

Minnesota establishes a new physics theory institute

Kenneth H. Keller, president of the University of Minnesota, announced at a press conference on 28 January that the university will be the home of a newly endowed physics theory institute. The initial idea for the institute came from its benefactor, alumnus William I. Fine (LLB, 1950); the university then picked up the ball and carried it.

The University of Minnesota already houses a supercomputer institute, equipped with a Cyber 205 and two Cray 2 computers, and the Institute for Mathematics and Its Applications, an NSF-supported institution that is modeled fairly closely on the Institute for Theoretical Physics in Santa Barbara. The success of that institute in winning over the physics community has helped inspire the creation of other institutes more or less on its model, including mathematics institutes in Berkeley and Minneapolis, an institute for astrophysics theory in Toronto (see the box on page 100) and, most recently, the new Institute for Theoretical Physics in Minnesota.

In contrast to the NSF-supported institutes for mathematics and theoretical physics, the theory institute in Minneapolis will be financed from a combination of private and university funds. Fine, a native of the Twin Cities, has been a leader in real estate development in his home territory and elsewhere. He has promised \$1 million and expects to raise an additional \$1-3 million from private individuals, corporations and foundations in the area. The university will more than match private contributions. The university has promised that the total annual operating budget for the institute ultimately will range from \$1.5 million to \$2.0 million, depending on how much additional money is raised—more than sufficient to support an institute on the style of Santa Barbara's, which receives about \$2 million per year from NSF.

The University of Minnesota's contribution to the new institute, assuming a return on capital of about 6% a



At the announcement of the Institute for Theoretical Physics at the University of Minnesota are (from left) William I. Fine, who initiated the idea and has promised at least \$1 million toward its endowment, Governor Rudy Perpich and Kenneth H. Keller, president of the university.

year, will be equivalent to an endowment of between \$15 and \$20 million in current funds.

The scope of the Minnesota Institute for Theoretical Physics, as described by Marvin Marshak, chairman of the school of physics and astronomy, will embrace such topics as condensed matter physics, the behavior of complex systems, elementary particles and astrophysics. The specific emphasis of the institute will be determined by the director and other participants.

Initially the institute will have two endowed chairs, including one for the director. Two other tenure-level faculty positions will be established. Thus the lion's share of the budget will be available for visiting scholars, junior faculty, staff, summer programs and computer time.

In announcing the theory institute Keller said: "Establishing this institute strengthens the university's commitment to basic research and its ability to attract top-notch faculty and students. Added to the already strong theory group in the physics department

and other university and community resources, the institute should contribute greatly to our fundamental understanding of nature. The permanence of endowment funding for teaching and research in basic physical science will be a major strength of the Minnesota institute. Fundamental knowledge should not depend on the year-to-year condition of government and foundation budgets."

A search committee has been established under the cochairmanship of Stephen Gasiorowicz, a theoretical physicist at the University of Minnesota, and Gloria B. Lubkin, editor of *PHYSICS TODAY*. The other committee members are D. Allan Bromley (Yale), Charles Campbell (Minnesota), Fine, Allen M. Goldman (Minnesota), Leo P. Kadanoff (University of Chicago), Joseph Kapusta (Minnesota), Serge Rudaz (Minnesota), James B. Serrin (Minnesota), Thomas Walsh (Minnesota) and Frank Wilczek (Institute for Theoretical Physics, Santa Barbara).

Background. The son of an immigrant dress manufacturer from Russia, Fine

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