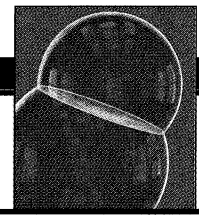
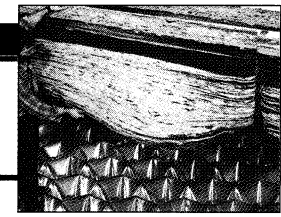




won't work for all." Adds Pui-Yan Kwok of Washington University in St. Louis: "It is not a surefire approach by any means."

Despite the uncertainties, official enthusiasm for SNPs seems undiminished. NIH and the SNP Consortium are about to embark on a 3-month project to sequence massive amounts of DNA to help finish the genome project. That effort should turn up a half-million or more SNPs, says Collins. The Japanese government, too, is embarking on an effort to find 200,000 SNPs. Within a year or two, there should be enough SNPs around to figure out whether they will live up to their advance billing. **–LESLIE ROBERTS**

SCIENTIFIC COMMUNITY

Oxford Wins a Crown Synchrotron Jewel

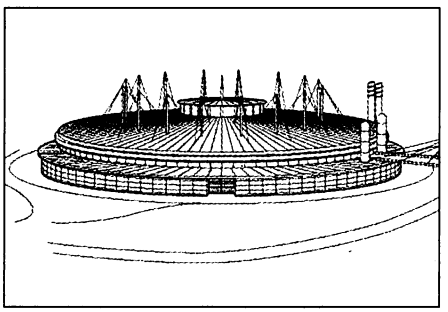
In this tale of two cities, one rejoices while the other pines for what might have been. On 13 March U.K. science minister David Sainsbury announced that DIAMOND, an $880 million synchrotron project that will allow scientists to probe the atomic structure of everything from proteins to ceramics, will be set at the Rutherford Appleton Laboratory (RAL) near Oxford. Losing out was the heir apparent—the Daresbury laboratory near Manchester, the site of the U.K.'s current synchrotron facility. Many scientists are denouncing the selection. "This is a crazy decision," says University of Liverpool physicist Peter Weightman, a longtime synchrotron user. "It's a triumph of finance over scientific arguments."

Soon after the British government proposed DIAMOND in 1993, financing problems put the project on hold. Five years later, a pair of strange bedfellows came to the rescue. The Wellcome Trust, Britain's largest medical charity, offered to put $184 million toward DIAMOND, and the French government pledged $56 million up front and up to $13 million a year in operating costs (*Science*, 6 August 1999, p. 819).

Then the political circus began. Wellcome officials lauded the benefits of DIAMOND at RAL, citing the ease of collaborations with an existing neutron source and a huge research community in the "golden triangle" formed by Oxford, Cambridge, and London. Secretary of State Stephen Byers talked up Daresbury, while his own advisers were touting RAL. Whatever tipped the scales toward RAL, the U.K. government isn't telling. "The decision was arrived at behind closed doors rather than through open discussions," contends crystallographer Paul Barnes of Birkbeck College in London. A spokesperson for the U.K.'s Department for Trade and Industry suggests that the preferences of Wellcome and the French were key. "If there hadn't been anyone else involved, [Daresbury] would have been an option," he says.

To soften the blow, Sainsbury also announced a boost for science in England's Northwest, including Manchester, pledging $80 million in new science spending in the region. But the consolation prize may not halt Daresbury's decline. The government has promised to keep Daresbury's synchrotron running until 2 years after DIAMOND comes online, at least another 7 years from now. "I imagine the whole thing will shut down in the long run because the synchrotron really defines Daresbury," says physicist Bob Cernik, Daresbury's trade union representative. Four of Daresbury's 270-strong synchrotron staff have left in the last few months, and Cernik fears the brain drain will accelerate.

–MICHAEL HAGMANN



A synchrotron built for one. Schematic of DIAMOND, a future landmark on Oxford's skyline.

ASTRONOMY

Distorted Galaxies Point to Dark Matter

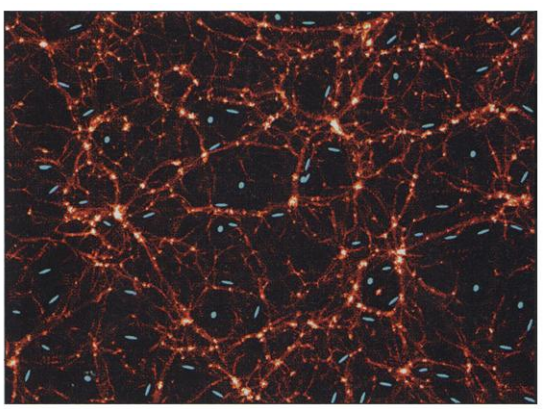
Never have so many astronomers been so eager to claim they can't see straight. Groups working with three different telescopes have detected weak lensing, a distortion of distant galaxies that reveals dark matter strewn across deep space. The results provide a first direct glimpse of the vast tangle of massive, invisible stuff that astronomers and astrophysicists believe makes up most of the mass of the universe.

Almost as interesting as the results themselves is how the researchers chose to make them public: Within days, all three groups rushed their findings into print—or, rather, into preprint—on Astro-Ph, an unrefereed Web server maintained by Los Alamos National Laboratory in New Mexico. Two did so with some misgivings, to avoid being scooped.

Such posting frenzies are becoming common, says Tony Tyson, an astrophysicist with Lucent Technologies' Bell Labs in Murray Hill, New Jersey, and leader of one of the teams. "Various groups have their results in various stages, and then somebody jumps in [with a preprint], and then everybody jumps in." A team working with the Canada-France-Hawaii Telescope (CFHT) in Hawaii made the first splash, followed by a group working with the William Herschel Telescope in the Canary Islands. Tyson's group, working at the Cerro Tololo Inter-American Observatory's Blanco Telescope in Chile, was the third to post its results.

Pricking the three groups' heels was the knowledge that weak lensing may prove the best tool for studying the colossal dark matter infrastructure of the universe. Researchers hope to use the technique to measure the distribution of the ripples and undulations in the intergalactic tangle of dark matter—information that would tell cosmologists precisely how the universe grew up after its birth in the big bang.

To glimpse dark matter, the three teams studied light from galaxies billions of light-years away. Such galaxies appear as faint luminous ellipses in the sky; gravity from intervening dark matter deflects their light, slightly squashing the ellipses in any small patch of sky so that, like schooling fish, neighboring ellipses tend to point in the



Stellar lineup. Dark matter bends light, making distant galaxies appear to be aligned.

CREDITS: (TOP TO BOTTOM) CLRC-DARESBURY LABORATORY; S. COLOMBI/INSTITUT D'ASTROPHYSIQUE DE PARIS

same direction. But to see the gravitational effect, the astronomers first had to filter out similar but much larger distortions caused by optical imperfections and the atmosphere. For that, they turned to stars within our own Milky Way galaxy that lie close to the line of sight of the distant galaxies. At such close range, weak lensing could not affect the stars' images; any distortions had to be due to optical and atmospheric effects. By calculating how to turn the blurred images of the stars back into points and then adjusting the shapes of the distant galaxies in the same way, the researchers could isolate the distortion due to dark matter—a distortion so slight that each group surveyed tens of thousands of galaxies to see it.

The three groups spent years analyzing their data. They picked up the pace as soon as the competition for recognition was on. On 27 February, the CFHT team posted a preprint detailing its results on Astro-Ph. Within 5 days, the Herschel and Blanco groups followed suit. On 7 March, the CFHT group issued a press release claiming to have seen weak lensing first.

The three preprints are just a drop in a still-gathering tsunami of unofficial publications in astronomy, astrophysics, and other physical sciences. In 1995 researchers posted 1663 papers on Astro-Ph; in 1999 they posted 5639. Last month alone, 531 papers appeared on the site.

"[Astro-Ph] has taken over [from the journals] as far as I'm concerned," says Nick Kaiser, an astronomer at the University of Hawaii, Manoa. "Every morning the first thing I do is read the Astro-Ph e-mail I get." The server will soon put traditional journals out of business, Kaiser predicts, and formal peer review will give way to some sort of electronic dialogue. That wouldn't surprise Princeton astrophysicist David Spergel. "For me personally, publication doesn't matter," he says. "I've pretty much stopped reading the journals."

The leaders of the three weak-lensing teams don't go that far. Tyson thinks it's presumptuous to post a paper before it's been accepted for journal publication. In fact, he says, his group's paper was in review with a journal when the CFHT preprint forced his hand. Richard Ellis, an astronomer at the California Institute of Technology in Pasadena and leader of the Herschel telescope team, tells a similar story and says he is leery of what can happen when fear of being wrong loses out to fear of being late. "There's a terrible danger that the standards go down," he says, "that it becomes just a race."

Yannick Mellier, an astronomer at the Institut d'Astrophysique de Paris and leader of the CFHT group, is more sanguine. Researchers should post as soon as they are confident of their results, he says; fear of humiliation will prevent them from posting weak or incomplete work. "If you do a bad job in this aspect, submitting a bad or nasty paper, you are almost immediately criticized by your colleagues." But even he would regret the passing of the traditional journal, he says, "because [journal publication] means a paper has been completely refereed; it has been officially accepted."

Whether or not traditional publications survive, weak lensing seems sure to thrive. Each of the three groups has already collected more data with which to sharpen and expand its results. Moreover, the Sloan Digital Sky Survey, a nine-institution collaboration working with a telescope at the Apache Point Observatory in New Mexico, intends to survey a full quarter of the celestial sphere and capture images of roughly 80 million galaxies by 2005. Within a decade, astronomers and astrophysicists may be telling long, detailed stories about the universe's childhood. And you're likely to read them on a server like Astro-Ph first. **–ADRIAN CHO**

SCIENTIFIC MISCONDUCT

Cancer Researcher Sacked for Alleged Fraud

It seemed too good to be true: Where others had only disappointing results, Werner Bezwoda found that breast cancer patients, blitzed with drugs and then given a bone marrow transplant, lived longer than patients on standard chemotherapy. Now investigators say the promising findings were indeed too good to be true. On 10 March, officials at the University of the Witwatersrand in Johannesburg, South Africa, brought to a close a 6-week probe triggered by a report from a U.S. expert team, which concluded that Bezwoda misrepresented his findings and had failed to obtain approval for the trial before proceeding. The university fired him.

Bitter pill. Bezwoda says he will appeal firing.

Besides dashing hopes of a new last-ditch weapon against breast cancer, the ignoble episode may tarnish the public image of clinical research, some experts fear. "The message [Bezwoda's] behavior sends out is 'Medical researchers should not be trusted,'" says Peter Cleaton-Jones, chair of Witwatersrand's Committee for Research on Human Subjects. Others agree. "It may become increasingly difficult to recruit patients" for clinical trials, says oncologist Robert Rifkin of U.S. Oncology, a national

ScienceScope

Ag Grants in Limbo A new $120 million pot for peer-reviewed agricultural research is facing extinction just 2 months after it was unveiled by U.S. Department of Agriculture (USDA) Secretary Dan Glickman (*Science*, 21 January, p. 402). Last week, the House Appropriations Committee added language to a supplemental budget bill for disasters and other items that would kill the Initiative for Future Agriculture and Food Systems by barring USDA from paying employees to run it. The move—prompted by a disagreement over the program's funding mechanism—came just 3 days after the agency published a request for proposals for applied studies in areas from crop genomics to food safety.

The House must still vote on the bill, and ag research supporters are hoping for a save in the Senate, where budgeteers will likely begin action next week. In the meantime, program staff are "proceeding as normal," says USDA's Cindy Huebner. Given the uncertainty, however, the agency has cancelled four workshops later this month that were meant to help scientists shape proposals for an 8 May deadline.

DNA Delay Interior Department scientists have won some extra time to try to extract DNA from the 9300-year-old bones of Kennewick Man, ancient remains found along Washington state's Columbia River in 1996. Judge John Jelderks of the U.S. District Court in Oregon had given the government until 24 March to respond to scientists suing for access to the remains. But last week he agreed to allow 6 more months—until 24 September—for DNA tests. Some scientists hope the long-delayed tests will help resolve Kennewick's cultural affiliation, but Native American groups that claim the remains have fought them (*Science*, 11 February, p. 963).

Jelderks noted that the government offered "no compelling reasons" for being so sluggish, but decided that hasty testing might create worse delays in the long run. Now the government must develop a work plan by 10 April and file monthly progress reports thereafter.

Contributors: Jocelyn Kaiser, Constance Holden

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