

*The tape, Image Tool for Macintosh is in the
SIGGRAPH '88 file.*

Visualization Techniques in the Physical Sciences

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COURSE # 19

Table of Contents

Robert S. Wolff (Apple Computer, Inc.)

<i>Introduction</i>	1
Appendix:	
1. Visualization Roundtable	2
2. Visualization in the Eye of the Scientist	13
<i>Visualization Techniques for Fluid Dynamic Systems</i>	21
Appendix:	
1. Global Deformation of Solid Primitives: Applications to Astrophysical MHD	31

Kevin J. Hussey (Jet Propulsion Laboratory)

<i>Image Processing as a Tool for Physical Science Data Visualization</i>	60
Appendix:	
1. Image Processing Methods Used to Simulate Flight Over Remotely Sensed Data	77
2. Environmental Data Display	81

Robert B. Haber (NCSA)

<i>Visualization in Engineering Mechanics</i>	89
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Lloyd A. Trelnish (NASA Goddard Space Flight Center)

<i>Discipline Independent Data Visualization</i>	119
Appendix:	
1. A Software Package for the Data-Independent Management of Multi-Dimensional Data	171
2. Graphical Manipulation, Management and Display of Hierarchical Data Structures	181
3. An Interactive, Discipline-Independent Data Visualization System	187

Larry S. Yaeger (Apple Computer, Inc.)

Synergies Between Entertainment and Scientific Visualization

Appendix:

1. Digital Scene Simulation: An Application of Vector and Parallel Processing to Computer Graphics 208
2. Combining Physical and Visual Simulation- Creation of the Planet Jupiter for the Film 2010 216
3. Cinefex: Jupiter Revisited - The Odyssey of 2010 224

Color Plates

Plate 1 234

Figure 1: Imagetool™ Image of MHD Flow (NCSA)

Figure 2: Cubetool Image of Turbulent Fluid (Pixar)

Figure 3: PLOT3D Image of F-16 Flow (NASA Ames)

Figure 4: Deformation of Cometary Magnetic Field (JPL)

Plate 2 235

Figure 1: Topography of the USA (NASA)

Figure 2: October, 1986 Global Ozone (NASA)

Figure 3: Infrared Image of the Celestial Sphere (NASA)

Figure 4: Ocean Depth from Radar Altimetry (NASA)

Introduction

This course is designed primarily for scientists and their programming staffs, although commercial hardware and software vendors interested in this market should find much of the information presented useful. *Visualization Techniques in the Physical Sciences* is an evolution of *Computer Graphics and Animation in the Physical Sciences* chaired by R. S. Wolff in SIGGRAPH '87. Drawing from the experience in SIGGRAPH '87, the comments from the course attendees, inputs from the scientific community, as well as the growth of the scientific visualization field over the past year, *Visualization Techniques* will focus on scientific visualization as a general paradigm for extracting information from science data sets.

Within the constraints of a one day course in an area as broad as this a balance must always be struck between the breadth of the topics covered and the depth to which one can go in any particular subject. In *Visualization Techniques* I believe that we have achieved a reasonable balance of material which should prove of significant benefit to interested members of the scientific community, as well as to commercial vendors seeking to understand this emergent market.

The underlying theme of the entire course is that scientific visualization may be viewed as an end-to-end paradigm for the process of solving scientific problems, whether in a data rich or data poor environment. In that regard, visualization techniques developed for amorphous systems might equally well be applicable to mechanically-based engineering systems, or vice-versa. Similarly, one can apply image processing techniques to extract information from "non-imaging" data sets as well as to traditional "images". Computer graphic tools developed for applications in the entertainment industry can be applied across the board to scientific data in order to more closely couple the eye-brain system into the analysis process. Approaching the problem from this perspective creates a more holistic view of the data from which detailed analysis processes may then be applied.

Each of the speakers in the course will employ a variety of illustrative examples drawn from their own work as well as from the general scientific community. The course notes will contain descriptive material of and references to many of the algorithms used to produce the examples shown in the talks. Hardware and software used to produce the visualizations shown in the course will be briefly described, as appropriate.