known astronomy and astrophysics decadal report. "I'm the chair of the solar and space physics committee of the [National Academy of Sciences] space studies board," Burch said, "and my committee felt that the astronomy and astrophysics report [most recently published in 2001] was a very powerful report and had it right. Their recommendations usually get done because both the [federal] agencies and Congress feel the recommendations are from the academy and ought to guide the programs. In solar and space physics, it hadn't been happening that way. We felt like a study needed to be done that was national in scope."

After discussions among several scientists in the solar and space physics community and NASA officials, Ed Weiler, NASA's associate administrator for space science, wrote a letter to the NAS, asking that the study be done. The NAS then appointed five independent panels to make recommendations on heliospheric physics; solar wind and magnetosphere interactions; atmosphere-ionosphere-magnetosphere interactions; solar theory, modeling, and data exploration; and education and society. After reviewing the panel recommendations, the survey committee set the priorities for the final report.

## Fundamental questions

The report said that there are long-standing and fundamental scientific questions about the physics of the Sun, the interplanetary medium, and the space environments of Earth and the planets. To answer those questions, the committee delineated five challenges that should be at the center of solar and space physics research for the next decade:

- ▶ understanding the structure and dynamics of the Sun's interior, the generation of solar magnetic fields, the origin of the solar cycle, the causes of solar activity, and the structure and dynamics of the corona
- ▶ understanding heliospheric structure, the distribution of magnetic fields and matter throughout the solar system, and the interaction of the solar atmosphere with the local interstellar medium
- ▶ understanding the space environments of Earth and other solar system bodies and their dynamical response to external and internal influences
- ▶ understanding the basic physical principles manifest in processes observed in solar and space plasmas
- ▶ developing near real-time predictive capability for understanding and quantifying the impact on human activities of dynamical processes at the Sun, in the interplanetary medium, and in Earth's magnetosphere.

To help meet those challenges, the committee looked at all of the federal support for solar and space physics research and then brought the programs together into a coordinated planning strategy. "The existence of ongoing NSF programs and facilities in solar and space physics, of two complementary mission lines in the NASA Sun–Earth Connection program (Living with a Star, and Solar Terrestrial Probes), and of . . . activities in NOAA and the Department of Defense helps facilitate such an approach," the report said.

This integrated systems approach creates a tapestry of interwoven projects that will, if done in the appropriate order, augment each other, Lanzerotti said. Although the report gives priority rankings to missions and facilities, he said, it doesn't mean that the lower-ranked items are less important. "It is a time-oriented ranking."

The interconnectedness of the rankings is apparent in the report's overview of some of the recommended projects: "As a key first element . . . the committee endorsed three approved NASA missions, Solar-B, STEREO, and [the] Solar Dynamics Observatory [SDO]. Together with ongoing NSF-supported solar physics programs and facilities as well as the start of the Advanced Technology Solar Telescope [ATST], these missions constitute a

## Physics Olympiad Held in Bali, US Stays Home

Welcoming students from 70 countries, Indonesian President Megawati Sukarnoputri kicked off the 33rd International Physics Olympiad in Nusa Dua, Bali, in July, by saying that the event "can be a positive means for increasing people's attention, understanding, and mastery of basic science." Her comments marked the first time the event has been opened by a head of state.

Vietnam's Ngoc Duong Dang earned the highest individual score. The People's Republic of China, with four gold medals and one silver, had the top overall team score for the third straight year. But Iran's team was the only one to win five gold medals. Back home, Iran's team is being recognized for its accomplishments: Members are exempt from both university entry exams and the military, and will meet with Iranian President Seyed Mohammad Khatami.

As usual, the competitors tackled both theoretical and experimental problems. One of this year's experimental problems required that they determine the unknown optical components inside a sealed box by probing optical signals from two slits in the box.

Originally scheduled to be held in Bandung, about 200 km southeast of Jakarta, the Olympiad was moved to Bali and delayed a week because of floods and security concerns. But the move was not enough to reverse the US team's no-show decision. Heeding a State Department warning against nonessential travel to Indonesia, the US team's sponsors—the American Association of Physics Teachers and the American Institute of Physics—kept their team home. Instead, the US team members attended a ceremony in their honor at NASA headquarters in Washington, DC.


33RD IPHO ORGANIZING COMMITTEE

**DURING DOWNTIME,** students took part in a kite festival on the beaches of Bali (bottom). Stamps commemorating the Olympiad (top) were issued by Indonesia's postal service.

The five US students who would have competed in Indonesia are Pavel Batrachenko of John Marshall High School in Rochester, Minnesota; Steven Byrnes and Sean Markan of Roxbury Latin School in Boston; Benjamin Schwartz of Staples High School in Westport, Connecticut; and David Simmons-Duffin of Shaker Heights High School in Shaker Heights, Ohio. AIP and AAPT presented them with medals and scholarships.

Next year's Olympiad will be held in July in Taipei, Taiwan. **ANTHONY TWEED**