



## A Message from SFI Vice President for Science



Though the aspens are well past their prime some of the lower elevation cottonwoods remain in full fall golden glory as we gear up for our annual ACTioN (Applied Complexity Network) and bi-annual Trustees meetings November 3-5. The topic for this year's ACTioN meeting is "The Complexity of Intelligence

- New Science for Hybrid Intelligence" which seeks to explore the evolving landscape of intelligent systems with a focus on hybrid natural and artificial intelligence. Other events you'll find under **Looking Ahead** include a number of working groups beginning with "Human Centered Interaction Networks Through Space and Time II," November 6-8, organized by yours truly; "The Nexus of Ecology and Evolution in Space and Time," November 27-30, organized by new Omidyar Fellow **Andy Rominger**; "Liquid Brains, Solid Brains," December 4th-5th co-organized by External Professors **Ricard Solé**, **Melanie Moses**, and **Stephanie Forrest**; and "Computational Study of the Law," December 11-14, co-organized by External Professor **Daniel Rockmore** and **Michael Livermore** and funded by the new Feldstein Program on Law, History, and Regulation. We have one final workshop before the end of the year on "Limits to Understanding: Past, Present and Future," November 29 - December 1, co-organized by **David Krakauer**, Former Omidyar Fellow **Joshua Grochow** (U Colorado, Boulder), and Program Postdoctoral Fellow **Brendan Tracey**. On November 7 our Community Lecture will be on "Energy and Matter at the Origin of Life" and presented by **Nick Lane**.

Under **Funding and People** we highlight External Professor **Laura Fortunato**. Laura began her relationship with SFI as an Omidyar Fellow and has maintained a close connection since assuming her appointment at Oxford, through visits and participation in workshops and working groups. She is currently on sabbatical at SFI.

**Jennifer Dunne**  
Vice President for Science

## Updates and trends

In early October **NSF's Biological Sciences Directorate** issued a **Dear Colleague Letter** eliminating deadlines for most programs. For these changes to take effect, the core programs in Division of Environmental Biology (DEB) and Integrative and Organismal Systems (IOS) are discontinuing use of the preliminary proposal mechanism in 2018. *There will be no call for preliminary proposals in January 2018.* Programs in Molecular and Cellular Biosciences (MCB) and Division of Biological Infrastructure (DBI) have upcoming deadlines in 2017; following those deadlines four divisions (DEB, IOS, MCB and DBI) will release new solicitations in 2018 for awards in FY 2019. These new solicitations will call for submissions of full proposals to the relevant programs and there will be no deadlines. Once the solicitations are released, but not before, full proposals may be submitted at any time. Proposals may only be submitted to one of the solicitations. NSF gives the following rationale for the changes: 1) better quality proposals; 2) more time to build collaborations; 3) reduced burden on submitting institutions; and 4) fewer proposal submissions.

NSF's National Science Board recently released its annual **Merit Review Report** which provides information regarding NSF's merit review process and awards. The report found that of the 49,000 competitively reviewed proposals acted on by NSF in 2016, 41,000 were research proposals. The agency made nearly 8,800 research awards in FY16, mostly to academic institutions, which corresponds to a 21 percent success rate.

The Eric and Wendy Schmidt Fund for Strategic Innovation, in partnership with the Rhodes Trust, recently announced the **Schmidt Science Fellows** program that aims to create a new generation of scientific leaders. The goal is to "give the world's best aspiring scientific minds a broader perspective, the ability to engage in an interdisciplinary way, and the opportunity to make a lasting impact in society. Through a combination of group sessions at some of the world's leading universities and a special postdoctoral study in a field different from their existing expertise, Fellows will be exposed to new topics, new ways of thinking, and new



people that will help guide their future paths to success. With an initial commitment of at least \$25 million for the first three years, this innovative fellowship represents the beginning of a broader \$100 million effort to drive scientific leadership and interdisciplinary research across society over the next decade and beyond.” Applications will be handled through the limited submission mechanism via select universities.

## Funding and people



### RECENT PROPOSALS

**Cristopher Moore**, *NSF, REU Site: Computational and Mathematical Modeling of Complex Systems*. \$348,806 over three years.

**Christopher Kempes**, *The Mind Research Network / NSF*,

*Collaborative Center for Advanced Multi-scale Imaging, Networks and Complexity in Biology (CAMINC-B)*. \$362,815 over five years.

**Joshua Garland**, *NSF EAGER, Collaborative Research: Targeted Resampling of Deep Polar Ice Cores Using Information Theory*. \$98,938 over two years.

**Christopher Kempes** and **Eric Libby**, *NASA, The Physiological, Energetic, and Evolutionary Consequences of Endosymbiosis in Unicellular Organisms*. \$451,976 over three years.

### RECENT AWARDS

**Christopher Kempes**, *University of Wisconsin/ NASA, The Emergence of Evolvable Surface-Associated Interacting Molecular Ensembles: A Chemical Ecosystem Selection Approach*. \$122,416 over three years.

**Eric Smith**, *NSF, Conference: Harold Morowitz Symposium*. \$93,841 for a year.

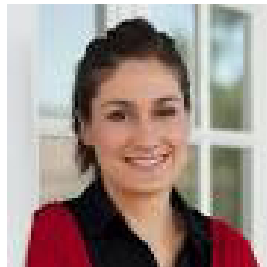
**David Krakauer**, *JSMF, Adaptation, Aging, and the Arrow of Time*. \$2,500,000 for five years.

### EXTERNAL FACULTY PROFILE

**Laura Fortunato**, Associate Professor of Evolutionary Anthropology, University of Oxford and Fellow in Evolutionary Anthropology, Magdalen College, Oxford.

**1) How did you first get involved with SFI?**

Overall, I have now accumulated over a decade of interactions with SFI! I attended the Beijing Complex



Systems Summer School in 2006 during my Ph.D. in Anthropology at University College London, and I first visited the Institute in 2009. I joined SFI in 2010 as part of the inaugural cohort of incoming Omidyar Fellows, and I was based here as a postdoc for over three and a half years. I left in September 2013 to take up my current positions in Oxford. I have been on the SFI External Faculty since 2015.

**2) What does SFI mean to you?**

SFI is a place where I feel free to think creatively about topics that interest me, with insightful input from like-minded colleagues working in many different fields. On top of that, the atmosphere at the Institute so vibrant, yet positive, and the surroundings so beautiful, that I have come to view SFI as a haven away from the hustle and bustle of everyday academic life in the university context.

**3) How have you been involved with SFI recently? What are you working on now?**

Since moving to Oxford, I have visited SFI at least once a year, often for several weeks at a time, typically in the summer. I am now based at the Institute for a longer sabbatical visit between October 2017 to March 2018. The focus of this visit is to lay the groundwork for a new project investigating the effect of network structure and dynamics on human social behaviour. I plan to organize a working group linked to this project early next year, bringing together researchers from Oxford and SFI, with a focus on the application of social network analysis to the study of intra- and inter-group behaviour in humans.

**4) What are you working on now?**

The project I mentioned above builds on ongoing work in my research group based in the town of Siena, Italy. Specific aspects of its social configuration make Siena a “natural laboratory” for the study of network structure and dynamics in relation to cooperation and competition. A second line of work that I have developed in recent years relates to the issue of research reproducibility. I currently lead the [Reproducible Research Oxford project](#) – a University-wide initiative to deliver training in effective computing for research reproducibility. I myself picked up many of the relevant skills during my time as a postdoc at SFI – it is now my turn to pay it forward!

## Opportunities

### FEDERAL AGENCIES

**NSF Dynamics of Coupled Natural and Human Systems (CNH)**

**Deadline: January 23, 2018**

The CNH Program supports interdisciplinary research that examines human and natural system processes and the complex interactions among human and natural systems



at diverse scales. Research projects to be supported by CNH must include analyses of four different components: (1) the dynamics of a natural system; (2) the dynamics of a human system; (3) the processes through which the natural system affects the human system; and (4) the processes through which the human system affects the natural system. CNH also supports research coordination networks (CNH-RCNs) designed to facilitate activities that promote future research by broad research communities that will include all four components necessary for CNH funding. **Note:** The upper limit of CNH Large Research Project (CNH-L) awards has been decreased to \$1,600,000. The upper limit of CNH Small Research Project (CNH-S) awards has been increased to \$750,000.

**NSF et al Collaborative Research in Computational Neuroscience (CRCNS) Innovative Approaches to Science and Engineering Research on Brain Function Deadline: January 05, 2018**

Computational neuroscience provides a theoretical foundation and a rich set of technical approaches for understanding complex neurobiological systems, building on the theory, methods, and findings of computer science, neuroscience, and numerous other disciplines. Through the CRCNS program, NSF, the National Institutes of Health (NIH), the German Federal Ministry of Education and Research (Bundesministerium für Bildung und Forschung, BMBF), the French National Research Agency (Agence Nationale de la Recherche, ANR), the United States-Israel Binational Science Foundation (BSF), and Japan's National Institute of Information and Communications Technology (NICT) support collaborative activities that will advance the understanding of nervous system structure and function, mechanisms underlying nervous system disorders, and computational strategies used by the nervous system.

Two classes of proposals will be considered in response to this solicitation: **Research Proposals** describing collaborative research projects, and **Data Sharing Proposals** to enable sharing of data and other resources. Award sizes for Research Projects (both domestic and international) are expected to range from approximately \$100,000 to \$250,000 per year in direct costs, with durations of three to five years. Many awards will be on the smaller end of this range. Awards for Data Sharing Projects will be scaled according to the needs of the project; typically they will be smaller in size than research awards.

**NSF International Research Experiences for Students (IRES) Deadlines vary beginning January 30, 2018**

The IRES program supports international research and research-related activities for U.S. science and engineering students. The IRES program contributes to development of a diverse, globally-engaged workforce with world-class skills. IRES focuses on active research participation

by undergraduate or graduate students in high quality international research, education and professional development experiences in NSF-funded research areas. The overarching, long-term goal of the IRES program is to enhance U.S. leadership in research and education and to strengthen economic competitiveness through training the next generation of research leaders.

This solicitation features three mechanisms; proposers are required to select one of the following tracks to submit their proposal. Track I focuses on the development of world-class research skills in international cohort experiences. Track II is dedicated to targeted, intensive learning and training opportunities that leverage international knowledge at the frontiers of research. Track III calls for U.S. institutional partnerships and coalitions to develop and evaluate innovative models for high-impact, large-scale international research and professional development experiences for graduate students, as individuals or groups. Funding amounts vary according to track: **Track- I: IRES Sites.** Up to \$300,000 per award. For exceptionally creative proposals, awards up to \$400,000 will be considered. **Track- II: Advanced Studies Institutes.** As appropriate. Typically, an average ASI budget is \$150,000 per award. Proposals involving a series of institutes are permitted when well-justified. **Track- III: New Concepts in International Graduate Experience.** Up to \$1,000,000 per award.

## FOUNDATIONS

**Whitehall Foundation Bioscience Research Projects Letter of Intent due January 15, 2018**

The **Whitehall Foundation** assists scholarly research in the life sciences through its research grants and grants-in-aid programs. It is the foundation's policy to support those dynamic areas of basic biological research that are not heavily supported by federal agencies or other foundations with a specialized mission. The foundation emphasizes the support of young scientists at the beginning of their careers and productive senior scientists who wish to move into new fields of interest.

1) Research: Research grants of up to \$225,000 over three years will be awarded to established scientists of all ages working at an accredited institution in the United States. Grants will not be awarded to investigators who have already received, or expect to receive, substantial support from other sources, even if it is for an unrelated purpose.

2) Grants-in-Aid: One-year grants of up to \$30,000 will be awarded to researchers at the assistant professor level who experience difficulty in competing for research funds because they have not yet become firmly established. Grants-in-Aid can also be made to senior scientists.

## Looking Ahead

### EVENTS

WSWG, Colloquia, Seminars, and more...



### VISITORS — November - December 2017

**Brelsford, Christa**, 11/13-14/2017, Oakridge National Laboratory. SFI Host: **Jennifer Dunne**.

**Chen, William**, 11/26-

28/2017, Nankai University. SFI Host: **Geoffrey West**.

**Elena, Santiago**, 11/20/2017 — 12/8/2017, CISC; SFI External Professor. SFI Host: **Jennifer Dunne**.

**Evans, James**, 11/1-8/2017, University of Chicago. SFI Host: **David Krakauer**.

**Fitzpatrick, Courtney**, 11/12-15/2017, Indiana University Bloomington. SFI Host: **Elizabeth Hobson**.

**Foster, Jacob**, 11/28/2017 — 12/6/2017, UCLA. SFI Host: **David Krakauer**.

**Foster, Jacob**, 12/28/2017 — 1/6/2018, UCLA. SFI Host: **David Krakauer**.

**Golan, Amos**, 11/5-13/2017, American University; SFI External Professor. SFI Host: **Jennifer Dunne**.

**Guo, Long**, 11/26-28/2017, Nankai University. SFI Host: **Geoffrey West**.

**Jen, Erica**, 12/12-27/2017. SFI Host: **Jennifer Dunne**.

**Lane, Nick**, 11/6-10/2017, University College London. SFI Host: **Jessica Flack**.

**Miller, John**, 11/1-6/2017, Carnegie Mellon University; SFI External Professor. SFI Host: **Carla Shedivy**.

**Mitchell, Melanie**, 11/15/2017, University of Portland; SFI External Professor. SFI Host: **Carla Shedivy**.

**Piñero, Jordi**, 11/18/2017 — 12/8/2017, Universitat Pompeu Fabra. SFI Host: **Jennifer Dunne**.

**Prelec, Drazen**, 12/4-8/2017, MIT Sloan School of Management. SFI Host: **Jessica Flack**.

**Rockmore, Daniel**, 11/2-5/2017, Dartmouth College; SFI External Professor. SFI Host: **Jennifer Dunne**.

**Solé, Ricard**, 11/18/2017 — 12/8/2017, Universitat Pompeu Fabra; SFI External Professor. SFI Host: **Jennifer Dunne**.

**Valverde, Sergi**, 11/18/2017 — 12/8/2017, Universitat Pompeu Fabra. SFI Host: **Jennifer Dunne**.