

Canadian Institute for Theoretical Astrophysics thrives in Toronto

Like the NSF-supported mathematics institutes in Berkeley and Minneapolis, the Canadian Institute for Theoretical Astrophysics in Toronto was inspired substantially by the Santa Barbara Institute for Theoretical Physics. Established in 1984, it currently has three permanent faculty members: Peter Martin, who was already at the University of Toronto at the time of the institute's founding; Richard Bond, who left a tenured position at Stanford to join the CITA staff; and its director, Scott Tremaine, who left a tenured position at MIT.

All three are Canadian. Tremaine, who got his PhD at Princeton, works on galactic dynamics, galactic structure and Solar System dynamics. Bond, with a PhD from Caltech, does work on nucleosynthesis and cosmology, and Martin, a Cambridge doctorate, studies star formation and the theory of the interstellar medium.

In all, there are about 50 theoretical astrophysicists in Canada, Tremaine reports, and the decision behind CITA's formation was that it would make sense to concentrate some efforts in one place that



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could then serve the whole community. "The Canadian decision to concentrate its resources in one center is an interesting contrast to NASA's astrophysics theory program," Tremaine says. "NASA has

spread its \$1 million annual investment over seven centers. My own belief is that CITA is having a significant impact even though it is costing only about \$200 000 annually." In addition to benefiting from concentration of resources, CITA, unlike most similar institutions in the United States, is not charged for overhead or summer salaries, Tremaine points out.

Relative to Santa Barbara, CITA puts less emphasis on visitors and more on postdocs. Tremaine says that in general it will employ about a dozen postdocs at any one time—a significant fraction of the postdoc positions available in theoretical astrophysics in North America.

Jeremiah P. Ostriker of Princeton University has served on a CITA review committee and he considers the institute "outstanding." Ostriker notes that Canada has produced several great theoretical astrophysicists, and now CITA is "led by the most able of the younger generation, Scott Tremaine, who has assembled a very good group. The concept is good and the people are good." —WS

started his career as an assistant district attorney in Dallas, Texas, and as a judge advocate trial lawyer for the US Air Force. After returning to Minneapolis in early 1953, he divided his time for the next two decades between legal work and real estate development, starting with conversion of a burned-out garage. He founded his current firm, Fine Associates, in 1972.

Fine has nurtured a lifelong interest in physics, which started, he says, when he thumbed through *World Book Encyclopedia* as a boy. As an adult Fine has maintained an interest in astrophysics and cosmology and expanded his horizons to include particle physics, the biochemistry of the brain, computers and artificial intelligence. About five years ago Fine met theorist Gasiorowicz socially. Some time later, after a memorial service for a mutual friend, Fine mentioned to Gasiorowicz that he might like to do something for physics, perhaps in his will, and he asked for suggestions. After deliberating for some time, Gasiorowicz got back to Fine with the suggestion that he endow a center for theoretical physics. With the success of Santa Barbara in mind, Gasiorowicz thought that it would make sense to concentrate theorists interested in large classes of problems common to particle, statistical and condensed matter physics. "Theorists in many areas now talk the same language," Gasiorowicz observes.

In April 1985, at the Sixth Workshop on Grand Unification, held in Minneapolis, Gasiorowicz introduced Fine to Lubkin, who subsequently became an

active adviser on the theory institute.

About a year ago, Fine got to talking about physics at a dinner party, and somebody suggested that he should be introduced to Keller, for whom he has come to have very high regard. By November 1986 the proposed theory institute had won the support of Minnesota Governor Rudy Perpich, Senator Dave Durenberger, Minneapolis Mayor Donald M. Fraser and Representative Bill Frenzel of suburban Minneapolis.

In November Perpich wrote to Keller: "I believe that these kinds of centers [the applied math institute, the supercomputer institute and the theory institute] have the potential to create an intellectual climate which benefits the quality of life for all of the citizens of our state, our region and our nation. I am gratified by one other aspect of the new Institute for Theoretical Physics: It represents a partnership between public and private sponsors, working together to improve our educational system."

Prospects for search. Fine considers it essential to get a "most highly respected theoretical physicist" to direct the institute, and he believes that there are "not too many" who could make it work. The director "will have to be an intellectual leader and personally command the respect of the physics community," Fine says.

One asset Minnesota has to offer potential recruits is the Institute for Mathematics and Its Applications, which is now firmly established, NSF having approved funding for a second

five-year period. The applied mathematics institute has no permanent faculty apart from a director and associate director. Each year it adopts a theme and hosts around 300 visitors who want to participate in discussions. The current theme is scientific computing, and last year it was stochastic differential equations.

In May, Avner Friedman of Purdue University will take over as director of the mathematics institute. Hans Weinberger, the current director, says that the establishment of the theory institute "certainly is good news from our point of view."

—WILLIAM SWEET

Third World Academy launches applied physics network

The Third World Academy of Sciences has decided to promote the establishment of an international network for applied physics, consisting of several "nodes" to be located near existing scientific facilities in several developing and industrialized countries and to be coordinated by a headquarters organization.

The idea for the network came out of an earlier proposal from the Third World Academy to establish an international center for applied physics on the model of the Trieste International Centre for Theoretical Physics, which was founded in 1964. The academy set up a study group of 20 physicists to evaluate the idea, but when the group met at ICTP's Adriatic guest house in

early July last year, the consensus was that a single center would not be able to meet the demand for trained applied physicists in developing countries. Furthermore, the cost of equipment and maintenance was considered too high to be borne by a single center.

The current proposal calls for the nodes to be linked by a computer network to speed collection and distribution of information, especially on the availability of equipment. Each node would provide fellowships for applied physicists from developing countries to participate in training courses and research.

The study group recommended the creation of a node in Trieste to act provisionally as the coordinating center for the network. Organizational work is being handled through this year by a task force in which The American Physical Society, the European Physical Society and IUPAP are represented. A select advisory committee consisting of distinguished scientists has been established; those who have accepted invitations to join the committee include Leo Esaki (US), Joseph A. Johnson III (US), Robert E. Marshak (US), Nevill F. Mott (UK), J. Robert Schrieffer (US), Kai M. Siegbahn (Sweden) and Abdus Salam (Pakistan), director of ICTP.

Hundreds of British scientists pledge to boycott SDI research

A pledge to boycott research in Britain funded by the US Strategic Defense Initiative Organization, similar to the pledge drafted by scientists at Cornell University and the University of Illinois in the United States, has been circulating in Great Britain since last May. By early November it had been distributed in at least 30 science departments at 24 universities, according to its promoters, and just over half the scientists in the departments—545 out of 1051—had signed.

The pledge reads, in part:

We... believe that the Star Wars program is technically dubious. An antiballistic missile defense system of sufficient reliability to defend populations against a Soviet first strike is not technically feasible in the foreseeable future. A system of more limited capability will only serve to escalate the arms race.... Accordingly, as working scientists, we will not apply for or accept support from the Strategic Defense Initiative Organization, which funds Star Wars research.

According to reports from the British defense ministry, Britain had received

a total of £25.7 million (about \$35 million) in contracts from SDIO by last fall, of which £8 million went to government laboratories and £6.5 million to the European Architecture Study—a study of whether the various Star Wars technologies could be integrated into a

system suitable for defense of Europe. Visiting London on 8 December, US Secretary of Defense Caspar W. Weinberger assigned another \$10 million in work on Star Wars to the British defense ministry.

—WILLIAM SWEET

Education

OSA expands programs for teachers

A full-day special program honoring outstanding primary and secondary school science teachers was a featured event for the second year in a row at the 1986 annual meeting of the Optical Society of America. At a cost of \$40 000, OSA brought 100 teachers from Washington State, Oregon and British Columbia to Seattle on 23 October for a series of lectures, demonstrations and workshops. The previous year OSA spent about \$15 000 to bring teachers from Maryland, Virginia and Washington, DC, to the Washington Hilton for a similar one-day program (PHYSICS TODAY, October 1985, page 104).

In 1985 all the teacher participants drove to Washington and although OSA reimbursed school districts for substitute teachers to replace participants for a day, the reimbursements were limited to \$35. In 1986 OSA covered the full costs of compensating employers for lost staff time, and the society flew more than half of the participants to Seattle at considerable expense. This year, at its meeting in Rochester, OSA will try to reduce its expenses somewhat by selecting teachers who live within driving distance in New York State and Ontario.

The Seattle program included a historical talk, "From klystrons to lasers," by Robert L. Byer of Stanford University; a demonstration-lecture by Robert G. Greenler of the University of Wisconsin, Milwaukee, called "Blue skies, red sunsets and the green flash"; and a lecture by Davida Y. Teller of the University of Washington about research on vision in infants. The afternoon was devoted mainly to workshops, including one session in which Donald

C. O'Shea of the Georgia Institute of Technology introduced a hands-on optics kit for primary and secondary schools, which O'Shea had designed on behalf of OSA's education committee.

OSA has produced 200 prototypes of the kits, which are currently being tested in classrooms around the country. The kits will be revised in light of reactions from teachers.

As another part of its effort in pre-college education, OSA has awarded nine optics education grants totaling \$10 000 to individuals who proposed innovative development projects. These include several ideas employing holography, a laser demonstration and several hands-on or blackboard kits.

In the coming year John Walkup of Texas Technical University will be chairman of OSA's education committee, which was established in 1985 and renamed the Education Council last October. This year the committee is expected to start deliberating about optics education at the college and graduate levels.

This summer OSA will bring an education fellow to its Washington headquarters to work on a variety of projects, including one chosen by the fellow. This year the fellow will monitor the optics education grants and evaluate the results from the tests of the prototype kits, among other things.

An elementary school, high school or college educator with a strong interest in optics would be a suitable candidate for the education fellowship. The application deadline is 15 February, and requests for information should be addressed to William A. Borrelle, Optical Society of America, 1816 Jefferson Place NW, Washington DC 20036.

Education

AAS involves teachers in meetings

Taking inspiration from the Optical Society of America's new programs for schoolteachers and also from similar activities conducted by the Astronomical Society of the Pacific, the American Astronomical Society is planning to start including high school teachers in

its annual meetings. The first AAS program for teachers will take place in conjunction with the society's January 1988 meeting in Austin, Texas, and a program probably will be scheduled for the June 1988 meeting in Kansas City.

Peter Boyce, the executive officer of