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BIOMEDICAL POLICY

NIH Wins an Exemption From HHS Peer-Review Overhaul

The peer-review system at the National Institutes of Health (NIH) rests on a simple notion: Fly in a panel of experts and let them decide, face to face, on the best science. It's a trusted system and so widely admired by most scientists that any proposal for improving it can easily be perceived as a threat.

That's what happened this month, after NIH officials received a leaked memo on 1 August from their political bosses at the Department of Health and Human Services (HHS). The memo appeared to call for cheaper ways to obtain expert advice. NIH officials reacted immediately, and within days, an HHS manager was trying to calm the waters, explaining that NIH's scientific programs were not a candidate for such reforms. The memo might have gone unnoticed had it not arrived on the heels of two other recent HHS directives, one clamping down on staff travel and the other cutting back on scheduled salary increases at NIH. The new policy thus seemed to fit a pattern of HHS asserting its management authority over one of its administrative units.

Cool it. NIH extramural chief Wendy Baldwin advises staffers not to fret.

The memo, written by HHS deputy assistant secretary for grants management Terrence Tychan, said that all HHS divisions should try to process grants more efficiently by cutting out face-to-face peer-review meetings. To reduce travel costs and other hassles, it proposed relying on "field readers." Opinions would be gathered by mail, the memo explained, and program managers would consult submitted comments in deciding which projects to fund. Under the plan, HHS offices would implement "standard application review processes," "consolidate and accelerate annual grant planning by linking it to the president's budget," and bring about "standard scoring of competing applications." According to Tychan's memo, the proposals were "favorably received" on 27 July by HHS Secretary Tommy Thompson and were headed for "a realistic implementation strategy." Because the plan has not been finalized, the memo notes, it "is not to be shared with the world."

But some NIH officials, worried that the plan might take effect without wider discussion, did not keep quiet. The matter reached Wendy Baldwin, NIH assistant director for extramural research. After talking with Tychan, Baldwin says she's confident that NIH's peer-review system is not going to be changed. "We have already been engaged in streamlining," Baldwin says. "I don't think [this memo] was talking about things that would really affect us. I have no indication that this is going to affect the way we do scientific peer review."

One NIH official, who asked not to be identified, remains concerned that the proposed system would give more responsibility to office managers and less to scientists directly involved in research. Another NIH official asserts that NIH's face-to-face reviews are of higher quality than mail reviews, because participants perform better when they must present their views to a live audience of peers. If the memo's policies were adopted, said one institute director, "there would be a revolution" at NIH.

Tychan acknowledges that NIH scientific review is "different and unique." The memo, he said in a telephone interview, was not intended for NIH but rather for a policy group that's "trying to streamline the way we do grant review at HHS." Their goal is to "make some improvements in the operating divisions" that process HHS awards for research on topics that range from child welfare to Medicare benefits. After talking to Baldwin, he says that "I don't want anybody at NIH to get worried; this is not designed to make vast changes to peer review" at NIH.

NIH runs the largest peer-review operation within HHS, tapping more than 10,000 scientists each year, according to an official in NIH's Center for Scientific Review (CSR). The reviewers—who are reimbursed for travel and lodging and receive $200 a day for expenses—are grouped by discipline into 150 study sections. They meet roughly three times a year to help sift through the 44,000 applications NIH receives annually. CSR deputy director Brent Stanfield estimates that each review costs NIH just over $1700—"very efficient," he claims.

Tychan's interpretation of the memo may put the concerns at NIH to rest. Even if it doesn't, however, the recent dialogue suggests that NIH wields sufficient clout to carve an exemption to a policy edict even before the edict is issued. **–ELIOT MARSHALL**

THE COST OF PEER REVIEW

Annual budget, NIH Center for Scientific Review	$55 million
Amount spent on travel, lodging, honoraria (for an estimated 10,000 reviewers)	$15 million
Cost per grant (based on 32,000 proposals reviewed)	$1718
Peer-review "tax" (based on a 4-year, $1 million grant)	0.17%

SOURCE: CENTER FOR SCIENTIFIC REVIEW, NIH

ASTRONOMY

Pull of Gravity Reveals Unseen Galaxy Cluster

Just as the brightest headlights on the nighttime freeway don't necessarily adorn the heaviest trucks, the brightest objects in the nighttime sky may not be the weightiest. Yet even though it is mass that ultimately determines the structure of our universe, astronomers traditionally flock like moths to bright sources, mainly because those are the ones they can see.

Now astronomers are taking long strides into the ponderous realm of dark matter. Tony Tyson of Lucent Technologies' Bell Labs in

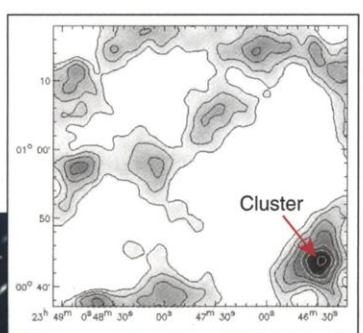
Murray Hill, New Jersey, and colleagues have discovered a whole new cluster of galaxies and calculated its distance, without relying on its emitted light. Instead they inferred the unseen cluster's existence from the way its gravity rerouted light from more-distant galaxies beyond. Tyson's team is one of several racing to show that the technique, known as gravitational lensing, can be used to map matter in deep space (*Science*, 17 March 2000, p. 1899). But the new work, to be published in the 20 August issue of *Astrophysical Journal Letters*, "is the first convincing demonstration this goal will actually be realized by gravitational lensing," says University of Chicago astrophysicist Wayne Hu.

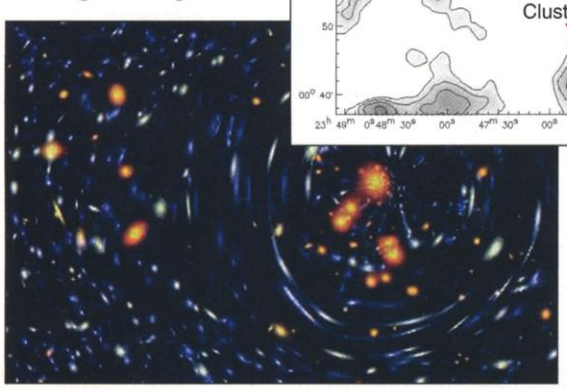
Astronomers believe that about 90% of mass in the universe is dark. Telescopes can't see it, but its gravitational pull blows its cover. "Gravity doesn't care whether matter is dark or luminous," says Tyson's Bell Labs colleague David Wittman, lead author on the paper describing the work. "All you need are background sources of light, which are all over the sky, and in principle you can find all the matter between us and the background sources."

The team, which also includes Vera Margoniner of Bell Labs, Judith Cohen of the California Institute of Technology in Pasadena, and Ian Dell'Antonio of Brown University in Providence, Rhode Island, used a special wide-field camera attached to the 4-meter Blanco telescope near La Serena, Chile. The astronomers studied a square of sky about twice as big as the full moon, containing tens of thousands of galaxies but no previously known galaxy clusters. They analyzed each individual galactic speck for telltale distortions that might be caused by massive but invisible objects closer to the telescope. Typically, images of distant galaxies appear to wrap around the lens core like the rim of a wheel (see figure). By scrutinizing the whole image a piece at a time and measuring the distortion in each region, the team created a "mass map" of the intervening space. A dense patch in one corner of the map revealed a cluster of galaxies, which the team subsequently confirmed using a conventional telescope.

To gauge the distance to the lens, the astronomers exploited the fact that the more distant a light source is beyond a gravitational lens, the more the lens distorts the light in transit. So determining both how far the sources are from Earth and the amount that the images are distorted reveals the lens's location.

To measure very large cosmic distances, astronomers rely on redshift, the reddening of light that takes place as expanding space stretches the light's wavelength. The more distant the object, the redder the light. Tyson's team estimated the remoteness of the source galaxies by comparing their colors to those of other galaxies at known distances. Then, after studying how much the lens cluster distorted the light of thousands of sources, they calculated the distance to the cluster, again in terms of redshift. The team pegged the lens cluster's redshift at 0.3, corresponding to a distance of about 3.5 billion light-years. Double checking the spectra from some galaxies in the lens, the team confirmed the redshift value to within 10%. "I am still surprised at how well it works," Wittman says.





Twisted. "Wheel rim" distortion of galaxies, simulated here, revealed a massive galactic cluster *(inset, above)*.

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Mapping clusters by mass should help to close the gap between predicted and observed cluster abundances, says Peter Schneider of the Max Planck Institute for Astrophysics in Garching, Germany. "In that respect, this sort of work is very valuable." Hu goes further. "A catalog of clusters selected by their mass will be invaluable for the study of dark matter and dark energy in the universe," he says. "I expect great things." **–ANDREW WATSON**

Andrew Watson writes from Norwich, U.K.

ADVANCED COMPUTING

NSF Launches TeraGrid For Academic Research

Promising benefits to researchers working on everything from drug discovery to climate forecasting, the National Science Foundation (NSF) last week launched what will be the nation's most powerful network for scientific computing. NSF has pledged $53 million to four U.S. research institutions and their commercial partners to build and operate a system expected to be up and running by 2003. Its official name is the Distributed Terascale Facility, taken from its targeted capacity to perform trillions of floating-point operations per second (teraflops) and store hundreds of terabytes of data. But if it's a success, it may go down in history as Internet 3.

The institutions—the University of California, San Diego; the University of Illinois, Urbana-Champaign; the California Institute of Technology in Pasadena; and Argonne National Laboratory outside Chicago—are no strangers to supercomputing. San Diego and Illinois, for example, are home base for NSF's Partnership for Advanced Computational Infrastructure program. Last year NSF gave $45 million to the Pittsburgh Supercomputing Center for a 6-teraflops machine. But the TeraGrid, as it's been dubbed, is touted as a new breed of supercomputer, with software that will allow high-speed, high-bandwidth connections previously not possible.

"It's not just size or speed," says Fran Berman, head of the San Diego Supercomputer Center. "This will change how people use data and how they compute." Her counterpart at Illinois's National Center for Supercomputing Applications, Dan Reed, says the TeraGrid will "eliminate the tyranny of time and distance."

It's already changed the sociology of supercomputing, with its cutthroat competition to have the biggest and fastest machine on the block. The winning institutions were the only entrants in what was scheduled to be a competition. "We were under a lot of political pressure to get this out by September," says an NSF official, "and we only gave [applicants] 3 months to put together their bid. We knew that would be a tough deadline for people to meet." Despite being the only applicant, the winners put together a proposal "that passed [peer review] with flying colors," says Bob Borchers, NSF's head of advanced computing.