



SANTA FE INSTITUTE

February 2, 2007

Dear Dr.

This is a formal invitation to participate in a National Science Foundation (NSF) sponsored workshop on March 4-6, 2007. The event will start with an opening reception at ~6:30pm on Sunday March 4, and will conclude at ~6:00 pm on Tuesday, March 6.

Goals of the Workshop:

NSF is interested in exploring research frontiers that increase the cross-fertilization and mutual benefit between neuroscience and the physical sciences. The physical sciences are broadly construed in this context to include physics, chemistry, materials science, mathematics, statistics, computer science, engineering, and related disciplines. The workshop is not officially advisory to NSF, but it is hoped that the value of the proposed discussions, the resulting report, and the commitment and excitement of the participants will help to catalyze the NSF mission of supporting basic research.

The March Workshop is an outgrowth of two planning meetings held last July and August (see <http://www.nsf.gov/od/oia/activities/neuroscience/>). The July workshop focused on identifying "grand challenges" for cognitive neuroscience. The August workshop focused on identifying mutual opportunities for neuroscience and the physical sciences, mathematics and statistics, computer science, and engineering.

The upcoming workshop will expand upon the previous discussions to identify new research directions, issues, and opportunities for the NSF basic research mission. Our charge is to identify, analyze, and prioritize emerging research opportunities, with attention to short- and long-term objectives, specific needs that must be addressed to enable efficient scientific progress, and broader impacts of the research. The NSF is interested in opportunities that will trigger major new scientific and technological advances, both in neuroscience and in other disciplines, and strongly encourages high-risk, high-impact research, transformative research. Workshop participants are encouraged to explore possibilities that go beyond conventional disciplinary boundaries, existing collaborative relationships, and organizational or institutional constraints.

Various aspects of neuroscience are supported in many different divisions of NSF. New opportunities may take advantage of advances in each of these areas, as well as leading-edge developments in other fields that NSF supports, which may both contribute to and benefit from advances in neuroscience. NSF is particularly interested in high-risk, high-impact, transformative research opportunities that will trigger major new scientific and technological advances, both in neuroscience and in the physical sciences. The group is encouraged to think "outside the box" of conventional disciplinary boundaries.

Seven discussion groups will be organized around the following themes:

1. Neuroethological and developmental mechanisms: molecular and cellular approaches (Eve Marder, Brandeis)

2. Cognitive systems across levels of analysis in the brain systems (Marcus Raichle, Washington University)
3. Plasticity, learning, and development: from computational models to learning algorithms (Tom Mitchell, Carnegie-Mellon University)
4. Measuring the brain: from synapse to thought (Jonathan Sweedler, University of Illinois)
5. Organization of behavior: Emerging principles (Partha Mitra, Cold Spring Harbor Laboratory)
6. Signal processing and its development in the brain (Emery Brown, MIT/HarvardMassGeneral)
7. Biomimetics and the neuron/silicone interface (Theodore Berger, USC)

“Homework” Assignment:

To maximize the value of the discussion time available at the workshop, participants are requested to identify two of the most exciting, compelling, and important opportunities for progress in neuroscience in the near- to intermediate-terms and to develop a single computer-generated “slide” for each opportunity. At least one of these opportunities should be outside of your immediate area of research. Please submit your two slides to me by email as soon as possible, but in any case no later than Friday February 23. Most graphic formats are acceptable.

Logistical Details:

The logistical details for the workshop, including reimbursement of travel expenses, will be coordinated through the Santa Fe Institute (SFI) in cooperation with NSF. Please contact SFI Event Managers, Carolyn Resnicke (carol@santafe.edu; 505-946-2757; before February 15) or Wayne Coté (wayne@santafe.edu, 505-946-2758; after February 15) for assistance.

The registration site for the workshop is: <http://www.santafe.edu/education/application/nsfneuro2007> which contains a link for hotel registration at the Westin Arlington Gateway Hotel, the workshop venue. A room block has been reserved for the nights of March 4 and 5 (deadline for registration: February 13). Rooms will be prepaid by SFI; a credit card is required for registration and for incidentals. You are requested to make your own travel arrangements. SFI will reimburse economy class air or train fare up to a maximum of \$600, local transportation and/or parking at your departure site, and local transportation in Arlington. The Westin is located a short distance from the Ballston Metro Station (Orange Line) and use of the Metro is encouraged. Original receipts will be required for all expenses to be reimbursed. Reimbursement forms will be provided at the workshop.

In order to be reimbursed, participants must provide written information about their citizenship. U.S. citizens will have an opportunity to confirm their citizenship on a Workshop roster to be circulated at the meeting. Citizens of other countries must confirm that their visa status is such that reimbursement can be paid. If you are not a U.S. Citizen, please bring your passport and visa documents to the meeting so that we may photocopy them to ensure that we are in compliance with U.S. immigration requirements.

Thank you for your willingness to contribute to science and to the mission of NSF by your participation in this workshop. Please let me know if you have any questions or concerns.

Sincerely,



C. C. Wood
Vice President
Santa Fe Institute
1399 Hyde Park Road
Santa Fe, NM 87501
Mobile: 505-310-4673
Email: ccwood@santafe.edu
WWW: <http://www.santafe.edu>