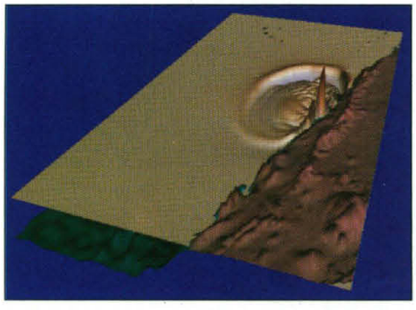
NETWATCH
edited by Jocelyn Kaiser

COOL IMAGES

Making Waves

A wall of water slams into the northern coast of Papua New Guinea in this spooky computer simulation of the 17 July tsunami that killed more than 2100 people.* The preliminary image by Eric Geist of the U.S. Geological Survey is displayed on a Web site that also features movies of the wave, which reached up to 15 meters in height and was spawned by a magnitude 7.1 earthquake offshore. Outside links lead to other groups' animations, a history of tsunamis in the region, and photos taken by an international team dispatched to survey the damage.



E. GEIST/USGS

Geophysicists are now scrambling to refine their models of the Papua New Guinea tsunami, although doing so may require a ship cruise to get higher resolution data of the ocean floor. The hope is to be able to anticipate the next tidal wave and map out evacuation plans, says Geist. "If we can get this right, we can use it in a predictive sense"—whether the wave is headed for a South Pacific island or the coast of Oregon.

* walrus.wr.usgs.gov/docs/tsunami/PNGhome.html

SITE REVIEW

For the Love of Space

They weren't even born when the first person set foot on the moon's dusty surface in 1969, but a group of high school, college, and graduate students is committed to promoting space travel to Mars and beyond. And with a Web site that garners about half a million hits daily and includes pages on the search for extraterrestrial life, NASA's shuttle launch schedules, and a history of artificial satellites from the 1960s to the present, they're passing their vision on to others.

Students for the Exploration and Development of Space (SEDS), a nearly 20-year-old organization with chapters worldwide, maintains a site hosted by its University of Arizona chapter. There, amateur and professional astronomers as well as those curious to sample the field will find thousands of pages, each packed with stunning images and text. A highlight is "Nine Planets," a section that gives a scientific précis on each of the planets, as well as their mythology. The numerous links cover everything from CNN's technology updates to NASA's international space station home page.

seds.lpl.arizona.edu

"It's a serious group effort," says University of Arizona chapter president Aaron Schultz, explaining that SEDS members from all over the world contribute. And these space devotees are prepared to help converts: The site provides info on modestly priced planetarium software.

HOT PICKS

Pick your poison. Want to know where carbon tetrachloride winds up in the environment, or what kind of mutations benzene can cause? Try the new free Web version of the National Library of Medicine's TOXNET system. Its 19 toxicology databases covering thousands of chemicals include literature references and the Hazardous Substances Data Bank. toxnet.nlm.nih.gov

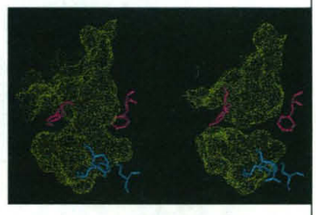
Almost R2-D2. See the Smithsonian's Material World exhibit through the eyes of Minerva, an "intelligent" robot that learns about its environment. The virtual tour takes place on 27 August from 6 to 8 p.m. EDT. www.si.edu/lemelson/minerva.htm

NET NEWS

Watching an Enzyme Find Its Groove

If you think Michael Jordan has quick moves, consider the enzyme that helps his nerves fire—it regularly slam-dunks key signaling molecules in quintillionths of a second. Yet the enzyme, called acetylcholinesterase (AChE), appears ill-suited for its task. Now a play-by-play computer model suggests that AChE's secret is incredibly rapid wiggling.

AChE breaks down the neurotransmitter acetylcholine (ACh) so that signals between neurons will be distinct. That's a seemingly tough task, because ACh must enter a cleft in the enzyme that's blocked by a mobile ring of molecules more than 97% of the time. University of California, San Diego (UCSD), biochemist Andrew McCammon wondered how the enzyme could be so efficient despite the odds against ACh ever binding to it.



S. WLODEK/U. OF HOUSTON

Fast moves. AChE with cleft closed (left) and open.

To find out, a UCSD, University of Houston, and Drexel University team used supercomputers to model subtle shape changes in AChE that last about a billionth of a second. They simulated the motion of about 130,000 individual atoms in the enzyme and the water molecules that surround it. The results showed that the entrance to the cleft opens and shuts so frequently that any ACh molecules loitering nearby have ample chances to diffuse in. They also found that molecules just a smidgen larger can't easily enter the cleft—a mechanism for keeping the binding site clear. (To see a movie, go to chemcca10.ucsd.edu/java_movie2/GorgeF.html)

The work, described in the 4 August *Proceedings of the National Academy of Sciences*, is an excellent combination of theory and computer simulations, says Attila Szabo, a theorist at the National Institutes of Health.

SCIENCE ONLINE

Most scientists will claim they're not in it for the money, but the fact remains that how much one earns—and how much one's colleagues earn—is an American obsession. Now's your chance to discover why postdocs in computer science are so cheerful and why psychology Ph.D.s are not. Check out the Next Wave's 1998 salary survey data and compare your discipline with 13 others. www.nextwave.org

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