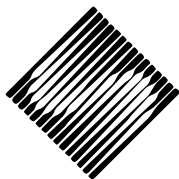# ACM SIGGRAPH VIDEO REVIEW

ISSUE 105

SIGGRAPH 94
Screening Room
Science and Technology Program

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1. Impact of Comet Shoemaker-Levy 9 on Jupiter: The First 40 Minutes

Time: 00:02:02

Producer:
Joel Welling

Summary:
During the week of July 20, 1994, the fragments of Comet Shoemaker-Levy 9 will strike the planet Jupiter. There are over 20 fragments involved, with sizes on the order of 1 km and an impact velocity of about 60 kms/sec. This animation illustrates the impact of a 1 km object with the density of ice on the Jovian atmosphere.

Contributors:
Mordecai-Mark Mac Low,
University of Chicago
Kevin Zahnle, NASA Ames
Research Center

Hardware:
Cray C90

Software:
Hydrocode Zeus-3D; In-house

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Anjana Kar
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2. Real-time Volume Rendering of Downbursts

Time: 00:01:00

Producers:
Bill Hibbard and Brian Paul

Summary:
This video uses real-time volume rendering to explore and explain interacting downbursts.

Contributors:
Bill Hibbard, Brian Paul, John Anderson, Leigh Orf

Hardware:
SGI ONYX RE

Software:
VIS 5D

Contact:
Bill Hibbard
Space Science and
Engineering Center
1225 W. Dayton St.
Madison WI 53706
608.263.4427
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whibbard@macc.wisc.edu

3. Visualization of Stratospheric Ozone and Atmospheric Dynamics

Time: 00:04:45

Producers:
Lloyd A. Treinish

Summary:
The existence of small regions of ozone depletion in the Northern hemisphere during the Spring of 1991 is considered by examining spacecraft observations of total column ozone, visually correlated with small upper atmospheric vortices and cold air masses derived from model computations.

Hardware:
IBM Power Visualization System

Software:
IBM Visualization Data Explorer

Contact:
Lloyd Treinish
IBM Thomas J. Watson
Research Center
P.O. Box 704
Yorktown Heights NY 10598
914.784.5038
914.784.5130 fax
lloydt@watson.ibm.com

4. Hurricane Gilbert

Time: 00:01:58

Producer:
Bill Hibbard

Summary:
This video uses real-time graphics to explore and explain the development of Hurricane Gilbert.

Contributors:
Brian Paul, Greg Tripoli, Peter Pokrandt, Bill Gray, Tom Wittaker

Hardware:
SGI 340 VGX

Software:
VIS-5D

Contact:
Bill Hibbard
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whibbard@macc.wisc.edu

5. Mount Redoubt Volcano Eruption

Time: 00:10:22

Producer:
Mitchell Roth

Summary:
A system for predicting and visualizing the movement of volcanic ash clouds was used to study a nearly catastrophic encounter of a 747 passenger jetliner with ash clouds produced by eruptions of Mount Redoubt Volcano.

Contributors:
Arctic Region Supercomputing Center / University of Alaska: Rick Guritz, Mark Astley, Greg Johnson
Army Corps of Engineers / Waterways Experiment Station: Steve Jones, Jon Warwick

Hardware:
Cray Y-MP, SGI Onyx

Software:
AVS

Contact:
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roth@acad5.alaska.edu

6. Rain

Time: 00:00:41

Producer:
Hideo Yamashita

Summary:
This is an animation of water droplets running down the glass plate. A discrete model of a glass plate was developed to simulate the streams from the water droplets. An extended method of environment mapping was employed to generate realistic images through a glass plate.

Contributors:
Directed: Kazufumi Kaneda
Programmed: Takushi Kagawa, Yasuhiko Zuyama

Hardware:
SGI

Software:
RainRay

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Hideo Yamashita
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yama@eml.hiroshima-u.ac.jp

7. Plastic Operation

Time: 00:01:45

Producer:
Yuji Furuta

Summary:
Sequential metamorphosis was made by three dimensional modulation of simple shape. The combination of mathematical factors (phase, frequency and amount of amplitude of cosine waves etc.) generates beautiful and incredible patterns in space. It is almost to be said 'a flower in abstract space'.

Hardware:
NEWS 3870,5000

Software:
Original software

Contact:
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Taiyo Kikaku Corp.
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8. MRI Face Mask
Time: 00:01:06

Producers:
S. Meiyappan and Pheng Ann Heng

Summary:
The animation produced using MR images of the head, depicts the peeling of outer layer of the face revealing the internal structures just below the skin and skull. 3D textures were used to render the volume bound by the complex boundary of the mask and also for the warped surface of the mask.

Contributors:
Produced/Directed:
S. Meiyappan, Pheng Ann Heng
Visualization/Animation software: S. Meiyappan
Support: Raghu Raghavan, Tim Poston, Wieslaw Nonwinski
Technical assistance: Geoff Nicholas, Chui Chee Kong

Hardware:
SGI Reality Engine

Software:
In-house

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meiyap@iss.nus.sg

9. Pump Up the Volume
Time: 00:01:04

Producer:
Phil Andrews

Summary:
'Pump Up the Volume' animates a computational model of a hog heart. The heart walls are represented by a fraction of the original data set fibers, imported into SoftImage, thickened and enhanced with spring-like surfaces. The motion results from a response to both fluid forces and tension forces.

Contributors:
Animation: Gregory Foss
Software support: Grace Giras
Researchers: David M. McQueen, Charles S. Peskin

Hardware:
SGI Crimson

Software:
SoftImage

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10. Cell Quakes

Time: 00:03:32

Producer:
Charles J. Lumsden

Summary:
Cell quakes are sudden releases of elastic energy that break the living cell's skeleton, promoting movement and shape change. We explore the cell quakes idea by visualizing the rupture of cell skeleton components under mechanical load. Custom simulation software allows cell quakes to be modeled for the first time.

Contributors:
Co-Investigator: Paul A. Dufort
Animation & design:
Anthony Zielinski
Production & design:
Judy Fitzgerald
Music: David Luginbuhl
Fluorescence micrography:
Catharine Whiteside

Hardware:
SGI VGX, Apple Macintosh IIci

Software:
Custom; Explorer; Photoshop

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11. ECO-R1

Time: 00:01:32

Producer:
David W. Deerfield II

Summary:
ECO R1 Endonuclease - molecular dynamics used to gain insight into the interaction between the protein and the DNA. This involved following the motions of every atom by solving Newton's equations. This animation shows the results of the simulation carried out on PSC's Cray C90, using the program Amber.

Contributors:
Researchers: Yong Duan,
Shankar Kumar, John
Rosenberg, Peter Kollman
Animation: David W. Deerfield II,
Joseph C. Lappa, Gregory Foss,
A. Marcela Madrid

Hardware:
Cray C90, SGI Crimson

Software:
Amber; In-house

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kar@psc.edu

12. Virtual Reality in Computational Neuroscience

Time: 00:09:30

Producer:
Jason Leigh

Summary:
Documents the new exploratory use of VR in computational neuroscience we developed, and the visualization application we have built using it. This system was demonstrated at the Neuroscience 93 conference in Washington D.C.

Contributors:
Jason Leigh,Thomas A. DeFanti, Chris Assad, Brian Rasnow, Alex Protopappas, Erik De Schutter, James M. Bower

Hardware:
SGI Indigo XS24

Software:
Proprietary "V" VR interface library

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spiff@eecs.uic.ed

13. Electro-Magnetic Distributions in an Induction Motor

Time: 00:01:35

Producers:
Hiroshima University, Electric Machinery Laboratory

Summary:
This is an animation of scientific visualization. Electro-Magnetic fields in an Induction Motor are calculated by F.E.M. and are visualized making it easy to understand the physical phenomena in the motor.

Contributors:
Directed: E. Nakamae, H. Yamashita
Music: H. Iriyana
Programmed: K. Kaneda, K. Nakao, H. Kanetani, A. Namera, K. Kamei

Hardware:
SGI, Toshiba Hi-vision CG Recording System

Software:
SoftImage; In-house

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14. NASA/JSC Excerpts

Time: 00:03:30

Producers:
Marco Zambetti

Summary:
Selected pieces from various promotional and educational video tapes produced at NASA's Johnson Space Center.

Contributors:
Marco Zambetti, Gary Rogers, Dexter Herbert, Laura Cole

Hardware:
SGI

Software:
Wavefront Advanced Visualizer, Dynamation

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