

Scientific data transformed into stunning 3-dimensional images will be displayed in "Science in Depth," an exhibition at The Computer Museum beginning March 1, 1991. The digitized, full-color photographic works, called phscolograms, show subjects that cannot be seen by the human eye, ranging from thunderstorms to viruses.

The pieces were created by (Art)ⁿ, a group of artists and scientists at the Illinois Institute of Technology, who have done ground-breaking work in the integration of art, science and mathematics. They coined the term phscologram (pronounced skol-o-gram) because their work combines elements of photography, holography, sculpture, and computer graphics.

Captured in a lightbox, the phscologram's kinetic three-dimensional imagery takes on a life of its own. The reason is that most phscolograms interleave a series of 13 images onto one photograph mounted behind a laminated line screen in the lightbox. The line screen filters the images so that each eye sees only one image at a time from any one angle. Since our eyes are at different angles from the phscologram, each eye sees a different image which the brain then condenses into one three-dimensional image. As we move, the picture changes, creating a feeling of depth and motion.

"The results are not only visually compelling, but have serious applications in mathematics, medicine, chemistry and physics," says Museum Executive Director Dr. Oliver Strimpel. (Art)ⁿ has collaborated with scientists from corporations, universities and government institutions nationwide.

One phscologram that (Art)ⁿ created in conjunction with NASA shows a computer rendered view of the planet Mars using surface data of Mount Olympus and the Valley of the Mariner. Other phscolograms offer three-dimensional X-ray views of viruses from data gained by microscopic analysis.

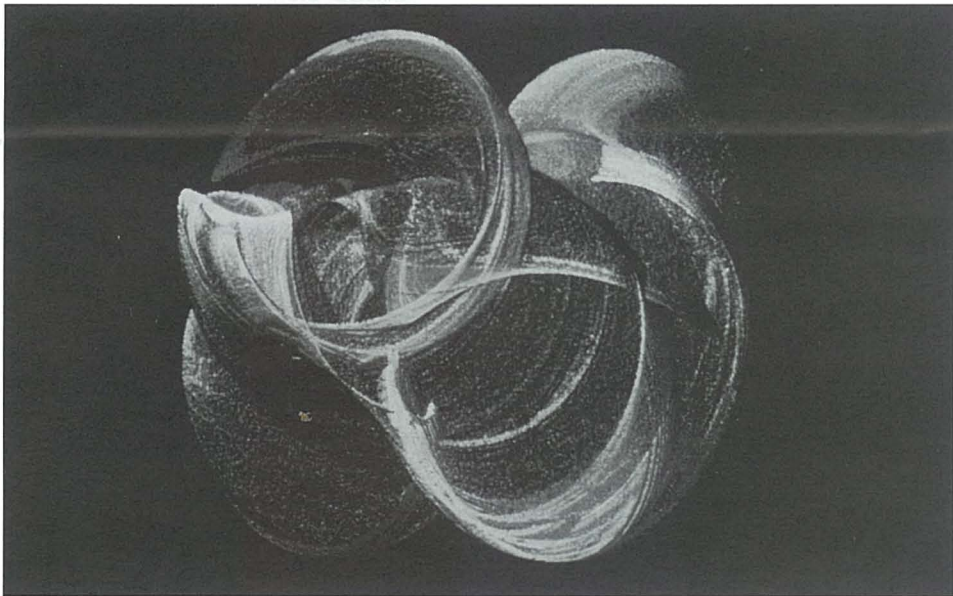
Originally, sculptor Ellen Sandor, director and founder of (Art)ⁿ, and her colleagues photographed their phscolograms with a huge camera and a complex system of multiple exposures. But in 1988 they developed the computer generated "stealth negative" phscologram, an image produced from a negative that exists only in digitized form so that both photographic and computer generated imagery are produced via computer.

The images are conceptualized at the (Art)ⁿ Laboratory and then compiled at the University of Illinois's Electronic Visualization Laboratory (EVL), in Chicago, where the computer graphics for the first *Star Wars* were



Stacked Julia Set, ©1989. (Art)ⁿ Artists: Dan Sandin, Stephan Meyers, Ellen Sandor. A progression of two-dimensional fractal forms is stacked on top of one another to form a three-dimensional fractal form. This view shows the entire form, looking "down" (original in color).

Science in Depth From Mars to Molecules



Strange Attractor, ©1989. (Art)ⁿ Artists: Stephan Meyers, Dan Sandin, Ellen Sandor. This image is a volume visualization of a strange attractor with a trigonometrically based recursive formula (original in color).

created. (Art)ⁿ's network of artists includes mathematician Stephan Meyers and EVL co-founders Tom DeFanti and Dan Sandin, among others.

(Art)ⁿ is now trying to figure out a way to mass-produce phscolograms and 3-D imaging that could be used in hospitals. Sandor has predicted that within a decade people will be able to create their own phscolograms on desktop computers.