

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

July 1, 2019

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

Arrivals

We did not have any new arrivals

BIP

BIP is on summer vacation and will resume in the fall.

Announcements

The following students have been awarded departmental honors for 2018-2019 by the Weinberg College Committee on Undergraduate Academic Excellence:

| <u>Student</u> | <u>Advisor</u> |
|-------------------|--------------------|
| Jeremiah Kim | Emily Weiss |
| Daniella Lewittes | Frederick Northrup |
| Yishan Li | Nathan Gianneschi |
| Kali Williams | Richard Schaller |
| Leighton Zhao | George Schatz |

Opportunities

The Solar Energy Conversion Group in the Chemical Sciences Division and the Surface Chemistry Group in the Materials Science Division at Argonne National Laboratory are in search of a postdoctoral appointee. The successful candidate will conduct fundamental research on X-ray structure-function characterization of interfacial catalysts for water remediation chemistry in surface-tailored, spatially-confined porous materials. This research will be conducted as part of a multidisciplinary team investigating advanced materials for energy-water systems ([link here](#))= with a goal of investigating how confinement and interfacial surface chemistries can be tuned to enhance aqueous redox processes in pore- and interface-tailored membrane materials. The candidate will perform atomic-scale characterization of catalysts at pore-confined, tailored interfaces using a combination of in-situ high energy X-ray scattering, atomic pair distribution function (PDF) analysis, and X-ray absorption fine structure (XAFS) spectroscopy. The candidate will further perform electrochemical characterization of interfacial catalysis and develops techniques for in-situ and electrochemical operando X-ray analyses. Finally, the candidate will participate in atomic layer deposition and molecular surface functionalization of membrane materials, analyzes data, prepares manuscripts for submission to peer-reviewed publications, make presentations at scientific meetings, maintains comprehensive knowledge of pertinent literature, and develop new ideas, concepts, and/or research proposals.

Considerable knowledge of and experimental expertise in one or more of the following techniques is desired: X-ray scattering, atomic pair distribution function (PDF) analysis, X-ray absorption near edge

(XANES) and X-ray absorption fine structure (XAFS) spectroscopies, electrochemistry, catalysis, atomic layer deposition, inorganic synthesis. Good interpersonal, verbal, and written communication skills as well as good skill in data processing, evaluation, and interpretation are also desired. This level of knowledge is typically achieved through a formal education in chemistry, materials sciences, chemical engineering or related disciplines at the Ph.D. degree level with 0 to 3 years of experience or equivalent in the scientific application of this knowledge and practical laboratory experience.

Interested candidates should send a detailed CV, along with a list of publications, to Karen Mulfort (mulfort@anl.gov), Dave Tiede (Tiede@anl.gov), and Alex Martinson (martinson@anl.gov). Argonne is a U.S. Department of Energy laboratory managed by UChicago Argonne, LLC. Argonne is an equal opportunity employer, and we value diversity in our workforce.

Loyola University Chicago (LUC), College of Arts and Sciences, Department of Chemistry and Biochemistry invites applications for a non-tenure-track position at the Lecturer rank in General Chemistry and Quantitative Analysis, beginning in Fall 2019. The Department offers Ph.D., M.S., and ACS-approved BS degrees. For more details about the department, visit <http://www.luc.edu/chemistry>.

The position involves teaching sections of General Chemistry and Quantitative Analysis in both semesters of the academic year. Candidates for the position must demonstrate the potential for distinguished teaching and student mentorship or possess a record of such accomplishments.

Qualifications

Candidates holding a M.S. degree or higher in Chemistry or in a closely related field are highly preferred. Candidates should have experience teaching Chemistry to students majoring in Chemistry, Biochemistry and Biology, and others who aspire to careers in the health sciences. The successful candidate will have a strong commitment to excellence in teaching. In addition, candidates also must be willing to support the mission of LUC and the goals of a Jesuit Catholic Education.

Minimum Education and/or Work Experience

Candidates holding a M.S. degree or higher in Chemistry or in a closely related field are highly preferred. Candidates should have experience teaching Chemistry to students majoring in Chemistry, Biochemistry and Biology, and others who aspire to careers in the health sciences. The successful candidate will have a strong commitment to excellence in teaching. In addition, candidates also must be willing to support the mission of LUC and the goals of a Jesuit Catholic Education.

Special Instructions to Applicants Candidates should submit a current Curriculum Vitae, a teaching statement, and a cover letter to www.careers.luc.edu They also must provide the names and email addresses of three individuals prepared to speak to their professional qualifications for this position. Referees will not be contacted immediately but might be at subsequent points in the review process.

Candidates may forward samples of materials related to teaching excellence to: Chair of the Search Committee Department of Chemistry and Biochemistry Loyola University Chicago 1068 W. Sheridan Road Chicago, Illinois 60660

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.

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 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