USA)
1249	Global Information/ElectroGIG
1000	IBM Corporation
2607	JVC Professional Products Company
115	Kinesix Corporation
2403	Magni Systems, Inc.
2044	Meckler
2603	Motorola, Inc.
1026	Omnicomp Graphics
227	Optibase Inc.
1426	Panasonic Communications & Systems Company
1226	Panasonic Industrial Company
737	Polhemus Incorporated
151	Redlake Corporation
226	Sixty Eight Thousand, Inc.
2021	StereoGraphics Corporation
129	Strata Inc.
1400	Sun Microsystems, Inc.
145	TEAC America, Inc.
117	Techexport, Inc.
1407	Tektronix, Inc.
1017	Thomson Digital Image (TDI)
217	Time Arts Inc.
1437	University of Lowell
1417	Videomedia
1248	Viewpoint Animation Engineering
338	VisionBase, Inc.

Booth	Image Processing
2237	Acrobat Graphics Systems
344	Advanced Imaging Magazine
142	Alacron, Inc.
2016	Alliant Computer Systems Corporation
2040	Analog Devices, Inc.
1144	Analogic Corporation, Computer Design & Applications
1007	Apple Computer, Inc.
832	Asaca/Shibasoku Corporation of America
817	AT&T Graphics Software Labs
207	Autodesk Multimedia Division
220	AXA Corporation
1244	Brooktree Corporation
607	Chromatek, Inc.
1817	Commodore Business Machines, Inc.
813	Convex Computer Corporation
1800	Digital Equipment Corporation
1040	Du Pont Pixel Systems
644	Everex Systems, Inc.
2615	F and S, Incorporated
1031	Folsom Research, Inc.
2631	Fraunhofer Computer Graphics Research Group (USA)

800	Hewlett-Packard Company
437	Hyperspeed Technologies Inc.
1000	IBM Corporation
2223	Ilford Photo Corporation
410	IMSL, Inc.
640	Infotronic SpA
834	Intel Corporation
2200	Intergraph Corporation
831	Ithaca Software
2607	JVC Professional Products Company
652	LAZERUS
2410	LSI Logic
2403	Magni Systems, Inc.
2234	Microfield Graphics, Inc.
148	Midwest Litho Arts
2144	Minnesota Datametrics Corporation
2220	Mitsubishi International Corporation
1026	Omnicomp Graphics
227	Optibase Inc.
1226	Panasonic Industrial Company
610	Parallax Graphics, Inc.
713	Peritek Corporation
616	Philips Semiconductors-Signetics Company
2217	Ramtek Corporation
151	Redlake Corporation
1634	RFX Inc.
2013	Ron Scott Inc.
445	Sharp Electronics Corporation
226	Sixty Eight Thousand, Inc.
1034	Sony Corporation of America
2207	Stardent Computer Inc.
1400	Sun Microsystems, Inc.
117	Techexport, Inc.
1407	Tektronix, Inc.
1431	Texas Memory Systems, Inc.
1017	Thomson Digital Image (TDI)
1013	Truevision
1437	University of Lowell
110	Univision Technologies, Inc.
338	VisionBase, Inc.
2147	Visionetics International Corporation
2423	Vital Images, Inc.
123	Wasatch Computer Technology
807	Wavefront Technologies, Inc.
1920	WaveTracer, Inc.
244	YARC Systems Corporation

Booth	Input/Output Devices/Formats
138	Advanced Technology Center
431	Ampex Corporation
1244	Brooktree Corporation
620	CELCO, Pacific Division
607	Chromatek, Inc.
2615	F and S, Incorporated
535	Helios Systems, Division of Piiceon, Inc.
634	Howtek, Inc.
2223	Ilford Photo Corporation
844	IRIS Graphics, Inc.
2607	JVC Professional Products Company
652	LAZERUS
2131	Oce Graphics USA, Inc.
1026	Omnicomp Graphics
1426	Panasonic Communications & Systems Company
1226	Panasonic Industrial Company
1240	P.E. Photron
713	Peritek Corporation
2427	Pixsys
737	Polhemus Incorporated
327	RGB Spectrum
445	Sharp Electronics Corporation
2021	StereoGraphics Corporation
145	TEAC America, Inc.
117	Techexport, Inc.
1631	Texnai Inc.
1248	Viewpoint Animation Engineering
1617	VPL Research Inc.

Booth	Low Cost Graphics Systems
1007	Apple Computer, Inc.
817	AT&T Graphics Software Labs
207	Autodesk Multimedia Division
220	AXA Corporation
2031	AZTEK, Inc.
1817	Commodore Business Machines, Inc.
246	Dassault Electronique
113	Diaquest, Inc.
1800	Digital Equipment Corporation
2615	F and S, Incorporated
800	Hewlett-Packard Company
1000	IBM Corporation
640	Infotronic SpA
834	Intel Corporation
831	Ithaca Software
523	C. Itoh Technology, Inc.
652	LAZERUS
1440	NewTek, Inc.
1026	Omnicomp Graphics
1226	Panasonic Industrial Company
713	Peritek Corporation
1434	Sampo Corporation of America
226	Sixty Eight Thousand, Inc.
2207	Stardent Computer Inc.
1400	Sun Microsystems, Inc.
117	Techexport, Inc.
1407	Tektronix, Inc.
1631	Texnai Inc.
217	Time Arts Inc.
1013	Truevision
1248	Viewpoint Animation Engineering
338	VisionBase, Inc.
2147	Visionetics International Corporation

Booth	Medical Imaging
1044	Abekas
142	Alacron, Inc.
2016	Alliant Computer Systems Corporation
431	Ampex Corporation
2040	Analog Devices, Inc.
832	Asaca/Shibasoku Corporation of America
817	AT&T Graphics Software Labs
607	Chromatek, Inc.
1040	Du Pont Pixel Systems
2615	F and S, Incorporated
1031	Folsom Research, Inc.
2631	Fraunhofer Computer Graphics Research Group (USA)
800	Hewlett-Packard Company
410	IMSL, Inc.
844	IRIS Graphics, Inc.
831	Ithaca Software
2607	JVC Professional Products Company
2234	Microfield Graphics, Inc.
2144	Minnesota Datametrics Corporation
2220	Mitsubishi International Corporation
131	ModaCAD
549	Octree Corporation
1026	Omnicomp Graphics
227	Optibase Inc.
1226	Panasonic Industrial Company
713	Peritek Corporation
2427	Pixsys
2217	Ramtek Corporation
337	Raytheon Company Submarine Signal Division
151	Redlake Corporation
2207	Stardent Computer Inc.
2021	StereoGraphics Corporation
1400	Sun Microsystems, Inc.
1407	Tektronix, Inc.
1431	Texas Memory Systems, Inc.
1013	Truevision
110	Univision Technologies, Inc.
1248	Viewpoint Animation Engineering

338	VisionBase, Inc.
2423	Vital Images, Inc.
1920	WaveTracer, Inc.
244	YARC Systems Corporation

Booth	Paint Systems
2237	Acrobat Graphics Systems
820	Alias Research Inc.
1007	Apple Computer, Inc.
817	AT&T Graphics Software Labs
207	Autodesk Multimedia Division
220	AXA Corporation
2031	AZTEK, Inc.
1817	Commodore Business Machines, Inc.
113	Diaquest, Inc.
417	Digital Arts
1800	Digital Equipment Corporation
800	Hewlett-Packard Company
2200	Intergraph Corporation
1440	NewTek, Inc.
2407	Shima Seiki U.S.A., Inc.
2026	SOFTIMAGE Inc.
1413	Symbolics, Inc.
117	Techexport, Inc.
1631	Texnai Inc.
1017	Thomson Digital Image (TDI)
217	Time Arts Inc.
1013	Truevision
123	Wasatch Computer Technology

Booth	Personal Computer Graphics Cards
1007	Apple Computer, Inc.
1817	Commodore Business Machines, Inc.
246	Dassault Electronique
113	Diaquest, Inc.
644	Everex Systems, Inc.
2631	Fraunhofer Computer Graphics Research Group (USA)
437	Hyperspeed Technologies Inc.
1000	IBM Corporation
640	Infotronic SpA
834	Intel Corporation
2234	Microfield Graphics, Inc.
1440	NewTek, Inc.
1831	Nissei Sangyo America, Ltd.
1026	Omnicomp Graphics
713	Peritek Corporation
151	Redlake Corporation
1020, 1420	Silicon Graphics
117	Techexport, Inc.
1631	Texnai Inc.
2630	Trix Company, Ltd.
1013	Truevision
1437	University of Lowell
2147	Visionetics International Corporation

Booth	Printers, Plotters, and Other Hard Copy Devices
832	Asaca/Shibasoku Corporation of America
2031	AZTEK, Inc.
1800	Digital Equipment Corporation
2213	Eastman Kodak Company
1249	Global Information/ElectroGIG
800	Hewlett-Packard Company
1000	IBM Corporation
2223	Ilford Photo Corporation
2200	Intergraph Corporation
844	IRIS Graphics, Inc.
423	Lasertek
148	Midwest Litho Arts
1826	Mitsubishi Electronics America — Professional Electronics
2220	Mitsubishi International
2131	Oce Graphics USA, Inc.
2107	Numonics Corporation
1426	Panasonic Communications & Systems Company
603	QMS, Inc.

337	Raytheon Company Submarine Signal Division
1400	Sun Microsystems, Inc.
117	Techexport, Inc.
1407	Tektronix, Inc.
1631	Texnai Inc.
524	Western Data Corporation

Booth	Publications
1746	Academic Press
623	Addison-Wesley Publishing Company
344	Advanced Imaging
344	AV Communications Magazine
2010	Computer Graphics World/ SIGGRAPH Show Daily
740	Digital Review/Cahners Publishing Company
723	IEEE Computer Society
2338	Jones & Bartlett Publishers, Inc.
2044	Meckler
1347	The MIT Press
731	Montage Publishing, Inc.
238	Morgan Kaufmann Publishers
2145	PCI Publications
1252	Presentation Products Magazine
2431	Scientific Computing & Automation Magazine
Lobby	
S114	SIGGRAPH Local Groups
721	Springer-Verlag
427	SunExpert Magazine
331	SunWorld-IDG
2337	Supercomputing Review
2538	Tech Images
2613	UNIXWorld Magazine
2045	Video Systems Magazine
537	John Wiley & Sons
2628	Workstation News

Booth	Rendering Software
2237	Acrobat Graphics Systems
820	Alias Research Inc.
1607	Alias Research Inc., Style! Division
1007	Apple Computer, Inc.
817	AT&T Graphics Software Labs
207	Autodesk Multimedia Division
1800	Digital Equipment Corporation
2631	Fraunhofer Computer Graphics Research Group (USA)
800	Hewlett-Packard Company
1000	IBM Corporation
640	Infotronic SpA
213	Intelligent Light
2200	Intergraph Corporation
652	LAZERUS
148	Midwest Litho Arts
2144	Minnesota Datametrics Corporation
131	ModaCAD
1440	NewTek, Inc.
1649	Ray Dream, Inc.
2026	SOFTIMAGE Inc.
129	Strata Inc.
1400	Sun Microsystems, Inc.
1413	Symbolics, Inc.
117	Techexport, Inc.
1017	Thomson Digital Image (TDI)
1013	Truevision
1417	Videomedia
1248	Viewpoint Animation Engineering
410	VITec
807	Wavefront Technologies, Inc.

Booth	Research Systems
1049	Dynamic Graphics, Inc.
607	Chromatek, Inc.
1040	Du Pont Pixel Systems
2631	Fraunhofer Computer Graphics Research Group (USA)
437	Hyperspeed Technologies Inc.
1000	IBM Corporation
831	Ithaca Software

2144	Minnesota Datametrics Corporation
549	Octree Corporation
1026	Omnicomp Graphics
2026	SOFTIMAGE Inc.
2207	Stardent Computer Inc.
1400	Sun Microsystems, Inc.
1413	Symbolics, Inc.
145	TEAC America, Inc.
1437	University of Lowell
1617	VPL Research Inc.
1920	WaveTracer, Inc.
1646	Wolfram Research, Inc.

Booth Scanners; Scan Converters

1007	Apple Computer, Inc.
832	Asaca/Shibasoku Corporation of America
2031	AZTEK, Inc.
607	Chromatek, Inc.
2213	Eastman Kodak Company
1031	Folsom Research, Inc.
634	Howtek, Inc.
1000	IBM Corporation
2200	Intergraph Corporation
1426	Panasonic Communications & Systems Company
1240	P.E. Photron
1634	RFX Inc.
445	Sharp Electronics Corporation
117	Techexport, Inc.
1248	Viewpoint Animation Engineering
524	Western Data Corporation

Booth Scientific Visualization

1044	Abekas
820	Alias Research Inc.
2016	Alliant Computer Systems Corporation
1007	Apple Computer, Inc.
832	Asaca/Shibasoku Corporation of America
817	AT&T Graphics Software Labs
607	Chromatek, Inc.
813	Convex Computer Corporation
113	Diaquest, Inc.
1800	Digital Equipment Corporation
1040	Du Pont Pixel Systems
1049	Dynamic Graphics, Inc.
1807	Evans & Sutherland
1031	Folsom Research, Inc.
2631	Fraunhofer Computer Graphics Research Group (USA)
800	Hewlett-Packard Company
437	Hyperspeed Technologies Inc.
1000	IBM Corporation
834	Intel Corporation
213	Intelligent Light
2200	Intergraph Corporation
831	Ithaca Software
523	C. Itoh Technology, Inc.
115	Kinesix Corporation
652	LAZERUS
2144	Minnesota Datametrics Corporation
131	ModaCAD
549	Octree Corporation
1240	P.E. Photron
737	Polhemus Incorporated
2026	SOFTIMAGE Inc.
2207	Stardent Computer Inc.
1400	Sun Microsystems, Inc.
145	TEAC America, Inc.
1407	Tektronix, Inc.
931	Template Graphics Software
1431	Texas Memory Systems, Inc.
1017	Thomson Digital Image (TDI)
1437	University of Lowell
1248	Viewpoint Animation Engineering
2423	Vital Images, Inc.
410	VITec
807	Wavefront Technologies, Inc.
1920	WaveTracer, Inc.

Booth	Software (Other)
1746	Academic Press
1007	Apple Computer, Inc.
817	AT&T Graphics Software Labs
207	Autodesk Multimedia Division
220	AXA Corporation
2031	AZTEK, Inc.
246	Dassault Electronique
1800	Digital Equipment Corporation
2615	F and S, Incorporated
2631	Fraunhofer Computer Graphics Research Group (USA)
800	Hewlett-Packard Company
437	Hyperspeed Technologies Inc.
1546	IMSL, Inc.
2200	Intergraph Corporation
831	Ithaca Software
652	LAZERUS
1362	MINC Incorporated
131	ModaCAD
713	Peritek Corporation
143	ProTech Marketing Inc.
2013	Ron Scott Inc.
2026	SOFTIMAGE Inc.
2207	Stardent Computer Inc.
1400	Sun Microsystems, Inc.
117	Techexport, Inc.
931	Template Graphics Software
1631	Texnai Inc.
1017	Thomson Digital Image (TDI)
217	Time Arts Inc.
2630	Trix Company, Ltd.
1013	Truevision
1437	University of Lowell
1249	Viewpoint Animation Engineering
338	VisionBase, Inc.
410	VITec
123	Wasatch Computer Technology
1646	Wolfram Research, Inc.

Booth	Systems Integrators
220	AXA Corporation
2031	AZTEK, Inc.
246	Dassault Electronique
2631	Fraunhofer Computer Graphics Research Group (USA)
2003	Megatek Corporation
1026	Omnicomp Graphics
226	Sixty Eight Thousand, Inc.
117	Techexport, Inc.
2630	Trix Company, Ltd.
524	Western Data Corporation

Booth	Turnkey Systems; Hardware/Software
2237	Acrobat Graphics Systems
431	Ampex Corporation
1007	Apple Computer, Inc.
220	AXA Corporation
2031	AZTEK, Inc.
113	Diaquest, Inc.
417	Digital Arts
1800	Digital Equipment Corporation
1807	Evans & Sutherland
437	Hyperspeed Technologies Inc.
2200	Intergraph Corporation
652	LAZERUS
1026	Omnicomp Graphics
1240	P.E. Photron
713	Peritek Corporation
2217	Ramtek Corporation
2407	Shima Seiki U.S.A., Inc.
226	Sixty Eight Thousand, Inc.
2026	SOFTIMAGE Inc.
1400	Sun Microsystems, Inc.
1413	Symbolics, Inc.
117	Techexport, Inc.
1017	Thomson Digital Image (TDI)

Booth	Video or Film Recorders
1044	Abekas
832	Asaca/Shibasoku Corporation of America
620	CELCO, Pacific Division
2236	Chase Technologies, Inc.

1817	Commodore Business Machines, Inc.
113	Diaquest, Inc.
1800	Digital Equipment Corporation
1000	IBM Corporation
1826	Mitsubishi Electronics America — Professional Electronics
1426	Panasonic Communications & Systems Company
713	Peritek Corporation
1634	RFX Inc.
2021	StereoGraphics Corporation
145	TEAC America, Inc.
117	Techexport, Inc.
524	Western Data Corporation

Booth	Video Projectors
607	Chromatek, Inc.
1826	Mitsubishi Electronics America — Professional Electronics
1426	Panasonic Communications & Systems Company
1034	Sony Corporation of America
2021	StereoGraphics Corporation
117	Techexport, Inc.

Booth	Video Technology
1044	Abekas
1007	Apple Computer, Inc.
832	Asaca/Shibasoku Corporation of America
817	AT&T Graphics Software Labs
1244	Brooktree Corporation
607	Chromatek, Inc.
1817	Commodore Business Machines, Inc.
113	Diaquest, Inc.
644	Everex Systems, Inc.
1031	Folsom Research, Inc.
2631	Fraunhofer Computer Graphics Research Group (USA)
1000	IBM Corporation
640	Infotronic SpA
2440	Intelligent Resources
523	C. Itoh Technology, Inc.
2607	JVC Professional Products Company
2410	LSI Logic
2403	Magni Systems, Inc.
1440	NewTek, Inc.
1026	Omnicomp Graphics
1426	Panasonic Communications & Systems Company
610	Parallax Graphics, Inc.
1240	P.E. Photron
616	Philips Semiconductors-Signetics Company
240	RasterOps Corporation
327	RGB Spectrum
141	Sigma Electronics, Inc.
2207	Stardent Computer Inc.
1400	Sun Microsystems, Inc.
1413	Symbolics, Inc.
145	TEAC America, Inc.
117	Techexport, Inc.
1407	Tektronix, Inc.
1017	Thomson Digital Image (TDI)
1013	Truevision
1417	Videomedia
2147	Visionetics International Corporation

Booth	Virtual Reality
832	Asaca/Shibasoku Corporation of America
1800	Digital Equipment Corporation
1040	Du Pont Pixel Systems
2631	Fraunhofer Computer Graphics Research Group (USA)
800	Hewlett-Packard Company
437	Hyperspeed Technologies Inc.
1000	IBM Corporation
2044	Meckler
1347	The MIT Press

2427	Pixsys
737	Polhemus Incorporated
721	Springer-Verlag
2021	StereoGraphics Corporation
1400	Sun Microsystems, Inc.
1248	Viewpoint Animation Engineering
1617	VPL Research Inc.

Booth **Windowing Systems**

1007	Apple Computer, Inc.
832	Asaca/Shibasoku Corporation of America
1817	Commodore Business Machines
246	Dassault Electronique
1800	Digital Equipment Corporation
2213	Eastman Kodak Company
2631	Fraunhofer Computer Graphics Research Group (USA)
800	Hewlett-Packard Company
1000	IBM Corporation
640	Infotronic SpA
523	C. Itoh Technology, Inc.
652	LAZERUS
2234	Microfield Graphics, Inc.
1226	Panasonic Industrial Company
610	Parallax Graphics, Inc.
1613	PEX Interoperability Committee
327	RGB Spectrum
1400	Sun Microsystems, Inc.
117	Techexport, Inc.
1407	Tektronix, Inc.
1013	Truevision
338	VisionBase, Inc.

Booth **Miscellaneous**

ADA Programming services

138	Advanced Technology Center

Architectural Design & Visualization

820	Alias Research Inc.
1017	Thomson Digital Image (TDI)

Array Processors

1431	Texas Memory Systems, Inc.

CAE Software

1362	MINC Incorporated

Character Animation

2026	SOFTIMAGE Inc.

Color-Corrected Halftone Separations

2615	F and S, Incorporated

Computer-Aided Industrial Design Software

820	Alias Research Inc.

Computer Generated Imaging

337	Raytheon Company Submarine Signal Division

Computer Imaging Cameras

2607	JVC Professional Products Company

Conference & Exposition

527	Eurographics
2327	Imagina
2007	National Computer Graphics Association
139	Nippon Computer Graphics
424	Supercomputing '91

Controllers

652	LAZERUS

Co-Processors

142	Alacron, Inc.

CRT Color Analyzer/ CRT Test Instruments

1740	Minolta Corporation

Dataware
1248 Viewpoint Animation Engineering

Fax Cards
1449 ATI Technologies Inc.

Film Recorders
600 Management Graphics, Inc.

Genlock Hardware
2403 Magni Systems, Inc.

Geoscience
2423 Vital Images, Inc.

Graphics I.C.'s
1244 Brooktree Corporation

Graphics Libraries
213 Intelligent Light

Graphics Programming Software (PHIGS)
800 Hewlett-Packard Company

Graphics Software
217 Time Arts Inc.

Graphics Supercomputers
437 Hyperspeed Technologies Inc.

Image and/or Voice Compression /Expansion
227 Optibase Inc.

Image Database Software
338 VisionBase, Inc.

Industrial Product Styling
1017 Thomson Digital Image (TDI)

Memory Systems
1431 Texas Memory Systems, Inc.

Modems
1449 ATI Technologies Inc.

Networking Equipment
237 American Power Conversion

News Workstations
1034 Sony Corporation of America

Parallel Processing Graphics Systems
437 Hyperspeed Technologies Inc.

Photographic Color Copiers
2223 Ilford Photo Corporation

Picture Databases
2631 Fraunhofer Computer Graphics Research Group (USA)

Presentation Monitors
1826 Mitsubishi Electronics America — Professional Electronics

Presentation Software
817 AT&T Graphics Software Labs

Rewriter Disks
1034 Sony Corporation of America

RISC Board Level Systems
244 YARC Systems Corporation

Robotics/Process Control
652 LAZERUS

Semiconductor Components
1244 Brooktree Corporation

Single Board Computers
142 Alacron, Inc.

Solid Modeling
549 Octree Corporation

Software and/or Network Security and/or Management
1046 Rainbow Technologies, Inc.
531 Software Security, Inc.

Stereoscopic 3D Viewing Systems
2021 StereoGraphics Corporation

Supercomputers

2016 Alliant Computer Systems Corporation
813 Convex Computer Corporation

Telecommunications-ISDN

151 Redlake Corporation

Textbooks

623 Addison-Wesley Publishing Company

Three-D Digitizers

1923 Cyberware Laboratory Inc.
737 Polhemus Incorporated

Three-D Objects/3D Clip Art

1248 Viewpoint Animation Engineering

Trade Association

2007 National Computer Graphics Association

Unified Graphics Systems

1413 Symbolics, Inc.

Uninterruptible Power Supplies

237 American Power Conversion

User Interface Systems

2631 Fraunhofer Computer Graphics Research Group (USA)

Video Compression

610 Parallax Graphics, Inc.

Volume Visualization

549 Octree Corporation
2423 Vital Images, Inc.

Wide Band Switching and Distribution

141 Sigma Electronics, Inc.

Workstation Furniture

637 Winsted Corporation

A D D E N D U M

Exhibitor Relocations

Company Name	New Booth Number
Acrobat Graphics Systems	234
Ampex Corporation	2413
IMSL, Inc.	613
Meckler Publishing	2417
Microfield Graphics, Inc.	1637
Minnesota Datametrics Corporation	2420
PCI Publications	2620
PixSys	2032
RGB Spectrum	404
SOFTIMAGE Inc.	1817
Video Systems Magazine	434
Visionetics International Corporation	1446

New Exhibitors Not Listed in the Final Program

AGFA Compugraphic Division
Booth 1144

1 Ramland Road
Orangeburg, NY 10962
914-365-0190; 914-359-3201 (fax)
Paul Streit, Product Manager

Apunix Computer Services
Booth 1444

5575 Ruffin Road, Suite 110
San Diego, CA 92123
619-495-9229; 619-495-9230 (fax)
Sylvia Berens, Vice President

Clarion Concepts, Inc.
Booth 2427

1950 Stemmons Freeway, Suite 5001
Dallas, TX 75207
214-746-4334; 214-746-4854 (fax)
Jacqui Harris, Communications Dir.

Computer Systems Architects
Booth 550

950 North University Avenue
Provo, UT 84604
801-374-2300; 801-374-2306 (fax)
Duane B. Call, President

Electric Image, Inc.
Booth 1834

9690 Telstar Avenue, Suite 225
El Monte, CA 91731
818-444-1819; 818-444-1135 (fax)
Jay Roth, President

FOR.A Corporation of America
Booth 741

313 Speen Street
Natick, MA 01760
508-650-3902; 508-651-8729 (fax)
Nicola C. Holm, Marketing Admin.

Imagraph
Booth 1637

11 Elizabeth Drive
Chelmsford, MA 01824
508-256-4624; 508-250-9155 (fax)
Bob Wang, Vice President, Marketing

Kingston Technology Corp.
Booth 2610

17600 Newhope Street
Fountain Valley, CA 92708
714-435-2600; 714-435-2699 (fax)
John Sutherland, Manager,
Workstation Products Group

La Belle Display Sciences Group
Booth 327

510 South Worthington Street
Oconomowoc, WI 55066
414-567-9101; 414-567-4047 (fax)
Glenn Schulz, Vice President

Memory X, Inc.
Booth 1352

3954 Murphy Canyon Road #D104
San Diego, CA 92123
619-292-1151; 619-292-0774 (fax)
Gary Smith, President

Oyo Geospace Corporation
Booth 1934

7334 North Gessner
Houston, TX 77040
713-939-9700; 713-937-8262 (fax)
Linda Lovern
Manager, Sales Administration

Precision Group
Booth 1149

5000 West Charlston
Las Vegas, NV 89102
702-870-7888; 702-870-4585 (fax)
Kurt Abbott

Roche Image Analysis Systems, Inc.
Booth 2317

112 Orange Drive
Elon College, NC 27244
919-584-0250; 919-584-9141 (fax)
Keith Phillips, Vice President,
Operations

Slide Services Inc.
Booth 549

2537 25th Avenue South
Minneapolis, MN 55406
612-721-2434; 612-721-4855 (fax)
Robert Remakel, President

Stardent Computer - AVS Consortium
Booth 413

95 Wells Avenue
Newton, MA 02159
508-287-0100; 508-371-7414 (fax)
Sharon Cullina
Manager, Exhibits and Promotions

Wolsey Company
Booth 534

15110 East Nelson
Industry, CA 91747
818-336-4575; 818-333-5156 (fax)
Jon Eastman, Vice President, Sales

Yuan-Yuan Enterprise Company Ltd.
Booth 1146

210 Post Street, #1118
San Francisco, CA 94108
415-392-3714; 415-392-6515 (fax)
Suzanne Lo, Manager

Additional Listing for Dassault:

Dassault Automatismes et Telecommunications
Booth 246

9, rue Elsa Triolet
Zone Industrielle Les Gatines
Plaisir, France 78370
33-103081-2410; 33-1-3081-2522 (fax)

Airline Information

Lobby S114
Las Vegas Convention Center
Sunday: 12:00 noon to 10:00 pm
Monday–Tuesday: 7:30 am to 7:00 pm
Wednesday–Thursday: 8:00 am to 6:00 pm
Friday: 9:00 am to 1:00 pm

American Airlines and Delta Air Lines are available to assist you with your travel plans. If you need advice, information, or itinerary changes, please visit the airline information desk during the above hours.

Audio/Visual Services

A/V Office
Rooms N201, N202
Las Vegas Convention Center
Sunday: 9:00 am to 9:00 pm
Monday–Friday: 8:30 am to 5:00 pm

Direct all questions about audio/visual needs to this office during the hours listed above. For more information, call 702-792-3521.

Electronic Theatre, Computer Graphics Screening Rooms, and Open Deck Office
Room S205
Las Vegas Convention Center
Monday–Friday: 10:00 am to 5:00 pm

Contributors can gather here to exchange ideas, leave messages, or handle concerns. To schedule showings on the open deck, come to this office or call 702-792-3502.

Speaker Prep Office
Rooms N205, N208
Las Vegas Convention Center
Sunday: 9:00 am to 9:00 pm
Monday–Thursday: 7:00 am to 10:00 pm
Friday: 7:00 am to 5:00 pm

All speakers are encouraged to check in during speaker prep room hours as listed above. Here you may preview your slides and videotapes, ask questions, and rehearse your SIGGRAPH presentation.

Speaker Slidemaking Office
Rooms N205, N208
Las Vegas Convention Center
Sunday: 12:00 noon to 5:00 pm
Monday–Thursday: 8:30 am to 5:00 pm

Speakers with last-minute slide changes can make alterations in this office (which also serves as the speaker prep room). This service is donated by Precision Group, Inc. For information, call 702-870-7888.

Child Care

Child care services are offered by most SIGGRAPH '91 hotels. Contact the concierge desk or guest services department at your hotel to find out which services are provided.

Conference Management Office

Room S201
Las Vegas Convention Center

If you have questions regarding SIGGRAPH '91, personnel are on hand to assist you. You may either visit the office or reach them by phoning 702-792-3812.

Exhibition Management Office

Room S202
Las Vegas Convention Center

If you have questions regarding the exhibition, personnel are on hand to assist you. You may either visit the office or reach them by phoning 702-792-3505.

First Aid Office

Central Concourse
Las Vegas Convention Center

A registered nurse or paramedic is on duty in this office during registration hours. The first aid office telephone number is 702-733-2354.

Hotel Information

SIGGRAPH '91 has selected these hotels to provide accommodations for conference participants. In addition to being easily accessible to the Las Vegas Convention Center, these hotels offer attendees special rates.

Free shuttle buses provide frequent service between conference hotels and all conference activities.

Caesars Palace
Headquarters Hotel
3570 Las Vegas Boulevard South
Las Vegas, Nevada 89109
702-731-7110

Aladdin Hotel
3667 Las Vegas Boulevard South
Las Vegas, Nevada 89109
702-736-0111

Alexis Park Resort
375 East Harmon
Las Vegas, Nevada 89109
702-796-3300

Bally's Casino Resort
3645 Las Vegas Boulevard South
Las Vegas, Nevada 89109
702-739-4111

Las Vegas Hilton
3000 Paradise Road
Las Vegas, Nevada 89109
702-732-5111

The Mirage
3400 Las Vegas Boulevard South
Las Vegas, Nevada 89109
702-791-7111

Riviera Hotel & Casino
2901 Las Vegas Boulevard South
Las Vegas, Nevada 89201
702-734-5110

Sahara Hotel
2535 Las Vegas Boulevard South
Las Vegas, Nevada 89109
702-737-2111

Housing Assistance

Lobby S114
Las Vegas Convention Center
Sunday: 12:00 noon to 10:00 pm
Monday–Tuesday: 7:30 am to 7:00 pm

A representative from the Las Vegas Housing Bureau is available at the housing desk during the above hours on Sunday, Monday, and Tuesday. The housing desk telephone number is 702-792-3509. Persons requiring assistance on Wednesday, Thursday, or Friday may call the Las Vegas Housing Bureau at 702-383-9100.

Information Booths

Lobby S114
Las Vegas Convention Center

Beginning at noon on Sunday and thereafter during registration hours, two information booths are available to answer quick questions and help you locate your conference destinations.

International Business Center

Hall S2
Las Vegas Convention Center
Sunday: 12:00 noon to 10:00 pm
Monday–Tuesday: 7:30 am to 7:00 pm
Wednesday–Thursday: 8:00 am to 6:00 pm
Friday: 9:00 am to 12:00 noon

The International Business Center is a place for you to meet with SIGGRAPH '91 exhibitors who are interested in international trade. Here international attendees may inquire about registration, locate translators, communicate with their offices, and meet other international attendees. Translators are available Sunday through Friday during the above hours.

Luggage Check

Central Concourse
Las Vegas Convention Center

Want to store your suitcase, backpack, or briefcase? Visit the SIGGRAPH '91 luggage check service.

Materials

Materials Desk
Hall S3 Balcony
Las Vegas Convention Center
Sunday: 12:00 noon to 10:00 pm
Monday–Tuesday: 7:30 am to 7:00 pm
Wednesday–Thursday: 8:00 am to 6:00 pm
Friday: 9:00 am to 1:00 pm

The materials desk serves as the pickup point for all course notes and materials purchased through advance or conference registration. If you didn't purchase materials through advance registration, you may buy SIGGRAPH '91 course notes, proceedings, slide sets, art show and electronic theatre catalogs, or other SIGGRAPH '91 items through conference registration and pick them up at the materials desk.

SIGGRAPH '91 Boutique
Lobby S114
Las Vegas Convention Center
Sunday: 12:00 noon to 10:00 pm
Monday–Tuesday: 7:30 am to 7:00 pm
Wednesday–Thursday: 8:00 am to 6:00 pm
Friday: 9:00 am to 1:00 pm

The SIGGRAPH '91 boutique is a convenient alternative for attendees who don't wish to stand in a registration line to buy SIGGRAPH '91 merchandise. Cash, checks, and credit cards (American Express, MasterCard and Visa) are accepted in the boutique.

Catalogs, Proceedings, and Video Reviews

Please note that one electronic theatre catalog, one art show catalog, and one Tomorrow's Realities catalog are included with papers/panels and courses registration. Additional copies may be purchased through the conference registration desk or the boutique.

SIGGRAPH Video Reviews are sold through the SVR booth in Lobby S114, Las Vegas Convention Center.

You can also purchase proceedings, slide sets, and video reviews after the conference. For proceedings and slide sets, phone the ACM Order Department at 800-342-6626 (from Alaska, Maryland and locations outside the US, call: 301-528-4261); or write ACM Order Department, P.O. Box 64145, Baltimore, MD 21264. To order video reviews, call: 800-523-5503. Or write: Jackie Poore, First Priority, 1601 West Glenlake, Itasca, IL 60143.

Message Center

Hall S2
Las Vegas Convention Center

Receive messages from SIGGRAPH attendees, your home, or your office at the SIGGRAPH '91 message center. The phone number is 702-792-3500.

Press Activities

Press Briefing
Rooms N209-N212
Las Vegas Convention Center
Tuesday: 8:00 am to 10:00 am

Highlights of SIGGRAPH '91 are presented to the working press. The briefing features several leading authorities from various computer graphics disciplines: graphic design, multimedia, scientific visualization, advanced animation, and virtual reality. Speakers offer an overview of the conference and discuss the future of the industry.

A private, guided press tour of the exhibition is offered from 9:00 to 10:00 am, immediately following the press briefing. The tour takes place before the official exhibition opening.

Press Registration Requirements

Complimentary press registration is a privilege reserved for journalists and industry analysts who attend SIGGRAPH '91 to gather information that will be published for their audiences. A separate registration desk for journalists and analysts is available in the main press office, N216. Press office registration hours:

Sunday
12:00 noon to 7:00 pm

Monday–Thursday
7:30 am to 7:00 pm

Friday
8:00 am to 12:00 noon

Please observe the following requirements for press registration:

Full-time employees of media or research organizations must present a business card or a letter from a supervisor confirming that the registrant is on assignment to cover SIGGRAPH '91.

These titles are acceptable:

- Editor
- Reporter
- Publisher
- Photographer
- Writer
- Analyst
- Camera Operator
- Audio Technician

Freelance writers must verify that they have been retained to cover SIGGRAPH '91 by presenting a letter from a recognized news organization or a publication related to the computer graphics industry.

Consultants with industry newsletters must present a business card from the newsletter and a copy of the publication.

Industry analysts must present a business card from their organization.

Publishers must present a business card and a copy of their publication.

Media sales representatives are not eligible for complimentary press registration.

Press Rooms

Press Office

Room N216
Las Vegas Convention Center
Sunday: 12:00 noon to 7:00 pm
Monday–Thursday: 7:30 am to 7:00 pm
Friday: 8:00 am to 12:00 noon

The press office serves as a general information center for members of the press. Journalists and analysts should come directly to this room to register and pick up press badges. The room is equipped with a fax machine and photocopying equipment. Exhibitor press materials may be picked up in the adjacent media library. In addition, a list of SIGGRAPH '91 photo opportunities and press conferences is posted here. The press office number is 702-792-3524.

Press Work Room

Room N215
Las Vegas Convention Center

Members of the media may use this area as a quiet work room for reading, writing, editing, or phoning their offices. Telephones, computer workstations with popular word processing software, and modems are available for press use.

Press Conference Room

Rooms N209-212
Las Vegas Convention Center

This room may be reserved through the press office for those requiring media conference space. It is equipped with seating and is wired to accommodate broadcasting and live interviewing needs.

Press Lounge/Interview Area

Rooms N213-214
Las Vegas Convention Center

In this area, media representatives may conduct interviews, meet acquaintances, and relax between events.

Registration

Hall S3 Balcony
Las Vegas Convention Center

The SIGGRAPH '91 registration desk is open during the following times:

Sunday
12:00 noon–10:00 pm

Monday–Tuesday
7:30 am–7:00 pm

Wednesday–Thursday
8:00 am–6:00 pm

Friday
9:00 am–1:00 pm

Restaurant Information

Lobby S114
Las Vegas Convention Center

Restaurant information desks provide SIGGRAPH '91 attendees with menus from local restaurants. Personnel can assist conference participants with restaurant selection and reservations. This desk is open during registration hours.

Shipping Desk

Hall S3 Balcony
Las Vegas Convention Center

The shipping desk is open during registration hours. Several shipping options are available, including next-day air and second-day air service to the United States, Canada, and overseas.

SIGGRAPH Local Groups

Hall S2
Las Vegas Convention Center

Information about SIGGRAPH groups in your local area, their membership, and their activities can be obtained here.

Slide Sets

SIGGRAPH '91 technical, art show, and stereoscopic 3D slide sets ordered before the conference must be picked up at the merchandise desk in the registration area of the Las Vegas Convention Center. Slide sets may also be purchased during the conference. After the conference, slide sets are available from the ACM Order Department.

Smoking Policy

Smoking is not permitted at any of the conference locations.

Social Functions

SIGGRAPH '91 receptions create the perfect atmosphere for seeing old friends, making new acquaintances, exchanging ideas, and simply having fun. This year SIGGRAPH has planned some exciting and memorable evenings for your enjoyment.

Be sure to bring your bathing suit to the courses reception Monday at 8:00 pm. It's scheduled for the most spectacular water-theme park in Las Vegas: Wet 'n Wild. In addition to acres of pools, slides, wave machines, rapids, and rivers, you'll enjoy SIGGRAPH's always-bountiful food and refreshments.

The tropical theme continues for the papers/panels reception Thursday at 8:00 pm in the Caesars Palace pool area (swimming not permitted). Shuttle buses provide transportation from the Las Vegas Convention Center and hotels to the receptions beginning at 7:30 pm.

Special Assistance Desk

The special assistance desk is open during registration hours to help attendees resolve a wide range of possible problems and concerns. This desk can provide assistance in the following situations:

- Course changes
- Misspelled names on conference materials
- Substitute registrations (only if authorized on company letterhead)
- Refunds
- Credit card problems (validations, errors, etc.)
- Registration forms submitted without payments
- Payments submitted without registration forms
- Speaker problems (changes, missing ribbons, etc.)
- Lost badges

Please **DO NOT** refer these problems to the special assistance desk:

- Press badges (see the press office, room N216)
- Parking validation
- Lost and found (go to the general information booth in Lobby S114)
- Housing problems (go to the housing desk in Lobby S114)

Telephone Numbers

A/V Office 702-792-3521
Conference Management Office 702-792-3812
Electronic Theatre Office 702-792-3502
Emergencies (ambulance, fire, police) 911
Exhibition Management Office 702-792-3505
First Aid Office 702-733-2354
Housing Assistance 702-792-3509
Las Vegas Housing Bureau 702-383-9100
Message Center 702-792-3500
Press Office 702-792-3524
Registration 702-792-3510
Speaker Slidemaking Room 702-792-3518

Transportation

Frequent shuttle bus transportation is available between SIGGRAPH '91 hotels and the Las Vegas Convention Center, free of charge. Shuttle buses are also provided for all conference activities. See the Las Vegas map located at the end of this program, for complete information on shuttle bus schedules and routes.

Slides

SIGGRAPH '91 and the speaker materials chair wish to thank Stokes Imaging Services, Inc., Dallas, Texas for producing pre-conference slides, and Precision Group, Inc., Las Vegas, Nevada for producing on-site slides for the conference. These computer-generated slides are used in the courses, paper/panel presentations, and educators' program.

Electronic Theatre

SIGGRAPH '91 and the electronic theatre chair wish to thank the following companies:

Audio Visual Headquarters Corporation
Inglewood, CA

Breene Kerr Productions
Mountain View, CA

Conceptual Litho Reproductions Inc.
New York

Digital Equipment Corporation, Workstations Business Unit and UNIX Software and Systems Group
Palo Alto, CA

Editel
Chicago

Editel SF
San Francisco

Esprit Projection Systems
Titusville, FL

George Coates Performance Works
San Francisco

HD/CG
New York

Intel Corporation
Santa Clara, CA

Kubota Pacific Computer Inc.
Santa Clara, CA

NHK Enterprises USA, Inc.

Opcode Systems
Menlo Park, CA

Quorum Incorporated
Ann Arbor, MI

Reflexite Corporation
New Britain, CT

Silicon Graphics Computer Systems
Mountain View, CA

Sony Corporation of America, Business and Professional Group

Very special thanks to Jeffrey Lane of Digital Equipment Corporation for his extraordinary support.

Tomorrow's Realities

SIGGRAPH '91 and the virtual reality and hypermedia chairs wish to thank the following companies for their valuable support: Pioneer Video Products for their donation of the video wall, Landmark Entertainment Group for their show design services, and Silicon Graphics Computer Systems.

Press Facilities

SIGGRAPH '91 and the Public Relations Chair thank Apple Computer, Inc., Hewlett-Packard Company, and International Business Machines Corporation for providing computer systems, application software, and peripheral equipment for use by the press for writing and transmitting their coverage of the conference.

In a conference the size and scope of SIGGRAPH, many companies and individuals make significant behind-the-scenes contributions. A special thank-you to all employers of volunteers for letting your staff take the extra time that was needed to organize SIGGRAPH '91. Also, thank you to employees of contractors who put in long hours and extra effort to make SIGGRAPH '91 a success.

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Dave Fox
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Hugh Dubberly
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Enrique Godreau III
Xerox PARC

Come to Chicago for SIGGRAPH '92

The SIGGRAPH '92 theme, "Insight Through Images," will stimulate your imagination and delight your senses in Chicago — a city full of diverse and captivating images. From lake front views stretching along miles of beach to colorful international neighborhoods; from towering skyscrapers to acres of parks; and from night life that never closes to sleepy sidewalk cafes. Chicago's images are exceeded only by the excitement going on inside SIGGRAPH.

For six days, the brightest, most-talented people in the computer graphics industry will be in Chicago's McCormick Place to experience, excite, explore...to look into the future. The conference attracts as many as 30,000 participants from around the world and hundreds of media representatives. The international diversity of SIGGRAPH conferences puts global communications and exchange of ideas through exciting paces.

At SIGGRAPH '92, you'll find more than pretty pictures. You'll see "pictures" with a purpose as art, science, and business converge to deliver computer graphics out of the lab and into the world. The conference is the pre-eminent forum for the presentation and publication of scholarly papers on computer graphics and the foremost showcase for electronic creativity and innovation. SIGGRAPH truly pushes the limits.

Check out what's new at SIGGRAPH '92 ...demonstrations of futuristic ideas in the showcase; student projects at SIGKids; a global, interactive art show; some of the newest "uncooked" projects in G-tech; and half-day courses that are short, sweet, and to the point. And, don't forget to bring comfortable shoes to wear when you visit the impressive displays of exhibitors' products.

See it, believe it, experience it at SIGGRAPH '92! There really is nothing else like it in the world.

19th International Conference on Computer Graphics and Interactive Techniques

Conference:
July 26-31, 1992

Exhibition:
July 28-30, 1992

Conference Venues

Technical papers bring new ideas to reality. SIGGRAPH is the leading forum for the presentation of technical papers on new, unpublished research and comparative surveys in varied disciplines, including science and math.

Panels offer discussion, debate and rare consensus. Looking for a window into the future? Look into SIGGRAPH's panels. Candid, thought-provoking discussions of trends, controversies, and viewpoints in the computer graphics industry are not only welcomed but expected of the SIGGRAPH panelists and audiences.

Courses challenge your mind. Probe the depth and breadth of new concepts, or learn the basics of computer graphics in SIGGRAPH's courses. New half-day courses are to the point and fit into even the busiest schedule. Full-day courses continue to provide subject substance.

Slide sets visualize the possibilities. Computer-generated slide set categories include new or enhanced technical concepts, application areas, stereoscopic 3D, and industry. The slide sets are sold at the conference. Look for slide images on conference promotional pieces and at the conference.

Electronic theater — where you have to see it to believe it. This international collection of multiple art forms, including computer animation, interactive art, and live performance, is the best of the best in the past year. It touches a broad range of disciplines, from science, engineering and art, to education, entertainment and corporate communications. And don't overlook the animation screening room where there's more computer graphics going on.

And, just when you think you've seen it all...there's HDTV. Special emphasis is placed on High Definition Television and how it impacts the many areas affected by computer graphics.

The art show — where a computer-generated "picture" is worth a thousand words. The art show provides a venue for live performance and interactive works in small theater settings; computer animations; 2D and 3D art; and online, tele-interactive works.

Showcase highlights the prospective direction of high-speed networked computer graphics. Showcase illustrates innovative, interactive, collaborative research and leading-edge applications and ideas. Within this functioning, networked, graphics environment, attendees can touch and interact with working displays and leave with a vision of the future!

SIGKids learning lab is a class in itself. The SIGKids learning lab workshop features technology for kindergarten through high school. SIGKids focuses on the value of visual and cooperative learning, and on the graphical tools that have been (and still need to be) developed to support this level of learning.

G-tech goes beyond the limits. "Guerrilla" technology, or G-tech, shows off the newest "uncooked" developments in stand-alone computer graphics. G-tech is not limited by categories, but accommodates works in progress and research that don't fit the traditional SIGGRAPH formats and venues.

Workshops address critical and unresolved issues. These lively, small-group workshops offer a unique, structured format to discuss topics that look forward and explore. Finished reports are published in a subsequent issue of *Computer Graphics.*

Exhibits are the martetplace of images. This is the best opportunity yet to explore the latest hardware, software, applications, systems, and ideas in the computer graphics industry. And it's all in one place. Come to compare; come to browse; come to buy — you'll find it at SIGGRAPH.

Special interest groups bring like minds together. These informal meetings are a great way for "birds of a feather" to get to know each other and exchange ideas. User groups also meet to discuss particular products, topics, or problems.

SIGGRAPH '92 is...

Focus on technologies. Through its many conference venues, from formal presentations to "show-'n-tell" demonstrations, SIGGRAPH '92 balances late-breaking developments in traditional computer graphics with cutting-edge discoveries in emerging technologies. Enrich yourself with SIGGRAPH's broad scope of technical content, including:

Visualization, Modeling and Simulation

Animation
Color
Computer-Aided Design (CAD)
Data visualization
Fractals
Geometric modeling
Image analysis
Image synthesis and rendering
Scientific visualization

Visual Communication and Multimedia

Art
Computer-supported collaborative work
Computer-human interface
Education
Graphic design
HDTV (High Definition Television)
Image compression, decompression, and manipulation
Multimedia
Publishing: print, video, and desktop
Virtual reality

Visual Computer Systems and Networks

Computer architecture
Computer software
Networking and telecommunications

General

Emerging policy
Intellectual property rights
Graphic standards

Focus on markets. SIGGRAPH '92 is focusing visualization technologies on five major markets. Applying visualization tools and techniques to discipline-specific problems generates more sophisticated solutions, and encourages more knowledgeable decisions. Learn how visualization benefits problem-solving from the researchers pioneering these advancements through SIGGRAPH's many venues.

Molecular Modeling

Medical Visualization

Printing and Publishing

Global Information Services

Financial Services

How to Participate

SIGGRAPH '92 offers several ways to participate. The *Call for Participation* explains how you can present your ideas and works at SIGGRAPH '92. To receive a copy of the Call, information on how to arrange a special interest group, or student volunteer applications, contact:

SIGGRAPH '92
Conference Management
401 North Michigan Avenue
Chicago, IL 60611 USA
312-644-6610
312-321-6876 fax
info92@siggraph.org

Remember to register early. Substantial discounts apply to registrations received by June 19, 1992. On-site registration at McCormick Place begins on Sunday, July 26. A registration form is included in the SIGGRAPH '92 *Advance Program* which is available in mid-April from the address above.

For information about exhibit or showcase space, contact:

SIGGRAPH '92
Exhibition Management
Robert T. Kenworthy, Inc.
866 United Nations Plaza
New York, NY 10017 USA
212-752-0911
212-223-3034 fax
exhibits92@siggraph.org

Welcome to Chicago

Touring Chicago is easy. O'Hare International Airport and Midway Airport serve cities around the world, around the clock. McCormick Place, the site of SIGGRAPH '92, is convenient to all the major hotels and restaurants in the downtown area.

The city comes alive during the summer with major league baseball, alfresco dining, Lake Michigan boat tours, and the Buckingham Fountain light show.

Education and culture buffs will want to check out the city's fine museums, including the Adler Planetarium, the Museum of Science and Industry, and the John G. Shedd Aquarium with its new Oceanarium. Or you can go to the top of the Sears Tower — the world's tallest building, shop on the Magnificent Mile along Michigan Avenue, and drop in on a late-night Blues club. Don't forget to try Chicago's deep-dish pizza and famous barbecued ribs.

SIGGRAPH '92 Conference Committee

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Illinois Institute of Technology

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Truevision

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Illinois Bell, an Ameritech Company

LetraSet

Midwest Litho Arts

National Center for Supercomputing Applications

Skidmore, Owings and Merrill

Students of the Electronic Visualization Laboratory, University of Illinois at Chicago

Office of the Chancellor, University of Illinois at Chicago

Working Software, Inc.

Sunday, 28 July

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DAY PLANNER

Monday, 29 July

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Tuesday, 30 July

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Thursday, 1 August

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Friday, 2 August

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Future Conference Dates

SIGGRAPH '92
26–31 July 1992
Chicago, Illinois

Co-Chair
Maxine Brown
University of Illinois at Chicago

SIGGRAPH '93
2–6 August 1993
Anaheim, California

Co-Chairs
Robert L. Judd
Los Alamos National Laboratory

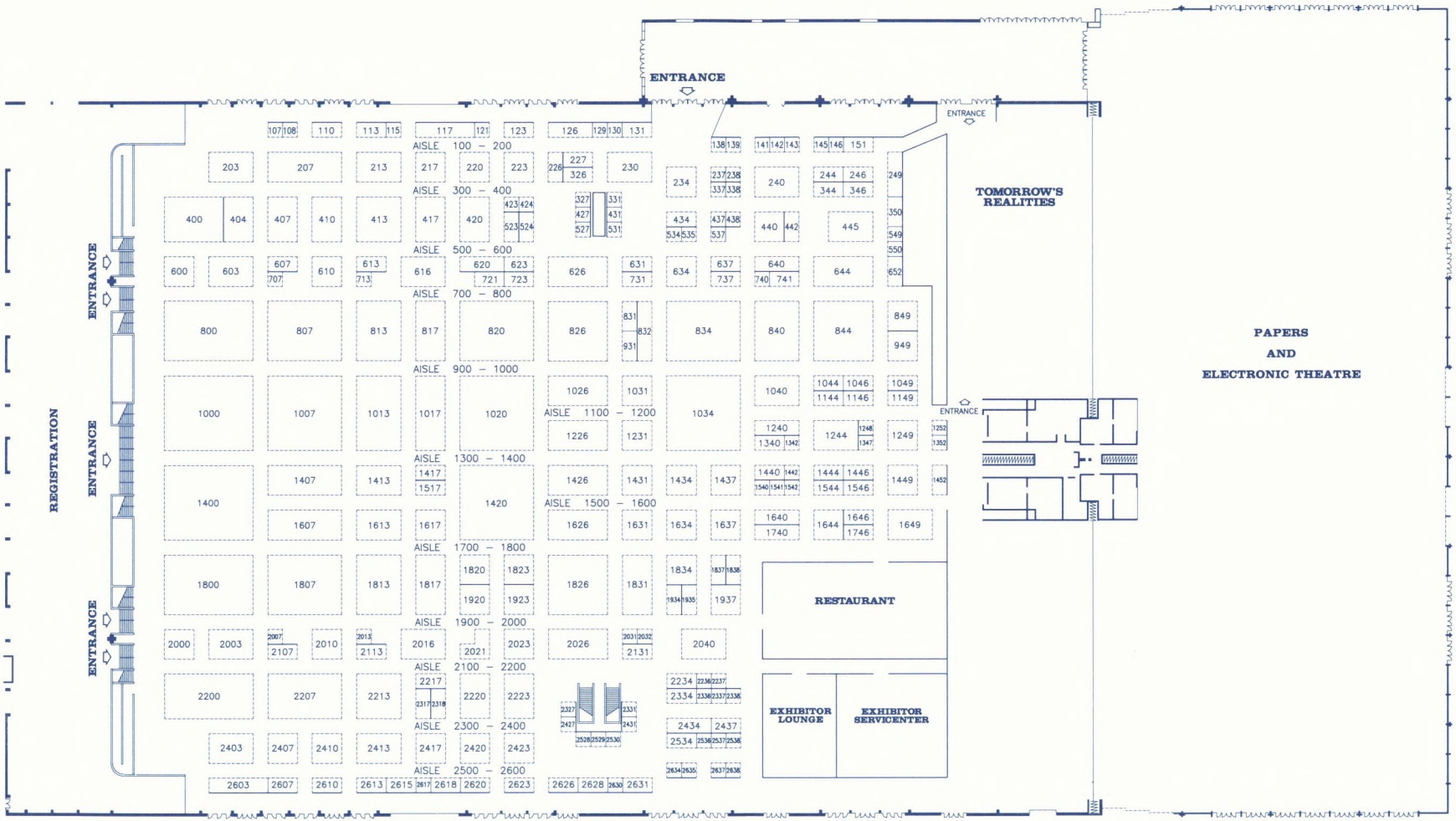
Mark Resch
Computer Curriculum Corporation

SIGGRAPH '94
1–5 August 1994
Orlando, Florida

Sponsored by the Association for Computing Machinery's Special Interest Group on Computer Graphics in cooperation with the IEEE Computer Society's Technical Committee on Computer Graphics.

Exhibit
Floor Plan

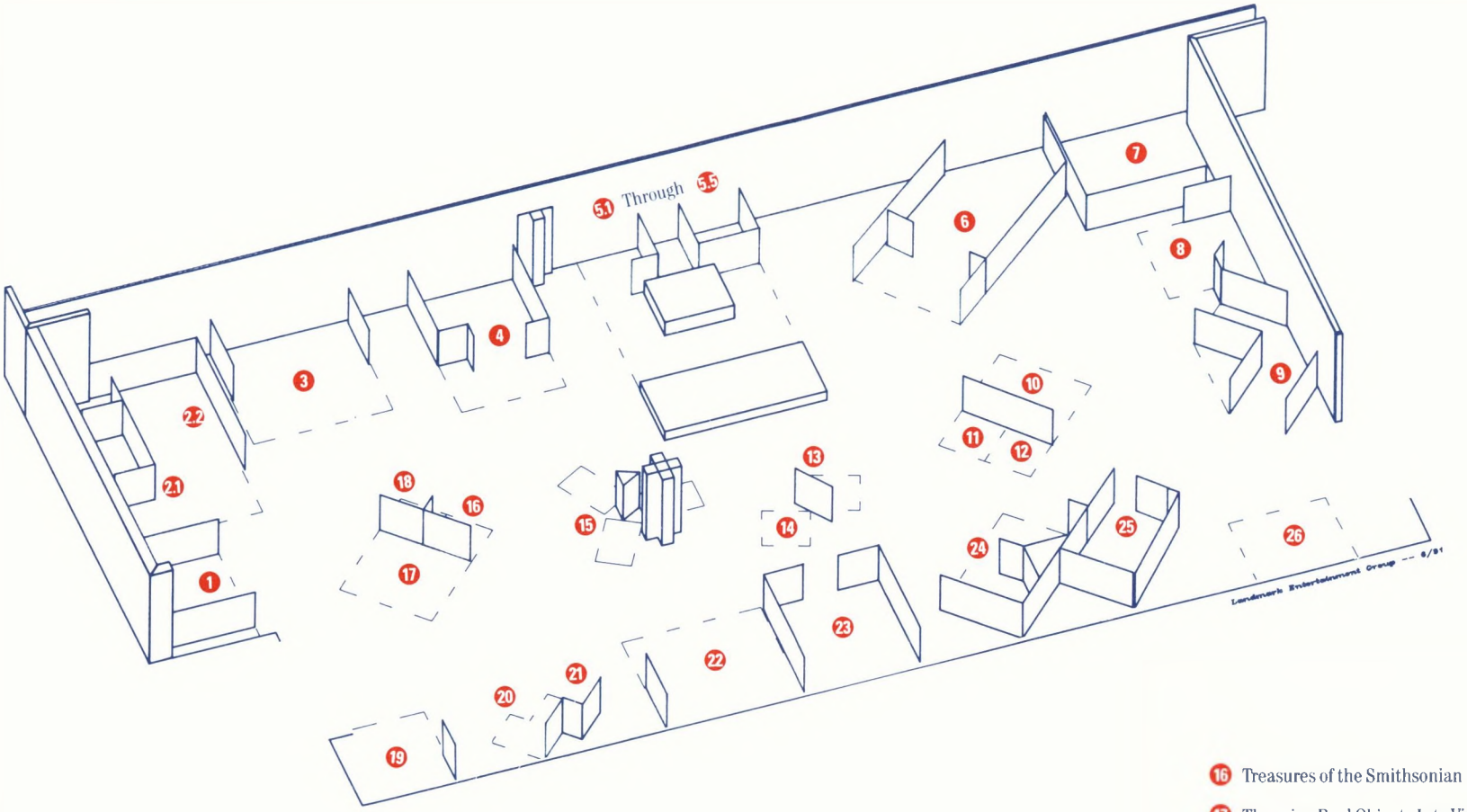
E X H I B I T F L O O R P L A N



Tomorrow's Realities Floor Plan

Demonstrations and Displays

TOMORROW'S REALITIES



1 Life On A Slice

2.1 EAT — A Virtual Dining Environment
2.2 VBK — A Moviemap of Karlsruhe

3 Assembly Modeller

4 Be Here Now

5.1 Radiation Therapy Treatment Planning with a Head-Mounted Display
5.2 Flying Through Protein Molecules
5.3 3dm, a 3-Dimensional Modeling System
5.4 An Interactive Building Walkthrough System
5.5 A Mountain Bike with Force Feedback for Indoor Exercise

6 Performance Cartoons

7 Mars Navigator

8 ClickOn MSU

9 The Mandala VR System

10 The Boeing VSX: Operations with Virtual Aircraft in Virtual Space

11 SuperImage

12 Simulation of Acute Myocardial Infarction

13 EXPO'92 Guest Information System

14 Interactive Color: A Guide for Color in Computer Graphics

15 Plasm: Above the Drome

16 Treasures of the Smithsonian

17 Throwing Real Objects Into Virtual Space

18 The Computer Sciences Electronic Magazine

19 PROvision

20 Portrait One

21 The Time Table of Science and Innovation

22 NPSNET: A 3D Visual Simulator for Virtual World Exploration and Experience

23 Watch Yourself

24 VIDEODESK Teletutoring

25 Virtual Acoustic Environments: The Convolvotron

26 Beethoven's Ninth Symphony

DEMONSTRATIONS AND DISPLAYS

1 Life On A Slice
Contact
Beverly Reiser
Beverly Reiser Design
415-482-2483
Multimedia poetry creation, narratives, and ambiguity.

2.1 EAT — A Virtual Dining Environment
Contact
Michael Naimark
Naimark & Company
415-391-4817
An art installation about consumption.

2.2 VBK — A Moviemap of Karlsruhe
Contact
Michael Naimark
Naimark & Company
415-391-4817
Surrogate travel on the tramway in Karlsruhe, Germany.

3 Assembly Modeller
Contact
Mike Fusco
SimGraphics Engineering Corporation
213-255-0900
Interactive visualization of product design and manufacturing processes.

4 Be Here Now
Contact
Mark Bolas
Fake Space Labs
415-688-1940
Three virtual worlds: a windtunnel, an algorithm-driven alternative reality, and a place filled with illusions.

5.1 Radiation Therapy Treatment Planning with a Head-Mounted Display
Contact
Suresh Balu, James C. Chung, Brad Crittenden, Terry Yoo
University of North Carolina
919-962-1700
Precision 3D delivery of radiation to tumors.

5.2 Flying Through Protein Molecules
Contact
Richard Holloway, Warren Robinette
University of North Carolina
919-962-1700
Exploration of 3D giant molecule models.

5.3 3dm, a 3-Dimensional Modeling System
Contact
Jeff Butterworth, Andrew Davidson, Stephen Hench, T. Marc Olano
University of North Carolina
919-962-1700
Interaction with and creation of complex 3D models.

5.4 An Interactive Building Walkthrough System
Contact
Fred Brooks, Henry Fuchs
University of North Carolina
919-962-1700
Pre-construction interior exploration of building designs for architects and their clients.

5.5 A Mountain Bike with Force Feedback for Indoor Exercise
Contact
Erik Erikson, Ryntarou Ohbuchi, Andrei State, Russell Taylor
University of North Carolina
919-962-1700
Virtual biking through mountainous terrain.

6 Performance Cartoons
Contact
Chris Walker
Mr. Film
213-396-0146
On-line, real-time surfing with Silver Suzy.

7 Mars Navigator
Contact
Thomas A. Volotta
Volotta Interactive Video
415-459-6949
Simulated exploration of Mars.

8 ClickOn MSU
Contact
Carrie Heeter
Michigan State University
517-353-0722
A whimsical, magical, hyper-real introduction to Michigan State University.

9 The Mandala VR System
Contact
Vincent John Vincent
Vivid Effects Inc.
416-340-9290
Navigation and creation of virtual worlds for training, exploration, and collaboration.

10 The Boeing VSX: Operations with Virtual Aircraft in Virtual Space
Contact
Chris Esposito, Meredith Bricken, and Keith Butler
Boeing Advanced Technology Center
206-865-3162
A conceptual demonstration of how virtual space would be applied to aircraft design and other complex systems.

11 SuperImage
Contact
Joseph W. Klingler
Medical College of Ohio
419-381-4586
A hypermedia introduction to digital imagery for medical students and technical professionals.

12 Simulation of Acute Myocardial Infarction
Contact
Lee T. Andrews
Medical College of Ohio
419-381-3653
A dynamic, interactive tutorial on the etiology and functional changes associated with heart attacks.

13 EXPO'92 Guest Information System
Contact
Lauretta Jones
IBM T. J. Watson Research Center
914-784-7622
Interactive guest information for the 1992 exposition in Seville, Spain.

14 Interactive Color: A Guide for Color in Computer Graphics
Contact
Holliday R. Horton
San Diego Supercomputer Center
619-534-5000
Interactive instruction on the use of digital color in scientific visualization.

15 Plasm: Above the Drome
Contact
Peter Broadwell, Rob Meyers
Silicon Graphics Computer Systems
415-960-1980
"Air surfing" with artificial life forms in a virtual aerodrome.

16 Treasures of the Smithsonian
Contact
Jim Hoekema
Hoekema Interactive
301-469-6588
An interactive survey of 150 objects from the Smithsonian's 14 museums.

17 Throwing Real Objects Into Virtual Space
Contact
David Thiel, Tim Skelly
Incredible Technologies
708-437-2433
The cue ball crosses the boundary between actual and virtual reality in a game of virtual billiards.

18 The Computer Sciences Electronic Magazine
Contact
Randy Koons
IBM T.J. Watson Research Center
914-784-7602 or 914-784-7966
A hypermedia magazine on computer sciences research.

19 PROvision
Contact
Charles Grimsdale
Division Ltd.
44-454-324527
Three systems demonstrating applications of virtual reality.

20 Portrait One
Contact
Luc Courchesne
Université de Montréal
514-343-7495
Conversations with a hypermedia portrait.

21 The Time Table of Science and Innovation
Contact
Jerry Isdale
Xiphias
213-841-2790
Linked multimedia explorations of the history of technological development.

22 NPSNET: A 3D Visual Simulator for Virtual World Exploration and Experience
Contact
Michael J. Zyda, David R. Pratt
Naval Postgraduate School
408-646-2305
Real-time simulation of vehicle movement.

23 Watch Yourself
Contact
Timothy Binkley
School of Visual Arts
212-679-7350
Video interaction with well-known images from art history.

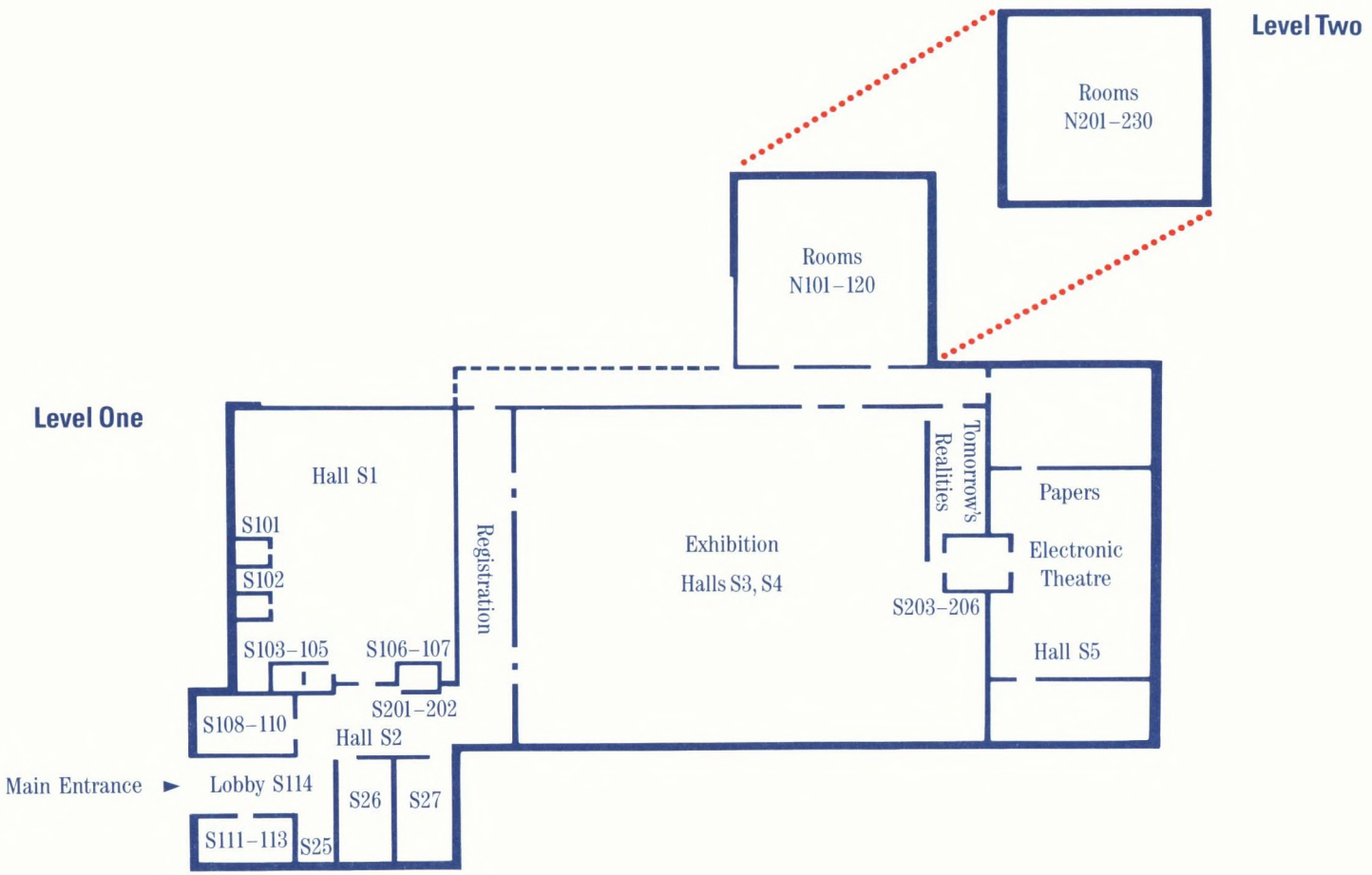
24 VIDEODESK Teletutoring
Contact
Myron Krueger
Artificial Reality
203-871-1375
Hand interaction with a virtual expert.

25 Virtual Acoustic Environments: The Convolvotron
Contacts
Elizabeth M. Wenzel
NASA Ames Research Center
415-604-6290

Scott Foster
Crystal River Engineering
Simulation of 3D reverberant environments.

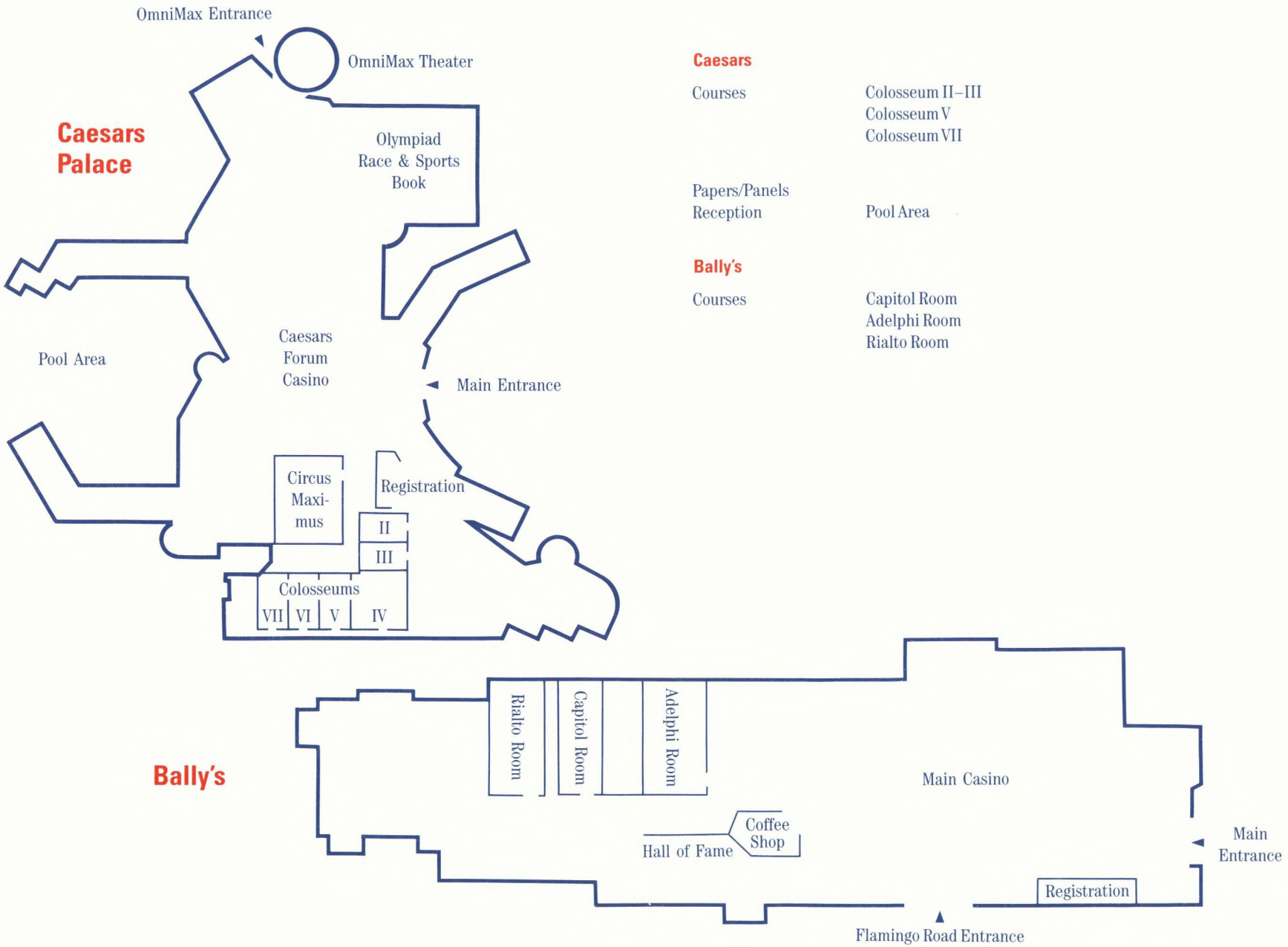
26 Beethoven's Ninth Symphony
Contact
Alex Albin
The Voyager Company
213-451-1383
Interactive exploration of the composer, the music, and the historical context of the Ninth Symphony.

Las Vegas Convention Center Floor Plan



Courses	N109–117 N101–103 S1, S6, S27 Bally's Caesars	Art & Design Show	S108–110	Boutique	S114	Conference Management Office	S201
		Computer Graphics Screening Rooms	S26, S111–113	Exhibition	S3, S4	Electronic Theatre Office	S205
		Electronic Theatre	S5	International Business Center	S2	Exhibition Management Office	S202
Educators' Program	N109–110	Tomorrow's Realities	In back of Halls S3, S4			Press Office	N216
Panels	S1, S27						
Papers	S5						

Caesars Palace and Bally's Floor Plans



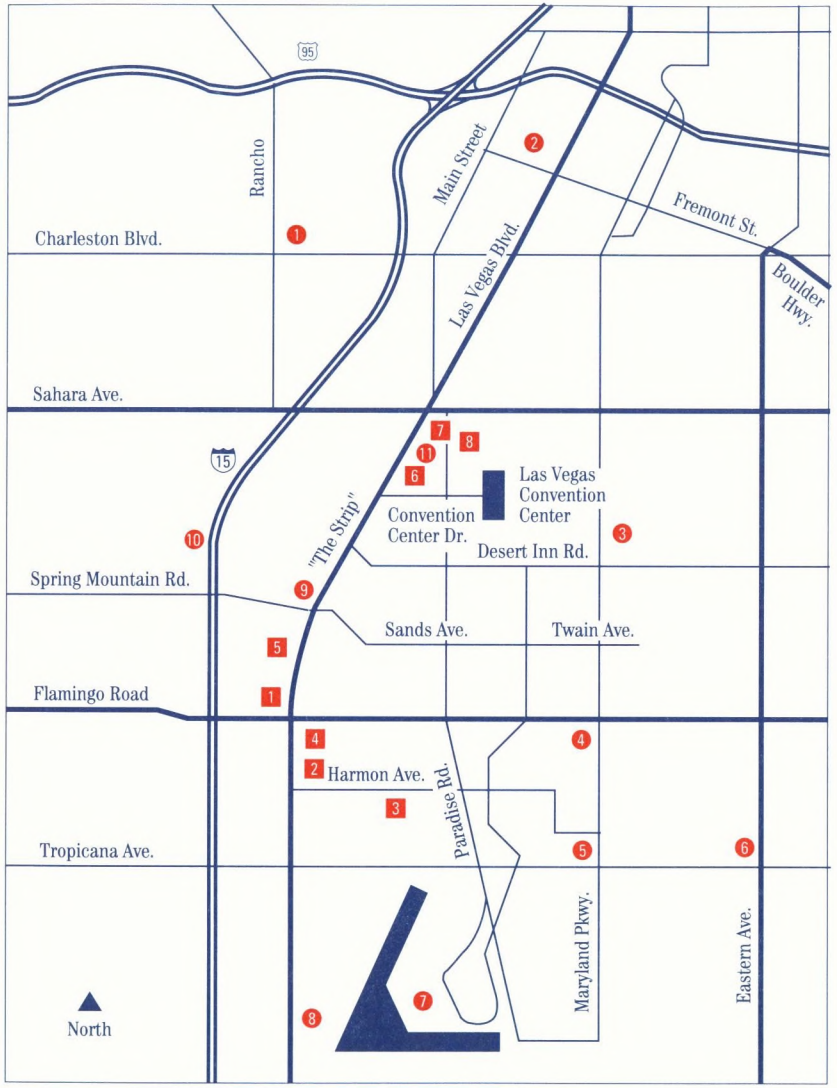
Caesars

Courses	Colosseum II–III
	Colosseum V
	Colosseum VII
Papers/Panels	
Reception	Pool Area

Bally's

Courses	Capitol Room
	Adelphi Room
	Rialto Room

Las Vegas Map
Shuttle Bus Schedule



Points of Interest

1. University Medical Center
2. Downtown Las Vegas
3. Humana Hospital Sunrise
4. University of Nevada Las Vegas
5. Thomas & Mack Center
6. Liberace Museum
7. McCarran International Airport
8. Hughes Executive Air Terminal
9. Fashion Show Mall
10. Scandia Family Fun
11. Wet 'n Wild

Hotels

1. Caesars Palace
2. Aladdin Hotel
3. Alexis Park Resort
4. Bally's Casino Resort
5. The Mirage
6. Riviera Hotel and Casino
7. Sahara Hotel
8. Las Vegas Hilton

Shuttle Pick-Up Locations

Shuttle buses pick up attendees at the following hotel entrances:

Caesars Palace
Omnimax Entrance

Aladdin
Alexis Park
Harmon Street Entrance

Bally's
Flamingo Road Entrance

The Mirage
North Entrance

Riviera
South Entrance

Sahara
Las Vegas Boulevard Entrance

See back for shuttle bus schedule.

S H U T T L E B U S

Shuttle buses run on the following schedule (limited service is every 15–20 minutes; heavy service is every 5–10 minutes):

Sunday	12 Noon–12 Midnight	Limited Service
Monday	7:00 am–9:00 am	Heavy Service
	9:00 am–5:00 pm	Limited Service
	5:00 pm–7:30 pm	Heavy Service
Tuesday	7:00 am–9:00 am	Heavy Service
	9:00 am–5:00 pm	Limited Service
	5:00 pm–7:30 pm	Heavy Service
	7:30 pm–9:30 pm	Limited Service
	9:30 pm–10:30 pm	Heavy Service
Wednesday	7:30 am–9:00 am	Heavy Service
	9:00 am–5:00 pm	Limited Service
	5:00 pm–7:30 pm	Heavy Service
	7:30 pm–9:30 pm	Limited Service
	9:30 pm–10:30 pm	Heavy Service
Thursday	7:30 am–9:00 am	Heavy Service
	9:00 am–5:00 pm	Limited Service
	5:00 pm–7:30 pm	Heavy Service
	7:30 pm–9:30 pm	Limited Service
	9:30 pm–10:30 pm	Heavy Service
Friday	8:15 am–5:30 pm	Limited Service

Receptions

Exhibitors Reception Sunday 8:00 pm-11:00 pm	Shuttle buses run 7:30 pm-11:30 pm Special designated buses between Wet-N-Wild and the convention center only.
Course Reception Monday 8:00 pm-11:00 pm	Shuttle buses run 7:30 pm–11:30 pm All routes add Wet-N-Wild as a drop off/pickup. After 7:30 pm, buses go directly to/from Wet-N-Wild to the hotels.
Papers/Panels Reception Thursday 8:00 pm-11:00 pm	Shuttle buses run 7:30 pm–11:30 pm All routes add Caesars Palace as a drop off/pickup. After 10:00 pm, buses go directly to/from Caesars to the hotels.

SIGGRAPH '92 CHICAGO

Conference
July 26-31
1992

Exhibition
July 28-30
1992

Propulsion
Laboratory/NASA

ACM SIGGRAPH

Sponsored by the Association
for Computing Machinery's
Special Interest Group
on Computer Graphics
in cooperation with the
IEEE Computer Society's
Technical Committee on
Computer Graphics