released into the air as much as 150 million curies of radiation, much of which settled onto nearby land. Authorities created a 30-kilometer "exclusion zone" around the nuclear plant, evicting more than 135,000 people and limiting access mostly to plant workers, cleanup crews, and scientists. As a result, the exclusion zone has become a unique ecological laboratory in the shadows of the still-operating power plant.

But what little money the Ukrainian government spends for research in the exclusion zone goes mostly to study hazards from the nuclear fuel remaining in the burned-out reactor core and the weakening sarcophagus that covers it (*Science*, 19 April 1996, p. 352). "There are not enough experts in radio ecology" in the zone now, says geologist Valentin Radchuk, who heads the Department of Scientific Programs for Ukraine's Cabinet of Ministers. Foreign ecologists can stay only for short stints, and they often must tailor their research to fit whatever analyses can be done on equipment at Chernobyl or nearby Kiev. The new lab will be able to tackle many problems, including contaminated groundwater and wind-borne radioactive dust.

Recognizing a compelling need for the lab, officials from various Ukrainian Ministries and the U.S. Department of Energy last October began hammering out the details. The $1.3 million agreement, signed at the second meeting of the U.S.–Ukraine Joint Commission in Kiev, calls for Ukraine to house the facility and pay its utility bills, and for the United States to

ROBERT BAKER

Hot research field. Ron Chesser (right) and Ukrainian colleagues sample mice in Chernobyl's forbidden zone.

furnish it with top-of-the-line instruments for separating radionuclides and carrying out other analyses. The lab should also help cut through red tape that stymies work in the most dangerous areas in the exclusion zone. "The greatest contribution of the new lab," says Robert Baker of Texas Tech University in Lubbock, who collaborates with Chesser at Chernobyl, is that "we'll be more likely to get permission to work in areas most in need of research." Scientists from the United States and Ukraine will meet in Chernobyl next month to draw up a list of necessary equipment and discuss their research strategy.

In the meantime, Ukrainian officials are searching for a suitable home for the lab. The leading candidate is an unfinished building intended as a hotel-resort in the ghost town of Pripyat, situated across a lake from the nuclear plant. Such a setting would also serve as a constant reminder of the accident. "It's very sobering," says Chesser. "You never get complacent."

–RICHARD STONE

SCIENCE POLICY

Outside Insider Named to Head EPA Research

FLORIDA INSTITUTE OF TECHNOLOGY

Norine Noonan

The White House this week tapped a veteran Washington insider for the top research post at the Environmental Protection Agency (EPA), a job vacant for over a year. The choice of Norine Noonan, a biologist-turned-bureaucrat without previous ties to EPA, is raising eyebrows. But some observers say Noonan's expertise as a scientist who knows the ropes in Washington—she spent a decade on Capitol Hill and at the White House before becoming vice president for research and dean of the graduate school of Florida Institute of Technology in Melbourne—will stand her in good stead in defending the $500 million research budget at EPA, an agency often accused of giving science short shrift. "I think that's what they need in that job," says Howard University toxicologist Bailus Walker.

The previous chief at EPA's Office of Research and Development, marine ecologist Bob Huggett, presided over a sometimes painful overhaul of EPA science launched in 1994 that includes shifting research dollars from agency staff to outside scientists and forcing EPA researchers and risk managers to work more closely together (*Science*, 21 January 1994, p. 312). Huggett left in June 1997 to become research vice president at Michigan State University in East Lansing.

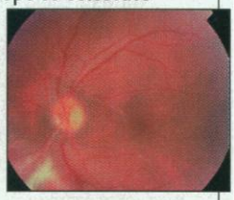
Noonan earned a Ph.D. at Princeton University in biochemistry and cell biology in 1976 but soon moved on to a congressional science fellowship and then to the White House Office of Management and Budget (OMB), where she oversaw budgets for the National Science Foundation and NASA. "She was very professional, very hard-nosed,

ScienceScope

GREEN LIGHT FOR ANTISENSE DRUG

After a decade of fencing with skeptics, drug developers soon hope to celebrate the launch of the first "antisense" DNA drug to hit the market.

ISIS PHARMACEUTICALS



Retina with fungus

Called fomivirsen, the compound deploys a mirror-image copy of viral DNA to block replication of cytomegalovirus. The virus causes retinitis, an eye infection leading to blindness that mainly afflicts AIDS patients. The drug won a thumbs-up last week from a Food and Drug Administration advisory committee, and the way is now clear for FDA approval. Although fomivirsen (or Vitravene) must be injected directly into the eye, its developer, Isis Pharmaceuticals of Carlsbad, California, says it has a big advantage over some antiviral drugs: Targeted locally, it causes only mild side effects such as increased pressure and inflammation.

Even antisense critic Arthur Krieg of the University of Iowa, Iowa City, calls the FDA panel vote "a landmark event." Five years ago, "the conventional wisdom was that antisense was a fraud," he says. "Isis deserves a tremendous amount of credit for bringing sense to the antisense field."

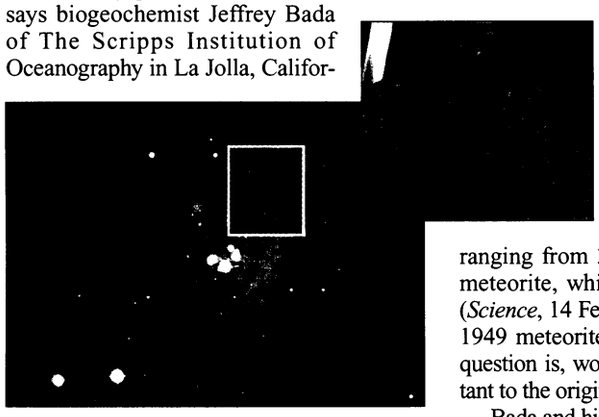
REFORM FOR ITALIAN CONCORSI

Observers are eager to see how Italian universities adapt to new rules for recruiting professors that eliminate a notorious system widely viewed as not only inefficient but rife with cronyism and nepotism.

Under the old "megaconcorsi," thousands of applications for academic posts landed at the Science Ministry in Rome every few years, taking years to process. The system "represented the Kafkaesque culmination of the triumph of bureaucracy," says astronomer Margherita Hack of Rome's Accademia dei Lincei.

Under the measure approved by the Senate on 1 July, each university will run its own concorsi. Critics say the reform is far from ideal: Although university panels must be dominated by outsiders, their selection "remains fully exposed to systematic manipulation by the academic superpower groups," asserts Aldo Massullo, a member of the Senate's Education Commission. Massullo notes that the reform also fails to address an underlying problem: An Italian academic post means tenure for life, with no standards for quality or productivity.

that hit Earth this century and thinks such space-borne amino acids might have set the pattern for ones made later on Earth. Origin-of-life experts have a different spin. "There are so many problems" with the scenario, says biogeochemist Jeffrey Bada of The Scripps Institution of Oceanography in La Jolla, California, who doubts that large quantities of amino acids from space would have survived the journey to Earth or hung around long enough to influence early biology. "I doubt this will settle the issue of how homochirality arose."



DAVID MALIN/ANGLO-AUSTRALIAN OBSERVATORY (INSET) DUANE WILLIAM DIETZ/VISUALS UNLIMITED

Stellar spin. Polarized light from part of the Orion Nebula (box) may form amino acids with a twist, such as those in the Murchison meteorite *(inset)*.

Those who favor an unearthly genesis for homochirality have for years pointed to circular polarization as a possible trigger. Astronomers have seen high levels of such radiation near binary stars and in other exotic settings with strong magnetic fields. Now, Bailey's team has found it in an environment much like the one that spawned our solar system. They studied the Orion Molecular Cloud, a cauldron of star formation, with an infrared camera on the 3.9-meter Anglo-Australian Telescope. They found that up to 17% of the infrared light streaming from Orion was circularly polarized, presumably by scattering off fine dust grains aligned in a magnetic field. "That was a big surprise," says Bailey, who had expected levels of 1% to 2%.

Infrared light, however, does not pack the energy needed to destroy organic molecules. That would take UV light. Although Bailey's colleagues could not see UV light from Orion because of obscuring dust, they calculate that a similar percentage of UV light should also be circularly polarized. If such light from a nearby star cascaded through our early solar system, it could have broken the bonds in enough D amino acids to yield one extra L amino acid for every 10 molecules—enough of an excess for early organisms to seize upon and amplify. Other planetary systems, depending on the direction of polarization, might see an excess of D amino acids.

Even so, Bailey and Hough acknowledge, many events must fall into place to render their scenario plausible. Those steps include making huge amounts of amino acids in space and delivering them to Earth without losing the surplus to "racemization"—the spontaneous transformation of homochiral molecules to an even-handedness that happens quickly at high temperatures and in water. "I consider each of those steps to be possible," says planetary scientist Christopher Chyba of the University of Arizona, Tucson, noting Cronin's recent discovery of L amino acid excesses ranging from 3% to 9% in the Murchison meteorite, which fell in Australia in 1969 (*Science*, 14 February 1997, p. 951), and in a 1949 meteorite from Kentucky. "The open question is, would such an excess be important to the origin of life?"

Bada and his colleague at the University of California, San Diego, chemist Stanley Miller, think not. "Once the amino acids get to Earth, they would racemize in very short order," Miller says. "I've always felt that homochirality arises by chance." **–ROBERT IRION**

Robert Irion is a science writer in Santa Cruz, California.

ORIGIN OF LIFE

A Sulfurous Start for Protein Synthesis?

Although Charles Darwin proposed that life originated in a warm, nourishing broth, new evidence supports a less cozy idea: that the cradle of life was more like a Puritan minister's version of hell—a sulfurous swirl of superheated water and oozing magma. On page 670, chemist Claudia Huber and patent attorney Günter Wächtershäuser report that they have re-created a crucial step in assembling the ingredients of living cells—the linking together of amino acids into short, proteinlike chains called peptides—under just such harsh conditions.

Although other researchers have achieved a similar feat in the lab, they generally did so with the help of additives or conditions not likely on early Earth. The amino acids had to be kept dry, for instance, or be activated by compounds not found in nature. In contrast, Wächtershäuser says, his system "uses nothing more than what is available in volcanic exhalations"—the magma and pressurized gases that suddenly hit cooler ocean water at cracks in Earth's crust. James Ferris of the Rensselaer Polytechnic Institute in Troy, New York, agrees: "These peptides are made under plausible prebiotic conditions. You don't have to throw anything in that is artificial."

Indeed, says evolutionary biologist Norman Pace of the University of California, Berkeley, the peptide formation is "very ex-

ScienceScope

INDIA TELESCOPE CUTS PHONE DEAL

An 11th-hour agreement was expected to be signed this week to prevent a global mobile phone system from interfering with India's new $17 million Giant Metrewave Radio Telescope (GMRT), an array of 40 huge antennas near Pune. Iridium India Telecom, a Motorola subsidiary, is planning on 23 September to start up a system that will send satellite transmissions to a gateway only 80 km from the telescope (*Science*, 28 November 1997, p. 1569). Now, astronomer Govind Swarup, the "father" of GMRT, says, "we have arrived at an agreement with Iridium"—details yet to come—to avoid interference from emissions in the 1610-MHz band, a frequency important for probing star-forming regions.

SELLING ONCE-SECRET, ONCE-SOVIET SCIENCE

Russia's beleaguered nuclear scientists are about to get help from a new program to get them into commercially productive research. Announced 24 July in Moscow by Vice President Al Gore and Russia Prime Minister Sergei Kiriyenko, the Nuclear Cities Initiative (NCI) aims to boost U.S. private-sector investment in the once–top-secret cities.

Times are tough in these towns. Last week, scientists in Sarov, 400 km east of Moscow, struck for a day to protest months of unpaid wages. And some researchers, it is believed, have resorted to aiding Iran's missile program. To get scientists more positively engaged, the U.S. Department of Energy (DOE) has sunk

ВНИИ

Logo of nuclear facility in Sarov

$30 million this year into applied research in science cities. But the problem is so great, says Janet Hauber, NCI manager at DOE, that "we don't think that model will respond quickly enough." Under the NCI, U.S. investment will be sought for projects at three nuclear cities—Sarov, Snezhinsk, and Zheleznogorsk. There's no new government money for the initiative, says Hauber, but hopes are that there will be enough private sector enthusiasm to expand it to seven more cities.

Contributors: Eliot Marshall, Susan Biggin, Pallava Bagla, Richard Stone.