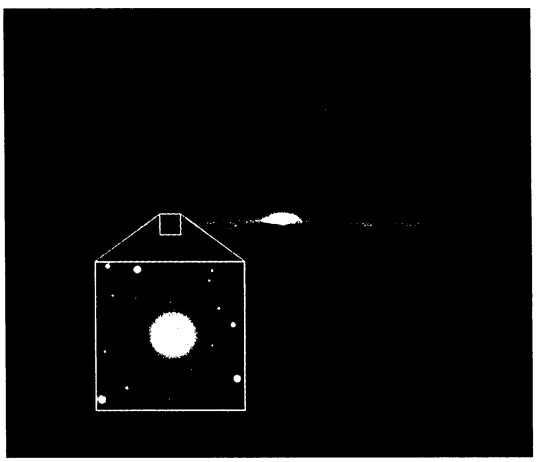
like Milky Way. But there is a possible catch: Their survey covered a nearby part of the galactic disk in which disk residents mingle with halo stars that just happen to be passing through. Indirect observations show that almost all of the galaxy's dark matter is native to the halo, making disk stars nearly useless for explaining it.

In principle, disk and halo dwarfs are easy to tell apart. Disk dwarfs are whirling around the galactic center at an average speed of 220 km/s, the same as the sun; halo dwarfs are, on average, standing still. Applying that test to separate out halo dwarfs and then extrapolating their density to the entire galactic halo, Oppenheimer and his collaborators estimated that white dwarfs could account for at least 2% of the dark matter known to make up 90% of the halo's mass. Suspected halo dwarfs currently too faint to be seen could boost their estimate to as much as a third of the dark matter.



Mixed message. Near the sun, mingled stars from our galaxy's disk (white) and halo (red) complicate the quest for dark matter.

Shortly after their paper appeared on *Science* Express, however, several scientists fired back a barrage of electronic critiques. On 5 April, a team led by astronomer Neill Reid of the Space Telescope Science Institute in Baltimore posted a paper destined for the *Astrophysical Journal Letters* on the LANL server. Reid and collaborators argued that Oppenheimer's criterion was not stringent enough to remove all of the disk white dwarfs from his sample. In Reid's view, the white dwarfs are not dark matter at all, but merely a part of a previously known population of stars in the galactic disk. "It is a gaping hole in their argument," Reid says.

A week later, astrophysicist David Graff of Ohio State University in Columbus made a similar argument in an LANL posting that was also submitted to *Science* as a Technical Comment. And on 16 April, in another paper posted on the LANL server and submitted to *Science* as a Technical Comment, astronomers Brad Gibson of Swinburne University in Australia and Chris Flynn of the Tuorla Observatory in Finland pointed out typographical errors in Oppenheimer's online paper. (The printed version of the paper in this issue includes minor corrections.)

Oppenheimer says he welcomes the criticism but that public release of the preprints before they had been peer reviewed distorted the debate. "Our paper went through the standard channels of scrutiny, with two referee reports that were very favorable," he says. "None of these comments or papers have been properly refereed." And rapid-fire online publication, he says, left no time to make a considered response. As a result, Oppenheimer says, "the playing field was unfair."

On 20 April, editors at *Science* asked the authors of the two Technical Comments to withdraw their preprints from the LANL server until they appeared in the journal. Gibson and Flynn complied with the request, although they say that it disrupts the normal flow of scientific discussion. "I'm quite stunned that *Science* is more concerned with being first than they are with being correct," Gibson says.

But the proverbial cat is out of the bag. Every one of the several experts *Science* contacted was already intimately familiar with the preprints in question. And their consensus on the white dwarf controversy is that the new survey has turned up some dark matter, but maybe not as much as the team claims. "I'd say that the Oppenheimer team makes a few assumptions that tend to increase the number of their white dwarfs attributed to the halo," says astrophysicist Dave Bennett of the University of Notre Dame in South Bend, Indiana. "The Reid team does the opposite." Astrophysicist Brad Hansen of Princeton University agrees. "Bottom line, these white dwarfs are definitely interesting, and I'm not sure anyone has the right picture yet."

–MARK SINCELL

Mark Sincell is a science writer in Houston.

MIDDLE EAST

Two Pledges Boost SESAME Project

ANKARA—A long-planned synchrotron project for the Middle East took a major step forward last month after its Jordanian hosts pledged the money to house the instrument and its German donors agreed to ship it.

SESAME (Synchrotron Radiation for Experimental Science and Applications in the Middle East) was founded in 1999 to implement Germany's donation of BESSY-I,

ScienceScope

Appealing Case A state court judge has delivered a surprising setback to a Harvard researcher hoping to prove job discrimination. After a 3-week trial, a Massachusetts jury last month found in favor of biomathematician Tamara Awerbuch-Friedlander, who claimed that Harvard's School of Public Health denied her a promised slot on the tenure track and then retaliated against her for complaining (*Science*, 23 February, p. 1466). But before the jury could set damages, Judge Diane Kottmyer surprised both sides by dismissing the case, ruling that Awerbuch-Friedlander's 1994 complaint missed a filing deadline. Harvard officials declined comment. But Awerbuch-Friedlander says she will appeal, arguing that the timing issue is moot because Harvard actively dissuaded her from filing the complaint.

Fined Example Spurred by a government fine for violating pollution laws, the Massachusetts Institute of Technology (MIT) plans to become a model environmental citizen. The Environmental Protection Agency (EPA) has been battling the Cambridge, Massachusetts, university since 1998 over sloppy hazardous waste handling at more than 200 of its 2200 labs, and on 18 April the agency fined the school $150,000. But the same day, MIT announced that it will spend an additional $405,000 to build a Web-based "environmental campus" which will demonstrate how other schools can cope with complex environmental laws. Funds will also go to an education program at Cambridge public schools and a biofiltration storm water management system.

In a letter to MIT President Charles Vest, EPA official Sam Silverman wrote that MIT's plan "to go beyond its compliance obligations by taking on far-reaching green initiatives is laudable."

Italian Living Researchers worried about the future of science aboard the international space station got some good news on 19 April. A month after NASA said it would cancel a planned crew quarters module to save money (*Science*, 9 March, p. 1883), the Italian Space Agency said it might take on the project in return for greater access to the station for its astronauts and scientists. Researchers say the quarters are essential, because they will house the larger crew needed to run planned experiments. NASA and Italian officials warn that it may take months to nail down a deal.

Contributors: David Malakoff, Andrew Lawler, Jocelyn Kaiser

a 0.8–giga electron volt synchrotron that has been mothballed in Berlin. Last month in Cairo, Jordan promised to fund a building for the accelerator and its upgraded beamlines at a site at Al-Balqa' Applied University outside Amman. At the same time, German research officials said they would ship BESSY shortly after groundbreaking this summer. "When this was announced, the whole atmosphere became positive, since SESAME members now think that the project will fly," notes Herwig Schopper, former CERN director-general and head of SESAME's interim governing council.

Schopper says five more countries have expressed interest in the project, making the total 16 and leaving Saudi Arabia and Syria as the only major nations in the region that have not yet joined. The members will help pay for the estimated $8 million in upgrades needed. Construction on the new building, to cost $11 million, is expected to begin this fall and be completed by the end of 2002.

The council also approved plans for a biomedical institute alongside SESAME. The new entity, to be called the Middle East Biological Sciences Institute for Research, will make use of the synchrotron's beamlines. "We hope it will foster regional cooperation in the life sciences," says Said Assaf, director-general of the Arafat National Scientific Center for Applied Research in Ramallah and the Palestinian Authority's representative to SESAME. "Science, like medicine, is for all who could utilize it best—and appreciate it." Work on the new institute will wait until after completion of SESAME.

–ROBERT KOENIG

JAPAN

Reforms Could Threaten Facility Spending Hike

TOKYO—The Ministry of Education, Science, Technology, Sports, and Culture last week promised to spend $13 billion over the next 5 years to renovate and expand cramped and outdated research facilities in Japan's universities. Now, the country's researchers and educators are waiting to see whether the promise survives the expected election this week of Junichiro Koizumi as prime minister and the resulting government reshuffle.

A recent ministry survey found that about one-fourth of the total floor space at national universities was more than 25 years old, meaning not only that the buildings are aging but also that they probably don't meet current standards for resisting earthquakes. Universities have also not expanded their research facilities in step with increased funding for research and additional numbers of postdocs and technicians. "The condition of facilities is really choking [research activities]," says Reiko Kuroda, a professor of chemistry at the University of Tokyo and a member of the Council for Science and Technology Policy, the country's highest policy advisory body. The council has made improving research facilities one of its priorities in a new 5-year spending plan.

The new infrastructure money is seen as a sign of the government's intent to follow the council's overall plan, which calls for spending $195 billion on research-related projects. The problem was supposed to have been addressed under the previous 5-year plan. But a lack of coordination between the Education Ministry and the Ministry of Construction, which builds and remodels public buildings, held down spending to $8 billion, far below the target. The council was given increased authority to carry out the program as part of a government restructuring earlier this year. "To facilitate this rebuilding, we will be trying to coordinate [efforts] among the different ministries," says Hiroshi Tamada, deputy director of policy planning for the council. The chief beneficiaries are expected to be graduate school classrooms and labs, designated centers of excellence, and biomedical facilities.

Although Japan prides itself on its ability to carry out such long-range plans, the fate of the initiative is uncertain. Koizumi, a self-proclaimed reformer within the ruling Liberal Democrat Party best known for advocating the privatization of the country's huge postal savings system, has pledged to examine public works spending, which has been used repeatedly over the last decade to stimulate a stagnant economy.

Shinichi Yamamoto, director of the University of Tsukuba's Research Center for University Studies, says he believes there will be strong support for continuing the recent boost in science funding. "And I think there is widespread understanding that we cannot perform research just with money; we need infrastructure, too," he says. Still, he and others realize that it may be a while before they find out if the new government agrees.

–DENNIS NORMILE

Structural changes? Junichiro Koizumi has pledged to take a close look at all government spending.

CREDIT: ITSUO INOUYE/AP

TASTE RESEARCH

New Gene May Be Key to Sweet Tooth

Can't resist sweets? Sensory scientists have discovered a gene that may be responsible for your sweet tooth. Variations in the gene seem to explain why some mice prefer sweet flavors more than others do, and the same may be true for humans as well.

Researchers have known for many years that taste cells on the tongue recognize five distinct tastes—sweet, sour, bitter, salty, and umami (or monosodium glutamate). For sweet, bitter, and umami tastes, this is done with the aid of cell surface proteins called receptors that bind to a particular taste chemical and then send a message to the brain. (Sour and salty directly change the ion flux of taste cells.) Last year, scientists found genes for receptors that recognize bitter and umami tastes. But the sweet receptor has remained elusive, leaving a major gap in our understanding of how humans recognize the spectrum of subtle flavors in the gustatory universe.

Now, four research groups have isolated a gene that may code for the sweet receptor. The work is published in the May issue of *Nature Neuroscience* by Robert Margolskee and co-workers at Mount Sinai School of Medicine in New York City; in the May issue of *Nature Genetics* by Linda Buck's group at Harvard Medical School in Boston; and in the May *Journal of Neurochemistry* by a team led by Susan Sullivan of the National Institute on Deafness and Other Communication Disorders. A fourth group led by Gary Beauchamp at the Monell Chemical Senses Center in Philadelphia announced its results on 27 April in Sarasota, Florida, at the annual meeting of the Association for Chemoreception Sciences.

Taste physiologist Sue Kinnamon of Colorado State University in Boulder says that the discovery of the gene "is very exciting. It allows you to really start asking what is the whole pathway that mediates this response." Understanding that pathway could, among other things, help the food industry develop better artificial sweeteners and help basic researchers identify potential links between taste and dietary health.

The search for the various taste receptors has been hampered by the fact that taste cells are sparsely distributed on the tongue and are