CONDESA
CONVERGENCE OF NANO-ENGINEERED DEVICES FOR ENVIRONMENTAL AND SUSTAINABLE APPLICATIONS

Passionate about your research? Concerned about the environment? Eager to reach across disciplinary boundaries? Ready to team up with like-minded scientists and engineers? Then apply to join the

1st Science and Engineering of Environmental Signatures (SEES) Convergence Research Incubator

From:

May 31st 2022 - June 21st 2022

To dive into research on:

1. Detection of Contaminants in Geoenvironments via Nano-enabled Sensors

2. Nano-enabled Sensing for Greenhouse Gases and Carbon Cycling in Soil

3. Advanced Quantum Sensing for Geoenvironments

Format:

In small multidisciplinary teams, students will work on assigned research and technology challenges that aim for device and process solutions for environmental and sustainable applications. Specific research topics are defined by CONDESA faculty and staff scientists under the below described three general themes. Prior to the beginning of the SEES Incubator, scholars are given a list of topics and asked to indicate their preference. Under the guidance of UC Merced faculty and Lawrence Livermore National Lab staff scientists, scholars will research the current state of the art, develop concepts, perform feasibility studies with the expectation to develop a proposal. The teams will pitch their proposals to a panel of experts to be awarded funds for research related expenses.[1] The students' skills and graduate development will be boosted by interactions with experts from around the country and the world, visits and access to research facilities, participation in technical and professional development activities.

[1] Each student will receive a minimum of $1000 in research travel funds. Based on the quality of their proposal, additional funds for research related expenses will be awarded and disbursed through the students' PIs.

Students:
This program is designed for 1st and 2nd year graduate students. The program will boost their launch into doctoral research by equipping them with skills in team science, ethics, leadership, careers planning, and by facilitating collaborations and career opportunities.

Research Themes:

1. Detection of Contaminants in Geoenvironments via Nano-enabled Sensors. This thrust will focus on nano-enabled sensors for high precision and robust detection of contaminants (including, but not limited to, heavy metals, microplastics, pharmaceuticals, and pathogens) in different geoenvironments, (soil, surface and groundwaters). Low-cost, in situ nano-enabled sensors developed here will allow comprehensive and customized detection of contaminants and will capture variations in concentration in time and space overlooked by conventional approaches.

2. Nano-enabled Sensing for Greenhouse Gases and Carbon Cycling in Soil. The design, fabrication, and testing of nano-enabled sensors for the detection of greenhouse gases and carbon cycling in soil will be the goals of this research thrust, with the aim of in situ tracking of changes in concentrations of relevant species, with higher spatial and temporal resolution than what is achievable using conventional approaches. Developments in this research direction will yield tools that will help us better understand critical phenomena such as climate change.

3. Advanced Quantum Sensing for Geoenvironments. This thrust will focus on determining the feasibility of quantum sensing achieved through solid state nanoscale devices for specific environmental sensing applications. The projects undertaken will revolutionize the monitoring of emerging phenomena such as hot spots in soil, and thus present excellent opportunities for trainees to perform cutting-edge fundamental science with environmental relevance.

Applications:
Applications will be accepted from **February 20th 2022** through **March 20th 2022**
Applications must contain the following materials:

A) A brief 250-word statement of current research interests
B) Preference of incubator research thrust area
C) Curriculum vitae (2 page maximum)
D) Unofficial transcripts
E) A signed letter from the research advisor stating that the student will be allowed to dedicate adequate time to focus on the SEES program.

Please send your application materials as a single PDF titled 'LastnameFirstname_condesaSEES.pdf' by email to ucmcondesa@ucmerced.edu. Any questions may be directed to Thomas Harmon (tharmon@ucmerced.edu) or Michael Scheibner (mscheibner@ucmerced.edu).