

**2018 WEEKLY BULLETIN**  
**DEPARTMENT OF CHEMISTRY, NORTHWESTERN UNIVERSITY**  
**EVANSTON, ILLINOIS**  
**May 14, 2018**

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

Tuesday May 15<sup>th</sup>:      *Faculty Lunch Seminar: Chad Mirkin*  
Tech K140  
12:00-1:00pm

Wednesday May 16<sup>th</sup>:    *3<sup>rd</sup> Year Student Organic Lectures:*  
*Max Klemes*  
Ryan 4003  
11:00am – 12:00pm

Friday May 18<sup>th</sup>:        *Department of Chemistry Colloquium:*  
*Vickie DeRose, University of Oregon*  
Tech LR3  
4:00-5:00pm

**Announcements**

**Danna Freedman has been selected to receive the 2018 Camille Dreyfus Teacher-Scholar Award**

This awards program is supported by the Camille & Henry Dreyfus Foundation, established to advance the science of chemistry, chemical engineering and related sciences as a means of improving human relations and circumstances throughout the world. It recognizes talented young faculty in the chemical sciences who demonstrate leadership in research and education, and it highlights Danna's personal commitment to excellent teaching, innovative research and the personal growth of her students in the chemical sciences.

**Chemistry at Merck** Come learn about *Chemistry at Merck* from Northwestern Chemistry alumni and Merck scientists. Tuesday, May 15th | 10:00 AM – 12:00 PM | Ryan Hall 4003

**BIP**

BIP meets every Friday in Tech K140 at 10:00am

**Arrivals**

We did not have any new arrivals

## Opportunities

**Dr. Nima Sharifi at the Cleveland Clinic in the Department of Cancer Biology** has a postdoctoral fellowship position.

Our laboratory and translational research program is focused on metabolic and molecular mechanisms of androgen synthesis and androgen receptor (AR) gain-of-function that lead to resistance to hormonal therapy.

A postdoctoral fellowship is available for drug discovery against a newly credentialed molecular target against prostate cancer. The candidate will take a leading role in the development of a compound screening assay for the identification and validation of a lead inhibitor compound against the molecular target, defining the mechanism of compound interaction with the target and optimizing the properties and potency of the lead compound.

The ideal candidate has a Ph.D. degree in biochemistry, chemistry or molecular biology and has the appropriate expertise that can be applied to drug development. Outstanding verbal and communication skills are required.

We discovered the first example of a gain-of-function in a steroid-synthesizing enzyme that enables prostate cancer resistance to hormonal therapy (Chang, et al. *Cell*. 2013 154(5):1074-1084), that we have shown drives poor outcomes after hormonal therapy (Hearn, et al. *Lancet Oncol*. 2016 17(10):1435-44; Hearn, et al. *JAMA Oncol*. 2017 Oct 12), yet serves as a tumor vulnerability to alternative steroid ablation inhibitors (Almassi, et al. *JAMA Oncol*. 2017 Oct 12).

We recently also discovered that abiraterone works by conversion to a more active steroidal metabolite (Li, et al. *Nature*. 2015 523(7560):347-51), that metabolism is pharmacologically modifiable to optimize therapy (Li, et al. *Nature*. 2016 533(7604):547-51), and that this is a class effect of steroidal androgen synthesis inhibitors (Alyamani, et al. *Cell Chemical Biology*. 2017 24, 1-8, July 20).

The position will provide a unique and multidisciplinary exposure to tumor metabolism, molecular oncology, drug development and clinical trials. Further details are available at the following link:

<https://www.lerner.ccf.org/cancerbio/sharifi/#lab>

Candidates with an interest in the position should send their CV and contact information for 3 references to:

Nima Sharifi, M.D.

Kendrick Family Chair for Prostate Cancer Research

[casalek@ccf.org](mailto:casalek@ccf.org)

### **PhD Position (66% TV-L E13) for Studies on Atomic Scale Cluster Dynamics by FastSTM**

The Chair of Physical Chemistry (Prof. U. Heiz) at the Technical University of Munich is specialized in the study of size-selected metal clusters for catalysis and other applications. One focus is on the dynamics and reactivity of these clusters on an oxide support in order to obtain atomic-scale insight into the local chemistry and energy barriers involved in chemical processes.

#### **Project Motivation:**

Typical heterogeneous catalysts consist of supported metal clusters. At reaction temperatures of a few 100°C, these cluster-assembled materials become dynamic and restructure, while adsorbed molecules diffuse across the surface. Exciting new questions arise: How do surface and bulk mobility of the support influence cluster stability? Can we control adsorbate diffusion by catalyst morphology? And how does cluster size influence reactivity? These questions shall be investigated at the atomic scale. To that purpose, we have accelerated our variable temperature scanning tunneling microscope (VT-STM) to video frame-rates to directly observe

morphological changes, spill-over and diffusion processes at elevated temperatures. You can find an example of hydrogen dynamics on a magnetite, Fe<sub>3</sub>O<sub>4</sub>(001), surface on our [website](#).

**Description of Work:**

In our ultra-high vacuum (UHV) apparatus we combine local and integral investigation methods. We implement and continuously develop new techniques such as FastSTM and Tracking within our VT-STM, and use our newly built pulsed-valve setup for catalytic testing via temperature programmed reaction (TPR). The successful candidate will prepare size-selected metal clusters in a state-of-the-art laser vaporization source that is directly connected to the measurement chambers, and investigate their stability and dynamics on oxide supports in STM, as well as their activity as a catalyst in TPR. By steering specific parameters, such as cluster size, individually, we aim to investigate their influence on a systematic, fundamental level. You will directly connect on current scientific work on CO oxidation and hydrogenation reactions on Pt clusters on Fe<sub>3</sub>O<sub>4</sub>.

**Requirements:**

Prospective candidates have a degree in chemistry, physics or a related field and are highly motivated to work on sophisticated experimental setups. A willingness to learn about new techniques and scientific fields is mandatory. We also encourage our group members to contribute to method development with their own ideas.

While not required, experience in one or more of the following topics are advantageous: *surface chemistry, UHV techniques, scanning tunneling microscopy, cluster science*

The group of Physical Chemistry at the TU Munich offers excellent research opportunities in a stimulating and friendly environment. We are part of the new Catalysis Research Center, which offers an interdisciplinary exchange and state-of-the-art infrastructure. The position is available immediately, for a duration of three years.

Interested applicants shall send their application letter together with a CV to Friedrich Esch ([friedrich.esch@tum.de](mailto:friedrich.esch@tum.de)) or Barbara Lechner ([bajlechner@tum.de](mailto:bajlechner@tum.de)) as soon as possible.

More information is available at the group's website: [www.pc.ch.tum.de/](http://www.pc.ch.tum.de/).

**MilliporeSigma is accepting applications for an Associate Product Manager**

A career with MilliporeSigma is an ongoing journey of discovery: our 52,000 people are shaping how the world lives, works and plays through next generation advancements in healthcare, life science and performance materials. For 350 years and across the world we have passionately pursued our curiosity to find novel and vibrant ways of enhancing the lives of others.

MilliporeSigma is a business of Merck KGaA, Darmstadt, Germany.

Materials Science is a rapidly growing product area within MilliporeSigma's Lab and Specialty Chemical business. The product management team operates as the hub to coordinate product development, innovation, marketing, and commercial efforts. Our products include monomers, polymers, nanomaterials, electronic chemicals, thin-film materials, and the advanced chemicals used to make them.

**Your Role:** The Associate Product Manager in the Materials Science team will manage the material synthesis product line and drive its growth through marketing campaigns, competitive pricing, availability, new products and product selection. The position will also assist in new product introductions and technical marketing content generation for other product groups within materials science. Additionally, the candidate is expected to support team efforts as assigned in order to meet department, business unit, and company objectives.

**Who You Are:**

- A strong background in materials science should be coupled with a scientific curiosity and keen interest in market analysis and product marketing.
  - M.S. or Ph.D. in Materials Science, Engineering, Chemistry, marketing or information systems and at least three years of experience related to marketing and sales of a related product line. MBA is preferred but not required.
  - Ability to work with a variety of teams, including product management, marketing teams and operational professionals
  - Understanding of the principles and techniques used in chemistry and materials science
  - Ability to communicate with customers, present technical proposals, and perform training colleagues and reports
  - Excellent communication skills, both written and verbal. Fluency in English is essential; other languages are a distinct advantage.
- To apply, visit: <https://goo.gl/85MuyA>

**Western Illinois University Department of Chemistry** is accepting applications for a tenure track Assistant Professor – Physical Chemistry position for August 2018. The successful candidate must have a commitment to excellence in teaching and student research at the undergraduate and graduate (M.S.) level. Teaching responsibilities include upper division physical chemistry including quantum mechanics, and graduate level physical chemistry courses, and either general chemistry, or lower division non-majors chemistry courses, as well as other courses as appropriate to the incumbent's area of specialization.

**RANK & SALARY:** Tenure-Track Assistant Professor. Salary is competitive. Negotiable, commensurate with experience. Western Illinois University offers a competitive benefits package including domestic partner benefits. For full benefit information visit: [http://www.wiu.edu/vpas/human\\_resources/benefits/](http://www.wiu.edu/vpas/human_resources/benefits/).

Applicants should have a Ph.D. in chemistry or related sciences with experience in physical chemistry. Applicants must also have excellent written and oral communication skills.

**PREFERRED QUALIFICATIONS:** Teaching experience in physical chemistry and post-doctoral research experience in physical chemistry preferred. Applicants with experience mentoring undergraduate physical chemistry research are preferred.

For a degree to be considered, it must be conferred from a regionally accredited degree-granting institution of higher education (or equivalent from an international accrediting body).

For more information about the position or the application process please visit: <https://wiu.interviewexchange.com/jobofferdetails.jsp?JOBID=94258>

**The Mund-Lagowski Department of Chemistry and Biochemistry at Bradley University** is seeking an individual with a strong commitment to excellence in teaching for a one-year appointment as a sabbatical replacement at the rank of Visiting Assistant Professor beginning in August 2018.

Bradley University is a top-ranked, prestigious, private university in Peoria, Illinois, offering 5,400 undergraduate and graduate students the opportunities, choices and resources of a larger university and the personal attention and exceptional learning experience of a smaller university. Bradley offers a comprehensive array of undergraduate and graduate academic programs in business, communications, education, engineering, fine arts, health sciences, liberal arts and sciences, and technology. The University is located on an 85-acre campus in Peoria, the largest metropolitan area in Central Illinois.

Candidates must have a Ph.D in Chemistry or Biochemistry. ABD candidates will be considered for the position, but completion of the doctoral degree is required by the start date. Teaching responsibilities will include introductory chemistry courses and advanced chemistry laboratories. Successful candidates must be able to: clearly communicate chemistry concepts, maintain good chemical hygiene in a laboratory setting, and supervise student assistants.

Qualified candidates must send, as a single PDF file: (1) a letter of application, which includes a brief summary of qualifications and motivation for pursuing a career in academics, (2) curriculum vitae, (3) copies of undergraduate and graduate transcripts, and (4) the names and contact information for three professional references to [chmsearch@bradley.edu](mailto:chmsearch@bradley.edu). Information regarding how the candidate will contribute to promoting diversity and equal opportunity should be provided either within the letter of application or in a stand-alone diversity statement.

To ensure full consideration, all application materials must be received no later than April 1st; however, review of applications begins immediately and will continue until the position is filled. Employment with Bradley University is contingent upon satisfactory completion of a criminal background check. Visa sponsorship is not available for this position. The Department is ACS certified; see [www.bradley.edu/las/chm](http://www.bradley.edu/las/chm) for general information about the Department.

Bradley University is an Equal Opportunity/Affirmative Action Employer. The administration, faculty and staff are committed to attracting qualified candidates from underrepresented groups.

**The inorganic & materials chemistry laboratory (IMCL) at the Technion – Israel Institute of Technology (<http://www.deruiterlab.com>)** is looking for excellent students at all levels.

Research within the laboratory focusses on supramolecular surface chemistry, and in particular, the self-assembly of inorganic metal complexes on conductive surfaces for electrocatalysis. Using non-covalent interaction to self-assemble supramolecular materials is an attractive approach towards addressing challenging problems pertinent to global energy concerns. Highly structured materials will be generated via a sequence dependent Layer-by-Layer (LbL) assembly strategy with various inorganic building blocks. By using LbL assembly, materials of variable thickness can be generated, vastly increasing the surface area for catalytically relevant transformations. The LbL assembly is facilitated by non-covalent interactions that involve pyridine-metal coordination chemistry, cyclodextrin host-guest interactions, and hydrogen bonding. The used molecular catalysts are based on first-row transition metals that are modified with supramolecular connectors, enabling their incorporation into larger supramolecular architectures. Successful candidates will work in a multi-disciplinary team within the inorganic & materials chemistry laboratory (<http://www.deruiterlab.com>) or within some of the excellent research centers present on the

Technion Campus:

1. Grand Technion Energy Program center (GTEP; <https://gtep.technion.ac.il/>) .
2. Russel Berry Nanotechnology Institute (RBNI; <https://rbni.technion.ac.il/>)

The aim the project will be developing new self-assembled materials suitable for water oxidation, oxygen reduction, hydrogen evolution, and carbon dioxide. Electrocatalytic reduction to ammonia is also within the scope of the program but is one of the future targets.

Accordingly, we are looking for excellent candidates (M.Sc., Ph.D, and Post-Doctoral) to fulfill three positions within our laboratory:

1. Synthetic Inorganic Chemists. We are looking for students with a background or interest in synthetic inorganic and organometallic chemistry. Emphasis is on the synthesis and characterization of first-row transition metal complexes that are modified with supramolecular connectors. A background with manipulation air-sensitive compounds is preferred, as well as with modern spectroscopic techniques.

2. Electrocatalysis Expert: Experience with various electrochemical techniques – both in solution and on the surface – is preferred. Quantitative analysis of gas evolution during electrocatalysis and benchmarking of surface-confined supramolecular catalysts is envisioned. The project is highly multidisciplinary and involves cooperating with synthetic, surface, and materials chemists.

3. Supramolecular Chemist: Students experienced with self-assembly and supramolecular chemistry are encouraged to apply, preferably with experience in surface characterization techniques such as AFM, XRR, and XPS. A background in synthetic (in)organic chemistry is highly desirable for modification of the molecular catalyst and surface modification of the inorganic substrates.

Students that fit any of these requirements are encouraged to apply directly to Assist. Prof. Graham de Ruiter ([graham@technion.ac.il](mailto:graham@technion.ac.il)). Applications should include a CV, a list of grades (M.Sc. or Ph.D.), and a desired starting date. The search will continue until all positions are filled.

**Georgia Institute of Technology College of Engineering/GWW School of Mechanical Engineering** postdoctoral researcher position available. The postdoctoral researcher is primarily expected to work on developing Kinetic Monte Carlo simulations of the growth and morphology of oxide particles. In addition, the researcher is expected to have knowledge of molecular dynamics and ab initio methods. The selected candidate will work with Dr. Chaitanya Deo at Georgia Institute of Technology on a project funded by Savannah River National Laboratory to develop morphological and physicochemical properties of oxalate and oxide production. The project will provide a better understanding of crystallization and calcination dynamics at plant-scale operating conditions. A multi-scale modeling approach will provide the most accurate description of the crystallization and agglomeration phenomena for the plutonium oxalate precipitation process and of the calcination mechanism.

Applications are available through: <https://apps.itos.uga.edu/ach/position/37937>