

June 20, 2012 | By Doug Ramsey

## Calit2 Class of 2012: Undergraduate Scholars Begin Their Summer of Research



*Calit2 UCSD division director Ramesh Rao (far right) talks with visual arts sophomore Boris Boryakov during orientation for Calit2 Scholars.*

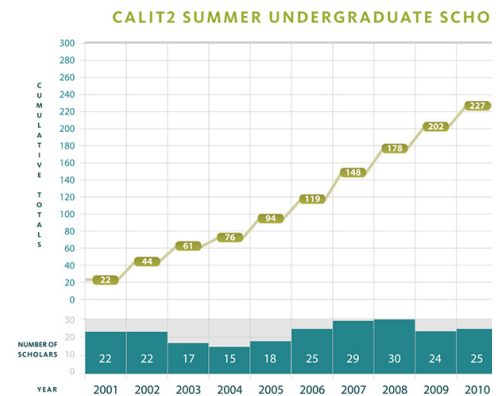
The UCSD division of Calit2 this week kicks off a summer of research opportunities for 30 undergraduates representing 17 academic majors. For the 12th summer in a row, Calit2 Summer Undergraduate Scholars are fanning out across campus to work full-time in the labs of Calit2-affiliated faculty members, doing research alongside graduate students, postdoctoral researchers and their advisors.

The 30 Calit2 Scholars were selected from among 77 applicants. This summer's class matches the record number of 30 students selected in 2008. The total number of undergraduates going through the program since 2001 – when Calit2 was just six months old – has now topped 280 (see graphic).

Each scholar receives a \$3,000 stipend for 10 weeks of work. Funding for the program comes from Calit2 industry partners, notably Qualcomm, Inc.

The range of projects undertaken by the Calit2 Scholars is impressive: from solar forecasting to virtual ethnoarchaeology, and from magnetization dynamics in nanoscale structures and devices to basal forebrain neuron firing patterns and their relationship with learning.

For the second year in a row, fewer than half of this year's Calit2 Scholars – 40 percent – are engineering majors. “We have made a deliberate effort to encourage more students to apply from non-engineering disciplines,” said chemistry and biochemistry professor Barbara Sawrey, the faculty lead who oversees the Calit2 summer program. “This year 10 percent of our scholars are from the social sciences, and 13 percent from arts and humanities. We hope their presence will send a signal to other students in those fields that Calit2 values what they bring to the institute's interdisciplinary mission.”



The 2012 class of 30 Calit2 Scholars ties the previous 2008 with total program alumni topping 280 since the program's inception. Click image for larger view.

Seven of the 12 engineering majors hail from the Department of Bioengineering, the top major among 2012 scholars, followed by four majoring in pharmacological chemistry. The single most-represented department among this year's undergraduates, however, is Chemistry and Biochemistry, with eight of the scholarships.

Majors represented among recipients included aerospace engineering, bioengineering, electrical engineering, mechanical and nanoengineering; biochemistry and cell biology, chemical physics, general chemistry, general biology, pharmacological chemistry, and physics; linguistics, cognitive science, anthropology, theatre, visual arts, and interdisciplinary computing and the arts (ICAM).

Many of the faculty advisors to this year's crop of students are participating in the program for the first time. These include Hollis Cline (neuroscience), Michael Gilson (pharmacy), Mary Corr (medicine), Steven Wasserman and Gentry Patrick (biological sciences), Bruce Torbett (pathology), Amalia Arvaniti (linguistics), Jorge Hirsch (physics), among others.

Only a handful of the Calit2 Scholars are based in Atkinson Hall. These include sophomore Samuel Avery, an aerospace engineering major who is advised by Calit2 research scientist Albert Yu-Min Lin. Avery will investigate ways to reduce high-frequency multi-rotor helicopter frame vibration for aerial videography and photography. (The current version of the remote-controlled copter was developed by the UCSD-National Geographic Engineers for Explorations program managed by Lin.) Another Calit2 research scientist, Jurgen Schulze, has advised multiple Calit2 Scholars in the past decade; this



ring freshman Joshua Yang (far right) celebrates as he completes a puzzle as part of a team-building exercise for Calit2 Scholars. Pictured clockwise from Yang: theatre/visual arts junior Donald Ripatti; bioengineering junior Adam Li; mechanical engineering senior Tyler Capps; theatre/visual arts junior Sean Estelle; and Ariel Dunn, a junior in pharmacological chemistry.

summer he will help senior Nicholas Price, a Visual Arts/Media major, in a project titled “Lunar Colonization: Logistics and Ethics.”

Applicants must work in advance with faculty advisors to propose a 10-week project, to be carried out in the advisor’s lab or research group. For most of the Calit2 Scholars, it will be their first opportunity to undertake a full-time, hands-on research project – and to get a real taste of what a future in academic or industry research might be like. Traditionally, full-time research is reserved for graduate students, so the opportunity to do so earlier in their university careers is a major attraction to the Calit2 program.

### Earlier Exposure to Research

One of the trends reflected in the demographics of the 2012 class is the shift to awarding fellowships to undergraduates earlier in their college experience. Until 2007, most of the Calit2 Scholars were seniors, and often graduating seniors, who left the university after completing their summer research experience. This year, only four students are seniors, and a similar number are freshmen. Fully half of all the Calit2 Scholars – 15 in all – are juniors, and seven others are sophomores.

“This reflects the program’s desire to provide more opportunity for the scholars to continue their work in their advisors’ labs even after the summer is over,” said Ramesh Rao, Calit2’s division director at UC San Diego. “It also means that next summer there will be a cohort of previous recipients who will still be on campus as undergrads, and many of them will advertise the program among their friends and hopefully mentor some of the younger scholars from next’s year’s program.”

Calit2’s summer program enhances the research experience for the undergraduates with weekly activities (seminars and presentations, as well as social activities). The seminars are designed to help students plan for their future, whether for graduate school, industry or non-profits. Learning to explain their work in front of internal and external audiences with public presentations and research posters will take place over the course of the summer, culminating with a final poster session and select presentations at a Calit2 General Staff Meeting scheduled for September.



Calit2 Scholars get to know each other (l-r): cognitive science senior Jerad Acosta; theatre/visual arts junior Sean Estelle; chemistry/biochemistry sophomore April Guan; and general chemistry junior Donald Ripatti.

A complete list of the students, their advisors and projects is available below or at <http://ucsdstudents.calit2.net/studentlist.php>. Full details are on the Calit2 Scholars website at <http://ucsdstudents.calit2.net>. Sessions for all Calit2 Scholars will take place at 11am each Tuesday and Thursday in Calit2 Room 4004, Atkinson Hall. The full calendar is on the website at <http://ucsdstudents.calit2.net/schedule.php>.

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