

2019 WEEKLY BULLETIN
DEPARTMENT OF CHEMISTRY, NORTHWESTERN UNIVERSITY
EVANSTON, ILLINOIS
June 10, 2019

For full schedule, including Center events, please see the Department Calendar:
<http://www.chemistry.northwestern.edu/events/calendar.html>

Tuesday June 11th: *Faculty Lunch Seminar: Tom O'Halloran*
Tech K140
12:00-1:00pm

Arrivals

We did not have any new arrivals

BIP

BIP every Friday at 10:00 am in Tech K140

Announcements

The National Academies of Sciences, Engineering, and Medicine administers awards for postdoctoral and senior researchers at the U.S. Air Force Research Laboratory (AFRL), the U.S. Air Force Institute of Technology (AFIT), and the U.S. Air Force Academy (USAFA) under the [Air Force Science & Technology Fellowship Program](#) (STFP). These awards include a generous stipend, starting at \$76,542 per year for recent Ph.D. recipients, and higher for additional experience. The STFP provides the opportunity for selected Fellows to conduct independent research in some of the best-equipped laboratories in the U.S., in collaboration with highly qualified scientists and engineers. Research opportunities in the STFP are open to U.S. citizens only.

The STFP receives applications in four annual review cycles:

- August: Opens June 1; Closes August 1
- November: Opens September 1; Closes November 1
- February: Opens December 1; Closes February 1
- May: Opens March 1; Closes May 1

Applicants should contact prospective AFRL, AFIT and USAFA Research Adviser(s) at the lab(s) prior to the application deadline to discuss their research interests and funding opportunities.

Thank you for your assistance in promoting these opportunities. For more information: Phone: 202-334-2760 Email: rap@nas.edu Web: www.nas.edu/afri

Opportunities

University of Cambridge, UK Department of Chemistry Applications are invited for a Postdoctoral Research Associate (PDRA) to work in the Reisner group in the Department of Chemistry at the University of Cambridge, UK. The project is part of a European Research Council (ERC) and Leverhulme Trust funded project on protein electrochemistry and spectroscopy.

The ERC funded project (0.7 FTE) on 'Semi-artificial photosynthesis with wired enzymes' aims to integrate enzymes into porous electrodes to explore novel pathways for efficient solar-to-chemical conversion. We thereby address the need for new innovations in the solar fuels field and develop a new chemical biology platform, in which biological pathways can be systematically re-wired in vitro to characterise important metabolic processes, such as water splitting and CO₂ utilisation. Central to this project is materials design (in particular 3D electrode architectures), where materials will be tailored to the dimensions and functions of the enzymes, as well as the development of spectroelectrochemical techniques to deepen our understanding of the enzyme-material interface. The Leverhulme Trust funded project (0.3 FTE) is closely connected with the goals of the ERC-project and will be executed in collaboration with Dr Maxie Roessler from Imperial College London (<https://www.imperial.ac.uk/people/m.roessler>). This project on "Film-electrochemical EPR: a new method to investigate redox-based catalysis" is intended to pioneer EPR spectroelectrochemistry of immobilised proteins using porous metal oxide electrodes.

Applicants should have (or be about to obtain) a PhD in Chemistry, Biochemistry, Materials Science, Electrochemistry, Spectroscopy or a closely related discipline. A strong background in bioelectrochemistry, catalysis, materials chemistry and/or spectroscopy are desirable for the position. The applicant should also have experience in coordinating activities as part of a larger interdisciplinary team. Candidates are encouraged to think outside of their formal field of training to fit into a creative, collaborative and dynamic research environment. A strong record of research productivity, reflected in a strong publication record as well as excellent communication, management and English writing skills will be required. The successful candidate will also be expected to help guiding undergraduate and postgraduate students as well as taking on laboratory management duties.

More information about the Reisner group, including relevant publications, can be found at <http://www-reisner.ch.cam.ac.uk/>. Recent reviews on this topic are available here: Kornienko, Ly, Robinson, Heidary, Zhang & Reisner, *Acc. Chem. Res.* 2019, in print (DOI: 10.1021/acs.accounts.9b00087); Kornienko, Zhang, Sakimoto, Yang & Reisner, *Nature Nanotechn.* 2018, 13, 890-899 (DOI: 10.1038/s41565-018-0251-7).

Click the 'Apply' button below to register an account with our recruitment system (if you have not already) and apply online.

Please ensure that you upload your Curriculum Vitae (CV), a covering letter and include a publications list in the upload section of the online application. If you upload any additional documents that have not been requested, we will not be able to consider these as part of your application.

For queries relating to your application or the application process, please contact Inger Lomax (administrator of the Reisner laboratory) via email on pa-reisner@ch.cam.ac.uk

Please quote reference MA19027 on your application and in any correspondence about this vacancy.

University of Cambridge, UK Department of Chemistry Applications are invited for a Postdoctoral Research Associate (PDRA) to work in the Reisner group in the Department of Chemistry at the University of Cambridge, UK. The project is part of a Leverhulme Trust funded project entitled 'Optofluidic microreactors for advanced photocatalysis'. Producing renewable solar fuel by Artificial Photosynthesis and sustainable chemicals by photoredox catalysis is recognised as a promising solution to the energy & environmental crisis, but these approaches are facing critical roadblocks in technology development.

This interdisciplinary project tackles the main problems holding back exploitation of photocatalysis: lack of quantitative in-operando (during reaction) analysis and therefore fundamental understanding. We will

develop optical detection strategies based on hollow-core photonic crystal fibre, whose glass microstructure guides light through metre-long microfluidic channels. The resulting optofluidic microreactors enable ultrasensitive absorption spectroscopy within minute reaction volumes (several nL per cm). By combining fibres with microfluidic circuits, we will create a rapid screening platform for photocatalysts and flow-chemistry in general. This project will be executed in collaboration with the group of Dr Tijmen Euser, Cavendish Laboratory, University of Cambridge (<https://www.np.phy.cam.ac.uk/research-themes/optofluidics>) . Work of this PDRA based in Chemistry will therefore be closely executed with the Tijmen team in the Physics department.

Applicants should have (or be about to obtain) a PhD in Chemistry, Materials Science, or a closely related discipline. A strong background in photocatalysis is required and knowledge in materials chemistry, mechanistic chemistry, microfluidics and spectroscopy are desirable for the position. The applicant should have experience in coordinating activities as part of a larger interdisciplinary team. Candidates are encouraged to think outside of their formal field of training to fit into a creative, collaborative and dynamic research environment. A strong record of research productivity, reflected in a strong publication record as well as excellent communication, management and English writing skills will be required. The successful candidate will also be expected to help guiding undergraduate and postgraduate students as well as taking on laboratory management duties.

More information about the Reisner group, including relevant publications, can be found at <http://www-reisner.ch.cam.ac.uk/>. Recent reviews on this topic are available here: Dalle, Warnan, Leung, Reuillard, Karmel & Reisner, Chem. Rev. 2019, 119, 2752-2875; Hutton, Martindale & Reisner, Chem. Soc. Rev. 2017, 46, 6111-6123; Willkomm, Orchard, Reynal, Pastor, Durrant & Reisner, Chem. Soc. Rev. 2016, 45, 9-23; Cubillas, Unterkofler, Euser, Etzold, Jones, Sadler, Wasserscheid & Russell, Chem. Soc. Rev., 2013, 42, 8629-8648.

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Please quote reference MA19028 on your application and in any correspondence about this vacancy.

MicroLink Devices is seeking a Senior Process Engineer to support the development and sustaining of manufacturing processes for the production of GaAs-based solar cells for space, UAV, and terrestrial applications. MicroLink's current device technologies are focused on ultra-thin, GaAs-based multi-junction solar cells fabricated using an epitaxial lift-off (ELO) technology. The successful candidate will be responsible for:

1. Developing processes for GaAs ELO solar cell fabrication (photolithography, wet and dry etch, metallization, AR coating)
2. Transitioning processes from laboratory demonstration to production scale
3. Providing process engineering support for ongoing solar cell manufacturing

Prior experience in the fabrication of solar cells or related optoelectronic components is required.

Duties and Responsibilities:

- Carry out new process development as part of the Process Engineering team.
- Implement improvements to existing manufacturing processes to increase yield and throughput.

- Work with semiconductor tool vendors to evaluate, purchase and qualify new tool sets.
- Carry out root cause analysis of manufacturing yield issues.
- Establish and monitor statistical process control (SPC) control charts for production processes.
- Create and update work instructions to document processes.
- Assist in the training of production technicians.
- Establish regular preventative maintenance procedures for production tool sets.
- Assist in the troubleshooting and repair of process equipment.
- Contribute to report and proposal preparation as required.

Education and qualification:

- M.S. or Ph.D. in Physics, Electrical Engineering, Chemistry, Materials Science, or related field is desired
- Experience in semiconductor device design and process development
- Must be able to read, speak, write, and understand the English language

Additional requirements:

- Strong aptitude for laboratory experimental work
- Capable of working on multiple tasks and projects
- Possess excellent verbal and written communication skills, strong analytical and problem solving abilities, and organizational skills
- Highly detail oriented and self motivated
- Able to work with minimum supervision
- Job offer will be contingent upon completing a successful limited background investigation.
- Must be eligible to work in the US, no sponsorship provided for this position.

About MicroLink Devices

MicroLink Devices is an exciting, dynamic new business specializing in the design, development and manufacture of solar cells for spacecraft, aircraft, and terrestrial applications. The company possesses a core competence in the design and growth of high performance semiconductor materials, which it has leveraged to enter the solar cell market in the last few years. MicroLink's staff possesses more than 100 years of combined experience in world-class, high-volume semiconductor manufacturing companies. With a limited number of firms meeting the increasing demand for high performance solar cells and semiconductors, MicroLink's outlook is very promising.

As a young company with a bright future, the opportunities for employees are unrestricted. The philosophy of MicroLink Devices is to allow every employee the opportunity to mature into a position that is rewarding both to the individual and to the company. At MicroLink Devices, Inc., you will gain a wealth of experience.

Located in the northern Chicago suburbs, MicroLink has an attractive and pleasant working environment. The company offers a full package of benefits, including paid vacation, health insurance, dental insurance, 401(k) with employer match, and disability insurance.

Please contact: Christopher L. Stender Ph.D. Process Engineering Manager cstender@mldevices.com

The Sensor Technology Group, part of Ecolab's Global Sensors and Equipment Group, has an opening for a Principal Chemist/Scientist/Engineer focused on new sensor development and computational sensing. The successful candidate must have a background in Experimental Physics or related field (see below). In addition, an advanced understanding of the full life-cycle of a sensor from design to prototyping and characterization of novel sensor and control systems. Candidates with a background in experimental physics or designing analytical equipment are encouraged to apply. This associate will work in teams with associates across Ecolab RD&E to provide Sensor solutions for

research and product development and will support manufacturing, intellectual property and regulatory efforts.

What You Will Do:

- Assess divisional teams' sensor needs and recommend, use, and/or develop sensor solutions to meet new product development needs
- Adapt and integrate commercially available sensor technologies for Ecolab applications
- Develop sensor technologies to meet Ecolab's product requirements and customer needs
- Collaborate with cross-functional teams to develop new products
- Document and publish research results
- Hands-on responsibilities for building prototypes and testing in the lab, "maker" mindset

Minimum Qualifications:

- MS in Applied or Experimental Physics, Physical or Analytical Chemistry, Electrical Engineering or related field with 3 years of experience
- High-level of self-motivation, with a passion for the complexity of market driven, multidisciplinary based sensor/control system development
- Experience in defining, implementing, characterizing and/or managing end-to-end sensing systems development or analytical instrumentation development
- Experience developing performance metrics for the evaluation of sensor systems
- Knowledge of, or experience in, sensor enabled control theory
- Proven problem-solving skills with innovative and creative solution generation
- Ability to manage a variety of technical projects and respond to shifting priorities
- Excellent technical writing and verbal communication skills and ability to present results clearly and concisely to variety of audiences
- The ability to work independently and to work collaboratively with colleagues from other groups to develop partnering relationships
- Experience in measurement and/or design tools for the planning, analysis and development of sensor systems

Preferred Qualifications:

- PhD in Applied or Experimental Physics, Physical or Analytical Chemistry, Electrical Engineering or related field
- Ability to develop Software and design electrical boards for prototyping new sensor technologies
- Mathematics and statistics background
- Knowledge of emerging sensor technology trends and the up-and-coming field of computational sensing in increasingly instrumented environment
- Computational sensing experience
- Broad-based expertise developing one or several sensor technologies: Optical, Opto-electronic, Electro-chemical, Electro-mechanical, Biological, and/or Acoustic Sensor Design and or Complex Analog and Digital Signal Processing
- High level of aptitude related to principles of design-for-manufacturability and agility in design sustainability (meeting global regulatory compliance standards)

https://ecolab.wd1.myworkdayjobs.com/Ecolab_External/job/USA---Illinois---Naperville/Principal-Chemist-Scientist-Engineer--Sensor-Technology--RD-E_R00085151