

NASA-ESA probe to Giacobini-Zinner

US space scientists are fond of complaining about NASA's decision not to support a Halley probe, and yet if one is willing to stretch definitions a little, the United States will in fact be sending a craft to Halley. On 11 September, the International Cometary Explorer—a spacecraft built by Fairchild Space Company for NASA's Goddard Space Flight Center—is to fly through the tail of Giacobini-Zinner, where it will study the magnetic and electric fields and plasmas of the comet's tail.

The spacecraft was launched in August 1978, with sponsorship of NASA and ESA, as the International Sun-Earth Explorer, to study the solar wind, the Earth's magnetosphere and their interactions. After completing that mission, the spacecraft was renamed the International Cometary Explorer and was diverted onto a course to reach Giacobini-Zinner in September 1985, which will be the first intercept of a spacecraft with a comet.

After completing that mission, it is to have the additional task of joining the Halley flotilla, which consists of the two Soviet Vegas (PHYSICS TODAY, March 1985, page 113) Giotto, and two Japanese probes. On two occasions, 31 October 1985 and 28 March 1986, NASA's International Cometary Explorer will pass between the Sun and Halley's comet. On the first pass it will be quite a long way off from the comet, but the second time it will be 180 000 miles away, close enough to measure the upstream solar wind.

Japan's first spacecraft to Halley, which was launched 7 January with a plasma-wave probe, an ion sensor and a magnetometer aboard, will miss the comet by several million miles. The second Japanese craft, "Planet A," is to be launched this month and is expected to come within about 60 000 miles of Halley. Its primary mission is to make ultraviolet television images of the comet's hydrogen coma.

on the "mandatory" space science program, which excludes everything having to do with Earth and everything related to microgravity, come to 134 million accounting units—roughly \$110 million. ESA estimates that it spends about one-seventh as much a year on space science as NASA; Frank McDonald, chief scientist at NASA, guesses that total European spending on space science, taking the programs of the individual countries into account, is probably one-fourth or one-fifth what the US spends. He agrees that the level of European spending has been an "anomaly." Europe's combined GNP is comparable to that of the US, and European allocations for fields such as particle physics and radioastronomy also are about the same as those of the US.

The intention now is to boost annual expenditures by ESA to around 200 million accounting units by the early 1990s, which will still leave ESA very far behind NASA, but more capable—ESA officials hope—of bargaining with NASA as a serious potential partner. As stated in the "Horizon 2000" report, the hope is to produce a "quantum jump in scientific significance" and to give Europe "the means of being an equal partner in a worldwide prospectus in space science, while honoring its cultural heritage and scientific tradition."

The long-term science program adopted at Rome rests on four "cornerstones":

► the Solar-Terrestrial Program, which is to involve two medium-size projects, a space observatory at the L1 Lagrangian point between Earth and Sun, and a cluster of satellites to investigate plasma physics in the mag-

netosphere

► an x-ray observatory, containing multiple telescopes, to be complementary to NASA's AXAF

► an 8-meter dish antenna, employing heterodyne equipment for high-resolution spectroscopy, to make observations in the as yet unobserved part of the submillimeter spectrum

► a mission to bring back pristine material from primitive bodies such as asteroids or comets.

The last project might be undertaken with US involvement, Bonnet indicated, and he considers the submillimeter antenna a prime candidate for the space station.

Bonnet said that the technical problems that need to be overcome have been identified for the four cornerstone projects, with the aim of seeing to it that requisite technology matures in the next 15–20 years, which "otherwise might not happen." In addition, the agency will continue to select smaller projects on an ongoing basis by traditional means.

The European Retrieval Carrier, EURECA, has a special status because it is to be launched from the space shuttle with the capability of staying up on its own for a period of months and then returning to the shuttle. Bonnet said there is a lot of interest in EURECA among European scientists. —ws

Biedenharn is new editor of mathematical physics journal

Lawrence C. Biedenharn of Duke University has been appointed the new editor of the *Journal of Mathematical Physics*, which is published by AIP,

effective 1 July. Biedenharn succeeds John Klauder of AT&T Bell Labs, Murray Hill, who was with the journal for 6½ years and is now secretary of the International Union of Pure and Applied Physics.

Biedenharn has worked primarily on general applications of symmetry to quantum physics. He was chairman of the *Journal of Mathematical Physics* review committee that recommended elimination of page charges for the journal. That recommendation has been accepted, and starting January 1986, no page charges will be made and no free reprints will be supplied to authors. (Page charges were eliminated for the *Review of Scientific Instruments* starting January 1985.)

Submissions for the *Journal of Mathematical Physics* should go to Lawrence C. Biedenharn, Editor, JMP, Science Drive, Duke University, Durham, NC 27706.

Science journalist Patrusky wins an AIP writing award

Ben Patrusky is the winner this year of the AIP Science Writing Award in Physics and Astronomy given to a journalist. The award was made to Patrusky in recognition of his article "The Wandering Continents," which was published in the *World Book Year Book*.

Educated at City College of New York and Columbia Journalism School, Patrusky currently is director of the Council for the Advancement of Science Writing "Horizons of Science" briefings. He is a contributing editor to *Science* 85, and he has written for *Mosaic*, the *Newsday* Sunday magazine supplement, and *Signature*, in addition to doing seven major features for *World Book's Science Year* since 1979.

East German physicist released by US in East-West exchange

As part of the exchange of four East Europeans imprisoned in the US on espionage charges for 25 Western agents held in jails in East Germany and Poland, Alfred Zehe, a solid-state physicist from the University of Dresden, was freed on 11 June. Zehe had been sentenced last April to eight years in prison for buying classified US Navy documents from a civilian double agent seeking money for the papers (PHYSICS TODAY, May, page 79). The papers Zehe received described Navy antisubmarine and communications systems that were even then considered no longer significant to national security.

Zehe had been arrested in November 1983 at the Boston meeting of the

American Vacuum Society. He entered a guilty plea last February after he was informed by US authorities that it would facilitate his release to East Germany. The State Department indicated that Zehe was central to the exchange—described by officials as the “biggest spy swap since World War II”—because East Germany considered him a victim of circumstances. “As an academic, he had been recruited by his government to review the technical importance of the papers, but he had no part in making the arrangements,” said his lawyer, Harvey A. Silverglate of Boston. “Zehe was caught up in a situation his government had created. He was personally devastated by the episode. Zehe is a tragic figure.” —IG

Education

Job market remains strong for graduating physics majors

Few changes showed up in AIP's 1983–84 Survey of Physics and Astronomy Bachelor's Degree Recipients. The total number of recipients rose modestly for the fifth consecutive year to 4878, which is 6% higher than in 1974–75. Just over half of the 1983–84 degree recipients planned to continue with graduate study in physics or some other field, while 40% planned to work in civilian or military jobs. Of the students planning to work, nearly 90% had at least one offer by the time of graduation. Median monthly salary offers were highest at Federally funded research centers (\$2200), with industrial and service jobs just slightly behind, and lowest for high-school teaching (\$1200).

Because of concerns about secondary physics instruction, the latest survey asked what type of high-school physics coursework the bachelor's recipients had, if any. Of the more than 2000 degree recipients who answered, 25% had taken PSSC, 12% Project Physics, 46% some other physics course, and 17% none. The number of degree recipients without high school physics appears to be about twice as high now as it was ten years ago.

Copies of the 1983–84 Survey of Physics and Astronomy Bachelor's Degree Recipients can be obtained free from Susanne D. Ellis, Manpower Statistics Division, American Institute of Physics, 335 East 45th Street, New York, NY 10017.

Medal established in memory of P. A. M. Dirac

The International Centre for Theoretical Physics has established a Dirac Gold Medal to honor the memory of

P. A. M. Dirac (see *PHYSICS TODAY*, January, page 111). The medal will be awarded annually to recognize the highest achievement in theoretical physics and will be announced each year on 8 August, Dirac's birthday. The selection committee for 1986 consists of Stig Lundquist, Goteborg University; Robert Marshak, Virginia Polytechnic; Abdus Salam, International Centre for Theoretical Physics; Julian Schwinger, University of California, Los Angeles; Léon Van Hove, CERN, Geneva; and Steven Weinberg, University of Texas, Austin.

Education

Society of Physics Students elects Askew president

Raymond F. Askew (Leach Nuclear Science Center, Auburn University, Alabama) was elected president of the Society of Physics Students Council for a two-year term. He has served as at-large member of the executive committee, twice as councilor for zone 6 and as chapter adviser at Auburn University. Donald F. Kirwan (University of Rhode Island) was appointed to a three-year term as at-large member of the executive committee. Kirwan is the new editor of *The Physics Teacher*. In addition, T. Michael Davis (North Georgia College) was elected as the new councilor for zone 6. Gary P. Agin (Michigan Technological University), Robert W. Green (Morningside College, Sioux City, Iowa) and Philip T. McCormick were reelected as councilors for zones 8, 9 and 12, respectively.

in brief

A new quarterly, the *Journal of Molecular Electronics*, was launched this winter by John Wiley & Sons Ltd. Wiley is soliciting papers on the preparation, characterization and properties of molecular materials, as well as their actual and potential applications. For a sample copy of the new quarterly, which will be sold for £65 per year, contact John Wiley & Sons Ltd, Journals Department, Baffins Lane, Chichester, Sussex PO19 1UD, UK.

A report on materials research programs funded by the Energy Department, as of 30 September 1984, is available from DOE. The report, “Materials Sciences Programs, Fiscal Year 1984” (DOE/ER-0143/2), can be obtained from the Division of Materials Sciences, ER-13, Mail Stop

G-226, GTN, US Department of Energy, Washington, DC 20545 or from the National Technical Information Service, US Department of Commerce, Springfield, VA 22161.

A Materials Referral System and Hotline has been established at the Materials Preparation Center, Ames Laboratory, Ames Iowa, by the DOE Office of Basic Energy Sciences, Division of Materials Sciences. Most services are intended to support DOE programs, but they are also available to the general research community. The computerized data base is operational, and services are provided at no charge. For further information, contact the manager of the hotline, Tom Wessels, at (515) 865-8900 or FTS (Federal Telephone System) 865-8900.

A nontechnical information packet with information about how to find and observe Halley's comet during 1985 and 1986 is available from the Astronomical Society of the Pacific. The packet includes a 36-page pamphlet with charts and schedules. It can be obtained for \$4 from ASP, Comet Packet Department, 1290 24th Avenue, San Francisco, CA 94122.

Susan Marie Tholen, a junior majoring in physics and mathematics at the University of Kansas, has been selected as the first recipient of the Society of Physics Students Scholarship (*PHYSICS TODAY*, December 1984, page 65). Tholen is president of the local SPS chapter, a flourishing unit, and plans to work toward a PhD in physics. She works as a research assistant in a space plasma physics group and recently presented a paper at a meeting of the American Geophysical Union.

A new Institute of Materials Science has been created at the University of Antwerp as a joint venture involving 14 laboratories and research groups. The participants plan to share experimental equipment of increasing complexity and cost. For further information, contact J. Devreese, University of Antwerp, Universiteitsplein 1, B-2610 Wilrijk-Antwerpen, Belgium.

Pergamon Press has introduced a new *International Journal of Plasticity*. The intention is to provide a vehicle for articles that have been scattered in journals of mathematics, mechanics, engineering and materials science. The journal is to appear quarterly, and the editor-in-chief is Akhtar S. Khan, School of Aerospace, Mechanical & Nuclear Engineering, University of Oklahoma. Subscription information can be obtained from Pergamon Press, Maxwell House, Fairview Park, Elmsford, NY 10523. □