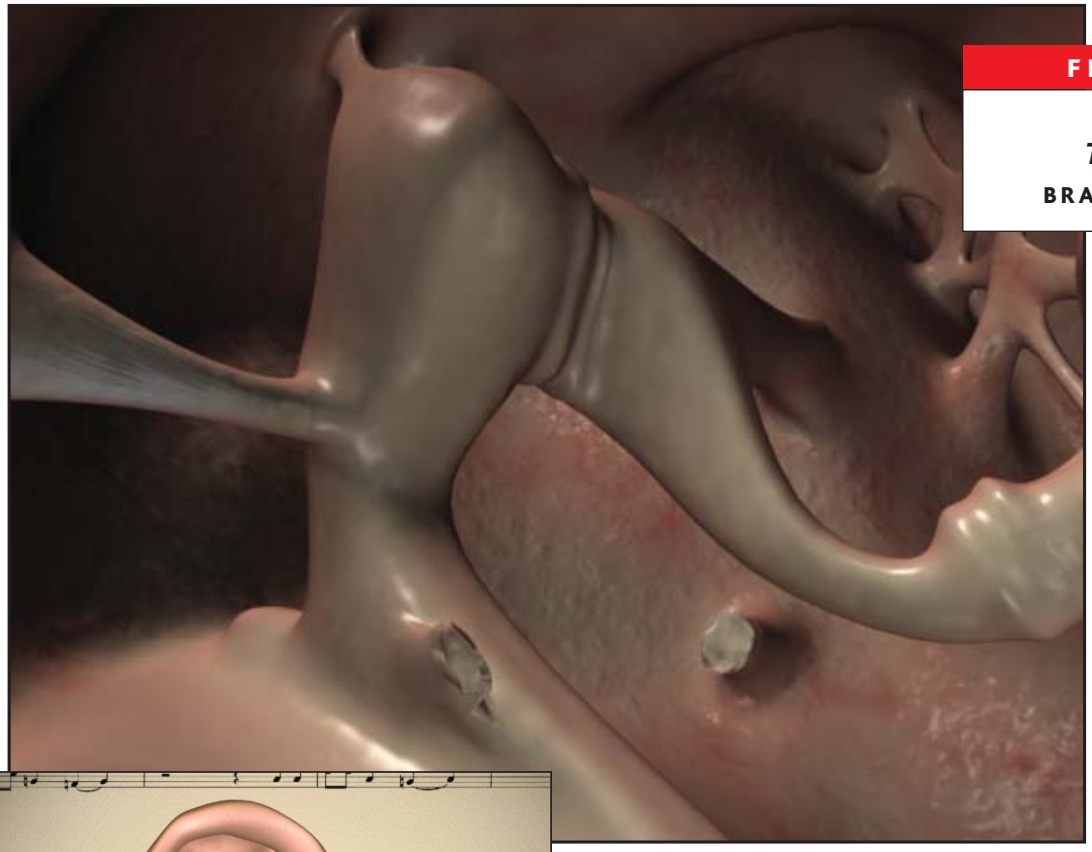
Multimedia



FIRST PLACE

Auditory Transduction

BRANDON PLETSCH

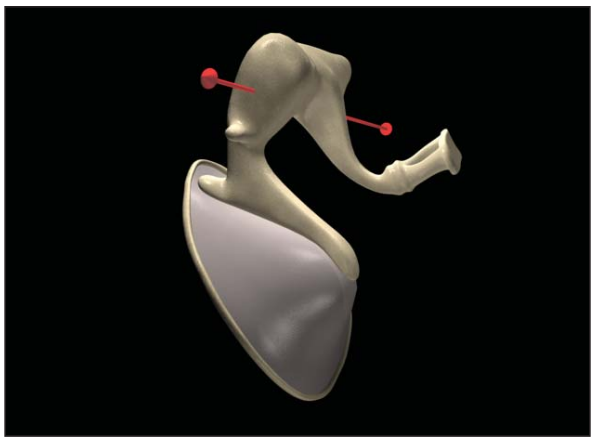
"Auditory Transduction" takes viewers on a step-by-step voyage through the inside of the ear, to the accompaniment of Beethoven's Ninth Symphony. Along the way, snatches of music trigger movements of each ear part.

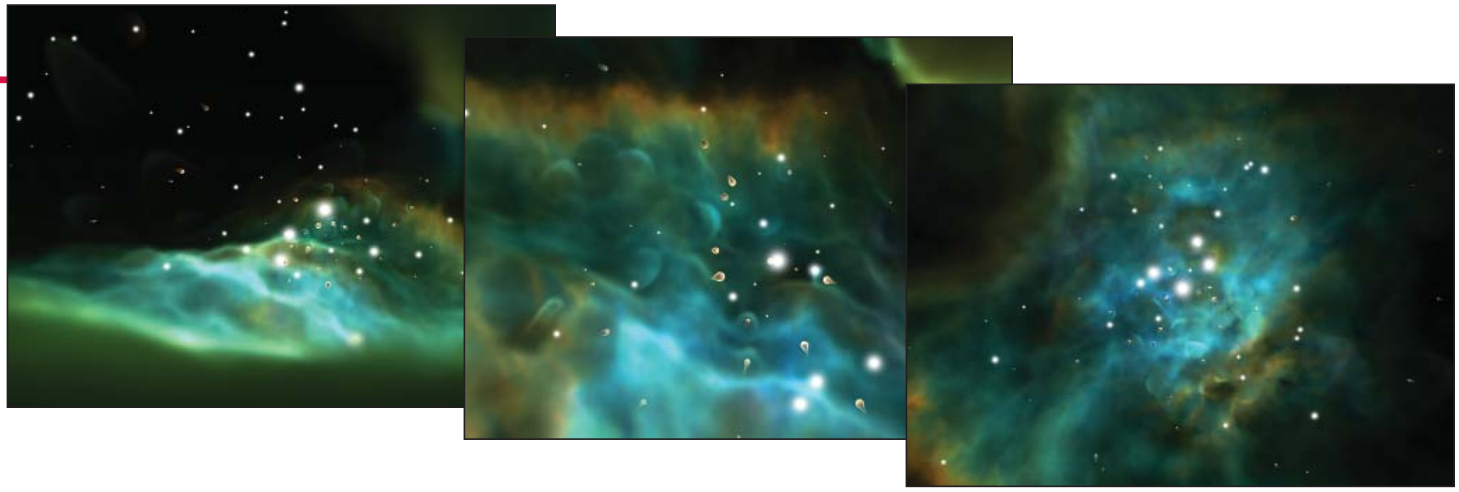
Brandon Pletsch began the animated video when he was a medical illustration student at the Medical College of Georgia in Augusta. He dissected the outer, middle, and inner ear of a human cadaver in his anatomy courses and built a physical model so he could map which frequency ranges hit which parts of the basilar membrane of the snail-shaped coil of the inner ear. Pletsch then created digital renderings of each part of the hearing pathway, using several software packages, including Discreet's 3ds max and Adobe's After Effects, to make the 7-minute video.

A narrator describes how the sound waves travel through each portion of the ear and how hair cells translate the vibrations they induce into nerve impulses.

Pletsch, who now works for iMed Studios, an interactive medical communications company in Ames, Iowa, says he intended the piece for high school audiences studying anatomy and physiology, as well as medical students.

"It took the whole of medical imaging and really brought it to the audience in a very understandable way," says panel of judges member Donna J. Cox. Also, she says, "the narrative in itself was excellent writing."





SECOND PLACE

Orion Nebula in Three Dimensions

DAVID NADEAU
JON GENETTI
CARTER EMMART
ERIK WESSELAK

Until humans can go there, the only way to experience space beyond our solar system is through three-dimensional animation. To visit the Orion Nebula, 1500 light-years away, a team from the San Diego Supercomputer Center (SDSC) and the American Museum of Natural History (AMNH) in New York City created an ethereal flight in and around the stellar nursery.

David Nadeau of SDSC created the volume and structure of the central region of the nebula as it would appear to a viewer actually there. He used Hubble Space Telescope images to generate true colors and fed infrared astronomy data into volume-rendering computer programs to model the light from glowing gases, as well as occlusions from dust and gas clouds. The animation also depicts proto–star systems embedded in the nebula.

The production team from AMNH created the underskeleton of the nebula and chose the flight path. The SDSC team used a supercomputer to compute 30,000 frames in the 3-minute animation, for use in a longer planetarium show. For the television version submitted to the competition, final production work on the narrative and music was completed at SDSC by Jon Meyer.

Panel of judges member Felice Frankel says this animation had "a quiet beauty" not present in other submissions. Even the sounds of the narration and background music were tempered, she says. "I think we can get sidetracked with overwhelming animation, but … something that brings us into ourselves is just as powerful."

THIRD PLACE

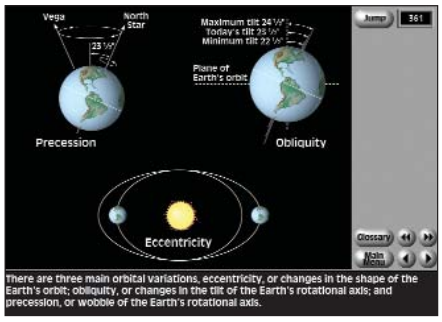
Interactive CD-ROM on Milankovitch Cycles

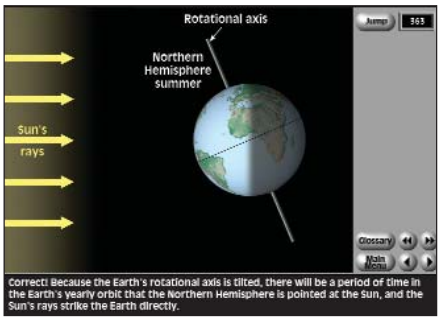
DENNIS TASA
FRANK PAZZAGLIA

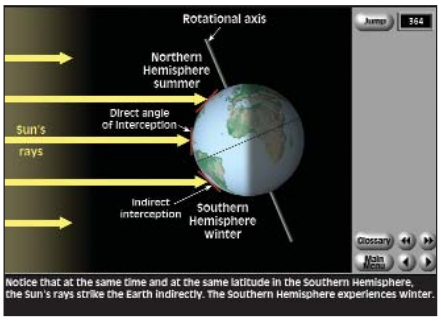
To introduce students to natural climate variability in the history of our planet, Dennis Tasa of Tasa Graphic Arts in Taos, New Mexico, put together the rhythms of the three major portions of Milankovitch cycles in an interactive CD-ROM. "The goal," says Frank Pazzaglia, Tasa's collaborator at Lehigh University in Bethlehem, Pennsylvania, "was to first get the student to appreciate changes in Earth's annual energy balance that they experience every year—the seasons—and then ramp those observations up to millennial time scales." Tasa animated a series of lessons, using Macromedia Director to animate multiple planet Earths that he created with Strata StudioPro 2.5.

The viewer must answer questions about obliquity (tilt), precession (wobble), and eccentricity (the change in Earth's orbit around the sun). For example, a student using the program must choose which of three rotating planets would receive the longest period of sunlight on its north pole. The CD-ROM ends by bringing the three cycles together to show how shifts in the ratio of oxygen isotopes in ice cores, which represent climate change over thousands of years, match Earth's wobbles and wanderings.

Panel of judges member Donna J. Cox called the interactive project "innovative" and "the most creative" using relatively simple multimedia technology. In conjunction with achieving its clear educational goal, the committee felt that the program communicated "very complex ideas very well," she said.





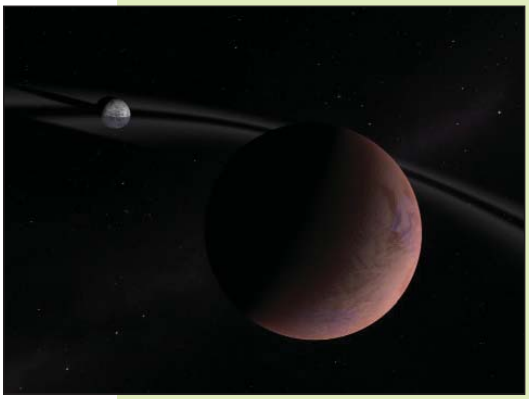


A Class Of Its Own

The Hayden Planetarium, housed in the Rose Center at the American Museum of Natural History (AMNH) in New York City, takes museumgoers into the depths of space, to the big bang and back. A cross-country consortium of supercomputer centers, scientists, artists, and others has created an array of animations and three-dimensional modeling to pull audiences along on these fantastic journeys. AMNH submitted one several-minute segment from its most recent time-and-space travelogue, exploring life in the universe.

Narrated by actor Harrison Ford, the "Creation of Earth" segment shows, for example, likely scenarios of how dust and gas coalesced into the Milky Way galaxy, how our solar system and sun formed, and finally how our planet might have come together from tiny planetesimals (with whirring and falling sand noises in the background).

Because this piece was produced with vastly more resources than the other entries, the judges decided it was in a class by itself. This year, they awarded it the multimedia category's honorable mention. Next year, it may give rise to a new category altogether.

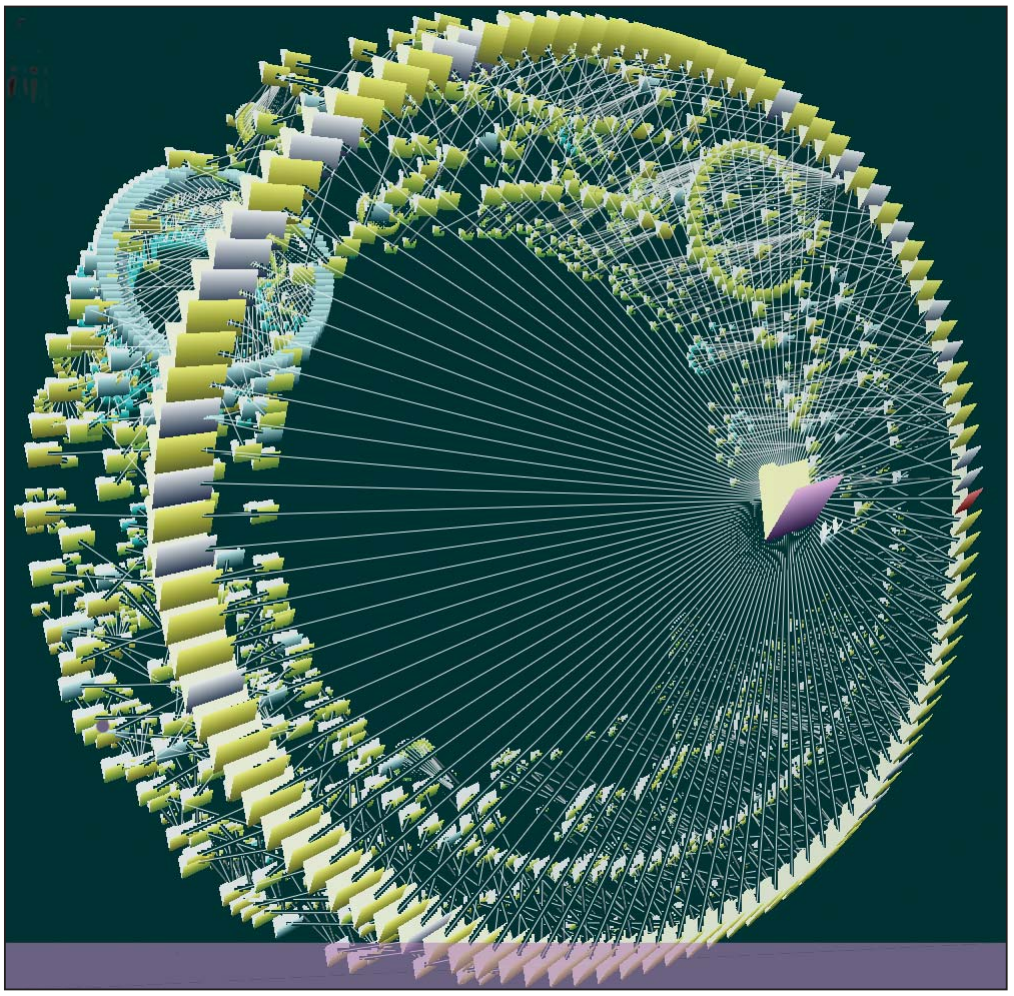


HONORABLE MENTION

Creation of Earth

AMERICAN MUSEUM OF NATURAL HISTORY AND OTHERS

Illustration



FIRST PLACE

Innolab 3D File Manager

ADAM MIEZIANKO

KRISTOPHER RAMBISH

KAREN FUNG

ZAVNURA PINGKAN

This Ferris wheel–like arrangement may be the next elegant solution for managing unwieldy amounts of information.

The three-dimensional interface organizes computer contents by their relationships rather than their physical position on a hard drive. Each spider-web thread marks the ties between folders holding contents related to the open file folder (in the center in purple). Colors show how the other folders are related: The red folder is the parent one, blue folders are subdirectories, and the yellow and gray folders are located elsewhere but relate somehow to the central folder.

The program displays relationships that would not be clear in a normal two-dimensional file tree, says Adam Miezianko, who created it with three fellow seniors at Boston University in Massachusetts. Miezianko says the system, built with OpenGL on a Linux platform, could be applied to any sort of hierarchical database, from corporate organizational charts to genetic or ecosystems data. The software could find, for example, all far-flung files containing data on mammals that live in tree canopies. The user can rotate, zoom into, pan across, and spin the three-dimensional file tree to see all possible links with varying criteria.

The screen snapshot the team submitted from the program is "visually striking," says panel of judges member Boyce Rensberger. "It's a good example of a way of organizing somewhat abstract information into categories, things that are normally not visual … showing degrees of relationship."