

SIGGRAPH/81 Program



The Eighth Annual Conference
on Computer Graphics and Interactive Techniques
August 3-7, 1981 . . . Dallas Convention Center . . . Dallas, Texas



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Introduction

Welcome to SIGGRAPH/81.

The *SIGGRAPH/81 Program* has been designed to help you make the most effective, efficient use of your time in Dallas. Used with the *Exhibits Directory*, you can discover all the areas you want to see or participate in and organize your own schedule before you take a step.

Daily activities are outlined in detail beginning on page 6. The conference-at-a-glance on pages 22-23 will give you a quick overview of SIGGRAPH/81 events. Information on exhibitors, Vendor Forum, meetings, film shows and other activities also are contained within this program.

Enjoy your stay in Dallas.

SIGGRAPH/81 Committee

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Texas A & M University

Tony Lucido

Intercomp Resource Development & Engineering

Technical Program Chairman

Henry Fuchs

University of North Carolina at Chapel Hill

Courses Chairman

Ingrid Carlbom

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Dick Mueller

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_____ conference committee

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Cornell University

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Vector General

Technical Program Committee and Senior Reviewers

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University of Toronto

John Beatty

University of Waterloo

Kellogg Booth

University of Waterloo

Carl Machover

Machover Associates

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Megatek Corporation

Aristides Requicha
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Tim Stevenson
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Assistant Films & Video Chairmen

Dan Sandin
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Jane Veeder
Electronic Visualization Center

Organizer, Presidents' Forum

L. Neil Johnson
Vector General

Publicity

Ken Anderson
The Anderson Report

Logo Design

Tom Pollock
Texas A & M University

Program Information

Courses

PLACE: The courses are held on levels two, three, and four of the Dallas Convention Center on Monday, August 3, and Tuesday, August 4. Please refer to the room assignments sheet in your registration materials for course location.

SCHEDULE: Please read the schedule carefully. Note that on Tuesday, August 4, the courses start at 8:30 a.m. and have a two-hour lunch break (12:00 noon to 2:00 p.m.) to permit attendance at the Equipment Exposition which is open Tuesday from 12:00 noon to 6:00 p.m. *Tutorial* attendance is by registration only—badges are coded to control entry. *Seminar* attendees, however, may attend more than one seminar provided that there is available seating space. We ask only that you move from one seminar to another between sessions so as not to disrupt ongoing presentations.

BREAKS: Refreshments are served during morning and afternoon breaks outside the lecture halls.

LUNCHEONS: Luncheons (included in course fee) are served in the Arena on the third level of the Convention Center. Luncheon ticket(s) are included in your registration packet.

EXPOSITION: Registration to one or more courses admits you to the Equipment Exposition and Vendor Forum free of charge.

COURSE NOTES: One set of notes is included in your course registration. Additional sets of course notes can be purchased in the registration area.

Technical Programs

SIGGRAPH/81 technical programs will be held on Wednesday, August 5, through Friday, August 7, and are open to all registered conference attendees. A total of 34 papers will be presented in eight timely topic areas. Three panel presentations and the Presidents' Forum are also part of the technical programs.

The technical programs have been specifically designed this year for maximum attendance. Each program has its own time slot—with the exception of one concurrent session on Friday morning.

All three days of technical programs will be held in the Dallas Convention Center Parquet Ballroom. The ballroom is located in the northeast corner of the Convention Center on the third level.

Each conference registrant will receive one copy of the SIGGRAPH/81 proceedings which contains complete texts of the 34 papers presented at the conference.

MONDAY - August 3

- 8:00 - 6:00 ANSI, X3H31 User Group Meeting
(Hyatt Regency)
- 8:00 - 6:00 REGISTRATION
(Convention Center Lobby)
- 8:00 - 5:00 Speaker's Lounge
(Convention Center N235/236)
- 8:30 - 5:00 PRIP meetings
(Sheraton Dallas)
- 9:00 - 5:00 COURSES
See detail below.
(Check room assignments sheet in
registration materials for course
location.)
- 12:00 - 1:30 Course lunch
(Convention Center Arena)
- 5:00 - Applicon Steering Committee User
Group
(Hyatt Regency)
- 7:30 - 9:30 Course Reception
(Open to course registrants only)
(Hyatt Regency Dallas)

TUTORIAL: INTRODUCTION TO COMPUTER GRAPHICS (A)

Part one of a two-day course

Chairman: Dr. John Beatty

- 9:00 Introduction and Outline of Tutorial/Beatty
- 9:30 Basic Software/Beatty
- 10:45 Break
- 11:00 Basic Hardware I/Booth
- 12:00 Lunch
- 1:30 Basic Hardware II/Booth
- 2:15 Raster Hardware/Matthies
- 3:30 Break
- 3:45 Advanced Software I/Beatty

Tutorial to be continued on Tuesday

Monday

SEMINAR: INTRODUCTION TO COMPUTER-AIDED DESIGN (B)

Part one of a two-day course

Chairman: Dr. Bertram Herzog

- 9:00 Introductory Remarks/Herzog
- 9:15 The Functional Elements of a CAD System/
Heilman
- 10:00 Break
- 10:15 Developments in Display Technology for
CAD/Weisberg
- 11:00 Vendor Talks I
 - 11:00 MCS/Hanratty
 - 11:30 IBM/Riedlinger
- 12:00 Lunch
- 1:30 Vendor Talks II
 - 1:30 Applicon/Cannizaro
 - 2:00 Graphics Technology Corp./Brown
 - 2:30 Computervision/Young
- 3:00 Break
- 3:15 Vendor Talks III
 - 3:15 Summagraphics/Dunn
 - 3:45 Intergraph/Wilkins
- 4:15 Panel Discussion/Staff
- 4:45 Closing Remarks/Herzog

Seminar to be continued on Tuesday

SEMINAR: LOW-COST GRAPHICS (C)

Part one of a two-day course

Chairman: Dr. Richard Phillips

- 9:00 Computer Graphics Overview/Phillips
- 10:30 Break
- 10:45 Applications of Apple II/Loats
- 12:00 Lunch
- 1:30 Graphics Input/Phillips
- 3:00 Break
- 3:15 ZGRASS Graphics on the UV1/DeFanti

Seminar to be continued on Tuesday

Monday

SEMINAR: COMPUTER GRAPHICS HARDWARE (D)

Part one of a two-day course

Chairman: Dr. John Staudhammer

- 9:00 Vector CRT Displays/Staudhammer
- 10:30 Break
- 10:45 Scan CRT Systems/Staudhammer
- 12:00 Lunch
- 1:30 Recording Media/Milligan
- 3:00 Break
- 3:15 Photo Recording Systems/Kirchof

Seminar to be continued on Tuesday

SEMINAR: GRAPHIC DESIGN AND INFORMATION GRAPHICS (E)

Part one of a two-day course

Chairman: Mr. Aaron Marcus

- 9:00 Introduction/A&S Marcus
 - a. Graphic Design and Computer Graphics
 - b. Visual Semiotics: Structure and Process
 - c. Information Narratives: An Example
- 10:30 Break
- 10:45 Elementary Principles/A&S Marcus
 - a. Elements of Visual Form: Point, Line, and Plane
 - b. Principles of Visual Organization
 - c. Elementary Phenomena: Figure-Field, Depth, and Movement
- 12:00 Lunch
- 1:30 Proportion and Composition/A&S Marcus
 - a. Basic Proportion
 - b. Compositional Grids
 - c. Critique of Conventional Layouts: Words and Images
 - d. Critique of Computer Graphics Layouts
- 3:00 Break
- 3:15 Letterforms and Symbols/A&S Marcus
 - a. Typographic Form and Function
 - b. Factors of Legibility and Readability
 - c. Non-Alphanumeric Symbol Systems
 - d. Critique of a Text-Oriented Interface

Monday

TUTORIAL: INTRODUCTION TO RASTER GRAPHICS (F)

Chairman: Dr. Donald Greenberg

- 9:00 Introduction/Greenberg
- 9:15 Raster Concepts/Friedberg
 - a. Mechanics of Raster Devices
 - b. Directives to Video Raster Devices
 - c. Image Quality Parameters
- 9:45 Frame Buffer Architecture/Friedberg
- 10:15 Break
- 10:30 Raster Performance Issues/Woolf
- 11:00 Low Level Graphics/Dill
 - a. Introduction
 - b. Hardware Functions
 - c. Software Functions
 - d. System Comparisons
- 12:00 Lunch
- 1:30 Raster Algorithms/Greenberg
 - a. Perspective Transformation
 - b. Hidden Surface Routines
- 2:30 Color/Meyer
- 3:00 Break
- 3:15 Illumination Models and Reflection/Greenberg
- 3:45 Anti-Aliasing/Cook
- 4:15 Applications/Woolf

TUTORIAL: TWO-DIMENSIONAL COMPUTER ANIMATION (G)

Chairman: Mr. Marc Levoy

- 9:00 Painting
 - 9:00 General Introduction/Levoy
 - 9:30 Frame Buffer Configuration/Levoy
 - 9:45 Painting Programs/Smith
 - 10:30 Color Palettes/Smith
- 10:45 Break
- 11:00 Scanning
 - 11:00 Introduction to Video/Odgers
 - 11:30 Video Scanning/Odgers
 - 11:45 Film Scanning/Smith
- 12:00 Lunch
- 1:30 Cel Coloring
 - 1:30 Scan and Paint Systems/Levoy
 - 2:00 Automatic Inbetweening/Catmull

(Tutorial G continued on page 10)

Monday

- 3:00 Break
- 3:15 Production
 - 3:15 Merging and Transformations/Wallace
 - 4:00 Video Recording/Odgers
 - 4:15 Film Recording/Catmull
 - 4:30 Design of Large Systems/Levoy
 - 4:45 Films and Video Tapes/Staff

TUTORIAL: PSYCHOLOGY FOR USER-COMPUTER INTERFACES (H)

Chairman: Dr. Jack Grimes

- 9:00 Introduction and Scope/Grimes
- 9:30 Cognitive Psychology and Applications Part I/Grimes
- 10:30 Break
- 10:45 Video Tape—Commercial Systems/Grimes
- 11:00 Cognitive Psychology and Application Part II/Grimes
- 11:45 Video Tape—Case Study/Grimes
- 12:00 Lunch
- 1:30 Visual Perception and Applications/Grimes
- 2:30 Interactivity and Perception of Time I/Grimes
- 3:00 Break
- 3:15 Interactivity and Perception of Time II/Grimes
- 3:45 Case Study/Grimes
- 4:00 Why Do Computers Make Me Nervous?/Grimes
- 4:30 Question and Answer Session/Grimes

SEMINAR: SOLID MODELING (I)

Chairman: Dr. Herbert Voelker

- 9:00 Introduction to Geometric Modeling/Voelcker, Requicha
- 10:30 Break
- 10:45 Introduction to Geometric Modeling II/Voelcker, Requicha
- 12:00 Lunch
- 1:30 The ROMULUS, BUILD, and DESIGN Systems/Hillyard
- 3:00 Break
- 3:15 The GMSOLID Systems/Sarraga

Monday

SEMINAR: GRAPHICAL CAD SYSTEMS FOR VLSI (J)

Chairman: Dr. Howard Shrobe

- 9:00 Daedalus-DPL: The Integration of Procedural and Graphical Systems/Shrobe
- 10:30 Break
- 10:45 Raster Oriented Validation Tools/Baker
- 12:00 Lunch
- 1:30 A High-Performance Display Processor/Weste
- 2:15 Virtual Grid Symbolic Layout/Weste
- 3:15 Break
- 3:30 Panel Discussion: Commercial CAD Systems/Shrobe, Baker, Weste, Shields, McCray, Williams

SEMINAR: BUSINESS GRAPHICS FOR MANAGERS (K)

Chairwoman: Ms. Maxine Brown

- 9:00 Why Graphics?/Brown
- 9:15 Graphics in Advertising/Demos
- 10:15 Break
- 10:30 Hardware/Software/Systems: Introduction and Overview/Orr
- 11:15 Acquiring and Justifying a Business Graphics Facility/Chappell
- 12:00 Lunch
- 1:30 Case Study: Artists and Computers/Frye
- 2:30 Panel Discussion: How Customers Use Business Graphics Products/Gafner, May, Ferguson, Carroci, Samit, Berard, Miller, and Folk
- 3:30 Break
- 3:45 Panel Discussion (continued)

SEMINAR: ADVANCED IMAGE SYNTHESIS (L)

Chairman: Dr. Turner Whitted

- 9:00 Overview/Whitted
- 9:05 Display of Curved Surfaces/Blinn
- 10:30 Break
- 10:45 Causes of Aliasing/Whitted
- 12:00 Lunch
- 1:30 Approaches to Anti-Aliasing/Feibush
- 3:00 Break
- 3:15 Use of Texture and Reflectance Maps/Williams

TUESDAY - August 4

- 8:00 - 2:00 Applicon Steering Committee User Group
(Convention Center N212/213)
- 8:00 - 6:00 REGISTRATION
(Convention Center Lobby)
- 8:00 - 5:00 Speaker's Lounge
(Convention Center N235/236)
- 8:30 - 5:00 PRIP meetings
(Sheraton Dallas)
- 8:30 - 5:00 COURSES
See detail below.
(Check room assignments sheet in registration materials for course location.)
- 10:30 - 12:00 Press Preview
(Press Room, Dallas Convention Center E405)
- 12:00 - 2:00 Course Luncheon
(Convention Center Arena)
- 12:00 - 6:00 EQUIPMENT EXPOSITION OPEN
- 2:00 - 5:00 Evans and Sutherland User Group
(Greenelefe Hotel)
- 5:00 - 7:00 Vegas (Vector General User Group)
(Hyatt Regency)
- 6:00 - 9:00 Muse (Modcomp Users Exchange)
(Hyatt Regency)
- 7:00 DI3000 User Group
(Hyatt Regency)
- 7:00 - 12:00 Vegas Reception/Dinner
(Hyatt Regency)
- 7:30 - 9:00 General Reception
Open to all conference registrants
(Fairmont Hotel)
- 7:30 - 9:00 Film Show
Open to press representatives, families and special guests
(Dallas Convention Center Theatre)

Tuesday

TUTORIAL: INTRODUCTION TO COMPUTER GRAPHICS (A)

Part two of a two-day course

Chairman: Dr. John C. Beatty

- 8:30 Advanced Software II/Matthies
- 9:30 Graphics Input Hardware and Interaction
Techniques I/Wein
- 10:30 Break
- 10:45 Graphics Input Hardware and Interaction
Techniques II/Wein
- 12:00 Lunch
- 2:00 Color and Color Perception/Beatty
- 2:45 Animation/Beatty
- 3:30 Break
- 3:45 Graphics Packages/Booth
- 4:45 Overview of Conference/Booth

SEMINAR: INTRODUCTION TO COMPUTER-AIDED DESIGN (B)

Part two of a two-day course

Chairman: Dr. Bertram Herzog

- 8:30 Vendor Talks IV
 - 8:30 Gerber/Taxin
 - 9:00 Auto-trol/Weisberg
 - 9:30 Sigma Design West/Trefz
- 10:00 Break
- 10:15 Vendor Talks V
 - 10:15 McDonnell Douglas/Spillman
 - 10:45 IGS/Crocca
- 11:15 How to Justify a CAD System/Chasen
- 12:00 Lunch
- 2:00 CAD/CAM Connection—A Glimpse of the
1980's/Thomas
- 2:30 Developments in Solid Modeling/Voelcker
- 3:00 Break
- 3:15 Developments in Sculptured Surface Rep-
resentation/Riesenfeld
- 3:45 Panel Discussion: A Look Into the Future/
Staff

Tuesday

SEMINAR: LOW-COST GRAPHICS (C)

Part two of a two-day course

Chairman: Dr. Richard Phillips

- 8:30 Interactive Graphics/Phillips
- 10:00 Break
- 10:15 Graphics on the TI 9918/Roper
- 12:00 Lunch
- 2:00 Hard Copy and the Low Cost Work Station/
Phillips
- 3:30 Break
- 3:45 Graphics on the Atari 800/Small

SEMINAR: COMPUTER GRAPHICS HARDWARE (D)

Part two of a two-day course

Chairman: Dr. John Staudhammer

- 8:30 Ink Jet Printers and Plotters/Keithley
- 10:00 Break
- 10:15 Printers and Laser Printers/Staudhammer
- 12:00 Lunch
- 2:00 Input Devices/Dunn
- 3:00 Break
- 3:15 Array Processors/Cannon
- 4:00 Direct Video Recording/Romanko

SEMINAR: GRAPHIC DESIGN AND INFORMATION GRAPHICS (E)

Part two of a two-day course

Chairman: Mr. Aaron Marcus

- 8:30 Color/A&S Marcus
 - a. Perceptual and Conceptual Basics
 - b. Elementary Phenomena
 - c. Critique of Conventional Use of Color
 - d. Critique of Use of Color in Computer Graphics

(Seminar E continued on page 15)

Tuesday

- 10:15 Break
- 10:30 Charts and Graphs/A&S Marcus
 - a. Basic Forms and Functions
 - b. Principles of Design
 - c. Critique of Conventional Charts
 - d. Critique of Charting in Computer Graphics
- 12:00 Lunch
- 2:00 Maps/A&S Marcus
 - a. Basic Forms and Functions
 - b. Principles of Design
 - c. Map Design: An Example
 - d. Critique of Mapping in Computer Graphics
- 3:30 Break
- 3:45 Diagrams/A&S Marcus
 - a. Basic Forms and Functions
 - b. Principles of Design
 - c. Critique of Conventional Diagrams: Visual Metaphors
 - d. Critique of Diagramming in Computer Graphics

SEMINAR: RELATED INDUSTRIES: TELEVISION, FILM, VIDEO, PRINTING (M)

Chairman: Dr. Stephen Levine

- 8:30 Video/Levine
- 10:00 Break
- 10:15 Film/Brown
- 11:30 Demonstration on Vision/Levine
- 12:00 Lunch
- 2:00 Vision/Montavo
- 3:15 Break
- 3:30 Printing/Levine, Brown
- 4:30 Demonstration on Vision and Optical Effects/Levine, Montavo

Tuesday

SEMINAR: THREE-DIMENSIONAL COMPUTER ANIMATION (N)

Chairman: Mr. Lance Williams

- 8:30 Introduction and Overview of 3D Animation/
Williams
- 9:15 Motion Modeling and Simulation/Badler
- 10:15 Break
- 10:30 Control and Animation of Articulated
Figures/Stern
- 11:15 Integrating Computer Graphics with Motion
Control/Kovacs
- 12:00 Lunch
- 2:00 Animating the Cosmos/Blinn
- 3:00 Break
- 3:15 Theatrical Computer Animation/Demos
- 4:15 Film Show/Staff

TUTORIAL: HOW TO DESIGN USER- COMPUTER INTERFACES (O)

Chairman: Dr. James Foley

- 8:30 A Methodology for Designing User Inter-
faces/Foley
- 10:00 Break
- 10:15 Guidelines for the Design of User Interfaces/
Foley
- 11:30 A Simple User Interface/Foley
- 12:00 Lunch
- 2:00 Interaction Devices and Techniques/Foley
- 3:30 Break
- 3:45 Visual Presentation of Information/Foley
- 4:15 Tools for Implementing User Interfaces/Foley

SEMINAR: SCULPTURED SURFACES (P)

Chairman: Dr. Richard Riesenfeld

- 8:30 Introduction to Computer Aided Geometric
Design/Riesenfeld

(Seminar P continued on page 17)

Tuesday

- 10:00 Break
- 10:15 Introduction to Discrete Curves and Surfaces/
Cohen
- 12:00 Lunch
- 2:00 Computer Aided Design of Freeform Surfaces/
Barnhill
- 3:30 Break
- 3:45 Display Algorithms for Freeform Surfaces/
Lane

SEMINAR: BUSINESS GRAPHICS FOR USERS (Q)

Chairwoman: Ms. Maxine Brown

- 8:30 Introduction/Brown
- 8:45 Software Development Techniques for
Graphics Systems/Ewald
- 10:30 Break
- 10:45 What Makes a Good Graph?/Vinberg
- 12:00 Lunch
- 2:00 Lying with Graphics/Rawlins
- 2:45 Guidelines for Designing a Graph/Szoka
- 3:30 Break
- 3:45 Special Effect Techniques for Presentation
Graphics/Carpenter

SEMINAR: STATE-OF-THE-ART IN IMAGE SYNTHESIS (R)

Chairman: Dr. James Blinn

- 8:30 Introduction/Blinn
- 8:45 State-of-the-Art in Object Description/Lundin
- 9:45 Break
- 10:00 State-of-the-Art in Surface Shading/Blinn
- 11:00 State-of-the-Art in Picture Composition/Em
- 12:00 Lunch
- 2:00 State-of-the-Art in Real-Time Image
Synthesis/Robinson
- 3:00 Break
- 3:15 State-of-the-Art in Lighting Environment
Simulation/Whitted
- 4:15 Film Show/Staff

WEDNESDAY – August 5

8:00 - 10:00 IKONAS User Group
(Convention Center N212/213)

8:00 - 6:00 REGISTRATION
(Convention Center Lobby)

8:00 - 5:00 Speaker's Lounge
(Convention Center N235/236)

8:30 - 5:00 PRIP meetings
(Sheraton Dallas)

9:00 - 6:00 EQUIPMENT EXPOSITION OPEN

9:00 - 6:00 VENDOR FORUM
Obtain Schedule at Information Center.

9:00 - 10:30 Opening Session
(Convention Center Ballroom)

- Conference Co-Chairman's Welcome
–Tony Lucido
- State of SIGGRAPH—Tom DeFanti
- Technical Programs Introduction—
Henry Fuchs
- Eurographics Report

10:45 - 5:15 TECHNICAL PROGRAMS
All technical programs held in Convention Center Ballroom.
See detail below.

10:45 - 12:00 THEORY AND ALGORITHMS I
Chair: John Warnock, Xerox Palo Alto
Research Center

1. Filtering Edges for Gray-Scale Displays, Satish Gupta and Robert Sproull, Carnegie-Mellon University.
2. Filtering High Quality Text For Display on Raster Scan Devices, James T. Kajiya and M. Ullner, California Institute of Technology.
3. A Visible Polygon Reconstruction Algorithm, Stuart Sechrest and Donald Greenberg, Cornell University.

Wednesday

12:00 - 1:30 Lunch
(On your own)

12:00 - 1:30 Attendee film/videotape shows

1:30 - 2:30 **THEORY AND
ALGORITHMS II**

Chair: Kellogg Booth, University of
Waterloo

4. Contour Filling in Raster Graphics,
Theo Pavlidis, Bell Laboratories.
5. Shading of Regions on Vector
Display Devices, D. T. Lee, North-
western University.
6. Frame-to-Frame Coherence and the
Hidden Surface Computation:
Constraints for a Convex World,
Harold Hubschman and Steven W.
Zucker, McGill University.

2:30 - 2:45 Coffee break
(Outside Ballroom)

2:45 - 3:45 **GRAPHICS HARDWARE**

Chair: Michael Wozny, Rensselaer
Polytechnic Institute

1. Parallel Processing Image Synthesis
and Anti-Aliasing, Richard
Weinberg, University of Minnesota.
2. A Frame Buffer System with
Enhanced Functionality, F. C. Crow
and M. W. Howard, Ohio State
University.
3. A VLSI Architecture for Updating
Raster-Scan Displays, Satish Gupta
and Robert Sproull, Carnegie-
Mellon University, and Ivan E.
Sutherland, Sutherland, Sproull and
Associates Inc.

Wednesday

3:00 - 5:00 Terak User Group
(Convention Center N215)

4:00 - 5:00 VIM (CDC User Group)
(Convention Center N217)

4:00 - 5:15 **PANEL: CUSTOM VLSI CHIPS
FOR GRAPHICS**

Chair: Robert Sproull, Carnegie-Mellon
University

The panel will discuss new VLSI-
oriented designs for high-performance
graphic processors.

Panelists:

James Clark, Stanford University
Henry Fuchs, University of North
Carolina at Chapel Hill
Turner Whitted, Bell Laboratories

4:00 - 6:00 Advanced Electronics Design User
Group
(Convention Center N232)

6:00 - 7:30 Movie.BYU User Group
(Hyatt Regency)

7:00 - 10:00 GCS User Group
(Hyatt Regency)

7:30 - 9:00 Film Show—Science and
Technology
Coordinator: Pat Cole, Lucasfilm Ltd.
(Dallas Convention Center Ballroom)

THURSDAY – August 6

8:00 - 10:00 Vendor Breakfast
(By invitation)

8:00 - 6:00 REGISTRATION
(Convention Center Lobby)

8:00 - 5:00 Speaker's Lounge
(Convention Center N235/236)

9:00 - 5:15 TECHNICAL PROGRAMS
All technical programs held in
Convention Center Ballroom.
See detail below.

9:00 - 6:00 EQUIPMENT EXPOSITION OPEN

9:00 - 6:00 VENDOR FORUM

Obtain schedule at Information Center.

9:00 - 10:30 INTERACTION TECHNIQUES

Chair: Ronald Baecker, University of
Toronto and Human Computing
Resources Corporation

1. The Effective Use of Color in Computer Graphics, Joan R. Truckenbrod, Northern Illinois University.
2. Tablet Based Valuers that Provide One, Two, or Three Degrees of Freedom, Kenneth B. Evans, Peter P. Tanner, and Marcell Wein, National Research Council.
3. A Methodology for the Specification of Graphical User Interface, Mark Green, University of Toronto.
4. Gaze Orchestrated Dynamic Windows, Richard A. Bolt, Massachusetts Institute of Technology.

10:30 - 10:45 Coffee Break
(Outside Ballroom)

(THURSDAY activities continued on page 24)

August 3

	8	9	10	11	12	1	2	3	4	5	6	7	8	9
Monday			Courses			Lunch		Courses					Reception	

August 4

	8	9	10	11	12	1	2	3	4	5	6	7	8	9
Tuesday		Courses				Lunch		Courses					Reception	
							Equipment Expo							

August 5

	8	9	10	11	12	1	2	3	4	5	6	7	8	9
Wednesday		Opening Session Tech. Program				Lunch		Technical Program					Film Show	
							Equipment Expo							

August 6

	8	9	10	11	12	1	2	3	4	5	6	7	8	9
Thursday		Technical Program				Lunch		Technical Program				Wine & Cheese Party	Film Show	
							Equipment Expo							

August 7

	8	9	10	11	12	1	2	3	4	5	6	7	8	9
Friday		Technical Program				Lunch		Technical Program						

at-a-glance

- 18 concurrent one- or two-day courses. Monday and Tuesday.
- Presentations by vendors of graphic technology.
- State-of-the-art technical sessions. Wednesday thru Friday.
- Films and videotapes. Wednesday and Thursday.
- Monday reception for course registrants only.
- Tuesday reception for all conference registrants.
- Thursday wine and cheese party open to all conference registrants.
- Meetings by users of graphics hardware and software systems.
- An exposition of graphics hardware and software by industry vendors. Tuesday thru Thursday.
- Room set aside Wednesday thru Friday for attendees to show own films and videotapes during lunch breaks.

Thursday (continued from page 21)

10:45 - 12:00 VIDEO PANEL SESSION ON INTERACTIVE SYSTEMS

Chair: Ronald Baecker, University of Toronto and Human Computing Resources Corporation

Each panelist will show a videotape illustrating the user interface of an interactive system and comment on techniques used. The systems have been refined through years of actual use.

Panelists:

Fred Brooks, University of North Carolina at Chapel Hill

William Newman, Logica, VTS

William Buxton, University of Toronto

12:00 - 1:30 Lunch
(On your own)

12:00 - 1:30 Attendee film/videotape shows

1:30 - 2:30 GRAPHIC SOFTWARE AND LANGUAGES

Chair: Richard Puk, Megatek Corporation

1. The George Washington University Core System Implementation, James D. Foley and Patricia A. Wenner, George Washington University.
2. GRAMPS—A Graphics Language Interpreter for Real-Time, Interactive, Three-Dimensional Picture Editing and Animation, T. J. O'Donnell and Arthur J. Olson, Lawrence Berkeley Laboratory.
3. An Attribute Binding Model, Michael T. Garrett, Applied Graphics, Inc.

2:30 - 2:45 Coffee Break
(Outside Ballroom)

2:45 - 3:45 CAD/CAM

Chair: Richard Riesenfeld, University of Utah

1. An Application of Color Graphics to the Display of Surface Curvature, John C. Dill, General Motors Research Laboratory.
2. SAMMIE—A Computer Aid for Man-Machine Modeling, Norman Schofield and E. C. Kingsley, Compeda Limited, and K. Case, University of Nottingham, England.
3. Variational Geometry in Computer-Aided Design, Vincent C. Lin, David C. Gossard and Robert A. Light, Massachusetts Institute of Technology.

4:00 - 5:15 PRESIDENTS' FORUM

Chair: L. Neil Johnson, Vector General

The Presidents of key companies in the computer graphics industry will open a dialogue among themselves and with the user community on contemporary business and technical issues.

Panelists:

Richard L. Davidson, Vice President and General Manager, Graphics Systems Division, Applied Dynamics International.

David C. Evans, President and Chairman of the Board, Evans &

Sutherland Computer Corporation

Wayne Huelskoetter, President, Dicomed Corporation

Ren Zaphiropoulos, President, Versatec Corporation, Xerox, Inc.

6:00 EXHIBIT HALL CLOSES

6:30 - 7:30 Wine & cheese party

Open to all conference registrants.
(Convention Center Arena)

7:30 - 9:00 Film show—Art and Entertainment Coordinator: Tom DeFanti, University of Illinois at Chicago Circle

(Dallas Convention Center Ballroom)

FRIDAY - August 7

8:00 - 4:00 Megatek User Group Exchange
(Convention Center N215)

8:00 - 5:00 Speaker's Lounge
(Convention Center N235/236)

8:30 - 3:45 **TECHNICAL PROGRAMS**
All technical programs (except Panel on Standards scheduled for Convention Center Theatre) held in Convention Center Ballroom.
See detail below.

8:30 - 10:30 **APPLICATIONS**
(concurrent session)

Chair: Carl Machover, Machover Associates

1. An Integrated System for Creating and Presenting Complex Computer-Based Documents, Steven Feiner, Brown University, Sandor Nagy, Hungarian Academy of Science, and Andries van Dam, Brown University.
2. Towards a Laboratory Instrument for Motion Analysis, Ronald Baecker, University of Toronto, William Reeves, Lucasfilm, Ltd., and David Miller, Micom, Ltd.
3. DATAPLOT—An Interactive High-Level Language for Graphics, Non-Linear Fitting, Data Analysis, and Mathematics, James J. Filliben, National Bureau of Standards.
4. Creating Repeating Hyperbolic Patterns, Douglas Dunham, and John Lindgren, University of Minnesota, and David Witte, University of Chicago.
5. Austere C3 Graphics, Patrick De Shazo, and Robert Todd, the MITRE Corporation.
6. Two Aspects of Domain Designing: C^∞ Curve Rendering and Blended Map Projections, Alyn P. Rockwood, and T. W. Jensen, Evans and Sutherland Computer Corp.

8:30 - 10:30 PANEL ON STANDARDS

(concurrent session)

Convention Center Theatre

Chair: Peter Bono, Naval Underwater
Systems Center

Several members of the ANSI Committee X3H3 will present current issues of the standardization effort and will describe avenues of attack and proposed solutions. Topics include Graphics Functionality, Programmers Minimal Interface, Virtual Device Interface and Metafile.

Panelists:

Richard Puk, Megatek

Ted Reed, Los Alamos Laboratory

Mark Skall, National Bureau of
Standards

Tom Wright, ISSCO

10:30 - 10:45 Coffee Break
(Outside Ballroom)

10:45 - 12:00 ANIMATION

Chair: Donald Greenberg, Cornell
University

1. Animating Facial Expressions,
Stephen Platt and Norman Badler,
University of Pennsylvania.
2. Merging and Transformation of
Raster Images for Cartoon Anima-
tion, Bruce A. Wallace, Cornell
University.
3. Inbetweening for Computer
Animation Utilizing Moving Point
Constraints, William Reeves,
Lucasfilm, Ltd.

12:00 - 1:30 Lunch
(On your own)

12:00 - 1:30 Attendee film/videotape shows

1:30 - 2:30 RASTER GRAPHICS I

Chair: John Beatty, University of Waterloo

1. A Software Test-Bed for the Development of 3-D Raster Graphics Systems, Turner Whitted and David Weimer, Bell Laboratories.
2. A Method of Interactive Visualization of CAD Surface Models on a Color Video Display, Peter Atherton, General Electric Company.
3. 3D Graphics and the Wave Theory, Hans P. Moravec, Carnegie-Mellon University.

2:30 - 2:45 Coffee Break
(Outside Ballroom)

2:45 - 3:45 RASTER GRAPHICS II

Chair: Turner Whitted, Bell Laboratories

4. A Lens and Aperture Camera Model for Synthetic Image Generation, Michael Potmesil and Indranil Chakravarty, Rensselaer Polytechnic Institute.
5. A Reflectance Model for Computer Graphics, Robert L. Cook and Kenneth Torrance, Cornell University.
6. Vectorized Procedural Models for Natural Terrain: Waves and Islands in the Sunset, Nelson L. Max, Lawrence Livermore National Laboratory.

(See you in Boston, July 26-30, 1982)

Exposition Information

Equipment Exposition hours:

Dallas Convention Center

Tuesday, August 4	12:00 Noon — 6:00 p.m.
Wednesday, August 5	9:00 a.m. — 6:00 p.m.
Thursday, August 6	9:00 a.m. — 6:00 p.m.

The annual SIGGRAPH conference and exposition is unique in the computer field. The excellence of the exhibitor community and their willingness to display their latest developments enhance the attraction of the conference as a whole. A conference attendee can compare products and services that will meet his requirements with state-of-the-art technology in one place.

SIGGRAPH takes pride in the balance achieved between the exposition and technical portions of the conference. This year's exposition is the largest yet held at a SIGGRAPH conference. Further information is provided in the separate Exhibits Directory.

Exposition Marks Its Sixth Year

This is the sixth year that the SIGGRAPH conference has included an Equipment and Services Exposition supported by the graphics industry vendors. The rapid expansion in number of vendors and total exposition floor space from 10 booths and 3,000 (gross) square feet in Philadelphia in 1976 to 135 exhibitors occupying 100,000 (gross) square feet in the Dallas Convention Center attests to the vitality of the industry and a resounding vote of confidence in the ACM/SIGGRAPH Conference.

Exposition Opening Ceremony

Tuesday, August 4

Dallas Convention Center 12:00 Noon

Main entrance to exhibit hall

A short ceremony will mark the opening of the largest computer graphics exposition ever held under one roof in the United States. Come join the crowd and see it happen—everyone is invited.

Exhibitors

<i>Company</i>	<i>Booth</i>	<i>Company</i>	<i>Booth</i>
ABT Computer Graphics Corp.	130	Conference Book Service	260
ABW Corporation	249	Cromemco, Inc.	540
AM Bruning	419	Datacopy	113
Adage, Inc.	725	Datacube Inc.	918
Advanced Color Technology, Inc.	920	Data Design Logic Systems, Inc.	115
Advanced Electronic Design, Inc.	717	Datamax, Inc.	351
Altek Corporation	346	Data Technology, Inc.	134
Analog Technology Corporation	931	De Anza Systems, Inc.	200
<i>The Anderson Report</i>	748	Design Aids, Inc.	802
Apple Computer, Inc.	241	Dicomed Corporation	841
Applicon, Inc.	940	Digital Engineering, Inc.	660
Applied Dynamics International	851	Digital Equipment Corporation	425
Association for Computing Machinery	141	Dunn Instruments, Inc.	915
Auscom, Inc.	916	Dynair Electronics, Inc.	447
Aydin Controls	715	E & O Systems Ltd.	205B
Benson, Inc.	341	Eigen Video	213
Benwill Publishing Corporation	733	Engineering Systems Corporation	111
CAD CAM Inc.	131	European Software Contractors	746
CEC Div./Bell & Howell	912	Evans & Sutherland	925
California Computer Products, Inc.	407	First Computer Corporation	905
CALMA	515	GTCO Corporation	909
CELCO	205A	General Electric Video Display	151
Chromatics, Inc.	919	Genisco Computers Corporation	441
Colorgraphic Communications Corporation	347	Grinnell Systems Corporation	641
Color Terminals International	647	Harris Computer Systems	105
Compeda, Inc.	360	Hewlett-Packard Company	525
Computer Design	350	Hitachi America Ltd.	124
Computer Decisions	804	Houston Instrument	650 & 808
Computer Graphics World	146	IBM Corporation	541
Computer Pictures Corporation	118	ID Systems Corporation	941
Computer Technology Review	860	IEEE Computer Society	235
Computerworld	114	ISSCO Graphics	951
Comshare, Inc.	331	Ikonas Graphics Systems, Inc.	127
Comtal Corporation	325	Image Resource Corporation	550
Conrac Div./Conrac Corporation	741	Imlac Corporation	305
		Industrial Data Terminals Corp.	958

exhibitors

<i>Company</i>	<i>Booth</i>	<i>Company</i>	<i>Booth</i>
Information Devices Corp.	217	PrintaColor Corporation	830
Integrated Terminals Inc.	109	Productivity International Inc.	948
Intelligent Systems Corp.	819	Ramtek Corporation	825
Interactive Machines, Inc.	558	Raster Technologies Inc.	231
Intergraph Corporation	315	Redac Interactive Graphics Inc.	258
International Imaging Systems, Inc.	335	Rothe Development, Inc.	630
KMW Systems Corporation	831	Sanders Associates, Inc.	551
Leading Edge Publishing Corporation	112	Scherago Associates Inc.	253
Lexidata Corporation	815	Science Accessories Corporation	904
Logic Sciences, Inc.	400	Science Applications, Inc.	632
Lundy Electronics & Systems, Inc.	760	Selamar Corporation	213
Lyon Lamb Video Animation Systems, Inc.	932	Space Science & Engineering Center	930
MacDonald Dettwiler & Associates Ltd.	731	Spatial Data Systems, Inc.	800
Matrix Instruments, Inc.	933	Summagraphics Corporation	507
Matrox Electronic Systems	233	Superset, Inc.	926
Measurement Systems, Inc.	246	Synercom Technology, Inc.	805
Megatek Corporation	607	Systems Engineering Laboratories	751
Mini-Micro Systems/Cahners Publishing Co.	300	Tektronix, Inc.	625
Modgraph, Inc.	119	Terak Corporation	934
Nicolet Zeta Corporation	834	3M Industrial Optics	247
Nissei Sangyo America Ltd.	137	Three Rivers Computer Corporation	205C
Numonics Corporation	229	USgraphics	656
OCLI/Optical Coating Laboratory, Inc.	732	Vector Automation	234
Octek Inc.	856	Vector General, Inc.	707
Omega Data	911	Versatec, Inc.	614
The Optical Publishing Company	914	Vickers Instruments	110
Optronics International Inc.	651	Vicom Systems, Inc.	451
J. Osawa & Co. Ltd.	133	Watanabe Instruments Corp.	152
Peritek Corporation	248	Xerox Corporation	225
Perkin-Elmer	735	Xynetics, Inc.	900
Phoenix Computer Systems, Inc.	250		
Polaroid Corporation	619		
Precision Visuals, Inc.	460		

Vendor Forum

The SIGGRAPH/81 Vendor Forum involves concurrent 30-minute sessions on six topic areas. Sessions begin on the hour and half hour Wednesday, August 5, and Thursday, August 6. The first forums start at 9:00 a.m. and the last begin at 5:30 p.m. and end promptly at 6:00 p.m.

The six vendor forum topics and their room assignments are:

1. Future Application Areas (Level 4, room E406)
2. Hardware Trends (Level 4, room E409)
3. Business Graphics (Level 4, room E410)
4. Geometric Modeling (Level 4, room E407)
5. Human Engineering or Ergonomic Work Stations (Level 3, room E301)
6. CAD/CAM (Level 3, room E302)

A preliminary list of participants is below. The final schedule is available at the Information Center in the registration lobby.

Abt Computer Graphics Corp.
Adage, Inc.
Analog Technology Corp.
Centercom
Compeda
Comshare, Inc.
Control Data Corporation
DeAnza Systems, Inc.
Ergonomics
European Software Contractors
Evans & Sutherland
IKONAS
Imlac
ISSCO
Lucitron
Megatek Corporation
Precision Visuals
PrintaColor Corporation
Sanders Associates Inc.
Spatial Data Systems
Superset, Inc.
Tektronix, Inc.
Vector General, Inc.

General Information

AIRLINE BOOTHS

Both American Airlines and Delta Airlines have booths set up in the corridor adjacent to the registration area to assist SIGGRAPH/81 attendees with travel arrangements.

CAR RENTAL

SIGGRAPH suggests you check with the concierge at your hotel regarding car rental arrangements.

CONFERENCE HEADQUARTERS HOTEL

Hyatt Regency Dallas
300 Reunion Boulevard
Dallas, Texas 75207
214/651-1234

DALLAS POINTS OF INTEREST

Check at the Information Center for guidance on things to do and see in Dallas.

DALLAS RESTAURANT BOOTH

The Dallas Restaurant Reservations Group is staffing a booth located in the corridor adjacent to the registration area. Its experts are prepared with menu displays to assist you in making restaurant reservations at any number of fine area restaurants.

FIRST AID

Paramedics will be available in the corridor adjacent to the exhibit area from Friday, July 31, to Tuesday, August 4, from 8 a.m. to 6 p.m. Hours on Wednesday and Thursday (August 5 and 6) are 8 a.m. to 10 p.m. and Friday, August 7, from 8 a.m. to 6 p.m.

HOUSING INFORMATION BOOTH

A Dallas Convention Bureau representative is staffing a booth Monday and Tuesday to assist SIGGRAPH/81 attendees with their housing arrangements.

general information

INFORMATION CENTER

The Information Center, located in the center of the lobby-registration area, is the site for up-to-date information on SIGGRAPH/81 activities and procedures. Information Center personnel are in constant communication with SIGGRAPH/81 officials. The hours are 8 a.m. to 6 p.m. Monday through Thursday and 8 a.m. to 4 p.m. Friday.

THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS CONFERENCE ON PATTERN RECOGNITION AND IMAGE PROCESSING (PRIP)

The PRIP conference, sponsored by the Institute of Electrical and Electronics Engineers, is running concurrently with SIGGRAPH/81 activities, August 3-5. PRIP headquarters hotel is the Sheraton Dallas located in the Southland Center area of downtown Dallas. The \$50 PRIP cross-registration fee includes the equipment exposition, technical programs and a copy of the proceedings. The \$10 student cross-registration fee includes the exposition and technical programs only.

LOBBY SIGNS

Signs appearing in the lobby contain information on:

- Course room assignments
- Vendor Forum schedule
- Users Groups schedule
- Technical Programs

MESSAGE CENTER

A Southwestern Bell Message Center is set up in the Convention Center corridor adjacent to the registration area. Messages can be left with message center personnel for other conference participants from 8 a.m. to 6 p.m. Monday through Thursday and 8 a.m. to 4 p.m. Friday.

PRESS ROOM

Room E405 is the base for SIGGRAPH/81 press operations. Press representatives can work with staff members manning this room to set up appointments with SIGGRAPH/81 officials. Press room hours are 9 a.m. to 5 p.m. Sunday through Thursday and 9 a.m. to noon on Friday.

general information

REGISTRATION

Pre-registrants can pick up materials at the pre-registration counter in the Convention Center lobby. On-site registrants can sign up for any portion of the conference at the on-site registration counter. Registration hours are:

Sunday:	9:00 — 5:00
Monday:	8:00 — 6:00
Tuesday:	8:00 — 6:00
Wednesday:	8:00 — 6:00
Thursday:	8:00 — 6:00

SIGGRAPH '82

The 1982 conference has been set for July 26-30, 1982, in Boston, Massachusetts. SIGGRAPH '82 Chairman Elaine Sonderegger or committee members are on-site to discuss the conference with you.

After the conference, general SIGGRAPH '82 information can be obtained by writing P.O. Box 353, Derby, Connecticut 06418. Telephone: 203/735-9980.

TRANSPORTATION:

Complimentary shuttle bus: Complimentary shuttle bus service is provided between hotels and the Dallas Convention Center on the following routes:

Route 1	Sheraton Dallas Plaza of the Americas Fairmont Holiday Inn-Downtown
Route 2	Travelodge Tower Loews Anatole Marriott-Market Center Rodeway Inn-Market Center Holiday Inn-Market Center Dupont Plaza Quality Inn-Market Center
Route 3	Hyatt Regency Greenelefe

There will be continuous service throughout each conference day between these hotels and the Convention Center. Buses will operate on a frequent schedule from 7:30 a.m. until 7:30 p.m., Monday and Tuesday; 7:30 a.m. to 10:00 p.m., Wednesday and Thursday; 7:30 a.m. until 4:30 p.m., Friday. Schedules are posted in hotel lobbies and at the Dallas Convention Center.

general information

Cabs: All cab service available on level one of the Dallas Convention Center.

Surtran: Ground transportation to the airport is available every half hour at the Mirilla Street side of the Convention Center all day Thursday and Friday. Tickets can be obtained from the Surtran representative on duty in the Convention Center lobby.

Luggage check area: A luggage check area will be set up in the Convention Center lobby for attendees.

USERS GROUP MEETINGS

User Groups traditionally meet during the SIGGRAPH conference. Early groups indicating participation are listed below. A complete schedule of users group activity is available at the Information Center. Also check the Information Center for details on the "birds of a feather" room open Wednesday through Friday.

Adage Graphics Exchange (Jerry Ornstein,
617/667-7070 ext. 211)

Advanced Electronics Design (AED) (J. D. Kennedy,
408/733-3555)

ANSI X3H3 Adhoc Group on Programmers Minimal
Interface to Graphics (Randall Simmons)

ANSI X3H31 Graphics Standards Development
Group (Dick Puk, 714/455-5590)

ANSI X3H33 Virtual Device Interface and Metafiles
Task Group (Mike Hayden, 512/385-9740)

Applicon Steering Committee (Beverly DiChiara,
617/272-7070 ext. 241)

Evans and Sutherland User Group (Steve Satterfield,
301/267-3127)

GCS User (Roy Lee, 415/422-2127)

IKONAS (Mary Whitton, 919/833-5401)

Megatek User Group Exchange (Mux) (Gary Washam,
714/455-5590)

Movie.BYU (Michael Stephenson, 801/378-2811)

Muse (Modcomp Users Exchange) (Lynn Kellar,
404/458-9521)

Terak User Group (Jerry Grady, 602/998-4800)

Vegus (Vector General User Group) (Sherry Keowen,
213/346-3410)

VIM (CDC User) (Peggy Brehm, 602/267-3552)

Telephone Numbers

The SIGGRAPH/81 conference committee supplies the telephone numbers below as a service to attendees. Listing does not imply endorsement by the committee.

SIGGRAPH/81 offices

Conference Office:	658-7450-51
Exhibit Office:	658-7452-53
Committee Office:	658-7206-07
Message Center:	658-7116
Press Room:	658-7208-09
Registration Area:	658-7204
Information Center:	658-7201-02

Dallas Chamber of Commerce/ Visitors Bureau/Housing Bureau	651-1020
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Dallas Convention Center	658-7000
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First Aid	658-7200
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Surtran	817/267-1506
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Dallas Transit System	827-3400
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Dallas Restaurant Information	658-7203
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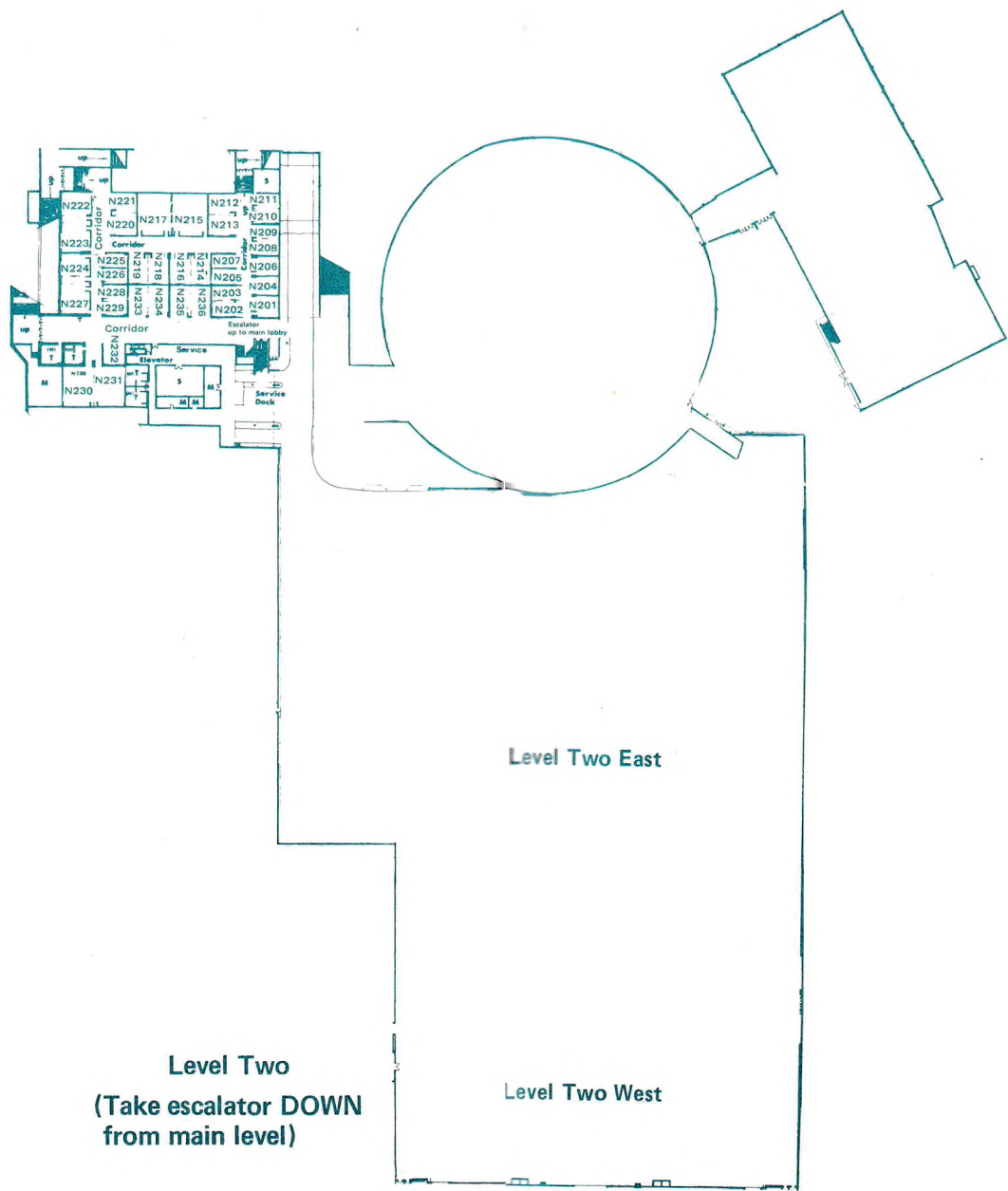
Dallas Information	658-7205
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Emergencies

Ambulance, Fire, Police	744-4444
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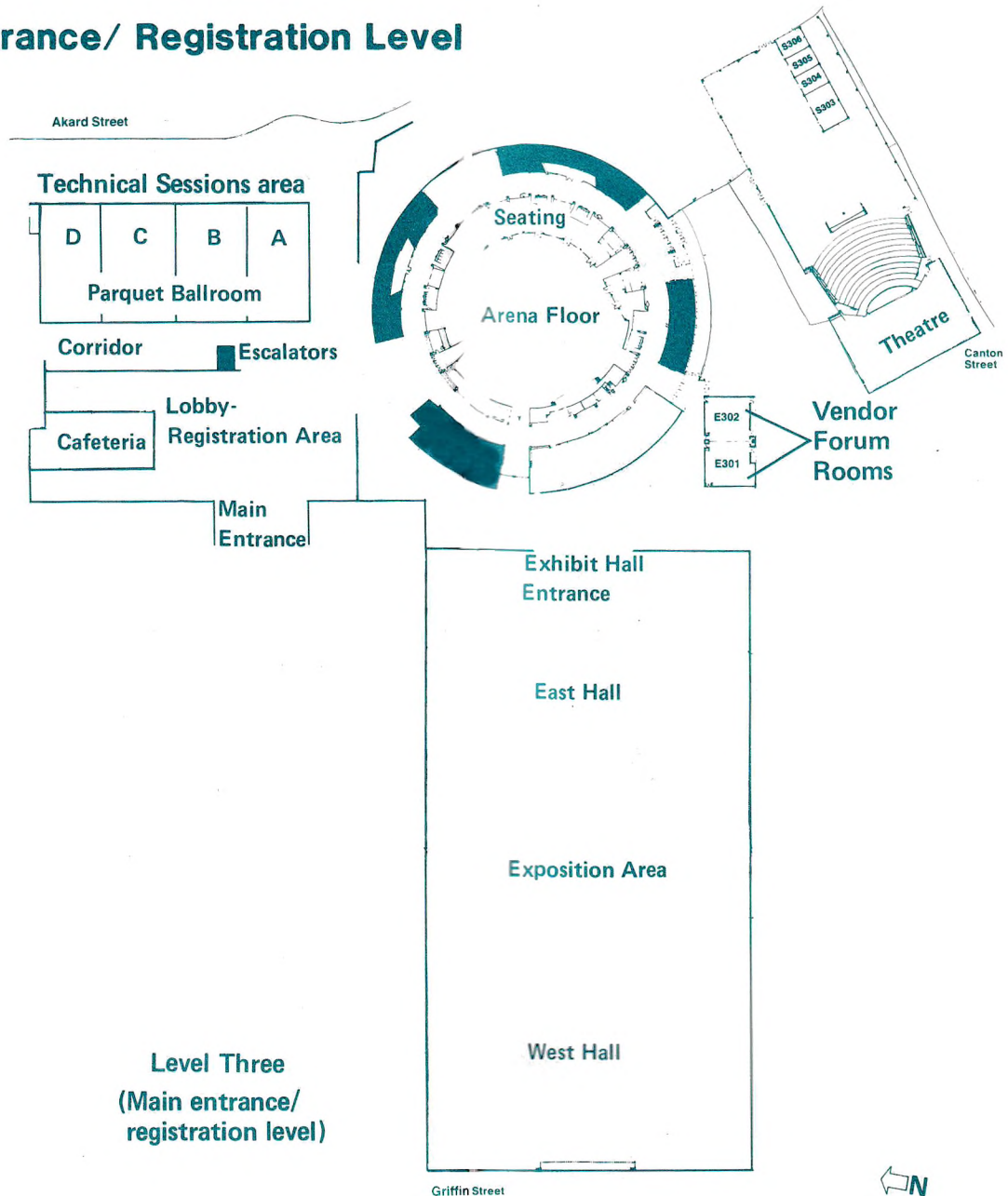
Floor Plan - Level Two

level two

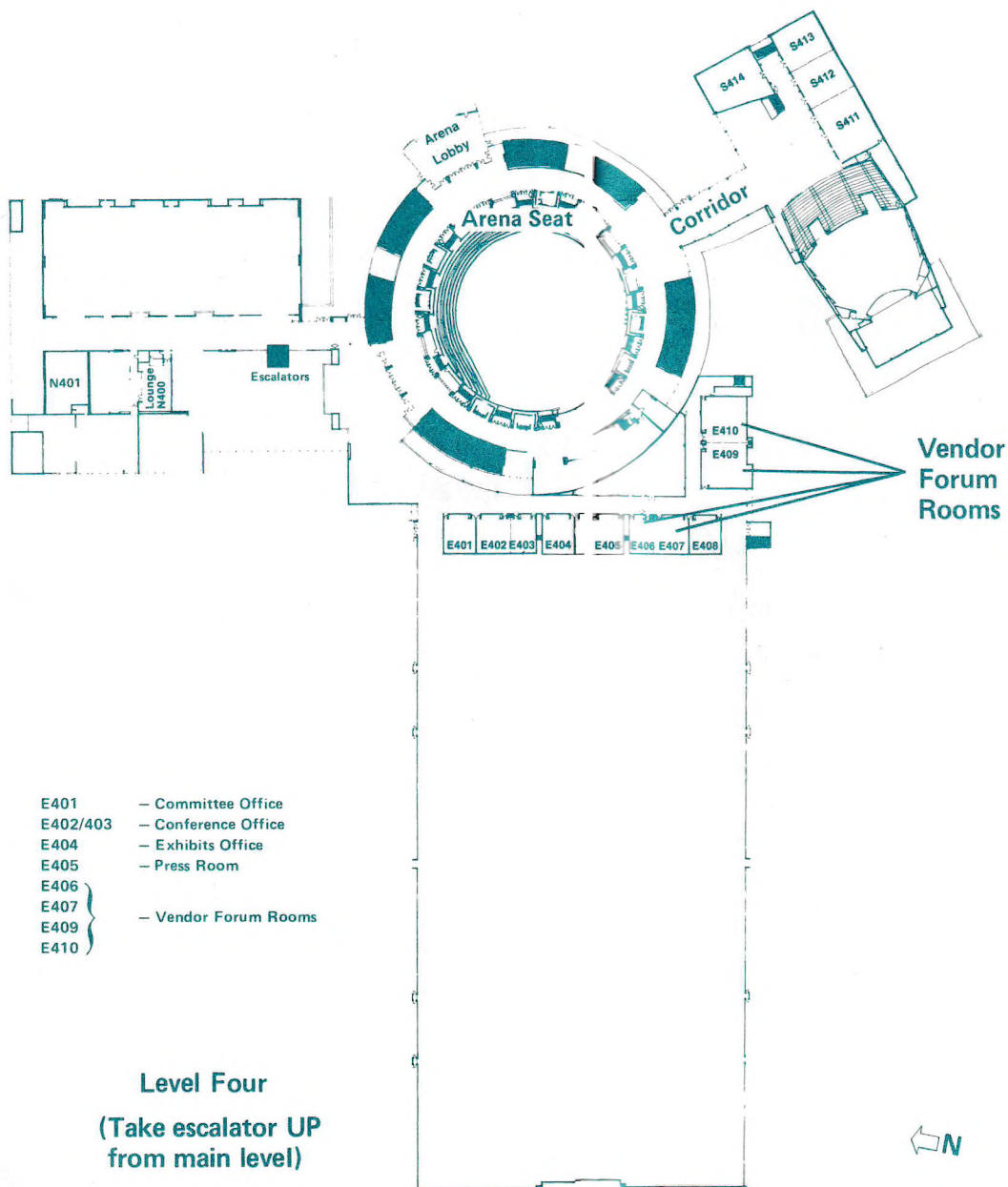


Floor Plan - Level Three

Main Entrance/ Registration Level



Floor Plan - Level Four



'82 Call for Papers

SIGGRAPH '82 will consist of a blend of paper and panel discussions with major emphasis on human-machine communication and applications demonstrating state-of-the-art techniques. Suggested topics include graphics algorithms, graphics systems and hardware, interactive techniques, applications and system management. Courses will precede the conference.

Due dates

300 Word Abstract	November 15, 1981
Complete Draft with Figures	December 15, 1981
Panel Proposals	January 15, 1982
Films, Slides, and Video	January 15, 1982
Author Notification	March 15, 1982
Final Copy	May 5, 1982

Panels

Panel proposals should be developed by a panel moderator and should include brief descriptions of topic issues and suggested panelists. The panelists will not be expected to submit formal papers and only a summary of the panel subjects will appear in the Proceedings.

Please send two (2) copies of panel proposals to:
Carl Machover, SIGGRAPH '82 Technical Program
Co-Chairman, Machover Associates Corporation, 199
Main Street, White Plains, New York 10601. Tele-
phone: 914/949-3777.

Film, Slides, and Video

Film, slide, and video submissions are encouraged. When appropriate, these will be considered for acceptance without an accompanying paper, although every submission must be accompanied by a one-page abstract describing the submission. Accepted submissions will be presented at the Conference and will be distributed as the SIGGRAPH Video Review. Film may be submitted in any format. Video must be NTSC (American Standard). Send one (1) copy of submissions to R. Daniel Bergeron at the address below.

'82 call for papers

Papers

Papers accepted will be published in the Conference Proceedings as an issue of *Computer Graphics*. Selected papers will be submitted for publication in the *ACM Transactions on Graphics*. Authors wishing their papers to be considered for *Transactions on Graphics* must so state on the paper when it is submitted. All submissions should conform to CACM publications standards in form. The suggested maximum length is eight to ten pages in final form.

Please send paper abstracts and six copies of papers to: R. Daniel Bergeron, SIGGRAPH '82 Technical Program Co-Chairman, Department of Computer Science, University of New Hampshire, Durham, New Hampshire 03824. Telephone: 603/862-2321.

SIGGRAPH '82

July 26-30, 1982

John B. Hynes Veterans Auditorium /
Sheraton-Boston Hotel
Boston, Massachusetts

**Sponsored by The Association for
Computing Machinery -- Special Interest
Group on Computer Graphics (SIGGRAPH)**