AMERICAN INSTITUTE OF PHYSICS

AIP IN 1988: AN ANNUAL REPORT

The institute launched a new magazine, expanded and relocated its Education Division, reorganized the publishing branches, adopted new objectives and released a study on high school physics.

A *New York Times* article by Edwin McDowell on 2 February 1989 was headlined "Top Books of 1988: Spies and Physics." Did he say physics? Yes. Best-seller lists in 1988 included Stephen Hawking's *A Brief History of Time* and James Gleick's *Chaos: Making a New Science.* Two books by Richard Feynman were selling well—*Surely You're Joking, Mr. Feynman* and *What Do* You *Care What Other People Think?* And there were other notable physics and astronomy books as well, such as Michael Riordan's *The Hunting of the Quark* and Richard Preston's *First Light*, both winners of AIP Science Writing Prizes.

Even apart from books, physics was a part of public consciousness to an extent perhaps greater than at any time since just after World War II. Prominent in the news were the Superconducting Super Collider, the greenhouse effect, industrial competitiveness, treaty verification, high-temperature superconductivity, nuclear power, missile-defense technologies, and a brand new pulsar. Physics even came up in connection with the detection of terrorist bombs (sniffer dogs are not enough; neutron activation is needed too).

Physicists (and other scientists), like it or not, must be statesmen as well as scientists, educators of the public as well as educators of the next generation of researchers. Individual societies have reacted to these realities by broadening the scope of their services and support for their members. The American Institute of Physics likewise continues to enlarge the ways in which it fulfills its mission of service to its member societies, to individual scientists, and to students and the public. In 1988 AIP:

- ▷ enlarged its publishing program and launched a new magazine, *Computers in Physics*
- ▷ enlarged and relocated its Education Division
- ▷ undertook major externally funded education projects
- ▷ established guidelines for public-policy activities
- ▷ gained approval to establish a Development Office to augment private funding of member society and AIP projects
- ▷ established a new International Affairs Committee
- ▷ developed a Long-Range Plan whose five-year goals and objectives were approved by the Governing Board
- ▷ completed extensive internal reorganization—in publishing, information technology and human resources—in order to meet its broadened responsibilities more cost-effectively and with greater "customer satisfaction."

Submitted by Kenneth W. Ford, AIP Executive Director and CEO, and accepted by the AIP Governing Board as its annual report to the AIP member societies in March 1989.

1988 HIGHLIGHTS

The table on page 48 shows various measures of AIP growth from 1987 to 1988 (for five-year trends, see the figures on pages 49, 50 and 52). The institute is financially healthy, and it is serving an increasing number of member and nonmember subscribers with more pages of journals and more books.

Publishing. In September 1988 Robert E. Baensch joined AIP as Director of Publishing, replacing Robert H. Marks, who left after 18 years of service for a position with the American Chemical Society. Following Baensch's arrival, Darlene Carlin was named to a newly created position, Director of Journal Publishing, in which she oversees the work of three publishing branches. Carol Fleming, formerly with the American Physical Society, joined the institute to head one of these branches. Publishing priorities include more cost-effective production, new capabilities for future electronic publishing and

AIP Objectives*

1. To provide high-quality, cost-effective, timely production services for AIP and Society journals, books, and other publications.
2. To publish research and education publications.
3. To identify and address problems in the public understanding of science.
4. To identify and address problems in science education at the pre-college and university levels.
5. To provide efficient managerial, financial, and other administrative services to the Societies.
6. To promote full communication of ideas and opinions among members of the national and international physics community.
7. To develop full and reliable information on the past, present, and projected future circumstances of physics, physicists, and their environment, and provide this information to the physics community and to science policy makers and others in the public whose actions are likely to affect the physics community.
8. To provide sales, marketing, and information services in order to disseminate widely physics publications and programs.

* Approved by the Governing Board, October 1988

LORRAINE DeCANDITIS/AIP

Robert Baensch, AIP's Director of Publishing, confers with Darlene Carlin (standing), Director of Journal Publishing, and Carol Fleming, Director of the Publishing III Branch, which handles most of the American Physical Society's journals.

major growth in the books program.

Information technology. Early in 1988, Timothy Ingoldsby joined AIP to fill a newly established position, Director of Information Technology. His responsibilities include managing all computer-support functions and helping to chart the institute's future in the "information age." During the year, an expanded staff, working with new hardware and software tools, brought the new Fulfillment and Member Information System (FAMIS) close to completion. A go-ahead decision on a new computer composition system was reached, and there was progress on a "new, improved" PINET (AIP's online service).

Education. In the fall of the year, the Education Division moved from Long Island to AIP's Washington office, with a mandate to expand beyond its traditional role of managing the Society of Physics Students and the related Sigma Pi Sigma honors society. Donald Kirwan, the division's new manager, is vigorously pursuing new initiatives in education, including Operation Physics, which provides training for elementary and middle-school teachers. In New York, John Rigden, Director of Physics Programs, oversees two projects that received National Science Foundation funding in 1988: the Introductory University Physics Project (IUPP) and Project SEER (Science Education for Equity Reform). Jorge Barojas joined AIP as its second Senior Education Fellow.

Human Resources. In 1988 Theresa Braun was promoted from Manager of the Personnel Division to Director of Human Resources. The promotion reflected the institute's recognition of the critical importance of human-resource issues in the success of its programs. Throughout the year, an Employee Advisory Committee provided useful advice to management, following up on an employee opinion survey conducted late in 1987. With the aid of a consulting firm, a compensation study got under way in 1988 and will be completed in 1989. Management and staff alike have worked harder at improved two-way communication.

Planning. In October 1988 the Governing Board reviewed a Long-Range Plan brought to it by the Executive Committee and a staff committee chaired by Spencer Weart, Director of the Center for History of Physics. The Board adopted the objectives (see the box on page 47) and goals in the plan. The plan provides a realistic look at the institute's strengths and weaknesses as well as the threats and opportunities inherent in AIP's operating environment. It also provides a better framework than AIP has had in the past for guiding future choices. At the same meeting, the Governing Board approved a set of guidelines for AIP's public-policy activities and approved establishing a Development Office.

UPDATE ON ISSUES

The 1987 Annual Report listed a dozen issues facing the institute. All were long-range, sure to remain alive on AIP's agenda. Many of them are now friendlier, less worrisome issues because in 1988 they were seriously addressed. This section of the report provides an update on these issues. Only the first of them looks as daunting this year as last. (Several of the issues are highlighted

Measures of growth

Quantity	1987	1988	Percent change
Dollar volume of activity	$47 million	$55 million	+17
Net revenue	$1.6 million	$1.8 million	+12
Total fund balances	$21.7 million	$24.5 million	+13
Revenue from private and government sources	$439 000	$605 000	+38
Number of employees	530	540	+2
Membership in member societies	88 931	92 354	+4
Number of pages published	160 600	173 400	+8
Active book titles			
Conference proceedings	162	179	+10
Other books	21	25	+19
Number of subscriptions billed	291 000	305 700	+5

in the preceding section.)

Locations and space for AIP activities. The year 1988 was a time for reassessing space questions, following the Governing Board's decision in late 1987 to allow more time for discussions within AIP and with the member societies. Divergent views on the board precluded an early consensus. As of the end of 1988, AIP and its resident societies occupied a total of about 145 000 square feet in five buildings—two on Long Island, two in New York City, and one in Washington—with no space to spare. During the year, space pressure was relieved by the move of the Education Division to Washington and the move of the *Computers in Physics* editorial office from New York to Long Island. In addition to the upkeep costs on the two buildings it owns, AIP spends over $1 million per year in rent. Space pressure is likely to intensify, so the issue of locations and space for AIP activities is sure to require renewed attention in 1989. One avenue being explored is construction of a new building on the 11 acres that AIP owns in Woodbury, New York—a step that can be taken only with approval of the Town Board of Oyster Bay.

Impact of the computer. The year was one of dramatic turnaround, in which threats were transformed into opportunities. The current year will see a new subscription-fulfillment and member-record system, an enhanced PINET with electronic mail, a new computer composition system and improved office automation.

Planning. The 1988 Long-Range Plan provides a better basis for future decision making and for the development of individual operating plans for AIP's branches and divisions.

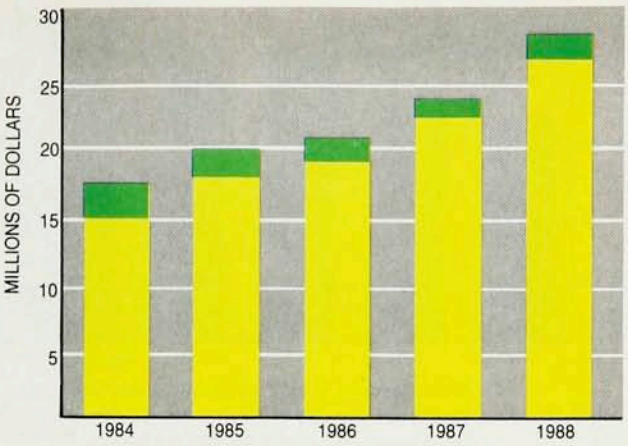
Society services and society relations. Responding to the advice of the Committee on Society Services, AIP planned a new format for the March 1989 Assembly of Society Officers. The Long-Range Plan and the guidelines for public-policy activities both helped to define AIP's roles relative to society roles. During the year, AIP officers made an effort to visit more society meetings and PHYSICS TODAY assigned a new staff member the special responsibility of improving coverage of the member societies. Better customer relations is a theme that AIP's management is stressing repeatedly.

Organization and management. Major changes included the restructuring of Publishing and the creation of the Information Technology Branch.

Physics education. Most adults know little science, and most children seem to be learning even less science than their parents. These facts underscore a growing concern for science education on the national agenda. (Our newly elected President has said he hopes to be remembered as the "Education President.") In 1988 AIP enlarged and strengthened its educational activities. In cooperation with its member societies, the institute must maintain a long-term commitment to helping improve physics education—in schools, in colleges and for the public.

Fund raising. In fund raising, as in many other areas, the respective roles of AIP and its member societies must be carefully delineated. In 1988 an advisory committee made up of society representatives concluded that AIP should establish a Development Office to assist the societies and AIP in raising more external funds for educational projects, prizes, buildings and general endowment. In October, the Governing Board approved the office and established guidelines for its operation. The Development Office will be established in 1989.

Public-policy activities. Based on a new consensus and Board-approved guidelines, AIP will be engaged in the public-policy arena through expanded activity in three of its existing divisions.



AIP income. The green bars represent costs, and green plus yellow income. These amounts exclude business conducted for the member societies, which exceeded $20 million last year.

▷ At PHYSICS TODAY a second person has been added to the magazine's Washington Bureau for broader reporting on the Washington scene.

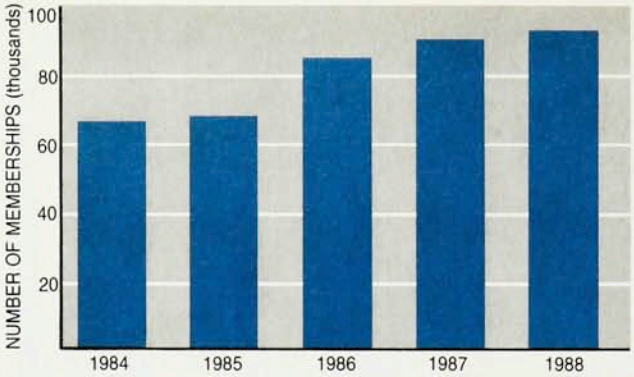
▷ The Education Division, as part of its expanded responsibilities in its new Washington home, will keep abreast of science-education issues in the Federal government and serve as a conduit of two-way information flow between policy-makers and physics educators.

▷ The Public Information Division is establishing a new two-person branch in Washington to provide a better information-gathering capability and to offer services such as the management of Congressional Science Symposia.

International activities. AIP is of course already very much an international organization, with authors and readers all over the world; ongoing business relationships in Germany, the United Kingdom, the Soviet Union, Japan, Sweden and Israel; and journal distribution to third world countries. A new advisory committee chaired by E. Leonard Jossem of Ohio State University will explore other international ties. This committee has recommended to the Governing Board that a new category of membership called International Associate be established.

New products and services. Research journals have long been the backbone of AIP's information services, and will no doubt continue to be so. Yet diversification in products and services is essential if AIP is to fully serve the physics community in the years ahead. Planning for a much-enlarged books program was begun in 1988. A new magazine, *Computers in Physics*, was launched. Seed money from IBM enabled the institute to begin its Physics Academic Software program, whose editor is John Risley at North Carolina State University. Work went forward on enhancements to the PINET online service. The Xyvision composition system, whose purchase was authorized in 1988, will provide a solid base for future electronic publishing.

Human resources. Many elements are needed for a satisfied, productive work force: adequate compensation, good working conditions, open communications, responsiveness to employee concerns, and "morale"—that intangible but essential spirit that ties staff members to one another and to the organization. AIP continues to work on



Membership in AIP member societies has increased steadily in recent years. The data have been adjusted to avoid counting duplicate memberships.

all of these elements: in part through concrete actions such as creating the new position of Director of Human Resources, commissioning consultant studies and offering programs of management training; in part through a myriad of small steps—meetings, memos and face-to-face talks—designed to stimulate more community spirit and a greater customer orientation. It is a truism (that is to say, an obvious yet profound truth) that an organization is made of people. Like the hedges and flowers in your yard, they require constant nurturing.

Intellectual property rights. The fact that some organizations help themselves to AIP's abstracts and bibliographic information without payment remains troubling, but is something that the institute to date has not pursued in court. In 1988 AIP concluded an agreement with Fachinformationszentrum (FIZ) in Karlsruhe, West Germany, granting to FIZ exclusive rights to reproduce and sell AIP's abstracts in the physics marketplace. As part of this ongoing business relationship AIP markets *Physics Briefs*, the printed version of the FIZ physics database, in North America. The electronic form of the database, called PHYS, is available on line through STN International.

PRODUCTS AND SERVICES

Journals, magazines and books

In 1988 the publishing operation of the institute was reorganized into three branches: Publishing I, comprising the Production I and Scientific Classification Divisions; Publishing II, consisting of the Proofreading–Page Makeup and Keyboarding Divisions; and Publishing III, made up of the Production III and Composition III Divisions, which are responsible for most of the American Physical Society journals.

AIP journals. AIP's strategy has been to maintain the highest quality for the six journals that it owns, allowing them to grow in size as the number of meritorious submitted articles grows, rather than to launch new journals at frequent intervals. In 1988, however, the diversity of subject matter in *Physics of Fluids* suggested a logical division into part A (fluid dynamics) and part B (plasma physics). Publication of the separate parts began in January 1989 under the editorships of, respectively, Andreas Acrivos and Fred Ribe.

Among AIP's journals, only the *Journal of Mathematical Physics* (Lawrence Biedenharn, editor) showed some decline in its number of pages in 1988. Growth occurred in the *Journal of Applied Physics* (Lester Guttman, editor), *Applied Physics Letters* (Gilbert Perlow, editor), *Review of Scientific Instruments* (Thomas Braid, editor), and the *Journal of Chemical Physics* (John Light, editor). For the six publications, a total of 45 400 journal pages were produced, an 11% increase over the 40 900 journal pages produced in 1987. In addition, *Review of Scientific Instruments* published its second five-year index, covering 1983–87.

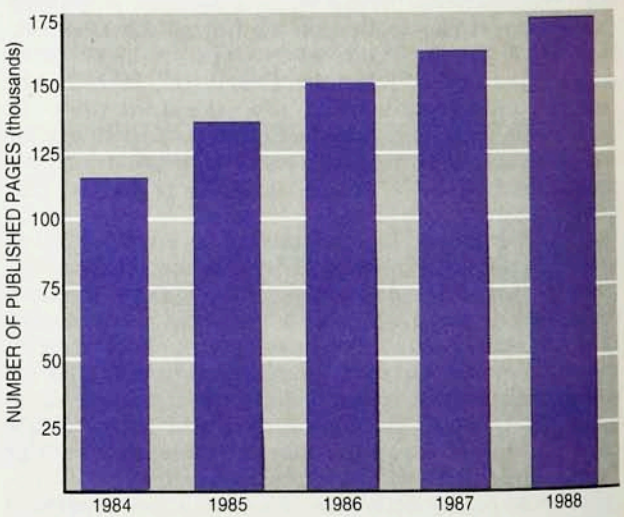
To compose the AIP journals, as well as many books and special reports, three in-house computer systems were used: Atex, Datapoint and the Kurzweil "intelligent scanner." Final photocomposition of pages took place on a new typesetter purchased in 1988—a VideoComp 570. The search for a composition system with many enhancements, including automatic page makeup, was concluded in 1988 when the purchase of a Xyvision system was authorized. The first phase of implementation for the new system is to occur in 1989, the final phase in 1990.

Society journals. Publishing I Branch produced seven journals for five AIP member societies and one for an affiliated society (not counting translation journals). Publishing III Branch provided editorial and composition services for publications of the American Physical Society: *Physical Review A–D*, *Reviews of Modern Physics*, *Bulletin of the American Physical Society* and *Physical Review Abstracts*. Some 50 000 journal pages were produced for APS in 1988, an 11% increase over the 45 000 APS journal pages produced in 1987. For the other societies (still excluding translation journals), the number of pages produced grew 10%, from 19 500 in 1987 to 21 400 in 1988.

AIP and APS worked together to produce Volume II of *High-Temperature Superconductivity*, a second collection of papers from AIP and APS journals. Because of a strong demand for Volume I, it was reprinted. The 1988–89 edition of AIP's very successful *Directory of Physics and Astronomy Staff* was mailed as Part II of the December issue of the APS *Bulletin*.

Using its UNIX system, Composition III Division continued to compose all journals of the APS except *Physical Review Letters*. A limited number of author-prepared articles were accepted for APS publications: as camera-ready copy, ready for paste-up; as keystrokes prepared on the author's UNIX system and submitted on magnetic tape; or as keystrokes prepared for input to the UNIX system, submitted on an MS-DOS-formatted disk.

Because of requests by authors in the physics commu-



Total pages published by AIP came to nearly 175 000 in 1988.

Finn Aaserud (left), an associate historian with the Center for History of Physics, conducts an oral history interview with Emanuel R. Piore.

nity, the APS Liaison Office and AIP's Publishing III Branch undertook research and development on a TeX math and text typesetting system. Software to enable acceptance of TeX-based author-prepared compuscripts was installed for projected use in the first quarter of 1989.

Copublished journals. The *Journal of Physical and Chemical Reference Data*, copublished by AIP and the American Chemical Society for the National Institute of Standards and Technology, grew by 47%, from 2 820 pages in 1987 to 4 160 pages in 1988.

Translation journals. AIP published the English-language versions of 19 journals from the Soviet Union and two from China. Two of the 19 Soviet journals were published for the Optical Society of America; one of the two Chinese journals was published jointly by AIP and OSA. The year saw publication of the proceedings of a meeting on superconductivity of the USSR Academy of Sciences, issued as a supplement to the *Journal of Experimental and Theoretical Physics Letters*. The number of translation pages held steady at about 29 000 in 1988.

Early in 1988 AIP officers journeyed to the Soviet Union and completed a renewal agreement with VAAP, the Soviet copyright agency, for continued translation and English-language publication of 19 journals. Because of the success of the Soviet translation program, AIP was able to agree to higher royalty payments to the Soviets while assuring the continued viability of the program. An interesting new feature of the VAAP–AIP protocol was an agreement by the two organizations to cosponsor a series of annual scientific conferences, to be held alternately in the two countries. The first of the series will be a conference on chaos scheduled for July 1989 in Woods Hole, Massachusetts.

As the technical publishing capabilities of the Soviet Union grow, more joint ventures can be expected, in which the parties more equally share the work, the risks and the potential net income.

Physics Today. At the end of 1988, PHYSICS TODAY's circulation stood at 106 000, with 18% of the copies being shipped outside the United States. Three special issues were published during the year: Space Science in May, Lasers in October and Disordered Systems in December.

The Reference Frame column, which began early in 1986, continued to grow in popularity. Newcomers as columnists were David Mermin, who began a series on how we communicate in physics, and Victor Weisskopf, who teamed up with regular columnist Herman Feshbach to write about quantum mechanics.

The February issue carried an article by Richard Feynman, "An Outsider's Inside View of the Challenger Inquiry." That same issue carried excerpts from a discussion of physics research in industry, which the magazine organized and held in Washington. The October issue carried replies from two Presidential candidates to questions submitted by PHYSICS TODAY.

Soviet authors are appearing more frequently. Roald Sagdeev, until recently Director of the Space Research Institute in Moscow, wrote two articles published in 1988—"Soviet Space Science" in May and (with Alexander Chernikov and George Zaslavsky) "Chaos: How Regular Can It Be?" in November.

Computers in Physics. The first full year of publication for *Computers in Physics*, edited by Robert Borchers, was capped by an honor from the Association of American Publishers. The magazine–journal was named Best New Journal in the field of Science–Technology–

Subscription-fulfillment billing statistics for 1988

	Number of invoices	Number of subscriptions	Value of billing*
Members billed			
Spring	40 400	31 000	$ 3 600 000
Fall	39 400	21 700	2 700 000
On membership (included in dues)	—	180 000	—
Nonmembers billed			
Subscription agency	8 400	44 000	25 700 000
Direct to AIP	3 000	29 000	11 900 000
Total	91 200	305 700	43 900 000

*Includes dues

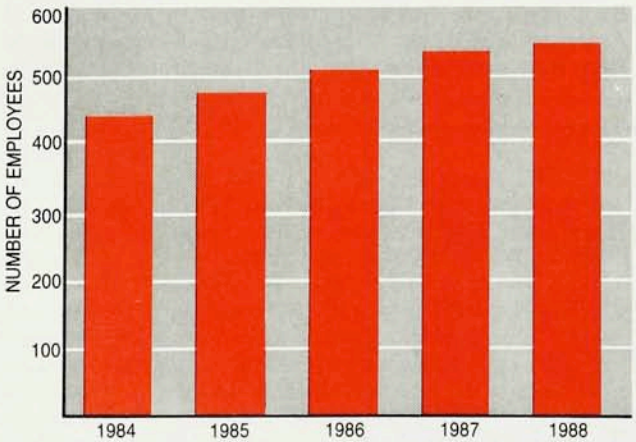
External sources of funding for AIP projects (gifts, grants and dues)

Source	AIP Division	Total funds	1988 Amount
NSF	Physics History	$233 400	$ 35 500
NSF	Physics Programs	490 500	50 800
Laser Institute	Physics History	22 100	7 200
Pew Charitable Trust	Physics Programs	85 900	85 900
Sloan Foundation	Physics History	30 000	11 500
National Endowment for the Humanities	Physics History	56 200	25 000
MacArthur Foundation	Physics History	97 100	97 100
Friends of the Center	Physics History	23 300	23 300
Allied Corporation Foundation	Physics Programs/SPS	5 500	5 500
Corporate Associates	(Dues)	112 000	112 000
SPS Membership	Education (Dues)	86 400	86 400
Sigma Pi Sigma	Education (Contributions)	64 900	64 900
		$1 307 300	$605 100

Medicine. Circulation reached 12 600, a good start toward the goal of 20 000. Advertising space sales averaged 19 pages per issue, a respectable beginning.

AIP's new Director of Publishing, Robert Baensch, led an intensive market research and analysis effort to assess the performance of *Computers in Physics* in the first year. Baensch, Borchers, AIP staff members and the publication's editorial advisory board convened in San Francisco to establish positive new strategies in both the marketing and editorial arenas for 1989. In the future, board members will be taking a more active role in inviting and selecting "Special Feature" articles. A variety of new regular departments have also been planned, including reviews of scientific software and "how to" columns by leading physicists.

Scientific classification. On 1 April, the document analysis and classification functions at AIP were separated from the Information Services (computer) operations with the creation of the Scientific Classification Division. This new division operates under the umbrella of the Publishing I Branch in close coordination with the companion Production I Division; the Scientific Classification Division's activities also have considerable overlap with other publication and information technology branches. It is composed of two sections, PACS and Scientific Document Classification.



The total number of AIP employees has increased by about 100 in the five years since 1984.

The PACS section is responsible for maintenance and revision of AIP's Physics and Astronomy Classification Scheme, which is the institute's primary tool for the production of journal subject indexes and *Current Physics Index*. This section also serves to coordinate other national and international physics classification systems with AIP's classification efforts. To this end AIP was actively involved in 1988 with the International Council for Scientific and Technical Information in the development of an updated International Physics Classification System. AIP also continued to maintain a cooperative relationship with the Department of Energy's Office of Scientific and Technical Information and with Germany's Fachinformationszentrum (FIZ) regarding classification specifications, operations and quality control.

The division's other section, Scientific Document Classification, is responsible for indexing all journal articles that go into the AIP database. This process involves the assignment of "keyword" descriptor terms from a composite DOE-FIZ Thesaurus in addition to PACS classification codes. In addition to a small in-house staff that handled about 70% of the approximately 36 500 articles processed in 1988, many outside consultants were involved in this classification effort.

Books and reports. In 1988 the Books Division added 17 books to AIP's Conference Proceedings series (bringing the series up to number 180). It also published a proceedings volume based on the 1987 joint meeting of the International Union of Pure and Applied Physics and the AIP Corporate Associates, and one on neural information processing systems. Several monographs, including some translated from Russian, were issued. Among the new books published in 1988 were *Quantum Physics in America* by Katherine R. Sopka, *Physical Optics of Ocean Water* by K. S. Shifrin, *On The Glassy Sea* by Tom Gehrels and *Error Estimation in Reactor Shielding Calculations*, edited by V. P. Maskovich.

The AIP–Tomash series on the History of Modern Physics now includes 11 titles, the most recent being a republication, in both English and German, of Max Planck's *Theory of Heat Radiation*. Henri Poincaré's *Celestial Mechanics* is the next book scheduled for publication in this series.

Within AIP's publishing branches, special projects sections are responsible for a wide variety of AIP and member society publications, including books, membership directories, meeting programs, special reports, brochures, and indexes. In Publishing I alone, the special

projects section produced 77 publications in 1988.

Microform products. AIP offers both microfilm and microfiche versions of all of the journals and magazines that it publishes (including those of the member societies and the translation journals). These microform products generated revenue of about $500 000 in 1988. The institute anticipates growth in sales of these and other nonprint products.

Marketing-related services

Advertising. In 1988 more than 2000 pages of advertising appeared in the seven AIP and member society publications whose advertising is managed by AIP. *Computers in Physics* carried 112 ad pages in its first full year of publication. AIP continued to solicit ads for the Japanese-language magazine *Parity* (published by the Maruzen Company), which uses excerpts from PHYSICS TODAY as well as original articles of its own. Beginning in 1988, advertisers in PHYSICS TODAY were offered the opportunity to run the same ad—at a modest surcharge—in *Physics World*, the new monthly publication of the Institute of Physics in the UK. The fifth annual PHYSICS TODAY *Buyers' Guide* appeared as a separate volume for the second time and carried a record-breaking 73 pages of ads.

Exhibits. AIP continued to organize, sell and manage exhibits for the Acoustical Society of America, the American Physical Society, the American Vacuum Society and the Materials Research Society.

Marketing and sales. The Marketing Services Division launched *Computers in Physics* with a series of full-color magazine advertisements, 15 exhibits at professional meetings and ten mailings, including a full-color direct-mail packet to 50 000 scientists, engineers and mathematicians. Reaching outside the physics community, a direct-mail campaign promoting PHYSICS TODAY was directed at public libraries with significant budgets for scientific materials. Links with the UK's Institute of Physics became stronger in 1988. In a new agreement, IOP was granted exclusive marketing rights to distribute AIP books outside the United States and Canada. In this country, AIP introduced four new IOP journals: *Nonlinearity*, *Journal of Radiological Protection*, *Engineering Optics* and *Superconductor Science and Technology*.

Cooperation with the German database service FIZ also grew stronger. Three new discount packages were introduced to promote FIZ's *Physics Briefs*.

Information technology

SPIN. For a number of years AIP has prepared its printed journal indexes and abstracts as byproducts of its computer-based composition of articles. The digitized information is then made available to selected database vendors to enable online, interactive searches for research information. SPIN, as AIP's tape service is called (an acronym for Searchable Physics Information Notices), is available for online searching on the Dialog Information Retrieval Service. AIP also provides SPIN to FIZ every two weeks at a rate of some 25 000 abstracts annually. The AIP information is merged into the PHYS database by FIZ and is then available for online searching on STN International. AIP continues to provide the US Department of Energy with abstracts of energy-related articles, and in 1988 it sold SPIN tapes to several large organizations for in-house use.

During 1988 AIP and FIZ completed negotiations for an agreement, to take effect in 1989, that grants to FIZ exclusive rights to market AIP bibliographic information online to the physics community. The agreement strengthens the business relationship between the two organizations and adds further incentive for AIP to help market FIZ products.

CECELIA BRESCIA/AIP

Publication of a high school physics survey provides occasion for mutual congratulations in the Education and Employment Statistics Division. Seated in the center is Beverly Porter, manager of the division, and standing from left are Roman Czujko, assistant manager, Maude Covalt, a coauthor of the survey report, and Michael Neuschatz, the principal investigator on the survey.

PINET and PIMAIL. For these two on-line services, 1988 marked the end of a trial period of several years. Enhancement of both services and their combination into a single PINET mail and database service mounted on a more substantial computer "platform" will take effect in 1989. Despite limited marketing, there was a significant increase in PIMAIL usage in 1988, attributable mostly to increased participation in the group accounts. The number of active users, not including AIP staff, went from 26 in January to 105 at year end.

At the same time, PINET experienced a decline in usage. As of December there were about 180 log-ons per week from a regular user base of about 350 people. The new PINET, to be implemented in 1989, will offer improved search capability, more flexible navigation among the different services, and an advanced electronic-mail service linking users to Bitnet and some 75 other networks.

Physics Academic Software. This project, with John Risley as its Editor, was launched late in 1987 with seed-money from IBM. Its purpose is to offer peer-reviewed software, with uniformity of style and user interface, for college physics. The first software packages will be offered for sale in 1989.

Membership and subscriber services. As of January 1989, what had been the Subscription Fulfillment Division became the Member and Subscriber Services Division, reflecting a new emphasis on enhanced membership services. Later in 1989 the division will be reorganized to provide more efficient work flow under the new Fulfillment and Member Information System (FAMIS).

Because of AIP's unhappy experience trying to

develop a new fulfillment system using an outside software firm, FAMIS was developed in-house and under great time pressure, beginning after a new Information Technology Branch was created and Timothy Ingoldsby was appointed to head it in 1988. The project task force consisted of personnel from the Production Systems Division, the Systems Development Division and the Member and Subscriber Services Division. Parallel operation of the new FAMIS system (utilizing Wang hardware and Oracle software) and the old UNIVAC/Data General system was scheduled for late March 1989.

Billing services were provided in 1988 for eight member societies. The total value of the 1988 billing was approximately $43.9 million, of which approximately $37.6 million was for nonmember subscribers. Billing statistics for calendar year 1988 are shown in the table on page 51.

Beginning with calendar year 1989, airfreight services were included in the foreign subscription price of nonmember subscriptions to the Eastern Hemisphere. Members of member societies still had the option of electing either airfreight service or sea mail service.

Computer systems. The Systems Development Division was created in 1988 to coordinate all aspects of computer-related development. Its principal responsibilities are development of new computer applications and provision of a research and development capability for the investigation of new technologies. The group consists of nine programmers, trained to support AIP's standard for application development, and two support persons. Applications use the Oracle relational database management system and the C and COBOL programming languages.

Beyond the major effort on FAMIS, a lengthy search for a new composition system was completed in 1988 with the selection of a Xyvision product. The Systems Development Division will be instrumental in phasing in the new photocomposition system for use in journal and book production.

Information technology innovation. AIP's Production Systems Division was involved in analyzing and tracking new trends in computer technology, and will help to keep AIP in the forefront of cost-effective new technology. Standardization on highly portable software products, such as the C language and the relational Oracle database, will ensure protection of AIP's software investment over a wide range of potential hardware.

With the addition of the Wang Systems and local area networks, AIP enhanced its office automation capabilities. Video-based training systems provided employees with cost-effective instruction on new technology.

Physics Programs

Education Division activities. The year 1988 was one of dramatic change for the Education Division. In September, Donald Kirwan was appointed as the new Division Manager, and in the same month the division moved from Long Island to Washington. Kirwan had numerous staff members to hire, some because of not-unexpected staff turnover, some to fill newly authorized positions. By year end, the division was a stronger going concern in its new home. The division's initiatives include:

▷ planned revisions of out-of-date or out-of-print publications on physics careers, educational opportunities and division programs

▷ closer interaction with the division's counterparts in the member societies

▷ studies of ways to involve retired physicists, other than in classroom teaching, in helping solve the crisis in physics education

▷ a pilot program in conjunction with the American Association of Physics Teachers to initiate a national network ofphysics clubs for high school students

▷ formation of an Education Advisory Committee

▷ bringing under the AIP umbrella the successful Operation Physics project. Operation Physics is a national project to improve the teaching and learning of physics concepts in the upper elementary and middle school grades. This project, supported in part by the National Science Foundation, had been operated by the University of Rhode Island, Louisiana State University and San Diego State University.

Until September, the primary function of the Education Division was management of the Society of Physics Students. During 1988, SPS membership expanded to 7 741 students in 556 chapters in 49 states, the District of Columbia, Puerto Rico and Canada. There are 378 chapters of Sigma Pi Sigma, the physics honor society.

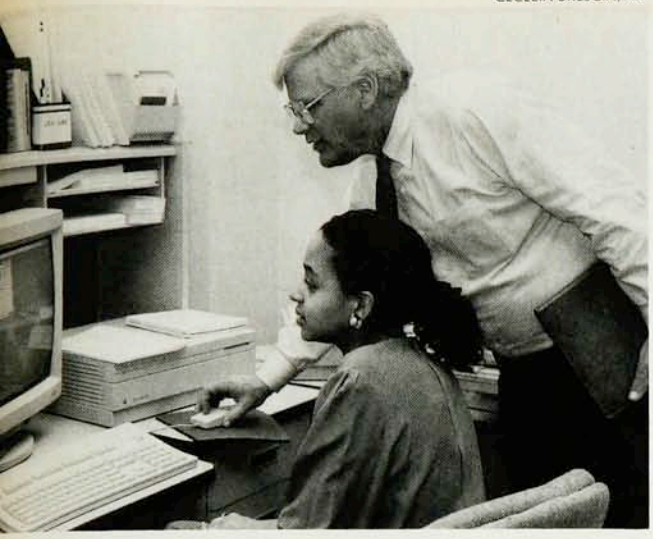
Three $1000 SPS Scholarships were awarded to outstanding undergraduate students, and the Outstanding SPS Chapter Advisor Award was presented to William B. Law of the Colorado School of Mines. Members of SPS continued to receive the *Journal of Undergraduate Research in Physics* and PHYSICS TODAY as membership benefits.

Other educational activities. A pilot project is under way in Arizona, California and Texas to form a network of science centers in two-year colleges. These centers will organize community activities relating to the physical sciences: astronomy, chemistry, geophysics and physics. In coordinating this project, AIP's Senior Education Fellow, Jorge Barojas, is working closely with the American Chemical Society and several AIP member

LORRAINE DeCANDITIS/AIP

At AIP's annual Publication Board meeting, which was held this year in Lancaster, Pennsylvania, Rosalind Nissim, Managing Editor, Production I, dines with Andreas Acrivos, the editor of *Physics of Fluids A*, and Fred L. Ribe, the editor of *Physics of Fluids B*. The journal was divided into the two sections in 1988.

CECELIA BRESCIA/AIP



Donald Kirwan, newly installed at AIP's Washington office as Manager of the Education Division, observes *SPS Newsletter* editor Tanya Noboa as she works on new desktop publishing system.

societies—the American Association of Physics Teachers, the American Geophysical Union, the American Astronomical Society and the American Physical Society.

The Introductory University Physics Project, managed by AIP with the cosponsorship of the American Physical Society and the American Association of Physics Teachers, is attempting to identify reforms needed in the calculus-level introductory course in physics to make it a better introduction to the subject as well as a more effective course for all the constituencies it serves. Science Education for Equity Reform is an AIP project whose purpose is twofold: to improve science instruction, in both qualitative and quantitative terms, at the elementary-school level, and to achieve a condition of equity that allows full educational opportunity for each child regardless of gender or ethnic origin. Both IUPP and SEER are supported by the National Science Foundation.

Center for History of Physics. The historical record of how multi-institutional collaborations have been carried out—for example, in particle physics—is in danger of being dispersed and forgotten. Under new grants, AIP's History Division began a large-scale study of the problem in 1988. Documentation of the history of geophysics picked up speed, with the collection of written autobiographical information and oral history interviews. This work included a case study of the dinosaur extinction controversy and a new program surveying eminent senior geophysicists in all fields. Other surveys gathered extensive information on eminent nuclear physicists and on the role of physicists in national policy making. AIP is providing assistance to Peter Galison of Stanford University, who is producing a carefully documented television film on the advent of the hydrogen bomb. Finally, a book-length history of solid-state physics went to press, and one on lasers in America neared completion.

Scholars are often unaware of the rich historical source materials already available. Under a new grant the History Center's staff will gather information on unpublished materials at repositories around the world and prepare this information for computerized access. As a first step, in 1988 information on the Niels Bohr Library's own manuscript collections was put on the Research Libraries Information Network, the national online library database.

Education and Employment Statistics. In October the Education and Employment Statistics Division released its first publication to come out of a three-year project on secondary-school education, carried out in collaboration with the American Association of Physics Teachers. *Physics in the High Schools: Findings from the* 1986–87 *Nationwide Survey of Secondary School Teachers of Physics* is a 66-page report highlighting the background characteristics of teachers, their conditions of employment, their professional development interests and activities, and their approaches to and experiences in physics teaching.

The statistics division published a report on the salaries of society members and four reports on physics enrollments and new degree recipients. A compendium of figures relating to changing demographics and their effect on the physics community was sent to all participants in the AAPT–APS February meeting of physics department chairs.

The 1988 Physics Faculty Workforce Survey was the second in a series, initiated in 1986, to monitor the supply of faculty candidates in different physics subfields. It was conducted in conjunction with the Committee on Opportunities in Physics of the American Physical Society. A continuing scarcity of condensed matter experimenters was noted.

The statistics division has frequently documented the paucity of women among physics degree holders and in the physics labor force, a long-term concern of the physics community. In 1988, research directed at examining the validity of role-model and mentor theories was initiated. Working in coordination with the APS, the division established a one-year demography internship to gather data on this issue. The division's staff, in addition to looking at its own data and data from member societies, is studying national data resources in close cooperation with staff at the National Academy of Sciences and the National Science Foundation.

Career Placement. The Career Placement Division managed placement centers at the January meeting of the American Association of Physics Teachers and the American Physical Society in Crystal City, Virginia; at the March APS meeting in New Orleans, Louisiana; at the Materials Research Society spring meeting in Reno, Nevada; at the APS spring meeting in Baltimore, Maryland; at the APS Division of Plasma Physics meeting in Hollywood, Florida; and at the MRS fall meeting in Boston, Massachusetts. The ratio of applicants to jobs at these centers increased from an average of 1.6 applicants per job in 1987 to 2.0 in 1988. A survey of employers participating in the placement centers from January 1986 through April 1988 showed that over 200 applicants were either hired or offered positions as a result of contacts made at the centers.

At the end of 1988 about 800 applicant files were registered in AIP's Employment Referral Service. Distribution of the *Summary of Open Positions* and the accompanying newsletter to chairs and employment information officers of physics departments continued at a rate of 2300 per month. Announcements in the *Summary* were also posted on PINET.

Personal career counseling continued, including programs for the physically handicapped. The Career Placement Division continued its efforts to encourage secondary schools to take an active role in the placement process, and focused on providing more complete services to bachelor's degree recipients. A pilot project was initiated to heighten interest in science among minority students from the middle school level. Project SEEP (Students to Explore

AMERICAN INSTITUTE OF PHYSICS INCORPORATED
BALANCE SHEETS

	1988 (unaudited)	1987 (audited)
Assets		
Current Assets		
Cash and short-term cash equivalents	$ 9 901 603	$15 163 609
Marketable securities, at cost	63 300	58 607
Accounts receivable, net of allowance for doubtful accounts of $50,500 ($47 100 in 1987)	2 103 882	1 983 376
Due from member societies	325 177	115 657
Prepaid expenses and other current assets	1 298 773	1 117 125
Total Current Assets	13 692 735	18 438 374
Deferred production expenses	813 079	748 575
Property, plant and equipment, at cost, less accumulated depreciation of $7 219 119 ($6 547 374 in 1987)	6 860 375	6 520 910
Long-term investments in marketable securities, at cost	21 090 287	17 413 687
Other assets	293 758	284 069
Total Assets	$42 750 234	$43 405 615
Liabilities and Fund Balances		
Current Liabilities		
Trade accounts payable	$ 581 818	$ 332 585
Accrued expenses	2 910 435	3 008 353
Due to member societies	417 304	3 259 328
Current maturities of long-term debt	48 603	44 767
Deferred income	2 362 459	3 213 549
Total Current Liabilities	6 320 619	9 858 582
Deferred subscription income	10 062 819	9 957 618
Long-term debt	1 827 164	1 879 979
Total Liabilities	18 210 602	21 696 179
Fund Balances		
Unrestricted, Board-designated for special purposes	17 851 002	15 550 093
Net equity in property, plant and equipment	4 984 608	4 596 164
Restricted	1 704 022	1 563 179
Total Fund Balances	24 539 632	21 709 436
Total Liabilities and Fund Balances	$42 750 234	$43 405 615

and Experience Physics) was planned for the San Francisco Middle School District at the AAPT–APS annual joint meeting in January 1989 (see PHYSICS TODAY, May, page 67).

Public Information. The Public Information Division helps to disseminate physics information to the general public, reporters, students, teachers, and libraries, and it provides a number of services to AIP member societies. In 1988 AIP reached the public through "Science Report," a series of radio programs about physics-related research. Sixty two-minute programs were sent to more than 500 radio stations around the country.

Science journalists were kept abreast of the latest physics developments through *Physics News in 1988*, part of an annual series of reviews of physics research highlights. The information division operated three newsrooms at physics meetings and held three seminars for science writers. One of the seminars was on the three "supers"—superconductivity, the Superconducting Super Collider, and Supernova 1987A; one was on news coverage of superconductivity research; the third was on physics and the brain. The Division cooperated with AIP member societies in numerous ways: in publicizing meetings, in disseminating news about officer elections, in designing printed materials and in passing along news clips (more than 6000 in 1988) concerning member society activities.

The Public Information Division served students through the distribution of career brochures (more than 7700 pieces mailed in 1988) and posters encouraging high-school students to enroll in a physics course.

Prizes and awards. AIP sponsored three science writing awards in 1988. The winner of the award for a children's book was Gail Kay Haines for *Micromysteries: Stories of Scientific Detection*; the journalist winner was Richard Preston for his book *First Light*; and the award for writing by a scientist was given to Michael Riordan for *The Hunting of the Quark*.

The second recipient of the Andrew Gemant Award was Freeman Dyson of the Institute for Advanced Study for "his creative writing on science, art and society in which he blends wide experience, deep physical understanding, and imaginative insight, producing books of high artistic merit, read and enjoyed by a wide public."

The 1988 Dannie Heineman Prize for Mathematical Physics, sponsored by AIP and the APS, went to Julius Wess of Karlsruhe Technical University and Bruno

AMERICAN INSTITUTE OF PHYSICS INCORPORATED
STATEMENTS OF REVENUE AND EXPENSE
(Excluding Activities for Member Societies)

	Year Ended December 31 1988 (unaudited)	1987 (audited)
Operating Revenue		
Publishing operations		
Subscriptions	$17 017 530	$14 796 069
Voluntary page/article charges	1 666 669	1 496 290
Advertising sales	3 658 893	2 953 804
Single copy and microfilm sales	1 087 644	991 275
Member society contributions	217 606	204 352
Other	1 138 937	1 040 289
	24 787 279	21 482 079
Program operations		
Grants, exhibits and other income	469 267	371 836
Physics programs	300 835	278 948
Corporate Associates contributions*	112 000	202 760
	882 102	853 544
Other operations		
Special Projects	68 071	51 412
Other	433 201	362 940
	501 272	414 352
Total Operating Revenue	26 170 653	22 749 975
Operating Expenses		
Publishing operations	20 175 124	17 893 598
Program operations	3 263 360	3 113 620
General and administrative	2 714 417	1 565 188
Other	397 841	356 318
Total Operating Expense	26 550 742	22 928 724
Net operating revenue before short-term investment income	(380,089)	(178,749)
Short-term investment income-NET	721 740	689 048
Net Operating Revenue	341 651	510 299
NON-OPERATING REVENUE		
Long-term investment income-NET	1 502 179	1 095 203
EXCESS OF REVENUE OVER EXPENSE	$ 1 843 830	$ 1 605 502

*1987 figure includes IUPAP contributions

In addition to the expenses shown in this statement, AIP expended approximately $28 million in 1988 to provide society services. These expenses were fully reimbursed by the societies. Including services provided to the societies, AIP's total operations in 1988 amounted to approximately $55 million. The 1988 net revenue of $1 843 830 was added to the institute's liquid reserves.

Zumino of the University of California, Berkeley. The 1988 Dannie Heineman Prize for Astrophysics, sponsored by AIP and the American Astronomical Society, went to Professor James E. Gunn of Princeton University.

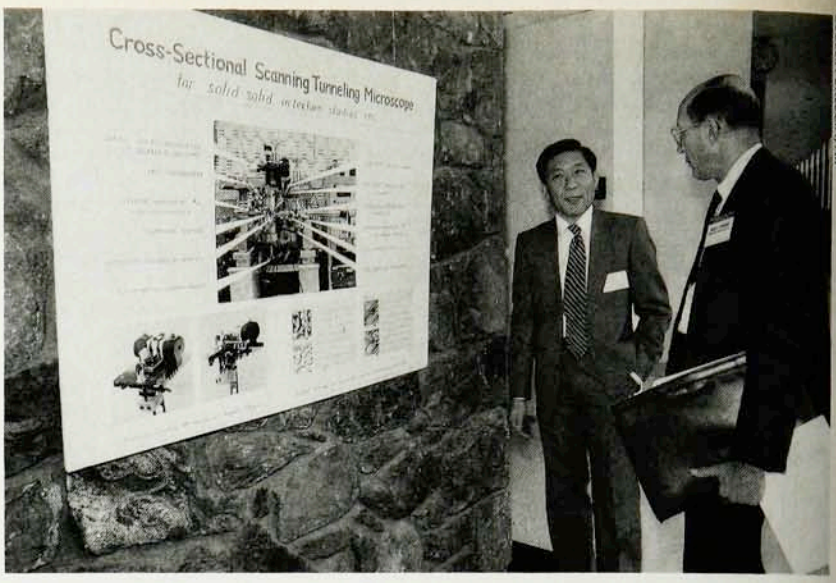
Finance and Administration

Human Resources. In 1988 the Personnel Division of the Human Resources Branch sponsored training and information sessions for AIP staff in areas as diverse as financial planning, interviewing and hiring, quitting smoking, losing weight, and avoiding AIDS. AIP's 1988 Blood Drive was very successful, with 120 staff in Long Island and New York City participating. Also offered were free flu shots and free cholesterol and blood pressure testing.

The year also saw the publication of a new Employee Handbook, the opening of new AIP offices in Plainview, New York, and a reorganization of the Personnel Division. At the end of 1988, AIP staff totaled 550, with 413 in Woodbury and Plainview, 130 in New York City, and 7 in Washington, DC.

Building facilities. In a never-ending effort to make optimal use of AIP's owned and leased facilities, the following units were relocated: *Computers in Physics* to Woodbury, the Publishing I Branch office and the Scientific Classification Division to rental space in Plainview, and the Education Division to Washington. These moves, together with the 1987 changes and the move of the Books Division to 140 East 45th Street, have made it possible to expand at Woodbury the APS Liaison office, the ASA Secretary's office, and the Production III, Composition III and Personnel Division offices, and to enlarge the APS offices at 335 East 45th Street in Manhattan. Six additional offices were leased in the American Geophysical Union's building in Washington to accommodate the institute's growing DC-based activity.

Accounting. During 1988 the Accounting Division continued its support of AIP operations, paying more than 550 employees twice each month and issuing more than 12 000 checks to vendors. Installation of three major computer systems in prior years allowed the reporting of accounting information on a more timely basis. Only one accounting function remained to be computerized, that being the job order system. Several members of the accounting staff attended seminars during the year to increase their skills in payroll accounting and supervision.



CECELIA BRESCIA/AIP

Julian Chen of IBM discusses microscopy with Frank Jamerson of General Motors Research Laboratories during AIP Corporate Associates meeting, held in October 1988 at IBM's Thomas J. Watson Research Center in Yorktown Heights, New York.

The five groups of auditors who examined our records during the year turned up no serious problems.

Budgeting. For the first time in 1988, AIP had a fully computerized budgeting process. The in-house work on it was done by Neil Plumer, Charles Walt and William Attick.

Publication Billing. In 1988 the Publication Billing Division added another function to its already extensive list of activities. The Plainview facility now houses a mini-warehouse: To make single copies of popular titles more readily available to AIP customers, quantities of various publications were stored in the Publication Billing offices and shipped directly from there.

Early in 1989 personal computers were phased out as a means of processing single-copy sales. New software was developed in-house that enables the division's staff to process orders on the Data General computer. This will afford greater flexibility for the timely processing of orders.

Investments. The purpose of the institute's investment portfolio is to build reserves for designated goals in the Building Fund, Equipment Fund, Physics Programs Fund and Publication Fund. During 1988 the institute's investment portfolios grew from $16 154 389 to $19 724 735. The designated goals for the reserve funds total approximately $30 million.

Outside funding. Grants, gifts and dues received in 1988 are summarized in the table on page 57. As indicated in the table on page 57, these external funds were substantially greater in 1988 than in 1987. At year end the institute's endowment funds totaled approximately $1 700 000. During the year the Executive Committee approved a new policy setting a normal limit of 5% on annual spending from endowment funds.

Public and world affairs

Public-policy activities. In May AIP named as its first Congressional Fellow Arthur Charo of Harvard University. He accepted an assignment with the Office of Technology Assessment in the fall, where he works independently of AIP, in much the same way that fellows of some 20 other science and engineering societies operate. In June 1988 the Executive Committee approved a two-year extension of the Congressional Fellowship program.

AIP's Committee on Public Policy recommended strengthening AIP's ability to serve its member societies in the public-policy arena. The need for better two-way communication between physicists and public officials is clear. In October the Governing Board approved a set of guidelines for AIP public-policy activities. One measure taken in 1988 was the addition of a second staff person to PHYSICS TODAY's Washington office as an editorial assistant.

A Congressional Science Seminar on Superconductivity was held in May 1988. The Committee on Public Policy has recommended continuation of such seminars for Members of Congress and their staffs. Throughout 1988 the institute continued to furnish complimentary copies of PHYSICS TODAY to members of Congress with cover letters drawing attention to items of interest.

Corporate Associates. AIP's annual Corporate Associates meeting was held in October 1988 at the IBM Research Center in Yorktown Heights, New York. It was attended by over 180 people, including leaders from industry, heads of graduate physics departments, AIP Governing Board members and staff members, and government officials. The meeting's general theme was the physical limits to computation. In 1988 more than 90 companies were Corporate Associates.

International activities. In 1988 more than 41% of the articles published in AIP-owned journals came from abroad, and more than 22% of subscriptions went to foreign addresses. AIP is very naturally a part of the internationalism that has always characterized physics.

A new International Affairs Committee, headed by Leonard Jossem, met in September 1988, with AIP's Director of Physics Programs, John Rigden, serving as staff liaison. The group recommended a new International Associate category of membership (for members of foreign physical societies). In addition it endorsed the idea of an international journal of physics education and agreed to investigate current activities of member societies and other organizations regarding distribution of books and journals to developing countries.

In 1988 AIP again accepted fund-raising responsibility for the International Physics Olympiad, managed by the American Association of Physics Teachers. Through the combined efforts of AIP and AAPT, about $100 000 was donated for the program. The US team of high school students came home from the competition in Bad Ischl, Austria, with three silver medals and one honorable mention. ■