tronomy information service will also be moved to Greenwich.

PPARC has been trying hard to minimize the number of job losses among RGO's staff of 110 and says that all senior researchers have been found alternative university positions. "We expect very few to be unemployed by the end of the year," says PPARC administrator Jim Sadlier. A few staff members will move to a telescope construction company set up by researchers from John Moores University in Liverpool, called Telescope Technologies Limited; five are expected to transfer to the new ATC; and another six will set up temporary home at Cambridge University's Cavendish Laboratory to complete ongoing projects.

RGO

Coming home. The RGO name will return to the original Greenwich observatory.

Despite PPARC's efforts, staff at the RGO are still bitter about the closure. "A close-knit, high-tech family has been blown apart, and we feel it very personally," says RGO director Jasper Wall. And many astronomers are still concerned about the effects of dispersing the RGO team. "Crucial technical expertise for future projects is being lost," says astronomer Phil Charles at the University of Oxford. "In the coming years, there are going to be many occasions when we realize we just don't have the support we need." –NIGEL WILLIAMS

ECOLOGY

NSF Eyes Biodiversity Monitoring Network

To most people, an observatory is a place for astronomers to probe the far reaches of the universe. But some life scientists think the concept might also help unlock secrets in their own backyards. In what could turn into the most ambitious effort yet to systematically study Earth's ecosystems, the National Science Foundation (NSF) has begun planning what may become a global system of biodiversity observatories. The idea appears to be on a fast track at NSF as one of several environmental initiatives promoted by new director Rita Colwell (see p. 1944).

The observatories program would build on a spate of NSF-funded activity in recent years to study biodiversity and ecological processes. NSF already funds 21 Long-Term Ecological Research (LTER) sites that monitor ecosystems ranging from Antarctic dry valleys to New England forests (*Science*, 15 October 1993, p. 334). Three years ago it created a National Center for Ecological Analysis and Synthesis in Santa Barbara, California, to support projects that attempt to glean insights from existing data collected across LTER sites and any number of field and marine research stations (*Science*, 17 January 1997, p. 310). More recently, Arctic researchers funded by NSF proposed pooling data from a network of circumpolar studies. And this fall the agency is preparing a competition to support microbial research at a half-dozen or so existing outposts.

The observatories idea is likely to incorporate elements of all those programs—although planners have not yet hammered out any details, including the definition, number, and locations of the observatories. The program's budget is also unknown, although researchers and NSF officials hope that some work can begin within 2 years. Despite such gaps, organizers have at least outlined the project's philosophical underpinnings: to take the broadest possible look at how organisms interact and evolve in a range of ecosystems. "We're trying to get away from the stamp-album approach, in which scientists go to one site and take a snapshot of conditions at that time for a particular organism," explains Doug Siegel-Causey, NSF's program manager for biotic surveys and inventories, who will manage the initiative. "But it's hard to take a picture of a dynamic process."

NSF took the first step in that direction earlier this month when it convened 15 experts. The group endorsed the idea of such observatories, agreeing that it is long overdue, says meeting chair Leonard Kristtalka, director of the University of Kansas Biodiversity Research Center. "Historically, the systematists and the ecologists have gone their separate ways, and biology has been the worse for it," he says. "These two approaches need to be brought together if we hope to understand biodiversity over time."

One idea likely to receive scrutiny is for a center to support any number of sites in what NSF officials describe as a hub-and-spokes arrangement. Whether it's a physical entity or a virtual presence, the center could serve as both online database and administrative support for field researchers. Participants also envision establishing the observatories at some combination of existing

ScienceScope

GORE GETS POLITICAL MILEAGE FROM NSF INTERNET GRANTS

The pivotal New Hampshire presidential primary election may be more than a year away, but Oval Office wanna-be Vice President Al Gore is already grabbing his chances to impress the state's voters. Last week's opportunity came in the form of a National Science Foundation (NSF) announcement that 36 universities had won grants of up to $350,000 each to hook up to the NSF's speedy Internet backbone. The headline on NSF's press release: "Vice President Gore Announces High Performance Award to University of New Hampshire." The names of the other worthy winners are relegated to a list at the end of the release.

Gore

An NSF official claims there is a nonpartisan explanation for the headline: Gore announced the awards during a visit to New Hampshire, after shelving a plan to announce them in California. More politically savvy headlines could be on the way: NSF plans to award at least a dozen more Internet grants before the 2000 elections.

HUGHES HEAD TO STEP DOWN

The largest U.S. private nonprofit biomedical research funder is looking for a new leader. On 22 September, Purnell Choppin, 69, president of the Howard Hughes Medical Institute (HHMI), announced that he will retire at the end of next year. In 2000, "it will be time for someone else to take up the reins," Choppin wrote in a memo that surprised staffers at the institute.

Choppin, a virologist, was recruited from The Rockefeller University to serve as HHMI's science chief in 1985. After becoming president in 1987, he oversaw construction of a new headquarters in Chevy Chase, Maryland, and guided the organization through a decade of extraordinary growth, focused on molecular biology. During his tenure, the number of HHMI scientists has grown from 96 to 330 and the annual budget from $77 million to $556 million. HHMI's endowment is roughly $11 billion.

A conservative manager, Choppin carefully planned his own departure, noting his 15-month advance warning "will allow ample time for the trustees to select a new president." The institute has not yet named a search committee.

Contributors: Elizabeth Pennisi, Richard Stone, David Malakoff, Eliot Marshall

field and marine stations and new sites. A second workshop this fall will prepare recommendations for NSF, says Siegel-Causey.

Meanwhile, a smaller NSF initiative is nearing the starting gate. That's a plan to spend $2.5 million in 1999 to set up microbial observatories at half a dozen existing field stations, with the intention to double or triple that number in 2000. The money would fund research that extends existing studies ranging from identifying new species and sequencing DNA to measuring nitrogen fixation and other biogeochemical processes. "For far too long, microorganisms have been a black box," says Colwell. "But it turns out that they play a fundamental role in everything."

The two initiatives would dovetail nicely, says Siegel-Causey: "I could imagine one station having adjacent plots of land labeled microbial and biodiversity observatories." But he says the biodiversity observatories initiative, once unveiled, could well be a far more ambitious project than the microbial stations: "We're thinking an order of magnitude larger." Not quite astronomical proportions, maybe, but a big step for environmental researchers and taxonomists. **–JEFFREY MERVIS**

CITATION ANALYSIS

Harvard Tops in Scientific Impact

Harvard University wins bragging rights in the latest ranking of U.S. research universities, according to the September/October *ScienceWatch*. It not only churned out more papers than any other university between 1993 and 1997, but the work was rated as having higher scientific impact across the board.

The Philadelphia-based Institute for Scientific Information, which publishes *ScienceWatch*, tracks citations from hundreds of scientific journals. To rank the top 100 federally funded universities in 21 separate fields, *ScienceWatch* worked out the average number of times that papers from researchers at each institution were cited in another paper. These scores were then calculated as a percentage above or below the world average for papers in the same field, to yield an estimate of their "relative impact." In clinical medicine, for example, papers from Johns Hopkins University were cited, on average, 9.19 times—129% above the world average for the field. Chris King, who edits *ScienceWatch*, says the calculation "represents what scientists think is important in their field when they write papers."

Harvard placed in the top 10 in 17 of the 21 categories, *ScienceWatch* reports. It was followed by Stanford University (13 top-10 placings), California Institute of Technology (Caltech) with 11, Yale University (9), the University of Michigan (9), Massachusetts Institute of Technology (MIT) with 8, University of California (UC) Berkeley (7), University of Washington (6), UC Santa Barbara (6), Cornell University (6), and UC San Diego (6).

Although the overall rankings were based on performance in all fields of science, *ScienceWatch* published rankings in only nine biological science fields in the current issue; it plans to publish the rankings in the physical sciences and some social science fields in its next issue. The biology rankings indicate that quality does not always go hand in hand with quantity. In neuroscience, for example, Caltech came out on top for relative impact, publishing 395 papers compared to Harvard's 2419. Washington University in St. Louis ranked first in immunology with only a third as many papers as number two Harvard, and MIT had the highest relative impact in molecular biology and genetics with a fraction of Harvard's publication rate. The same held true for the rankings of biology and biochemistry, which Duke University topped.

–AMY ADAMS

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TOP UNIVERSITIES IN BIOLOGICAL SCIENCES

Institution	# of papers	Relative impact*
Neuroscience		
Caltech	395	135
Stanford University	911	106
Johns Hopkins University	1558	105
Immunology		
Washington University	551	140
Harvard University	1668	107
Stanford University	631	87
Molecular Biology and Genetics		
MIT	823	239
Rockefeller University	547	213
Harvard University	3064	149
Biology and Biochemistry		
Duke University	1446	130
Univ. of Texas Southwestern Medical Center, Dallas	1377	124
Harvard University	4525	123

* Citations per paper as percent above world average for that field.

ORIGIN OF LIFE

A Biomolecule Building Block From Vents

In 1952, University of Chicago chemists Stanley Miller and Harold Urey staged a simple demonstration that transfixed other scientists pondering the origin of life. They showed that a mixture of ammonia, methane, hydrogen, and water yielded amino acids—the building blocks of proteins—when zapped with the lab equivalent of a lightning bolt. The demonstration was hailed as a re-creation of a likely first step toward life. But critics later dubbed the experiment a creation rather than a re-creation, pointing out that whereas inert nitrogen gas (N_2) would have been abundant on the early Earth, the reactive forms needed to make amino acids, such as ammonia (NH_3), would have been scarce. "The formation of ammonia has always been a big problem for origin-of-life scenarios," says Jim Ferris, a chemist at Rensselaer Polytechnic Institute in Troy, New York.

J. EDMOND/WHOI/VISUALS UNLIMITED

Pressure cooker. Minerals formed at deep-sea vents like this one could have catalyzed the formation of ammonia.

Now, a team of researchers at the Carnegie Institution of Washington, D.C., report in this week's issue of *Nature* that they may have found a major source of early ammonia: the hot springs on the deep sea floor. In a series of laboratory tests, the researchers found that minerals deposited there make efficient catalysts for converting nitrogen into ammonia at the high temperatures and pressures of the vents. And because the vents continuously heat up and spew out huge vol-