

AIP IN 1989: AN ANNUAL REPORT

The institute inaugurated a new computer composition system, negotiated several new joint ventures with the Soviets and cosponsored a US-Soviet conference on chaos, joined in the publication of a children's science magazine, and established a public information office in Washington, DC.

A paradox of physics in these times is that the public is increasingly interested in reading about it while young people in schools and colleges are less and less interested in studying it. A 1989 AIP report, *Who Takes Science?*, gives disheartening statistics on the study of mathematics and science by high school students. Another AIP report published in 1989, *Enrollments and Degrees*, shows that after a decade in which the number of bachelor's degrees awarded in physics was inching slowly back upward toward its 1970 level, that number turned down again.

Yet at the same time, the public seems to have an insatiable appetite for stories on cold fusion, elementary-particle theory (even in ten dimensions), the distribution of galaxies in the universe, the effects (if any) of 60-hertz radiation, black holes and seismic detection of nuclear explosions—to name a few topics that got attention last year. One of those who helped to meet the demand for information was Robert Park, an unusually skilled expositor and executive director of The American Physical Society's Office of Public Affairs. Through his weekly newsletter, "What's New," and his numerous newspaper articles, he reached countless decision makers, science writers, physicists and other citizens in 1989.

Another seeming paradox is that while the average attainment of American high school students in science and mathematics remains distressingly low, the attainment of our very best students ranks with the best in the world. In 1989 Steven Gubser, a seventeen-year-old from Englewood, Colorado, finished first among 150 competitors from 29 countries in the International Physics Olympiad in Warsaw, Poland. In the few years of US participation in the Physics Olympiad, our teams have performed with distinction.

The American Institute of Physics, through its Physics Programs Branch, concerns itself with physics education in at least three ways: through statistical studies of students and teachers, through programs designed to improve education in schools and colleges, and through direct education of the public. In 1989 the institute made significant contributions in all three of those ways. Public education, in particular, got a boost with the addition of a print version of *Science Report* (previously a radio version only) and the planned launch of

a video version. Listeners, readers and viewers of *Science Report* will all be numbered in the tens of millions.

AIP's mission—to serve the sciences of physics and astronomy by serving its member societies, by serving individual scientists and by serving students and the general public—is accomplished through a variety of avenues, as this annual report will emphasize. One of those avenues, publishing, dominates the income and expense statement and accounts for the bulk of AIP employees. The net revenue from publishing makes possible almost all of the other things that AIP undertakes in fulfilling its mission. Publishing requires constant analysis and nurturing from two complementary perspectives: business and service. Because of its central importance and because of the many changes that took place in it in 1989, publishing is featured in this annual report.

1989 HIGHLIGHTS

The table on page 46 shows various measures of AIP change from 1988 to 1989 (for five-year trends, see the figures on pages 47, 48 and 49). The institute had a strong bottom line in 1989 (see the balance sheet and financial statement on pages 54 and 55). Both fiscally and programmatically, it is in good health.

Strong finances provide no reason for complacency. The institute must constantly work at cost-effectiveness and customer service. It must look for new products and services and keep abreast of information technology. In 1989, alert to these considerations, AIP found ways to trim publishing costs without compromising quality; it established new links with the Soviet Union; it expanded its books program, strengthened *Computers in Physics* and introduced a powerful new electronic service, PINET; and it planned a development office to help find more support for AIP and society programs from private sources.

Some highlights of 1989:

- ▷ A new computer composition system (Xyvision) was tested, debugged and brought into operational service by year's end.
- ▷ A new fulfillment and member information system, FAMIS, was brought nearly to completion, and its predecessor system, operating on an aging Univac computer, was decommissioned.
- ▷ Off-premises keyboarding—much of it done by employees who cannot commute but are willing to work at home—was expanded and found to be cost-effective.
- ▷ PINET was linked to Bitnet and Internet; more than 750 users signed up in its first quarter of operation.

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 1990.



Telemarketing is a new, cost-effective sales technique initiated by AIP in 1989. Chris Verdesi (seated) and Franc Lacinski of the Marketing Services Division contact physics educators, booksellers and distributors to keep them up to date on AIP titles.

- ▷ Several joint ventures with the Soviets, including a large dictionary project, were initiated.
- ▷ AIP and VAAP, the Soviet copyright agency, jointly sponsored a Soviet-American Conference on Chaos, held in Woods Hole, Massachusetts.
- ▷ A new marketing agreement with Britain's Institute of Physics was completed.
- ▷ An agreement was concluded for AIP to take over publication of the *Journal of Rheology* from Wiley, on behalf of the Society of Rheology.
- ▷ The first products of the *Physics Academic Software* program were marketed.
- ▷ Book fulfillment was moved to American International Distribution Corp in Vermont.
- ▷ AIP joined the American Chemical Society in publishing the children's magazine *WonderScience*.
- ▷ Public Information established a branch office in Washington to monitor and to keep the physics community informed of Federal activities.
- ▷ New senior staff joined the books program and the marketing-sales program to spearhead growth in those areas.
- ▷ Detailed operational plans were completed by most units of AIP.
- ▷ The Placement Division increased its services to bachelor's degree recipients and to immigrant scientists,

and it launched programs to motivate children to study science.

▷ Arthur Bent joined the institute as Treasurer and Chief Financial and Administrative Officer.

▷ Financial performance was stronger than budgeted.

NEW DIRECTIONS IN PUBLISHING

Under the leadership of Robert Baensch, AIP's publishing program extended its reach in 1989 in a number of ways. Many of the achievements are highlighted above. Divisional realignments and production efficiencies at the Long Island Publishing Center resulted in record-breaking on-time performance for journal publishing.

Publications Business Manager. To improve fiscal management of the publishing program, Paul A. Parisi (previously Manager of Special Projects) was named Publications Business Manager early in 1989. Preparing publications budgets, monitoring the performance of various AIP branches and divisions under those budgets and reviewing current printing contracts (as well as negotiating new ones) are some of his charges. The net revenue from AIP-owned journals and translation journals has grown steadily—from \$2.3 million in 1982 to \$6.4 million in 1989 (more than a doubling in constant dollars).

Measures of change

Quantity	1988	1989	Percent change
Dollar volume of activity	\$55 million	\$60 million	+ 9
Net revenue	\$1.8 million	\$2.1 million	+ 17
Total fund balances	\$24.4 million	\$26.4 million	+ 8
Revenue from private and government sources	\$ 605,000	\$ 1,220,000	+ 102
Number of employees	540	555	+ 3
Membership in member societies*	103,300	107,900	+ 4
Number of pages published	175,600	185,800	+ 6
Active book titles			
Conference proceedings	179	201	+ 12
Other books	25	49	+ 96
Number of subscriptions billed	305,700	253,800	- 17 ¹

*Number of memberships at 30 June. Persons belonging to more than one member society are counted more than once.

¹ In 1989 The American Physical Society billed for its own members' subscriptions.

Institute of Physics. Under a new agreement covering the United States and Canada, AIP began marketing and distributing the books of the Institute of Physics in 1989. This supplements an existing agreement for journals. AIP will be handling about 75 new book titles in 1990 and more than 300 backlist titles. In a reciprocal agreement, IOP has been AIP's exclusive books marketing agent outside the United States and Canada since 1988.

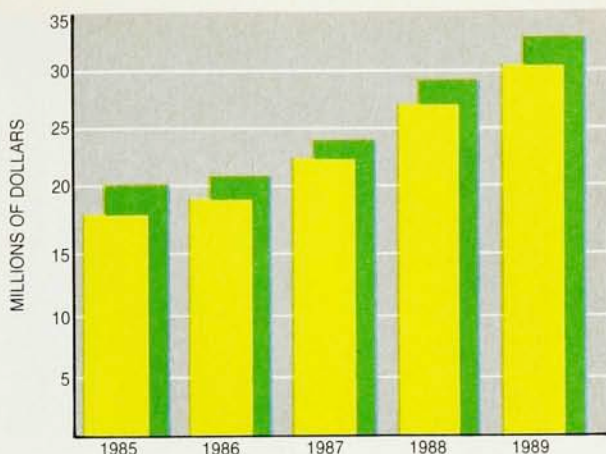
With the addition of the IOP book list, AIP's Marketing Division launched a major series of direct-mail campaigns in topical areas such as optics, condensed matter, medical physics, plasma physics, astronomy and astrophysics, as well as large mailings promoting titles of general interest to physicists. The division increased its participation in conference exhibits from 17 in 1988 to 25 in 1989, and it plans for 36 in 1990.

Books warehousing and distribution. In mid-1989, AIP reached an agreement with American International Distribution Corp in Vermont under which AIDC provides AIP—and several of the member societies, as well as IOP—with warehousing and distribution for books. Included in AIDC's services are invoicing, credit, collection, packing, shipping and reporting. The new service saves money and time. AIDC's computer-generated reports are providing valuable sales and marketing information as well as data that enable AIP to set more accurate printing quantities for new books.

Sales Manager. Another new position, that of Sales Manager, was created for the purpose of building sales through library, wholesale, retail and subscription agency channels. Dale Cunningham, appointed to this position, has initiated telemarketing in the AIP sales program. A cost-effective method of generating revenue, telemarketing provides the physics academic community, booksellers and telemarketing distributors with current information about our titles through phone contacts. Such contacts can be used to encourage textbook adoption, solicit reviews and carry out academic market research. Additional benefits include the creation of a client database and enhanced recognition of AIP as a resource for publications. To support this program efficiently, the SaleMaker telemarketing software is now in use.

Books program. 1989 was a pivotal year for AIP's books program, combining strong growth in the number of titles published with important innovations in the program's structure and focus. During the year, 33 new books appeared, compared with 21 in 1988. Expansion of the books program occurred in four principal areas—monographs, texts, reference books and general-interest titles. Because of diversification and growth, a second Books Division was established, and Timothy Taylor joined AIP as the new Division Manager in mid-year. By year's end, the groundwork was laid for four new book series in mathematical physics, chemical physics, materials science and applied physics. A series of nontechnical writings by distinguished physicists was launched under the title "Masters of Modern Physics."

At international book fairs in Frankfurt and Moscow, AIP negotiated for a variety of projects with publishers from the Soviet Union, United Kingdom, France, Italy and Japan. The ongoing economic restructuring in the Soviet Union favors joint ventures (rather than straight translation rights with royalties, which was formerly the usual practice). In 1989 AIP entered into copublication arrange-



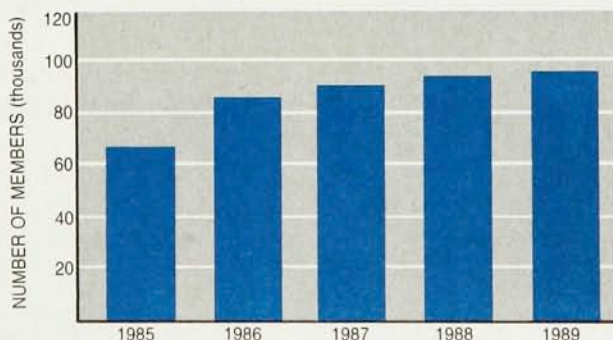
AIP income and expenses. The yellow bars represent expenses and the green bars represent income. These amounts exclude business conducted for the member societies and the Institute of Physics, which came to approximately \$29 million last year.

ments with Mir Publishers and with Nauka (the publishing arm of the Soviet Academy of Sciences). Also among the new ventures was an agreement with Russky Yazyk Publishers in Moscow for a computer-based Russian/English and English/Russian *Dictionary of Physics*.

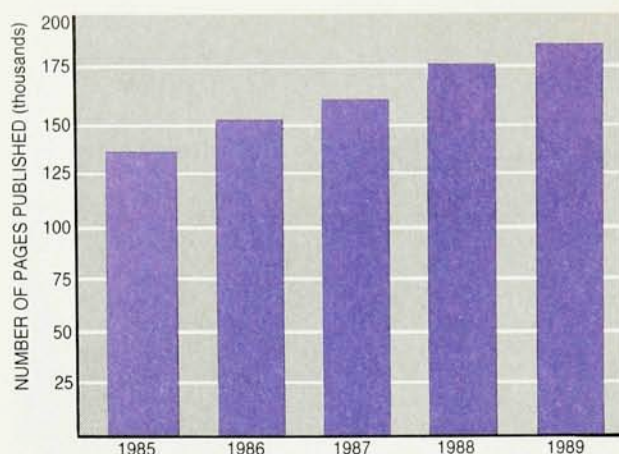
Books I Division, headed by Rita Lerner (until her retirement at the beginning of 1990), added 16 titles to AIP's Conference Proceedings series in 1989, bringing the series to 196 volumes. Several monographs were issued, including some translated from Russian, and new titles in the history of modern physics brought the AIP-Tomash series to 12 titles. Also, AIP produced a second edition of the popular *Physics Vade Mecum* under the new title *A Physicist's Desk Reference*.

Other 1989 activities in the books program were aimed at placing the program on an even firmer editorial and financial footing. These included drafting a long-range plan, introducing a new system of PC-based financial modeling and establishing joint working committees with the journal production and marketing divisions.

New Soviet ventures. Joint ventures with the Soviet Union were established for two new journals: *Superconductivity*, with the Kurchatov Institute of Atomic Energy, Moscow; and, with the Institute of Atmospheric



Membership in AIP member societies continued to rise in 1989. The data have been adjusted to avoid counting duplicate memberships.



Total pages published by AIP (in journals, books and reports) came to 185 800 in 1989.

Optics in Tomsk, *Atmospheric Optics*, which AIP is doing in collaboration with the Optical Society of America. The journals are published in Russian, translated into English by the Soviet institutes, and edited and distributed outside the USSR by AIP. This new form of collaboration brings with it a new set of problems as well as opportunities, as all parties face the challenge of producing a high-quality product that is economically viable.

A new feature of AIP's agreement with VAAP, the Soviet copyright agency, is a series of co-sponsored scientific conference/workshops, to be held alternately in the two countries. The first in the series, held in Woods Hole, Massachusetts, in July 1989, brought together 30 leading chaos researchers—20 from the United States and 10 from the USSR—for a week of valuable interaction.

JOURNAL PUBLISHING

The year 1989 was one of change and challenge for Journal Publishing, with a focus on efficiency and cost control. Director of Journal Publishing Darlene Carlin reorganized Publishing Branches I and II (which handle journals of AIP and member societies other than The American Physical Society): Proofreading and Copy Editing were joined, and Books and Special Projects Production were made into a division separate from Journal Production.

A major challenge was posed by the acquisition and implementation of a new composition system, Xyvision. From its March 1989 installation through year's end, the

emphasis was on testing and debugging this new system while maintaining schedules for the 120 000 pages produced in Branches I and II. Xyvision became an operational tool in January 1990.

Altogether, Publishing Branches I, II and III published 184 000 pages in 1989, about 5% more than the 175 000 pages published in 1988. (Branch III handles APS journals.)

AIP journals. AIP continued to stress high quality in the production of the seven journals it owns while striving to achieve more cost-effective procedures and methods. In 1988 *Physics of Fluids* was divided into Part A (fluid dynamics) and Part B (plasma physics); publication of these separate parts took place in 1989 under the editorships of, respectively, Andreas Acrivos and Fred Ribe. Total combined pages of A and B for 1989 amounted to 4904, an increase of almost 1000 pages over the 3960 journal pages produced in 1988.

Both *Applied Physics Letters* and *Review of Scientific Instruments* also registered strong growth in published pages. *APL* was up 9% in 1989, following a 17% increase in 1988; *RSI*, with the help of two conference proceedings, was up 45%, after a 12% increase the year before. AIP's largest journal, *Journal of Chemical Physics*, published more than 16 000 pages in 1989. The *Journal of Mathematical Physics* published a five-year index, covering 1984–88.

For the seven AIP-owned journals combined, a total of 46 700 pages were produced, up from the 45 400 pages produced in 1988. (The increase would have been more but for the appearance of conference proceedings in *Journal of Applied Physics* in 1988 but not in 1989.)

Two long-time editors relinquished their duties at the end of 1989: Gilbert Perlow retired from *Applied Physics Letters*, and Lester Guttman retired from *Journal of Applied Physics*.

Computers in Physics. In 1989 *Computers in Physics* repositioned itself editorially, in keeping with a strategy set early in the year by its editorial board, Editor Robert Borchers of Lawrence Livermore National Laboratory and AIP Director of Publishing Robert Baensch. In addition to putting an increased emphasis on coverage of desktop and medium-sized computers in physics, the magazine/journal introduced two new departments to enhance its coverage of the educational use of computers. "Computers in Physics Education" offers a broad range of reports on how computation is being integrated into physics curricula; "Computer Simulations" features tutorials in simulation methods suitable for the advanced undergraduate. Reviews of computer products by physicists, a new regular CIP feature, included Mathematica software and the NeXT computer system.

Member and subscriber services billing statistics for 1989

	Number of invoices	Number of subscriptions	Value of billing
Members billed			
On membership (included in dues)	—	160,000	—
Invoiced	41,000	21,800	\$ 3,500,000*
Nonmembers billed			
Through subscription agencies	8,500	45,000	32,600,000
Direct to subscribers	3,400	27,000	9,200,000
Total	52,900	253,800	\$ 45,300,000

*Includes dues



Xyvision, the new page-composition system, was introduced at AIP in 1989. Laurele Barton, Portia Hsiung and Cheryl Taub, shown left to right, work at a Xyvision terminal at the Long Island Publishing Center. The new system will eventually replace the current Atex system.

CIP also launched an Education Software Contest, and the first prizes will be awarded in mid-1990 for the finest physics education packages in a variety of categories. A special grand prize will be awarded for the best student-written entry.

Managing Editor Ben Bacon and staff moved from AIP's New York City offices to the Long Island Publishing Center, consolidating CIP's editorial and production departments. Paid circulation increased to 13 800 in CIP's second full year of publication.

Composition. To compose journals, books and special reports, four in-house computer systems were used: Atex, a Unix-based Vax, Datapoint and the Kurzweil "intelligent scanner." In 1990 about one-third of the Atex load will be picked up by Xyvision, and the complete transition from Atex to Xyvision is expected in 1991. Among other benefits, this will make it possible to accept electronic submissions from authors.

The year saw an expansion in off-premises keyboarding, from three persons at the beginning of the year to thirteen by year end. These "cottage-industry" employees work at home, using PCs provided by AIP, and they receive the same salaries and benefits as on-premise employees. In 1989 they processed 27 200 manuscript pages, or 9000 journal pages. This pilot work force will be augmented in 1990. On a trial basis, a limited amount of composition was also contracted out to a firm in Barbados.

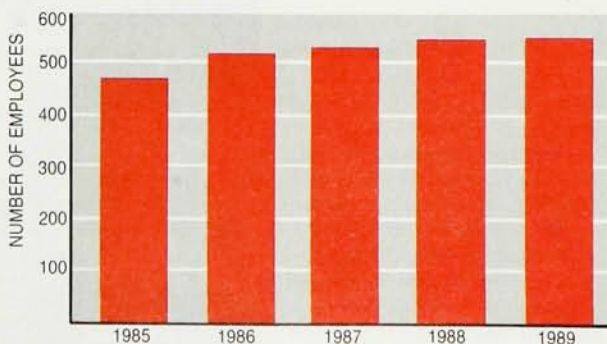
Publishing for APS. Publishing Branch III, dedicated to the publications of The American Physical Society, continued to handle *Physical Review A-D*, *Reviews of Modern Physics*, *Bulletin of The American Physical Society* and *Physical Review Abstracts*, as well as special projects. Total pages in these journals reached almost 61 000, of which 54 000 were produced in Publishing Branch I, an increase of 8% over 1988 (the remaining pages were produced at APS's Ridge, New York, publishing center). Branch III also carried out some internal restructuring, consolidating to provide fewer sections under more direct management.

In 1989 APS responded to increasing requests from their authors to accept TeX-based manuscripts. Upon completion of the research and development program, which included software enhancements, additional hardware and the writing of an input guide, production procedures were put in place in Branch III to accept TeX files on floppy disks or via electronic mail.

Other society journals. A new agreement was reached with the Society of Rheology to produce *The Journal of Rheology* commencing with the January 1990 issue. About 20 400 pages were published for member societies other than APS in 1989 (exclusive of society translation journals). A five-year index (1984-88) was published for the *Journal of the Acoustical Society of America*. In 1989 the *Journal of Physical and Chemical Reference Data* continued to be copublished by AIP and the American Chemical Society for the National Institute of Standards and Technology.

Translation journals. In 1989 the Translations Section was reorganized, and Maya Flikop was appointed to the new position of Manager of Translations. Helped by this reorganization, AIP was able to reduce production costs for the translation journals and to reduce the time delay between the appearance of a Russian-language journal and the appearance of its English translation. This time had typically been slightly more than six months. In the second half of 1989, it was reduced to just over five months. (See figure, page 50). For the program's 19 Soviet journals and one Chinese journal, 30 200 translation pages were published in 1989.

In the new era of *perestroika*, individual Soviet publishers are allowed to have direct contact with Western publishers. As a result, international competition involving the Soviets has increased markedly. AIP has reacted both through improvements in its existing



The number of AIP employees grew to 555 in 1989, an increase of about 85 since 1985.

translation program and through the initiation of several joint ventures structured in new ways.

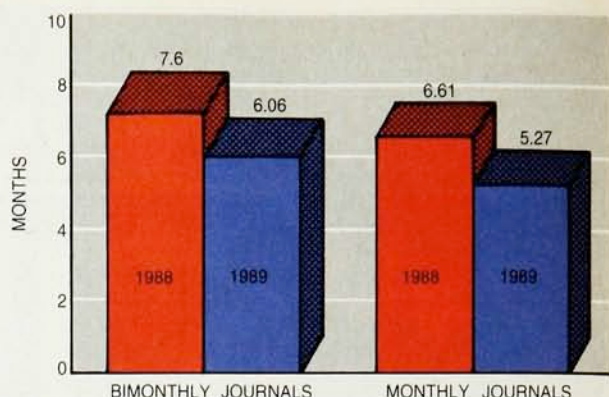
Scientific classification. AIP's Scientific Classification Division (consisting of a small in-house staff and a larger group of outside consultants) indexed more than 37 000 articles in 1989, about one-third of the world's physics and astronomy literature. The terms assigned by the staff—PACS (Physics and Astronomy Classification Scheme) codes and descriptor words—are added to standard bibliographic information to create the SPIN database. This database is searchable on AIP's PINET service, and it is also furnished to West Germany's Fachinformationszentrum, where it is incorporated into a worldwide physics database, PHYS, which is readily available for searching on STN International.

Through its membership in the International Council for Scientific and Technical Information, AIP has taken a leadership role in standardizing classification schemes used worldwide. The bilingual (English-French) ICSTI Classification Scheme for Physics, which was completed in 1989 and will be published in 1990, establishes agreement among AIP's PACS and the classification schemes used by INSPEC in England (for *Physics Abstracts*), by INIST in France (for *Bulletin Signalétique*) and by FIZ in Germany (for PHYS). The last time these schemes were in accord was in 1978.

Books and special projects. Because of the growth in the number and complexity of non-journal publications produced by AIP, a new division was formed in 1989: Books and Special Projects Production, headed by Larry Feinberg. The division's output of 91 publications, totalling 21 500 pages, encompassed books, membership directories, special reports, brochures and booklets for AIP divisions and member societies. Included were the annual *Graduate Programs in Physics, Astronomy and Related Fields* and the biennial *Directory of Physics & Astronomy Staff*.

INFORMATION PRODUCTS AND SERVICES

Marketing and sales. The Marketing Division continued its efforts for *Computers in Physics* with advertising,



Average production time for AIP translation journals was reduced by more than a month in 1989.

special promotions at professional meetings and direct mail. It promoted the recent addition of the *Journal of Rheology* to AIP's journal list, and it introduced six new journals for Britain's Institute of Physics: *Physics World*, *Journal of Physics: Condensed Matter*, *Liquids*, *Network*, *Quantum Optics* and *Nanotechnology*. It also promoted the initial offering of *Physics Academic Software*.

Cooperative efforts continued with the German database service FIZ, and STN International promoted new discount packages for *Physics Briefs*. In cooperation with Kinokuniya, AIP's journal agent in Japan, promotional campaigns were launched that increased circulation in Japan an average of 7% for nine selected journals.

The division's first comprehensive marketing plan was prepared in 1989. It systematically analyzed the market and AIP's products, and developed goals, operational plans and related budgets.

Advertising. In 1989, 2032 pages of advertising appeared in the seven AIP and member society publications whose advertising is sold and managed by AIP. Income was up 22%, which was a remarkable achievement

Norman Ramsey of Harvard University (center) chats with (left to right) Lawrence Valvo, Jeffrey Sciortino, Kristin Koch, Wayne Faruga and Daniel Crouse II, who are physics students at Fredonia College of the State University of New York. Ramsey's visit was arranged through AIP's Visiting Scientist Program in Physics.



DEBORAH A. LANNI



given that advertising in competing publications was down or flat at best. Ad pages in *Computers in Physics* were up 21% over 1988. AIP continued to sell ads in the Japanese-language magazine *Parity* (published by Maruzen), which uses excerpts from *PHYSICS TODAY* as well as original articles of its own.

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. The March APS show in St. Louis had 117 booths, an increase of more than 25% from the previous year. The MRS show in Boston was oversubscribed and had a waiting list. There were over 335 booths at the AVS show in Boston, making it the premier show in the industry. A new International Show on Physics and Electronics of Atomic Collisions, held 26-27 July 1989 in New York City, was managed by AIP on behalf of APS and others.

PINET. In September 1989, the newly redesigned PINET (Physics Information Network) went online. This marked the end of a three-year pilot phase that saw the concept grow from a test program displaying only AIP's job notices (which remains a popular service) to a comprehensive electronic communications and information service. The new PINET operates on a modern, Unix-based computer located at AIP's Publishing Center, and it can be accessed using a toll-free number from anywhere in the United States and Canada. New developments include electronic mail linked to Bitnet and Internet, an enlarged searching capability, five years of AIP's SPIN database, and tailored bulletin boards.

During its first three months of operation, PINET had more than 750 users. Several of the member societies have established group accounts for their staff and committee members. Efforts will continue during 1990 to broaden the support of the societies so that PINET truly serves the entire physics and astronomy community.

Special Programs. In order to give PINET the priority and attention that it needs, its management was incorporated into a new Special Programs unit, headed by Lawrence Merrill. This office will also engage in meetings management, providing support to other AIP units and offering meetings management service to member and

A magazine designed to introduce youngsters in grades 4 to 6 to the physical sciences, *WonderScience*, has been published by the American Chemical Society for several years. In 1989 AIP began copublishing the magazine with ACS.

affiliated societies. In 1989 planning began for a *Computers in Physics* conference to be held in the spring of 1991.

Information Technology. The Information Technology Branch was formed in 1988 to support all existing computer applications at AIP, to develop new applications and to advise the institute on future directions of information technology. Its most visible activity in 1989 was work on a new fulfillment and member-record system. But it did much more. The new branch supported the installation, testing and debugging of Xyvision; provided technical support for PINET; handled the SPIN database; managed all of the computer aspects of preparing several large directories; supported the growing array of PC-based applications and office automation; and carried on the major tasks of fulfillment, label production and subscriber/customer relations. (At the end of the year, operation of the Member and Subscriber Services Division was moved to Finance and Administration.)

FAMIS (Fulfillment and Membership Information System) was brought to near-operational status by the end of 1989, replacing an aging Univac batch processing system used by AIP since the early 1970s. It should achieve smooth, responsive operation in 1990. It will provide greater flexibility in information that can be stored and retrieved, and greater speed in processing. Societies that are served by the system can access it using computers and modems in their own offices.

SERVING PHYSICISTS, STUDENTS AND THE PUBLIC

In addition to its core business of publishing journals and books, and providing related information products and services, AIP undertakes a wide range of activities designed to serve physicists, students and the public. Most of these activities are encompassed within the Physics Programs Branch, headed by John Rigden. They are the subject matter of this section.

Physics Today. The magazine *PHYSICS TODAY* had 109 000 subscribers in 1989; 17% of the circulation was outside the United States. For the first time in recent years, *PHYSICS TODAY* achieved its goal of publication within the first few days of each month. Late in the year, Paul Hersch, former editor of *Solar Today*, joined the magazine as managing editor.

The special February 1989 issue in memory of Richard Feynman was especially well received. "Reference Frame" gained several new columnists: Vitaly Ginzburg of the Lebedev Institute, David Gross of Princeton University and Daniel Kleppner of MIT. Ginzburg was only one of several Soviet contributors to *PHYSICS TODAY*. Taking advantage of the new freedom that Soviet scientists have to travel and to write, Editor Gloria Lubkin obtained articles from Victor I. Balykin and Vladilen S. Letokhov, Ginzburg, I. M. Khalatnikov, Lev Okun and Evgeny Velikhov.

Career Placement. The Career Placement Division managed placement centers at five major meetings in 1989. The ratio of applicants to jobs registering or registered at the centers increased from an average of 2.0

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

Source	AIP Division	Total funds	1989 Amount
NSF	Physics History	\$ 218,300	\$ 166,600
NSF	Physics Programs	1,489,800	714,500
Laser Institute	Physics History	22,100	10,700
Sloan Foundation	Director's Office	25,000	25,000
Mellon Foundation	Physics History	79,000	8,900
National Historical Publications and Records Commission	Physics History	80,000	20,000
National Endowment for the Humanities	Physics History	49,800	23,500
MacArthur Foundation	Physics History	195,600	8,900
Friends of the Center	Physics History	9,700	9,700
Corporate Associates	Director's Office	108,000	108,000
SPS Membership	Education (Dues)	67,000	67,000
Sigma Pi Sigma	Education (Contributions)	56,800	56,800
		<u>\$2,401,100</u>	<u>\$1,219,600</u>

in 1988 to 2.4 in 1989. A survey of employers participating in the placement centers from January 1985 through April 1989 showed that more than 380 applicants were either hired or offered positions as a result of contacts made at the centers. At the end of 1989, about 900 applicant files were registered in AIP's Employment Referral Service. Distribution of the *Summary of Open Positions* and an accompanying newsletter to physics departments continued at a rate of 2300 per month. Announcements in the *Summary* were also posted on PINET.

Special attention was given in 1989 to immigrant scientists from the USSR and Eastern Europe, and to retired scientists seeking to redirect their skills into new avenues of employment. Personal career counseling continued, including programs for the physically handicapped. A more complete service to bachelor's degree recipients was inaugurated.

Project SEEP. As part of its effort to work more broadly on physics careers, the Career Placement Division initiated a pilot project to heighten interest in science among minority students at the middle school level. Project SEEP (Students to Explore and Experience Physics) was first presented to the San Francisco Middle School District at the AAPT/APS Annual Joint Meeting in January 1989. Children who participate in the program hear presentations (with demonstrations) from prominent physicists, and then perform a variety of physics and chemistry experiments for themselves.

Education and Employment Statistics. The fifth in a series of Society Membership Profiles was published in the spring of 1989. This 41-page publication presented detailed demographic and employment information on the membership of AIP's member societies, both collectively and individually. A special section focused on employment mobility and career change and their impact on the flexibility of the physics labor force. These mechanisms have allowed the physics community to respond to the fluctuations in demand that have become the hallmark of the scientific enterprise.

Highlights from the four reports issued in the series on physics enrollments and new degree recipients include: the continuing increase in physics PhD production fueled by the emergence from the pipeline of substantial numbers of foreign graduate students; the renewed popularity of postdoctoral positions among both foreign and US citizens, reflecting expectations for expanding academic opportunities in the 1990s; and the first decline

in the production of physics bachelors recipients in a decade.

The statistics division has become active in high school studies. A second National Survey of High School Physics Teachers was launched in 1989, this time expanded with the support of the American Chemical Society to include high school chemistry teachers. By the close of the year, a full 100% of the principals in the 3350 sample schools were cooperating with the survey work. Late in the year, the division issued a report, *Who Takes Science?*, on patterns of high school enrollment in mathematics and science.

The statistics division also played a major role in several society-directed projects. The report of the Faculty Workforce Study, carried out in cooperation with the APS Committee on Opportunities in Physics, was published in the April issue of the *Bulletin of The American Physical Society*. The division's involvement in new APS projects initiated in 1989 included the Survey of Young Faculty in Universities, which focused on funding patterns and was done under the auspices of the APS Physics Planning Committee; and the APS membership survey, which focused on society services and was done under the auspices of the APS Membership Committee.

For the American Association of Physics Teachers, statistics division staff made presentations at regional and national meetings and prepared extensive statistical materials for a Topical Conference on Graduate Education for chairs of PhD-granting physics departments (run in conjunction with The American Physical Society) and the Topical Conference on Critical Issues in Two-Year College Physics and Astronomy.

The division worked closely with representatives of the American Astronomical Society in providing them with detailed information on human resources in astronomy for the new National Astronomy Survey (expected to be issued in 1990 by a committee of the National Academy of Sciences), and it aided them in the design of a membership survey to evaluate society services.

Education Division. The core responsibility of the Washington-based Education Division is to the Society of Physics Students and its companion honor society, Sigma Pi Sigma. In 1989 a Constitution Revision Committee looked for ways to increase SPS effectiveness, including the possibility of more geographic zones, which would facilitate communications among the 567 SPS chapters. The division is also encouraging more programs of invited and contributed papers by students at national meetings

of AIP's member societies.

The Education Division is reaching in new directions, especially to improve physics and science education for children in the elementary and middle school grades. Beginning with the 1989-90 school year, AIP cosponsored *WonderScience*, a magazine aimed at 4th to 6th grade children that the American Chemical Society had published on its own for several years. Each issue of this magazine contains eight full-color pages, focusing on a single physical science topic and containing activities for children to do with an adult partner. ACS initiated publication of *WonderScience* in 1987, producing four issues of the magazine each year. With AIP's joint sponsorship, eight issues per year of the magazine are now being produced. Circulation exceeds 20 000 and is expected to keep growing. Gayle Ater, AIP Education Division Special Projects Coordinator, is associate editor.

Another Education Division program of national scope is Operation Physics, aimed at improving physics teaching and learning in grades 4 to 8. The program, supported in part by a grant from the National Science Foundation, provided over 1000 physics workshops for more than 15 000 teachers during 1989.

Other educational activities. Management of AIP's Visiting Scientist Program in Physics was moved from Washington to New York in 1989, with the intent of enlarging its scope and impact. VSPP arranges for visits of top-level physicists to colleges and universities across the country.

The Introductory University Physics Project, managed by AIP with the cosponsorship of The American Physical Society and the American Association of Physics Teachers, moved into its second phase in 1989. It is attempting to identify reforms needed in the calculus-level introductory college 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. To this end, an IUPP conference was held in Denver in November 1989, where new models for the introductory course in physics were discussed by the 84 physicists in attendance.

Project SEER, Science Education for Equity Reform, is a project whose purposes are to improve science instruction in the early grades (K through 5), and to achieve a condition of equity that allows full educational opportunity for each child regardless of gender or ethnic origin. Funded by the National Science Foundation, this project is being conducted on a pilot basis in a St. Louis school district.

Center for History of Physics. The demand for completeness in historical and archival projects is so great that such projects typically take many years; some are never entirely finished. This is true, for example, of the Center's International Catalog of Sources for History of Physics and Allied Sciences, which helps scholars find the unpublished correspondence and other raw data they need for research on the human side of science. Begun over 25 years ago, the catalog is being reborn as a computerized and greatly expanded database. With the help of grants from the Mellon Foundation and the National Endowment for the Humanities, the history center reached agreements in 1989 with archivists in a number of countries, from the United Kingdom to the Soviet Union, so that much new information on materials abroad can be added to the catalog. Meanwhile, indexing work neared completion for the holdings in one important archive—AIP's own Niels Bohr Library.

Adding to the holdings of our library—for example, by conducting oral history interviews—is another unending task. Attention has now been turned to geophysicists. Of a dozen such interviews, the most notable was with the renowned M. King Hubbert, whose recollections were

fully recorded only months before his death. Meanwhile, a different and entirely new sort of interviewing program began for high-energy physics. Here the aims are to analyze the social structure of a broad sample of large collaborations and, more generally, to learn how to preserve for posterity the historical record of all such transient "mini-institutions."

Public Information. Steven Sester assumed the position of Manager of the division early in the year. To help meet the Governing Board guidelines on public-policy activities, the division established a branch in Washington, staffed by Richard Jones (Senior Liaison-Government and Institutional Relations) and Marguerite Mulhall. In New York, the new position of Television Broadcast Coordinator was created and was filled by Mia Mascitelli.

The Public Information Division implemented a new management measurement system in 1989, including a comprehensive job log and a print and broadcast newspaper analysis system. The audiences for *Science Report—A Radio Presentation* were verified by correlating with data from Arbitron, the broadcast ratings service. Satellite transmission of the radio program was initiated, and the addition of workable telecommunications systems allowed the division to begin accessing national wire services and electronic mail systems. All of the forms and associated materials used to communicate with the media were redesigned and expanded, and the Science Writing Award materials were restyled.

A 1989 initiative of note was the plan to expand the traditional radio program *Science Report* into a three-



CECILIA BRESCIA

Arthur T. Bent (left), AIP's new Treasurer and Chief Financial and Administrative Officer, and **William Attick**, Controller.

AMERICAN INSTITUTE OF PHYSICS INCORPORATED BALANCE SHEET

	Assets	
	December 31	
	1989 (audited)	1988 (audited)
Current Assets		
Cash and short-term cash equivalents	\$ 5,969,087	\$ 8,873,219
Marketable securities	2,095,520	61,631
Accounts receivable, net of allowance for doubtful accounts of \$57,700 (\$50,500 in 1988)	3,314,124	2,578,766
Due from member societies	1,215,965	100,753
Prepaid expenses and other current assets	1,045,626	785,876
Total Current Assets	13,640,322	12,400,245
Deferred production expenses	901,561	888,024
Property, plant and equipment, at cost less accumulated depreciation of \$8,222,105 (\$7,219,119 in 1988)	7,097,664	6,874,951
Long-term investments in marketable securities	22,630,057	22,114,960
Other assets	298,658	293,758
Total Assets	\$44,568,262	\$42,571,938
Liabilities and Fund Balances		
Current liabilities		
Trade accounts payable	\$ 671,751	\$ 581,818
Accrued expenses	4,047,089	3,212,904
Due to member societies	76,066	616,775
Current maturities of long-term debt	52,768	48,603
Deferred revenues	1,547,624	1,863,733
Total Current Liabilities	6,395,298	6,323,833
Deferred subscription revenues	9,968,440	10,062,899
Long-term debt	1,769,822	1,827,164
Total Liabilities	18,133,560	18,213,896
Fund Balances		
Unrestricted, Board-designated for special purposes	19,160,664	17,490,993
Unrestricted and undesignated	200,000	200,000
Restricted	1,798,964	1,667,865
Net equity in property, plant and equipment	5,275,074	4,999,184
Total Fund Balances	26,434,702	24,358,042
Total Liabilities and Fund Balances	\$44,568,262	\$42,571,938

pronged integrated feature for radio, print and television. Surveys revealed a large and diversified audience for the radio program (996 stations covering 20 "formats"—easy listening, talk radio, gospel, and so on—with more than 150 million listeners annually), and suggested a large potential audience through other media. A print version was launched in illustrated and electronic wire-service form in 1989, and a video version was approved for launch in 1990.

The print version, *Science Report—A Feature Presentation*, reaches 795 wire service outlets and, in illustrated form, about 1000 science writers throughout the country. Five million or more people are expected to read each feature.

Science Report—A Video Presentation will be sent to

880 television stations and is likely to be redistributed to 5315 cable systems. At least five million viewers are expected to see each of the six features planned for 1990.

The cost-effectiveness of these forms of science education is impressive: It costs less than one cent to reach a television viewer, less than one-tenth of a cent to reach a radio listener, and less than one-hundredth of a cent to reach a newspaper reader (the newspaper feature being a by-product of the radio show).

Prizes and awards. AIP sponsored three science writing awards in 1989. The winner of the award for a children's book was Gail Kay Haines for *Micromysteries*; the journalist winner was Timothy Ferris for his *Coming of Age in the Milky Way*; and the award for writing by a scientist was given to Mark Littmann for *Planets Beyond*:

AMERICAN INSTITUTE OF PHYSICS INCORPORATED STATEMENT OF REVENUE AND EXPENSE

(Excluding Activities for Member Societies)

	Year Ended December 31	
	1989	1988
	(audited)	(audited)
Operating Revenue		
Publishing operations		
Subscriptions	\$19,524,791	\$17,013,497
Voluntary page/article charges	1,689,723	1,665,846
Advertising sales	3,902,017	3,658,894
Book, single copy and microfilm sales	1,400,813	1,107,733
Member society contributions	222,012	217,606
Other	1,400,739	1,178,585
	<u>28,140,095</u>	<u>24,842,161</u>
Program operations		
Grants, exhibits and other income	1,371,446	495,152
Physics programs	257,414	291,230
Corporate Associates	113,950	112,038
	<u>1,742,810</u>	<u>898,420</u>
Other operations		
Special projects	173,490	67,240
Restricted contributions and income	199,834	217,730
Other	598,101	429,526
	<u>971,425</u>	<u>714,496</u>
Total Operating Revenue	<u>30,854,330</u>	<u>26,455,077</u>
Operating Expense		
Publishing operations	23,400,707	20,597,261
Program operations	3,421,712	2,900,964
General and administrative	2,290,467	2,569,350
Restricted purpose	68,735	113,044
Other	1,809,062	778,978
	<u>30,990,683</u>	<u>26,959,597</u>
Total Operating Expense	<u>30,990,683</u>	<u>26,959,597</u>
Net operating revenue before short-term investment income	(136,353)	(504,520)
Short-term investment income	801,084	718,194
Net Operating Revenue	<u>664,731</u>	<u>213,674</u>
Non-Operating Revenue		
Long-term investment income	1,411,929	1,589,409
EXCESS OF REVENUE OVER EXPENSE	<u>\$ 2,076,660</u>	<u>\$ 1,803,083</u>

In addition to the expenses shown in this statement, AIP expended approximately \$29 million in 1989 to provide services to member societies and the Institute of Physics. AIP's total operations in 1989 amounted to \$60 million.

Discovering the Outer Solar System.

The third recipient of the Andrew Gemant Award for "significant contributions to the understanding of the relationship of physics to its surrounding culture and to the communication of that understanding" was Gerald Holton of Harvard University. The 1989 Dannie Heineman Prize for Mathematical Physics, sponsored by AIP and APS, went to John S. Bell of CERN. The 1989 Dannie Heineman Prize for Astrophysics, sponsored by AIP and the American Astronomical Society, went to Carl Heiles of the University of California at Berkeley.

Edoardo Amaldi received the John T. Tate International Award for Distinguished Service to the Profession of Physics only a few months before his death in December 1989. He was recognized for his role in rebuilding European physics after World War II and for his leadership in establishing CERN, the European Center for

Nuclear Research. AIP's Prize for Industrial Applications in Physics was presented at the October Corporate Associates meeting to Rowland W. Redington of General Electric for his application of physics to medical diagnostic scanning and imaging devices.

Corporate Associates. AIP's annual Corporate Associates meeting in October 1989 was hosted by the General Motors Research Center in Warren, Michigan. With more than 175 physicists from industry, academia and government attending, the meeting had as its theme "Creating New Materials: Physics with an Economic Perspective." Among the speakers was D. Allan Bromley, President Bush's science advisor. The meeting included tours of GM's research laboratories and a highly automated GM assembly plant.

An expanded role for the Corporate Associates is foreseen. In 1989 planning began for a series of annual



Soviet physicist Yakov Sinai (left) with Jerry Gollub of Haverford College during a US-Soviet conference on chaos, held in July 1989. It was the first in a series cosponsored by AIP and VAAP, the Soviet copyright agency.

Spring Topical Workshops to be sponsored by the Corporate Associates. The first conference is scheduled for 1991.

FINANCE AND ADMINISTRATION

In August 1989 Arthur T. Bent joined AIP as its new Treasurer and Chief Financial and Administrative Officer, succeeding Gerald Gilbert, who retired after 28 years of service to AIP. In November, William Attick, formerly Manager of Accounting, was named AIP Controller.

Human resources. Following a comprehensive study assisted by an outside consulting firm, new compensation structures (consisting of salary grades and ranges) were developed and implemented for all AIP staff. In August 1989 an Employee Assistance Program was introduced to AIP staff. Through this program, confidential assistance, free of charge, is offered to employees and their families experiencing personal problems. A Drug-Free Awareness Program was also established.

A new employee benefits program was announced in December, consolidating medical and other insurance coverage into one plan. It is administered by the same company that underwrites the dental and vision care plans. In addition, AIP will offer a Flexible Spending Account Program that allows participants to designate pre-tax income to be saved for qualified health and dependent care expenses, as allowed by the Internal Revenue Service.

The Personnel Division sponsored a very successful blood drive in February 1989, a Weight Watchers seminar in April, an employee picnic in June, free flu shots in October and a holiday party in December. In accordance with a new Attendance Incentive Program, approximately 125 employees qualified for a \$200 bonus for perfect or near-perfect attendance in 1989. At year's end, AIP staff totaled 555 at six locations.

Building facilities. Expanding its presence in Washington, DC, AIP leased a 2300-square-foot office on Connecticut Avenue and renovated it for the Education

Division. The Florida Avenue space in the American Geophysical Union building accommodates the Washington offices of PHYSICS TODAY and Public Information, the Senior Education Fellow, and the newly established Development Office.

To keep the Woodbury, Long Island, building operating efficiently and comfortably, extensive renovations were made to the ventilation systems and to the spaces occupied by the Human Resources and Information Technology branches. Steps were initiated to increase the automation of heating, cooling and lighting controls to hold down escalating utility costs in both the buildings that AIP owns—in Woodbury and at 335 East 45th Street in New York City.

At year's end, AIP and its resident societies occupied 143 000 square feet in six buildings in three locations, all used very nearly to capacity. A seventh building was used for storage.

Accounting. The Accounting Division continued its support of AIP's operations, providing services in payroll, general accounting, accounts payable and accounts receivable. The decision was made to transfer payroll processing to Automatic Data Processing Corp to mesh with the excellent human resources software soon to be available from that firm. The actual conversion will occur in 1990. Staff members attended seminars to update their skills in payroll accounting and supervision. The five groups of auditors who examined our records during the year discovered no serious problems.

Member and subscriber services. Billing services were provided in 1989 for seven member societies, one fewer than in 1988. The American Physical Society assumed the responsibility of billing its members beginning with its fiscal year 1990 (from 1 July 1989). The total value of the 1989 billing by AIP was \$45.3 million, of which approximately \$41.8 million was for nonmember subscribers. Billing statistics for calendar year 1989 are shown in the table on page 48.

Beginning in 1989, nonmember subscribers in the Eastern Hemisphere received their journals by airfreight. This has provided better and faster delivery of journals to this area of the world. Overseas members of member societies continue to have the option of electing airfreight or sea mail services for their journals and for PHYSICS TODAY.

Publication Billing. Responsibility for handling book orders and payments was transferred in 1989 from the Publication Billing Division to AIP's new fulfillment contractor in Vermont. This new arrangement will allow for much faster shipping of books at lower cost to AIP. Publication Billing continues to handle invoicing for reprints, advertising and back issues of journals.

Investments. The purpose of the institute's investment portfolio is to build reserves for designated goals in the Building Fund, Physics Programs Fund and Publication Fund. During 1989 the market value of the institute's investment portfolio increased by \$2 740 000 to \$22 483 000. The designated goals for the reserve funds total approximately \$35 million.

Outside funding. Grants, gifts and dues received in 1989 are summarized in the table on page 52. The 1989 amount of \$1 219 600 is approximately double the amount received in 1988. At year's end, the institute's endowment funds were approximately \$1 800 000. ■