



Integrated NanoSystems Research Facility



Bio-Organic NanoFabrication

Undergrad/Graduate 199/299 Research Opportunities

The INRF is seeking student innovators for cutting-edge, industry focused engineering, art/technology interface, and computer science research in energy efficiency, micro-nanofabrication, and gamification research areas.

More than 200 UCI faculty and students are actively engaged in Calit2, INRF/BION (Clean rooms) and CalPlug (a division of Calit2) research on environmental, transportation, energy management, health care, education and entertainment-based projects.

APPLICATION PROCESS AND REQUIREMENTS

Motivated applicants are welcome to apply. Please follow these procedures:

1. Students may only receive 199/299 credit for the first quarter of research. No paid positions are available to new research students unless otherwise stated. Paid positions will be offered only if funding is available and to students showing high caliber research with need.
2. GPA's >3.0 are strongly desired. Students applying with lower GPAs must explain extenuating circumstances and show maintained academic improvement to be considered.
3. Students must be prepared to dedicate a minimum of 1 year (3 quarters) to research at time of application.
4. Submit a one-page resume along with unofficial academic transcript with introductory letter to Alana Valencia (anvalenc@uci.edu) and Steven Martinez (stevenm4@uci.edu). (Please discuss projects of interest (including Position ID) in the reply email. Send current unofficial transcript and resume. This must be done **BEFORE January 15th** to allow time for interviews and processing to meet the enrollment deadline of **January 20th**.
5. Selected students will be contacted to schedule an interview. Interviews will focus on student ability, interest, availability, and project matching. Project scheduling will follow the interview.
6. Students are expected to work a minimum of 8 hours per week on research (equivalent to 2 units).
7. Students are expected to work in professional, interdisciplinary teams.
8. Students are strictly held to unit-hour requirements (4 hours/week per unit). Substantial unexcused divergence from the required time will result in an incomplete or fail grade.
9. Students are required to submit a summary report for the work performed each quarter.
10. No more than 1/3 of research work can be performed offsite from Calit2. Students must be present to gain personal and team development.
11. Students will keep timesheets and work logs during projects. Research notebooks will be maintained. A quarter-end written report is required from all 199/299 students. Reports and presentations will be used to assess grades.



BENEFITS

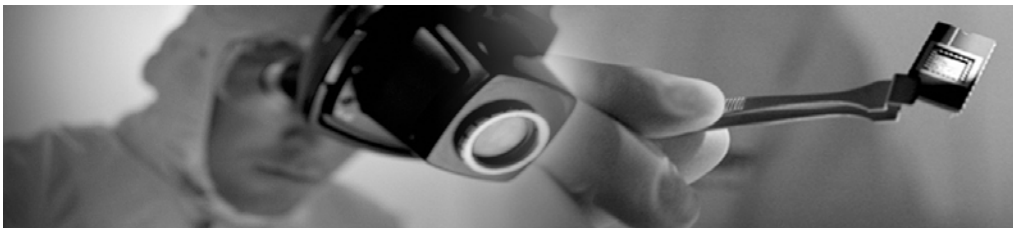
- Students will obtain **hands-on research experiences** for industry leading topics under the guidance of **Prof. G.P. Li**. Day-to-day supervision will be available from project leaders at Calit2/INRF.
- Students work to build maker skills while building practical career experience from other coursework.
- In addition to **199/299 course credits** during the first quarter of research, students who maintain outstanding research performance will be considered for **potential compensation** as funded projects become available.
- Designated **cubicles, project space, project supplies, test equipment, and computers** will be provided to students according to project needs.
- **Recommendation letters** provided to exemplary students are valuable thanks to Calit2 and CalPlug's strong affiliation with major organizations and industry players and other UC Schools and campuses, Ex: California Energy Commission, Southern California Edison, Microsemi Corporation, and the Consumer Technology Association. More than 2 quarters of work is required to be potentially eligible for a recommendation letter. Students must present a case of impressive work completed.
- **Hard and soft skill development** in students is a focus. We seek to develop our students into high quality engineers and leaders. Impressive project portfolios with solid, real-world achievements are commonly the result of conducting research at INRF/Calit2.

INRF/BION RESEARCH OPPORTUNITIES

In each of the 3 opportunities below, research students in the 199/299 INRF/BION program will gain the experience of working in two nanotechnology research and development cleanroom lab spaces on the UCI campus (INRF and BION). Research students will have the opportunity to work closely with the technical staff members of the INRF and BION facilities to



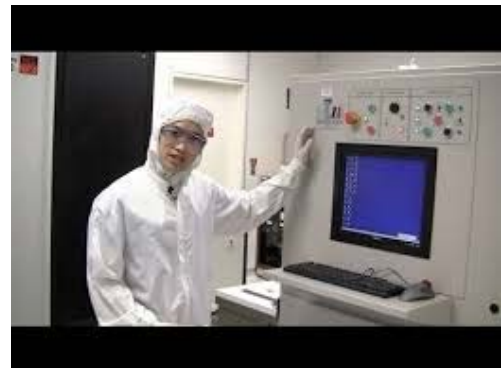
grow and develop their skill-set, gain invaluable hands on lab experience, and apply their efforts and knowledge to solve real world engineering problems. Student researchers in the program will find that their hard work and research will add immediate and ongoing value to the INRF/BION laboratories of the Henry Samueli School of Engineering.



Research Field: Process Development

Main Tasks: Develop baseline processes for the INRF/BION cleanroom lab equipment, design and implement fabrication experiments and process controls, Monitor and work to optimize fabrication process techniques

The students in this research field will work closely with technical staff and assist with process development work for nanotechnology research in the INRF/BION facilities. Example areas of research include photolithography, etch, and deposition. Responsibilities of student researchers will include but not be limited to device fabrication, developing and running process experiments ensuring optimal tool performance and repeatable processing, developing baseline processes on equipment, continuously measuring, monitoring, and working to improve equipment and process performance.



The work of student researchers will add great value to the INRF/BION facilities enhancing the existing and future process knowledge and capabilities within the labs.

Knowledge of semiconductor processes and cleanroom lab operations a plus.

Research Field: Equipment Engineering**Main Tasks: Work on INRF/BION cleanroom lab equipment as well as supporting equipment, helping with the maintenance and repair of such equipment**

The students in this research field will work closely with technical staff and assist with equipment engineering work for nanotechnology research in the INRF/BION facilities. Both lab equipment as well as supporting facility equipment are areas where students can focus on. Responsibilities of student researchers will include but not be limited to important maintenance work on complex lab equipment, equipment evaluations, inspections, upgrades and repairs, equipment installations and troubleshooting faults/issues with equipment. Student researchers can also expect to assist with implementing equipment controls ensuring optimal equipment performance critical to the success of optimal equipment process and overall research results.

The work of student researchers will add great value to the INRF/BION facilities enhancing the existing and future smooth operation of the cleanroom lab equipment, and improving equipment success and uptime.

Demonstrated hands on and mechanical/electrical skills a bonus. Knowledge of semiconductor processes and cleanroom lab operations a plus.

**Research Field: Software Development and Computer Engineering****Main Tasks: Integrate, develop, and optimize the software capabilities used to enhance the automation and monitoring of the INRF/BION**

The students in this research field will work closely with technical staff and assist with software development and computer engineering work for nanotechnology research in the INRF/BION facilities. Responsibilities of student researchers will include but not be limited to software coding/programming, as well as software integration of lab equipment with new devices (



sensors, cameras, etc) to upgrade, automate, and integrate current existing systems for an improved and optimal facility operation.

The work of student researchers will add great value to the INRF/BION facilities enhancing the overall monitoring capabilities of critical lab functions, and optimizing the entire operation of both lab facilities.

Knowledge of computer programming, assembly layout work, and hands on skills like soldering, using a multimeter, and test programs will all be beneficial as well.



For more exciting information on the INRF and BION please visit our website: <http://www.inrf.uci.edu/>

We also have a youtube channel here https://www.youtube.com/channel/UCR_gRf5Mmxmoj2aNI05q4wg and 2 great introduction to the facility videos here <https://www.youtube.com/watch?v=sInIZUpXNlg> and here <https://www.youtube.com/watch?v=FwORvSckQGk>