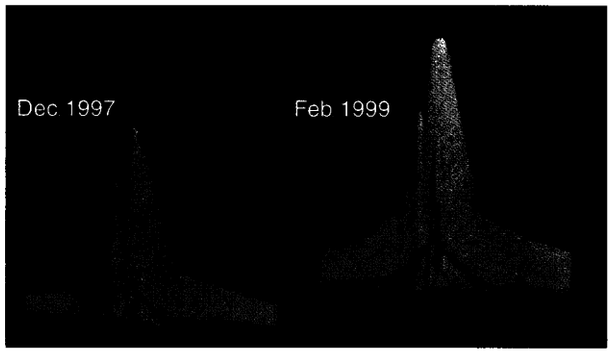
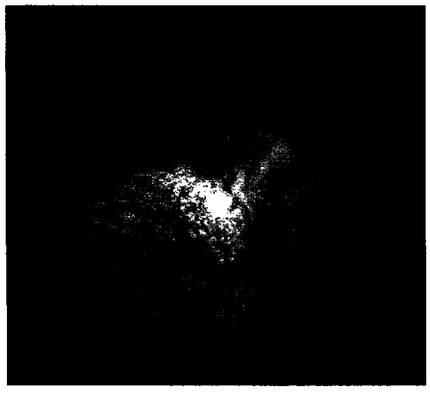
ertheless, organizers do have a bird in hand: $150,000 this year (and perhaps future years) from the Smoky Mountains Natural History Association, as well as some matching funds. How many birds are in the bush is anyone's guess. Organizers plan to submit proposals to the National Science Foundation and other agencies and nonprofit foundations starting later this year, after they can make a more persuasive case based on data from this summer's fieldwork. "I'd say there's a huge number of taxonomists out there" who are interested, Pickering says. "We've got to convince them we've got the organization and the money." **–JOCELYN KAISER**

ASTRONOMY

An Oversized Star Acts Up

CHICAGO—Is it a distress signal or just a boisterous how-do-you-do? A star called Eta Carinae is flashing a mysterious message, and theorists are struggling to make sense of it. Visible to the naked eye in the southern sky, Eta Carinae is one of the biggest stars known to astronomers; shrouded in gas and dust, it is perhaps 100 times the mass of the sun, and so bright that if it gets any brighter it should blow itself apart. But observations announced at a meeting of the American Astronomical Society here last week show that over the last 2 years, it has indeed brightened —by a factor of more than two—while remaining intact. And whereas such a star would be expected to expand and cool when it brightens, Eta Carinae has heated up.





Bright spot. Plots of brightness *(top)* show the change in the central star, which is shrouded in a nebula *(above)*.

"Here's a very massive star doing some weird stuff," says Craig Wheeler, an astrophysicist at the University of Texas, Austin. So erratic is the behavior that some astronomers are speculating that, rather than being on the verge of blowing up because of its own brilliance, the mammoth star may be about to collapse, triggering an even bigger explosion called a supernova.

Astronomers at the University of Minnesota and the NASA Goddard Space Flight Center in Greenbelt, Maryland, picked up the brightening in four measurements made by the orbiting Hubble Space Telescope's Imaging Spectrograph (STIS) between December of 1997 and February of 1999. The star, which Kris Davidson of Minnesota says "reminds us a little of a geyser," has acted up before. A tremendous eruption in the 1840s belched up several solar masses of material that formed a dumbbell-shaped cloud around the star, which astronomers call the Homunculus. That event, during which the entire structure was about 10 times as bright as it is now, was followed by a smaller burp in the 1890s and a gradual brightening in this century, probably because the central star is shining through more and more clearly as the Homunculus expands and its veil of gas and dust thins.

But this time around the star itself has brightened. When the brightening turned up in the STIS spectra, "we started questioning, 'Is this real or is it an instrumental effect?' " says Goddard collaborator Theodore Gull. The team was reassured when they checked lower resolution images by other telescopes and discovered that ground-based astronomers had missed a smaller, but rapid, overall brightening, says Roberta Humphreys of the University of Minnesota.

The brightening remains mysterious, however, because the star is thought to be very close to its "Eddington limit," where light exerts so much outward pressure that gravity is just barely able to hold the star together. So any further brightening should produce an outrush of material. But an expanding burst of gas—although still too small to be seen directly—would cool like gas rushing out of a spray can. The cooling would strengthen the star's infrared signal and turn down the ultraviolet. But the full STIS spectra showed just the opposite pattern.

"One explanation is that the star got hotter" without changing size, says Humphreys —although theorists don't know how a star could do that. Whatever the cause, astronomers are wondering what comes next. Perhaps Eta Carinae is about to pop off as it did in the 1840s, or perhaps it is about to collapse and blow up as a supernova. Stars of that mass are also the conjectured progenitors of hypernovae—even larger explosions that might produce the cosmic blasts called gamma ray bursts. "It really is a Rosetta stone of some kind," says Wheeler. "We just don't know of what." **–JAMES GLANZ**

SCIENCE AND SOCIETY

Germany Waves a Flag for Science

German scientists aren't known for blowing their own horns. Compared to their U.S. colleagues, they tend to be a bit shy about publicizing and explaining their research. Now, in response to an apparent deterioration in the German public's regard for science, resulting from conflicts on issues such as genetic engineering, animal rights, and nuclear power, Germany's science establishment is getting behind a major new effort to improve the public's understanding of—and, in theory, its appreciation for—scientific research. The initiative, called "Public Understanding of the Sciences and Humanities" (PUSH), is being financed by an initial $280,000 grant from the Association for the Promotion of German Science, an industry-funded organization based in Essen that is spearheading the program and offering grants for scientists.

This month, the leaders of Germany's major scientific organizations—including the Max Planck Society, the DFG granting agency, the University Rectors' Conference, the Helmholtz Association of National Research Centers, the Fraunhofer Society applied-research organization, and the Science Council—signed a memorandum supporting the PUSH initiative and took part in a forum in Bonn to publicize the concept. Detlev Ganten, chair of the Helmholtz association and head of Berlin's Max Delbrück Center for Molecular Medicine, says today's German scientists should follow the examples of Albert Einstein, Alexander von Humboldt, and other renowned researchers who helped explain science to the masses. At best, he says, only about 6% of the public now understands what physicists and chemists do. The PUSH program should try to "deepen the understanding of how much science affects all areas of society—and will have even more impact in the future," he says.

The German science organizations have

CREDITS: T. GULL, K. DAVIDSON, R. HUMPHREYS

pledged to devote more resources to efforts by their scientists to improve dialogue with the public and news media and also to take such efforts into account when they evaluate those researchers. In addition, the memo says "an incentive system is to be developed that will be suitable to offer the prospect of rewards to those scientists who are actively engaged in fostering dialogue with the public." The Science Promotion association has already posted a grant application form on its Web site (www.stifterverband.de) for grants ranging from $11,500 to $35,000 for scientists' programs that would help explain research to students, teachers, churches, local groups, and the news media. The grant recipients will be chosen by a jury, led by Joachim Treusch, chair of the Jülich national research center, and including prominent German science journalists.

The German initiative parallels similar efforts in the United Kingdom and the United States, which Germans believe have helped connect science and society. In addition to the PUSH grants, Treusch is leading an effort to organize a major science festival in Berlin in 2001 which he says might take some pointers from the annual meetings of the American Association for the Advancement of Science (the publisher of *Science*) and its British counterpart on focusing attention on science. Says Treusch: "We have the obligation to give German science a major step forward into the new century with this PUSH."

–ROBERT KOENIG

DEFENSE SCIENCE

Outlook Improves for Research Funding

Funding for defense-related research has languished since the Cold War, even as some civilian research budgets have spurted ahead. Now Congress is moving to slow the trend, proposing to erase cuts in military science that were requested by the Clinton Administration. But some administrators and lobbyists worry that the gains may not hold in an especially uncertain budget year.

In February, the White House submitted a 2000 budget request that shrank the Department of Defense's (DOD's) $4.3 billion basic and applied research accounts by 5%. Although the Clinton budget would raise overall defense spending by a hefty $12.6 billion, it held the Pentagon's basic research account steady at $1.1 billion and trimmed the applied account by more than $230 million, to $2.9 billion. If approved by Congress, the cuts would have pushed DOD research spending to its lowest level in 35 years when adjusted for inflation.

CREDIT: (TOP) HOUSE COMMITTEE ON VETERANS AFFAIRS

That prospect greatly worries university administrators. DOD is the third-largest source of academic research funds (after the National Institutes of Health and the National Science Foundation), with more than 350 U.S. schools getting defense dollars. Some disciplines are especially dependent on military support: The Pentagon provides 70% of federal funding for electrical engineering, 60% for computer sciences, and about one-third for math and oceanography, for example.

In an April response to the threat, 19 university groups, scientific societies, and business groups formed a Coalition for National Security Research. The lobbying effort—coordinated by Liz Baldwin of the Optical Society of America and Peter Leone of the American Association of Engineering Societies, both in Washington, D.C.—bore fruit late last month, as the full Senate and the House Armed Services Committee separately recommended defense spending levels that are friendlier to research. Lawmakers suggested spending $7 million to $15 million more on basic research than the White House request, and they nearly reversed the cut in applied science with a proposed budget of $3.1 billion. A Senate appropriations subcommittee—which actually approves spending—did even better, voting an even smaller cut in applied research and a $35 million boost for basic science.

Congressional staffers say that lawmakers eager to fund specific initiatives, such as one to develop an antimissile laser and another to combat bioterrorism, fueled the increases. But the concerns raised by university presidents and the coalition also played a role. "We felt their pain," says one House staffer. Indeed, both Armed Services committees scolded DOD for its paltry request, with the House panel saying "it does not believe DOD has a coherent R&D funding strategy."

Although the numbers are preliminary, some coalition members say they are a good omen. "It was heartening to see that the members were concerned enough to up the numbers," says Leone. But he and others admit they are far from the coalition's goal of a 2% overall R&D boost this year. That reality "is disappointing," says Greg Schutz of the American Chemical Society in Washington, D.C., who worries that any cut in applied science budgets could threaten some physical chemistry labs.

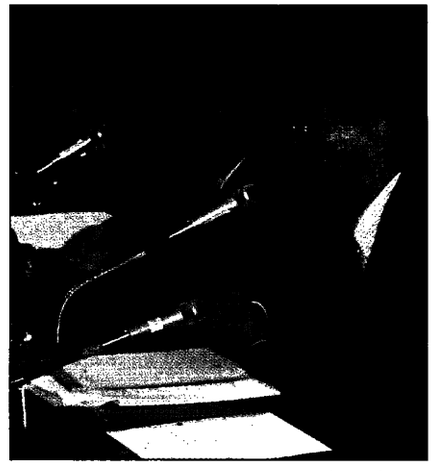
Schutz and others also fret that success could be ephemeral, pointing to the rising costs of the Kosovo conflict and mounting pressure to beef up other portions of the defense budget. "The tide has been going in and out on the budget process all year," he says.

–DAVID MALAKOFF

CLINICAL RESEARCH

NIH Ethics Office Tapped for a Promotion

A government watchdog that monitors the treatment of patients and animals in federally funded research may be about to develop a more powerful bite. A panel recommended last week that the unit, called the Office for Protection from Research Risks (OPRR), be moved up the federal hierarchy. It currently resides in the office of National Institutes of Health (NIH) director Harold Varmus, and the panel urged that it be shifted to the Department of Health and Human Services (HHS). Varmus agreed that this would be appropriate to avoid an apparent conflict between NIH's dual roles as funder and regulator of clinical studies.



On the move? OPRR chief Ellis (right) and staffer Tom Puglisi speak at a House hearing.

The proposal to give OPRR higher status was discussed on 3 June at a meeting of Varmus's scientific advisory committee and was approved so quickly that some observers felt this was exactly what Varmus wanted. "It looked like a done deal," says one non-NIH expert on bioethics who has followed the process closely. He thinks NIH may have decided to make a change after media and congressional attention focused on recent lapses in the treatment of human subjects. Last year, for example, witnesses at a congressional hearing blasted OPRR—which is supposed to keep tabs on research funded by 17 federal agencies—and others for lax enforcement of rules designed to protect volunteer research subjects (*Science*, 19 June