

is considered foreign travel," for the 2009 NA PAC in Vancouver.

As of earlier this year, DOE regulations were tightened so that agency labs wanting to send more than 30 people to a conference—domestic or international—or spend more than \$10 000 for conference attendance must now get approval from the DOE Office of Science. But, says Robin Staffin, the office's associate director for high-energy physics, "that's a reporting threshold, not a cap." Moreover, he says, if the NA PAC is switched to a three-year cycle, "we would make every effort to accommodate this decision by facilitating travel." **Toni Feder**

NASA's future workforce a complex problem

Concern has grown in both NASA and Congress over the past few years about how the space agency—a massive and complex bureaucracy with 17 000 civil service employees and more than 40 000 contract workers—would reorient its workforce as the quest to return to the Moon has waxed and the space shuttle program has waned. In April, NASA officials tried to address those concerns by submitting to Congress a "workforce strategy" document showing that the agency has a plan to ensure it has the right people in the right positions to return to the Moon, prepare to go to Mars, and conduct myriad other scientific projects over the next 15 to 20 years. But although the document was full of language about new approaches to workforce planning and integration of business and resource activities, an interim National Research Council (NRC) report on NASA's workforce issues says the agency has "not yet translated that [workforce] analysis into a strategy and action plan."

While the issues facing the NASA workforce can easily be lost in a fog of bureaucratic planning jargon, members of the House subcommittee on space and aeronautics tried during a hearing in June to better understand the problems the agency faces. The hearing's background document put together by the subcommittee staff noted that NASA is entering a critical period for ensuring that it has a workforce of the appropriate size and with the proper skills to carry the agency through the next 15 years. "NASA has several major new undertakings related to the goal of returning to the Moon by 2020," the document said. "To free up funds for that purpose,

it is terminating the space shuttle program in 2010, reducing aspects of the International Space Station research, and reducing the budget for aeronautics."

The NRC report says NASA needs to develop a plan that first deals with the next five years, which covers the end of the space shuttle program, and then lays the foundation for a longer-term process. In addition to space-oriented programs, the report says, NASA needs to fund university-based research programs in aerospace sciences to ensure that "universities continue to sustain curriculum, faculty, and student interest."

NASA must also determine the right balance between scientists and engineers who are federal employees and those who work for outside contractors. The concern expressed by congressional staff members and several people testifying at the hearing was that if NASA contracts out too much work, it will lose the in-house science and engineering expertise that has been critical to the agency's past successes.

Testifying as the co-chair of the NRC report, David Black, president of the Universities Space Research Association and an astronomer at Rice University, said the NRC committee's "initial reaction to NASA's work done so far is that it is incomplete and reflects a top-down view of what skill mixes are needed and as such is more theoretical than empirical." Black also said that NASA management must find a way to give a sense of "hope and promise to potential future members of the agency's workforce. Twenty years ago, the mere mention of NASA was an attractor," he said. "It had vocational pizzazz. That is no longer the case."

Black cited the delay and cancellation of NASA projects over the past few years and added, "There are fewer opportunities for NASA staff to be engaged in meaningful science and engineering. I am concerned that many of the best and brightest young people are attracted to the science part of what NASA does, but the inability of the administration and Congress to properly fund NASA's implementation of [President Bush's Moon/Mars initiative] will mean that support for science will erode."

NASA also faces a "retirement bulge," and subcommittee chairman Ken Calvert (R-CA) called the age distribution of the agency's workforce "troubling." More than 30% of NASA's employees are currently eligible for regular or "early out" retirement, and NASA estimates that by 2011, just after the space shuttle program is shut down, 28% of its engineers and 45% of its scientists will be

eligible to retire. Currently, 12% of its engineers and 21% of its scientists are eligible to retire.

Calvert noted that NASA's civil service workforce has shrunk by more than 20% during the past 10 years and asked how NASA will prepare for its future needs and how it can successfully recruit and retain the necessary scientists and engineers.

Toni Dawsey, NASA's assistant administrator for human capital management and chief human capital officer, told committee members that NASA's workforce strategy plan will allow the agency to "deal effectively with the critical issues" that loom. She added that NASA "does recognize that some future events, such as the retirement of the space shuttle program, require long-term planning."

Black said it is clear from the data gathered for the interim NRC report that NASA officials don't know how to manage a workforce problem as complex as the one confronting them. "Does anybody know how to do it? I can't give you a categorical yes or no on that," he concluded. The final NRC report is due out early next year. **Jim Dawson**

Nakamura wins prize for solid-state lighting

The creator of the first blue, green, and white light-emitting diodes and the first blue laser diode—each of which has represented an important milestone in the development of new energy-saving light sources—has won the 2006 Millennium Technology Prize.

Shuji Nakamura will receive the award from Finland's Millennium Prize Foundation at a September ceremony in Helsinki. The honor, which carries a cash prize of €1 million (\$1.3 million), recognizes outstanding technological achievement aimed at promoting quality of life and sustainable development. Nakamura is a professor of materials and of electrical and computer engineering at the University of California, Santa Barbara, where he is also codirector of the solid-state lighting and display center.

In a recent interview with PHYSICS TODAY, Nakamura said he started working with LEDs and laser diodes



Nakamura

RANDY LAMB, UCSB