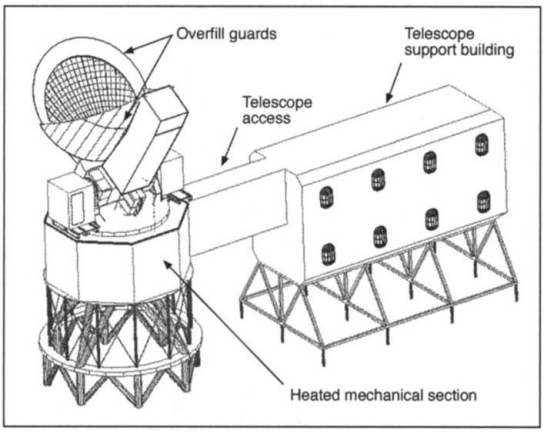
Sunyaev-Zel'dovich (SZ) effect, named after Russian physicists Rashid Sunyaev and Yakov Zel'dovich. The SZ effect is a distortion in the energies of photons left over from the early ages of the universe and occurs when those photons bump into hot electrons in galaxy clusters. Submillimeter-wavelength telescopes can detect the telltale distortion of the SZ effect, helping cosmologists find galaxy clusters too distant or dim to be spotted by other means. Those observations, in turn, can help cosmologists figure out how the clusters evolved—and possibly identify the location of dark matter in the universe.



Polar explorer. Planned telescope, shown with lab building, will start scanning Antarctic skies about 2006.

The new 8-meter telescope will focus light from the sky on an array of sensitive heat-sensors called bolometers, allowing the telescope to map large areas of the sky at one time. "It will do several square degrees per day and hundreds of square degrees per year, depending on the weather," says Stark. "You will be able to see all significant clusters of galaxies in that area."

"We're really delighted" that the telescope has been approved, says John Carlstrom, an astronomer at the University of Chicago and principal investigator of the project. So are other cosmologists. "In 5 years, we'll have a much better understanding about the physics of the evolution of clusters," says August Evrard, a cosmologist at the University of Michigan, Ann Arbor, who explains that galaxy clusters, along with supernova data and cosmic microwave background (CMB) measurements, form a "triad" of crucial observations for cosmology. "We're really just opening the door on this kind of investigation."

Astronomers chose the pole because its altitude and extraordinarily cold, dry air preserve the very faint signal of the SZ effect that otherwise would be swamped by heat from the ground and atmosphere and scrambled by turbulence. "Being in the central Antarctic plateau is almost like being in the stratosphere," says Stark. "Antarctic astronomy has been a tremendous success." The new telescope will join about a dozen other NSF-funded astrophysical instruments installed at the pole in the past decade and operated by a consortium of universities.

Carlstrom expects that it will take about 4 years to build the telescope and get it into working order and another year before the first scientific data become available. In addition to resolving any technical problems in design and fabrication, scientists must also conquer the forbidding logistics of moving 60 tons of equipment to the pole. However, the SZ survey marks just the beginning of the telescope's life.

"This really is not a proposal to build a telescope," says Dennis Peacock, head of Antarctic research for NSF's Office of Polar Programs. "They're proposing to do a certain set of measurements of great importance, and they need the telescope to do those measurements." After the SZ survey is complete, he says, the telescope can take on new scientific challenges.

One likely target is the search for polarization in the CMB, one of the hottest areas in cosmology. Cosmologists suspect that the CMB is polarized—that incoming photons have preferred "orientations"—but scientists so far have not been able to see that polarization. The new telescope can easily be modified to search for a particularly faint polarization in the CMB, caused by gravitational waves that resulted from the rapid inflation of the early universe.

With funding assured, astronomers can now tackle another important item of business: finding a snazzy name for the instrument. "We have to get clever now," says Carlstrom. "We're open to suggestions."

–CHARLES SEIFE

CREDITS: (TOP TO BOTTOM) J. CARLSTROM/UNIVERSITY OF CHICAGO; NASA/JHU-APL/CORNELL UNIVERSITY

CELL BIOLOGY

Alliance Launched to Model *E. coli*

All cell biologists have at least "two cells of interest," wrote biologist Frederick Neidhardt of the University of Michigan, Ann Arbor, in 1996: "the one they are studying and *Escherichia coli*." The lowly intestinal bacterium has been an indispensable tool for half a century. Now it is the object of a mammoth international modeling effort that is expected to occupy hundreds of scientists for 10 years at a cost of at least $100 million.

Scientists around the world are busy computerizing models of parts of interesting cells, such as yeast and the *Haemophilus influenzae* bacterium. But as yet there is no comprehensive computer model of an entire

ScienceScope

Sensitive Meeting The White House is seeking science and university group views on new guidelines that could restrict access to "sensitive" government information. Bush Administration officials met last week with about a dozen research advocates to discuss the new rules, which could be out in draft form within a few months. "It was a listening session: a chance for [research advocates] to voice concerns," says Shana Dale, chief of staff at the White House Office of Science and Technology Policy (OSTP).

Several science lobbyists who attended say that Administration officials did not detail their thinking but did reassure the group that university-based basic research was not the target of the emerging policies, which aim to keep "sensitive homeland security information" generated by government scientists and contractors out of hostile hands. How the rules would affect more applied studies was less certain, they said.

"There are no clear answers yet," says Dale, who notes that the White House Office of Management and Budget hopes to release a proposal for public comment by the end of the year.

Contour 2? As hopes of recovering the comet-bound Contour spacecraft fade, NASA officials have named an admiral-studded panel to look into the disaster—and begun considering a second try at the nearly $100 million mission.

Mission director Robert Farquhar of Johns Hopkins University's Applied Physics Laboratory in Laurel, Maryland, says "we are not very optimistic" about the spacecraft, which apparently blew apart on 15 August when it began a rocket burn designed to lift it out of Earth's orbit (*Science*, 23 August, p. 1253). Telescopes have picked up evidence that it exploded into at least three pieces.

The investigation panel, which will be led by NASA chief engineer Theron Bradley and will include two retired admirals, is expected to report this fall. Engineers, meanwhile, are looking at building a replacement that would not require a solid rocket motor burn in orbit but might require a larger—and more expensive—launch vehicle. The Contour program does not have enough spare parts for a second spacecraft, so a new mission would be costly, although agency officials say it is too early to estimate a price.

day's more invasive methods. Clinical developments are still a long way off, however, cautions Nancy Brackett, a neuroscientist who works with men with spinal cord injuries at the University of Miami School of Medicine in Florida.

All the same, the study is certain to stimulate more research from scientists curious about sex. One intriguing line of investigation: What do LSt cells do in females? "It's a great question," Coolen says. "That's a study we're planning to do." –GREG MILLER

HUMAN SUBJECTS

Ethicists Fault Review Of Children's Study

The ethics panels that assess proposed experiments on human subjects by U.S. researchers traditionally operate behind closed doors. A recently dusted-off federal rule governing certain children's studies is opening that process to the light of public review, however, and some bioethicists don't like what they see.

The specific rule involves studies in which healthy children would be exposed to greater than minimal risks. Under a 19-year-old standard, a university's Institutional Review Board (IRB) must pass such a research hot potato to the Department of Health and Human Services (HHS), which then seeks advice from an expert panel. Last year HHS's expert panel, acting on the first of what appears to be a new wave of such proposals, opted to allow a group of healthy Japanese-American and Caucasian children to be exposed to above-minimal-risk procedures, such as the use of a catheter for glucose tests. The children would be studied because Asian Americans are believed to be at elevated risk for developing type II diabetes around puberty.

On 7 August the responsible HHS agency, the Office for Human Research Protections (OHRP), put out a request for public comments on its proposal to proceed, but some bioethicists believe that the agency isn't giving the public enough time or information. "The way this has been handled is atrocious," says Robert Nelson, who oversees ethics reviews at The Children's Hospital of Philadelphia.

HHS had previously been sent only two studies under the rule, 45 CFR 46.407. But the cancellation of a National Institutes of Health study on obesity in children nearly 2 years ago (*Science*, 17 November 2000, p. 1281) led OHRP to clarify the rule, and seven such studies are now in the pipeline, according to OHRP spokesperson Pat El-Hinnawy. A 1998 law requiring companies to test drugs on children might be a contributing factor, along with added caution by IRBs.

Shining more light on the IRB process is good, says medical ethicist Loretta Kopelman of East Carolina University in Greenville, North Carolina, especially given recent shutdowns of trials at several institutions (including the University of Washington, which proposed the diabetes study). Kopelman says that openly discussing the study could help explore questions such as what risks to children are acceptable, and when the overall benefits to society from research on healthy children outweigh the risks to individuals. Such issues are not aired often, because IRB reviews normally remain confidential.

Kopelman and others are sharply critical of how OHRP is seeking comments, however. The notice says the expert panel's summary report is available upon request but doesn't offer anything else—such as individual panelists' reports or the protocol. Of 10 comments received by OHRP, three viewed by *Science* called for more time and more sharing of information. "What gives moral credibility to [rule] 407 is the public nature of the discussion," and "a 2-week comment period falls far short," says Nelson, who was a member of the panel that reviewed the University of Washington study.

No pain, no gain. Government panel weighs value of performing procedures such as imaging on healthy children.

The protocol is available under the Freedom of Information Act, but some have suggested that OHRP should post it on the Web. IRBs consider protocols confidential, notes Mary Faith Marshall of the University of Kansas Medical Center in Kansas City, because they usually haven't received federal funding, and they contain information that could be used by a competitor.

The OHRP spokesperson declined to say how the agency plans to proceed once it has finished reviewing the comments. The rule sets no time period for a final decision.

–JOCELYN KAISER

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ScienceScope

Stem Cell Slowdown Australian scientists will have to wait a little longer for national legislation endorsing research on human embryonic stem (ES) cells. Researchers had hoped that federal legislators would finalize a long-debated law (*Science*, 12 April, p. 238) by the end of August, but the Senate last week ordered another committee review, delaying action until at least December.

The delay won't disrupt existing research, scientists say. But "we really do need the endorsement of the legislation to get on with our work," says cell biologist Martin Pera of the Monash Institute of Reproduction and Development in Melbourne and chief science officer of the new Centre for Stem Cells and Tissue Repair. The bill would ban human cloning but allow researchers to use and derive certain human ES cell lines.

Researchers are cautiously optimistic that the bill will pass this year. But if it fails, at least three of the nation's six state governments—which have the power to regulate health research—have vowed to enact similar laws.

It's in the Mail U.S. efforts to implement a major new bioterrorism law have hit a glitch—infuriating some university officials who are scrambling to meet a looming deadline. Under the law, universities and thousands of other facilities must notify the Centers for Disease Control and Prevention (CDC) in Atlanta by 10 September if they possess any of about 40 potential bioterror agents. But when a CDC contractor mailed out 190,000 special notification forms earlier this month, it somehow missed the nation's 3000 or so colleges and universities—one of the major targets of the law.

"Given more time, we certainly could have had a more accurate list," the contractor, Analytical Sciences Inc. of Durham, North Carolina, told academic officials in a note posted on an Internet bulletin board. It promised to have the forms—which are printed with special machine-readable ink and paper—in the mail to academia by this week. But if one doesn't show up, the company advises campus officials to "go looking for it!"

The oversight "is helping making a hard job for universities even more confusing and difficult," says Cheri Hildreth, who is managing compliance for the University of Louisville, Kentucky. Even institutions that don't get the forms, she notes, could face penalties for missing the deadline. Help seekers can call 866-567-4232.

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