



National Science Foundation
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Dear Colleague Letter: Expanded Directions in Cyberinfrastructure

Dear Colleague:

The Office of Cyberinfrastructure (OCI) would like to inform the community about some expanded directions that the National Science Foundation (NSF) is planning to take in the future. We are strengthening the national cyberinfrastructure (CI) through investments in the TeraGrid, and the Track 1 and Track 2 programs, while forging important new activities in areas of expanded computing services, data, networking, virtual organizations, and education. We plan to continue building in these areas as well as expanding in the areas listed below that will help round out the portfolio of activities needed to advance science through CI.

As an overarching theme, OCI will promote the development of collaborative computational science---defined broadly to encompass *research and development* of comprehensive CI in all areas described below, as well as the *application of CI to solve complex problems* in science and engineering---as one of OCI's primary missions. OCI will work to provide stewardship for computational science at NSF, in strong collaborations with other offices, directorates, and agencies.

In order to support these activities, we anticipate building new programs over time, and will solicit input from the community to guide us through a series of task forces and workshops in each of the areas listed below. In the short term, OCI will begin to support specific existing programs that allow us to jumpstart some of these areas. You will be able to find more detail on these activities, as they develop, on the OCI website.

Learning and workforce development in computational sciences. OCI anticipates supporting the following existing programs:

- Faculty Early Career Development Program (*CAREER*). OCI will fund CAREER awards to support outstanding young faculty in any area of computational science. This includes computer and computational scientists who research, develop and prototype advanced CI (software, tools, computing hardware, data, networks, visualization, human-computer interfaces, etc.) needed to advance science, as well as domain scientists in any discipline who use, develop, and drive advanced CI needed in their communities. The CAREER solicitation can be found at http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5262.
- Graduate Research Fellowship Program (*GRFP*). Likewise, OCI encourages submissions for GRFP awards for outstanding graduate students who use or advance development of CI for, or in, any discipline. Proposal information can be found at http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=6201
- Course, Curriculum, and Laboratory Improvement (*CCLI*). As part of OCI's growing mission to support computational science education, we encourage submissions for the development of undergraduate multidisciplinary computational science curricula at colleges and universities. The current CCLI solicitation can be found at http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5741.

We are also planning additional activities in this area, and will make further announcements when ready.

- **Software.** OCI anticipates continuing and expanding its activities in software. Existing programs

that encourage software development include *PetaApps* and Strategic Technologies for Cyberinfrastructure (*STCI*), which is a recurring program. (Note that in 2009 STCI has a target date of August 13, but can accept proposals at any time. See http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=500066 for details.) Other programs may be announced in time for FY10 funding.

- **Networking and Campus Bridging.** As data volumes grow, and collaborations become more important in science, alignment of computing environments and connectivity within and between campuses, to remote instruments, and to colleagues and facilities worldwide is increasingly important. OCI has recently released a new solicitation for International Research Network Connections (*IRNC*). See http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=503382&org=NSF&sel_org=OCI&from=fund. NSF has also recently issued the Academic Research Infrastructure Program: Recovery and Reinvestment (*ARI-R²*) that may be used to advance campus and regional network environments http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=503380&org=NSF&sel_org=XCUT&from=fund. Look for more information on these and other programs on our website.
- **Grand Challenge Communities and Virtual Organizations.** As science tackles more complex problems, the scale of collaborations is growing. OCI wishes to support the development of teams needed to solve complex problems through grand challenge teams and communities through virtual organizations. We anticipate continuing activities such as *PetaApps* and Virtual Organizations as Sociotechnical Systems (*VOSS*), and expect to develop new programs to support complex problem solving using advanced CI in the future.
- **Advanced Computing and Services.** In addition to our current *TeraGrid*, *Track 1*, *Track 2*, and *XD* programs, we would like to draw your attention to an expanded Major Research Instrumentation Program (*MRI-R²*) solicitation that has just been released, aimed at providing much stronger campus-level resources. Please see <http://www.nsf.gov/od/oia/programs/mri/> for more details. Additional programs, addressing advanced high performance computing, services, and other computing paradigms will be developed.
- **Data and Visualization.** Data-driven science is upon us in a big way and growing fast, and OCI is working to support new data-driven science activities. In addition to the current *DataNet* competition, the recurring Community-based Data Interoperability Networks (*INTEROP*) program has a target date of July 23, 2009, although proposals can be accepted at any time. Please see http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=502112&org=OCI&from=home. We expect to grow activities in this area in the future.
- **EAGER.** OCI is planning to fund Early-concept Grants for Exploratory Research (EAGER) awards that promote the innovative use or development of advanced Cyberinfrastructure. For more information on submitting EAGER proposals please see: http://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpg .

Please look for further announcements as we move forward in this exciting time.