

IRES: Training next generation U.S. researchers at the chemistry-industry interfaces

Would you like to immerse yourself into an international scientific community during your PhD? Are you interested in interdisciplinary education with intercultural experiences? Then you might want to consider becoming an IRES Fellow and broadening your educational experience!



Images (from left): RWTH at night, Magnetic resonance facility, RWTH in the historic city of Aachen

Application. PhD students in the Chemical Sciences and Engineering at UCSB, UC Berkeley and UCLA are encouraged to apply to become IRES Fellows. You will perform research in the summer at the RWTH Aachen University in Germany on the topics, and at the interface, of catalysis, chemical transformation, modeling and characterization. Your research stay will be framed with several workshops on sustainable chemistry and chemistry at the academia-industry interface, while as IRES fellows you will participate in the annual SusTech workshop taking place at UCSB. You will receive a summer stipend of \$5500, while your travel expenses and accommodation are covered. Our RWTH partners will organize the accommodation for the IRES fellows in Aachen.

Scope. Our goal is to train a cohort of early-stage chemistry and chemical engineering graduate students to the connecting M³ cycle consisting of synthesis (Make), innovative measurements (Measure) and system modeling or sustainable operation (Model) in the context of applied chemistry in Germany. This M³ cycle is critically important in modern chemistry as it represents an effective way to achieve rapid advances in chemical synthesis and the understanding of chemical transformation. The educational excursion will give students an appreciation for the interrelationship between academia and industry, and intercultural differences that they will encounter in a global economy. A conference visit will top off the students' research stay in Europe. This can be either EuropaCat 2019 in Aachen (<http://europacat2019.eu/>) or ICMRM 2019 in Paris (<https://icmrm2019.sciencesconf.org/>), as the focus of the IRES program lies in catalysis and magnetic resonance (participation in the ICMRM to be discussed with advisor).

UC-RWTH Partnership. Expert groups in advanced characterization at UCSB, UC Berkeley, UCLA and the RWTH Aachen University in Germany joined together to pool their advanced analytical tools to work on integrated problem-solving in a three-way M³ cycle, in synergistic collaboration with chemistry and engineering colleagues to concentrate their efforts on the training of a cohort of graduate students. Several research groups at the RWTH Aachen University are ideal partners to pursue this educational endeavor, not only because the RWTH is ranked #1 in forging chemistry-engineering partnerships, but also because there are strong existing multi-PI collaborations between the UCLA/UCSB/UCB and RWTH PIs that the IRES fellows can immerse themselves in.

IRES-Program. A cohort of 6 graduate students per year will be selected (from three different campuses) and recruited as IRES fellows. These select students will be prepared pre-departure with weekly online sessions on the German customs in the Spring. The IRES cohort will gather at UCSB for an orientation workshop in Spring, ahead of their travel to Aachen in the summer following their accepted application. The expected outcome is that the graduate students have gained hands-on experience on how to accelerate the *discovery and triaging* of chemical, materials and system parameters and how to *design reaction pathways* given a set of starting chemicals. This learning process and evolution will be shared at an annual workshop at UCSB involving current and past IRES fellows, and their professional connection within the cohort and the collaborators fostered and maintained through social media.

Application and Event Calendar

Application Window: December 1, 2018 – until filled. **Priorities will be given to those who apply by Jan 31, 2019.**

Selection Criteria: Inspire collaboration between faculty, applicant quality and applicant motivation

Selection Date and Announcement: Early 2019

SusTech Workshop: Early April 2019

Spring Info Sessions: Weekly online meetings during Spring quarter 2019

Research stay abroad: June 22-August 17, 2019 at RWTH Aachen University. Activities include:

IRES welcome and kick-off workshop: week 1, RWTH Aachen University

IRES intermediate seminar: week 3 or 4, RWTH Aachen University

Events: excursions to industries and historic sites
IRES concluding seminar: Week 8, RWTH Aachen University
Conference visit: EuropaCat 2019, August 18-23, 2019, Aachen or ICMRM 2019, August 18-22, 2019, Paris

Application Material

The application package should include the following items in the listed order, within a single PDF file.

1. A 1-page cover letter in which the motivation and goals of the applicant for research abroad at the RWTH, in the context of his/her future career objectives, are succinctly stated.
2. A 2-page curriculum vitae (in quality and format that would qualify for a job application)
3. Two letters of agreement expressed in a short paragraph, 1 from the host faculty at the RWTH and 1 from the current or prospective advisor at UCSB, UCLA or UCB, supporting the applicant.
4. A written proposal of the research to be carried out at the RWTH, limited to no more than 3 pages (Arial, 11pt font, standard margins). The proposal should address the following questions: Title and goal of proposed research in one sentence. What specific research project do you propose to pursue at the RWTH? Have you connected to faculty / labs at the RWTH? How does this project connect to your own PhD project? The connection of your summer research to your PhD studies may be broadly defined. What are your goals for your PhD studies?

Please submit applications to: songji@chem.ucsb.edu with the subject line "IRES application 2019".

Before You Apply

The success of your application will hinge on the potential to forge RWTH-UC collaborations between groups. Thus, it is important to discuss your application with IRES faculty and identify RWTH host laboratories and faculty (see <http://www.acalnet.com/en/>). If you are interested, please contact songji@chem.ucsb.edu.

You can find potential projects in the project data bank here:

<https://www.acalnet.com/en/news/ires-program>

<http://sustech.ucsb.edu/projects>



Images (from left): Aachen cathedral at night, Charlemagne emperor

**RWTHAACHEN
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