The tape, Image Tool for Macintosh is in the SIGGRAPH '89 file.

Visualization Techniques in the Physical Sciences

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COURSE # 19

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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 sicence 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 inany 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 emergin 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 sicnetific 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 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 enmploy a variety of illustrative eamples 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 breifly described, as appropriate.