INTEGRATED DIGITAL INFRASTRUCTURE
CALL FOR PROPOSALS 2015/16

The Office of Research Affairs (ORA) and Larry Smarr, Director of the Integrated Digital Infrastructure (IDI) at UC San Diego, are pleased to invite proposals for funding of Integrated Digital Infrastructure (IDI) Transformational Projects and Digital Research Platforms for fiscal year 2015/16.

These funding opportunities are for one-year projects to work with campus IT providers (ACMS, ACT, Calit2/Qualcomm Institute, The Library, and SDSC) to support the UCSD Strategic Plan by developing and promoting the use of novel digital/computing/networking technologies in research and instruction.

These one-time, early adopter grants have the goal of exploring the application of new digital technologies in research. Some of these technologies at present include, but are not limited to:

- advanced high performance computing (HPC)
- advanced (10G/40G/100G) networking
- big data analysis and visualization
- cloud computing and storage
- digital fabrication (3D printing)
- mobile applications

Funded projects in the research arena must show, by year’s end, how the technologies have been incorporated into applications for extramural funding.

Transformational Projects
Transformational Projects typically enhance the research of a single laboratory and/or graduate/undergraduate class/related set of classes/research effort. They may involve application of a new digital technology in the research or teaching environment, or application of an established technology in a novel way or to a novel environment.

Funding for a Transformational Project typically ranges from $1,000-$75,000.

Digital Research Platforms
Digital Research Platforms serve the needs of multiple faculty members (and, ideally, students) in a variety of disciplines. They typically join two or more technologies (e.g., end-to-end high-speed networking, high-performance computing, high-speed storage, data management, specialized research instruments) into a unified environment in which research can be performed. They substantially advance UCSD’s research capabilities.

Funding for a Digital Research Platform typically ranges from $50,000-$300,000.

Overview
Only academic personnel who are eligible to serve as Principal Investigators (PIs) for an extramural award may submit a proposal for research-related Transformational Projects or
Digital Research Platforms. Personnel with instructional responsibilities are eligible to submit a proposal for instructional technology Transformational Project.

Proposals should be submitted as Word documents to idi-info@ucsd.edu by the deadline of June 15, 2015.

Proposals to extend funding of the previous year’s projects will be considered, but must include an explanation of how the coming year’s technology application will differ from the previous year’s.

Nature of Support
All awards will include technical expertise and support from IDI and partner unit staff to develop an approach, provide workflow and data management guidance, install software and hardware, and troubleshoot problems.

Funding is not provided directly to the applicant. Funding will be applied by IDI to:

- Appropriate transformative hardware, software, data networking, integration equipment or cloud services.
- Personnel identified to conduct specified technology-enhancing work (e.g., software development staff). It is not intended that this funding support graduate student researchers.

Whenever possible and appropriate, funded personnel will be drawn from one of the five IDI partner units (ACMS, ACT, Calit2, The Library, SDSC) but may also be drawn from the applicant’s laboratory, department or division.

Proposal Format
Proposals should be no more than five pages in length and should include the following:

1. Project title, which should be descriptive and include whether a Project or Platform is envisioned.
2. Names of Principal Investigator/applicant(s) and department. Indicate primary applicant or contact. Please specify whether the primary applicant is in Academic Affairs, Health Sciences, Scripps Institution of Oceanography, or holds multiple affiliations.
3. Relationship of intended project to UCSD strategic plan goals and/or specific research initiatives.
4. How students (graduate or undergraduate) will be engaged.
5. Description of intended project or need, including:
   a. Description of intended research or instruction
   b. Problem to be solved or challenge to be addressed by the Project or Platform; or, new digital technology to be employed in a research or instructional setting
   c. Requested technology details (hardware, software, data networking, integration technology, cloud services, etc.) and/or personnel, if known
   d. Approximate costs for requested technology or personnel, if known
6. Describe how data will be managed and shared (unless that is the target goal of the proposal).
7. Identify specific funding solicitations and/or programs that could be the target of a follow-up proposal to federal or other extramural funding agencies based on IDI-enhanced work. Outline any specific reasons why the proposed project would enhance the PI’s ability to go after follow-on funding from NSF, NIH, or other grant-making institutions.

8. Note any compliance requirements, incl:
   a. Vertebrate animals or custom antibodies
   b. Human subjects: protocol submitted?
   c. Export control requirements
   d. Use of human stem cells: Embryonic or adult? Federal cell line?
   e. Environment, health and safety issues (including radioactive isotopes, recombinant DNA)
   f. HIPAA-qualifying data
   g. CDC/USDA Select Agents use in project: which agent(s)?
   h. Use of SCUBA or small boats (<26 ft in length)

9. For Digital Research Platforms only, describe other UCSD researchers, staff and students who may be able to leverage the Platform for research and instructional goals, and how this is proposed to work.

All proposals should include the following language and be signed with the Principal Investigator’s name for research-related proposals:

_I certify that the information above is accurate and complete. I understand university regulations concerning conduct of the proposed research and accept responsibility for the design, execution and management of the project proposed._

It is not necessary for applicants to know the precise technology or budget that is necessary to solve their problem or challenge, but in this case the problem or challenge should be very clearly articulated, including a description of the scientific workflow.

Selection criteria

The successful proposal will be distinctive and have a clearly articulated potential to lead to future extramural funding for larger-scale projects, and/or lead to clear advances in student access to cutting edge research digital technology.

Transformational Projects should present the opportunity to learn about a new digital technology in the research or instructional environment, with transferable lessons for other researchers or instructors.

In support of IDI’s effort to ensure that accepted proposals achieve broad coverage of the Strategic Plan, research should fall into one of the five Goals of the Strategic Plan, including the four Grand Research Themes listed in the Strategic Plan under Goal 3.

Plans should employ groundbreaking or non-commercialized digital technologies; UCSD grant-developed digital technologies across new areas; or novel applications of existing commodity digital technology.
Student engagement, especially supporting student research, is an important addition.

Strategic partnerships with vendors or other industry partners (to moderate the cost to the institution) are encouraged.

Proposals should indicate meaningful non-IDI-funded resource commitments on the part of the faculty (“skin in the game”), either in the form of financial contributions, FTE, or course/student time.

Potential to enhance diversity and outreach to underserved communities is an important facet.

Final selections will represent a mixture of Big Data and modest-sized data projects from a variety of disciplines across the campus.

Examples of projects funded in 2014/15

Kim Albizati, Lecturer in Chemistry, is using IDI support to deploy an electronic lab notebook (ELN) in upper-division Chemistry classes. ELNs prepare students for industry work and make notebook management, editing and grading easier for students and instructors.

Mark Ellisman, Distinguished Professor of Neurosciences and Bioengineering, is using IDI support to enable a dedicated 40Gbps for movement of tens of terabytes of data from the National Center for Microscopy and Imaging Research (NCMIR) to SDSC and back to NCMIR, which is located in the Biomedical Sciences Building at the UCSD School of Medicine. This project uses highly-tuned FIONA PCs designed and built by IDI technical staff (SDSC’s Papadopoulos and QI’s Keefe and Graham) over the Prism@UCSD network.

Jules Jaffe, Research Oceanographer with Scripps Institution of Oceanography, is using IDI support to add 10Gbps connectivity to underwater microscopes at Scripps Pier, coupled with 10G connectivity, FIONA compute technology and large displays in his labs at Spiess Hall and Nierenberg Hall and in Birch Aquarium to allow real-time imaging and display of underwater microorganisms.

Falko Kuester, Associate Professor of Structural Engineering, is using IDI support to equip and staff a student-accessible 3-D printing lab that builds drones (and even bigger 3D printers). The drones were tested successfully during a recent field trip, and the data is now being processed.

Thomas Levy, Distinguished Professor of Anthropology, is using IDI support to develop new interfaces to UCSD’s Research Data Library to curate important new data archaeological sets concerning the evolution of societies in the southern Levant from the Neolithic to Islamic periods for archive, discovery and reuse.