

Proposal for Partnership with Tsinghua University A Case for Funding

Introduction

In keeping with the ideas you have expressed about your wish to encourage collaboration between the Institute for Advanced Study (IAS) and Tsinghua University, we have developed a funding proposal for ten Memberships over a three-year period. We suggest a model for selecting ten Members per year from China, with a preference for scholars from Tsinghua University in the Schools of Mathematics and Natural Sciences, beginning with the 2017–18 academic year. Funding for this collaboration would total \$3 million and could be paid in three annual installments of \$1 million per year. Depending on the success of this arrangement, which we see as very high potential, IAS would seek permanent funding at the end of the three-year period based on the Institute's funding needs at that time.

Mathematics Memberships

The School of Mathematics is an international center of research and postdoctoral training in many diverse aspects of mathematics including pure mathematics, theoretical computer science, mathematical physics, and applied mathematics. Each year the School selects some sixty talented scholars who come from all over the world, bringing many different points of view and representing all stages of mathematical careers, a mix designed to foster productive interactions. The range of Members in Mathematics includes:

- **Distinguished Visiting Professors**, who are associated with the yearly research theme, which accounts for about one-third of the Members each year. In 2016-17, DVP Paul Seidel from the Massachusetts Institute of Technology is leading the program on Homological Mirror Symmetry.
- **Visiting Professors**, who typically number two to three per year, are associated with the yearly research theme or the special program in Theoretical Computer Science and Discrete Mathematics. In 2016-17, the VPs are Ju-Lee Kim, Professor of Mathematics at the Massachusetts Institute of Technology, and Ran Raz, Professor of Computer Science at Princeton University.
- **Senior Members**, about half of whom participate in the yearly research theme.
- **Mid-Career Members**, who have five, but no more than fifteen years' experience beyond the Ph.D. About twenty mid-career scholars are in residence at IAS each year. They are eligible to apply for one of eight von Neumann Fellowships.
- **Postdoctoral Members**, who have diverse mathematical specialties and make up the largest group in the School with over forty scholars per year. These include three recipients of the Veblen Research Instructorships, which are three-year positions for candidates who have received their PhDs in the last three years and include two years of instructorship at Princeton University and one year of unrestricted research at IAS.

Natural Sciences Memberships

The School of Natural Sciences selects approximately fifty largely postdoctoral men and women working full time on frontier topics in astrophysics, biology, mathematical physics, quantum field theory, particle phenomenology, string theory and quantum gravity. Postdoctoral Members are selected on their ability to conduct independent research but collaborate frequently with each other, with faculty at IAS or Princeton University, and with researchers at other institutions. The range of Members in Natural Sciences includes:

- **Distinguished Visiting Professors**, who are esteemed senior scientists with a deeply influential influence on other scholars in the School. In 2016-17, the DVP is theoretical physicist Gregory Moore from Rutgers, The State University of New Jersey.
- **Visiting Professors**, who typically number one or two per year. Astrophysicist Rashid Sunyaev from the Max-Planck Institute for Astrophysics has served as the Maureen and John Hendricks Visiting Professor for many years.
- **Junior Visiting Professors**, who typically number two to three per year and stay at IAS for a single term or full year. JVPs hold a faculty or equivalent position and are within ten years of receiving their PhDs. They conduct their own research and serve as mentors to the large community of postdoctoral scholars.
- **Postdoctoral Members**, who represent the majority of scholars in Natural Sciences, have high quality research projects and an enthusiasm for collaboration. They are typically at IAS for three years, some for up to five years.

Structure of \$3M Proposal

In the current economic climate, the need is compelling for operating support for Members in Natural Sciences and Mathematics. Funding for scientific research from the government (including NSF, NASA, and DOE) is decreasing and becoming more restrictive. Based on cues from program officers at the various agencies that support IAS, we expect that as our government grants come up for renewal over the coming years, we will see a 30% to 40% reduction in grants for postdocs in future awards. In addition, we are facing at least a decade of conservatively planned investment returns.

A gift of \$3 million in operating support for ten Members per year over three years would be of great benefit to IAS, Tsinghua University, and the international scientific community. The funds would cover the comprehensive costs of Membership in the Schools of Mathematics and Natural Sciences, including, as most needed, all aspects of the academic appointment and community life that are unique and fundamental aspects of the IAS experience.