

posals for just such an agency, with startup funding of \$200 million.

Whether the administration will officially adopt the PCAST recommendations is unclear. "PCAST isn't the administration, it's an advisory panel," a congressional staff member involved in the DHS discussions said.

So the report by itself isn't a "full reversal" of White House policy on the structure of R&D in the DHS. But, the staff member said, it is likely to influence how the administration supports the role of R&D in the House and Senate DHS bills.

JIM DAWSON

Solar and Space Physics Get a Detailed 10-Year Plan

An array of large, medium, and small spacecraft, including the canceled solar probe flight into the Sun's atmosphere, should be launched over the next 10 years as part of a "time ordered" mix of projects to better understand the Sun and the Sun-Earth environment, according to a National Research Council report. Put together over 18 months by a 15-member solar and space physics survey committee, the report lays out a literal flow chart of NASA, NSF, and National Oceanic and Atmospheric Administration (NOAA) projects based on "scientific importance, technological readiness, and synergy among different programs," said committee member James Burch of the Southwest Research Institute in San Antonio, Texas.

The report, released in early

▶ A comprehensive National Research Council study weaves a decade's worth of projects together into a tapestry that could reveal the answers to some of the most difficult questions in solar and space physics.

August, contains recommendations for programs separated into three basic categories: moderate programs (mostly space missions costing between \$250 and \$400 million); small programs (costing less than \$250 million); and "vitality" programs that are not missions per se, but recommendations to improve solar theory, modeling, information, and education programs to reenergize the field.

The report also calls for NASA to

restore the \$650 million solar probe mission, which was canceled last year. That mission was designed to put a spacecraft within four solar radii of the Sun's surface, and is viewed as having "especially high scientific value," said committee chairman Louis Lanzerotti, a physicist with Bell Laboratories, Lucent Technologies, in Murray Hill, New Jersey.

Although the solar probe mission is important, the committee realized that there is no money for the project in NASA's budget, Lanzerotti said, so the committee took two approaches to recommending the flight. "The solar probe is the highest priority as a major mission, but you can't do the solar probe at the same time you do all of the other missions unless you have an add-on of funding," he said. Without extra money, the committee concluded, the solar probe would have to move from the front to the end of the line of committee-endorsed projects. For all of the recommended projects, the committee provided alternative flow charts based on whether the solar probe mission gets new funding and goes early or moves to the back of the queue.

The report, titled *The Sun to the Earth, and Beyond: A Decadal Research Strategy in Solar and Space Physics*, was inspired by the well-

Gell-Mann Meets Muster Mark, Honors Hamilton

*Three quarks for Muster Mark!
Sure he hasn't got much of a bark
And sure any he has it's all beside the mark.*
—James Joyce, *Finnegans Wake*

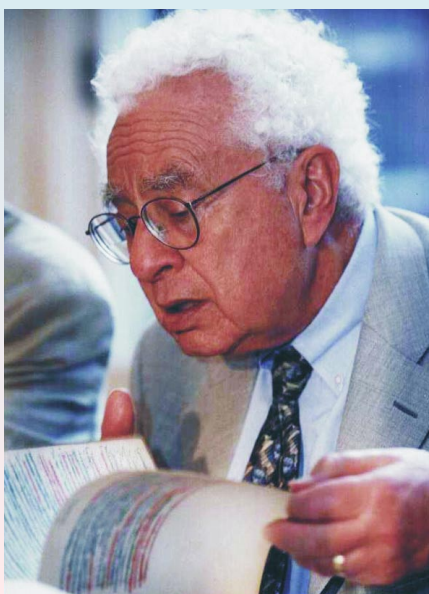
There may be no better-known lines of poetry than these, at least among physicists, thanks to Murray Gell-Mann's having dubbed the elementary constituents of matter "quarks." Gell-Mann had come up with the sound "kwork," but then adopted the spelling in James Joyce's *Finnegans Wake*, partly because "the number three fitted perfectly the way quarks occur in nature," as Gell-Mann writes in *The Quark and the Jaguar: Adventures in the Simple and the Complex* (W. H. Freeman, 1994).

In Dublin this spring, Gell-Mann got a privileged peek at some of Joyce's original manuscripts. In 1941, after Joyce died, a friend, Paul Léon, broke into the author's Paris apartment and salvaged his papers, including handwritten notes for *Finnegans Wake* and *Ulysses*. The papers, but not Léon, survived the war. They surfaced recently when Léon's son Alexis was sifting through his father's belongings, and were purchased in May by the National Library of Ireland for roughly

\$12.2 million.

Gell-Mann will be back in Ireland this month to deliver the Royal Irish Academy's inaugural Hamilton Lecture at Trinity College Dublin. "They are celebrating Hamilton's quaternions, which are beautiful and mathematically interesting, even though they never proved to be of that much use for physics," says Gell-Mann. "But Hamilton did wonderful

work rewriting mechanics and optics in ways that made them look quite analogous. He foreshadowed quantum mechanics." The lecture is part of Hamilton Day, which will be celebrated on 16 October, the date on which, in 1843, William Rowan Hamilton scratched his formulas for quaternion algebra onto a stone on Broome Bridge outside Dublin. "Hamilton is Ireland's most eminent scientist," says the academy's Pauric Dempsey. "But Irish scientists don't have the same profile that writers have. On the street, people talk about Joyce and Yeats and Beckett. We want to build up Hamilton Day to raise the profile of math and science in Ireland." **TONI FEDER**



SHANE O'NEILL/JASON CLARKE PHOTOGRAPHY

MURRAY GELL-MANN peruses James Joyce's blue-and-red handwritten notes for *Ulysses*.