

2018 WEEKLY BULLETIN
DEPARTMENT OF CHEMISTRY, NORTHWESTERN UNIVERSITY
EVANSTON, ILLINOIS
June 18, 2018

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

- Tuesday June 19th: *Faculty Lunch Seminar: Regan Thomson*
Tech K140
12:00-1:00pm
- Malcolm Dole Distinguished Summer Lectures in Physical Chemistry:*
 David Nesbitt, University of Colorado, Boulder
Tech L211
4:00-5:00pm
- Wednesday June 20th: *Malcolm Dole Distinguished Summer Lectures in Physical Chemistry:*
 David Nesbitt, University of Colorado, Boulder
Tech L211
4:00-5:00pm
- Thursday June 21st: *Malcolm Dole Distinguished Summer Lectures in Physical Chemistry:*
 David Nesbitt, University of Colorado, Boulder
Tech LR4
11:00am – 12:00pm

BIP

BIP has finished for the 2017-2018 school year. They'll be back in the fall.

Arrivals

Daniel Friedrich joined the Kanatzidis Group

Announcements

The following students have been awarded departmental honors for 2017-2018 by the Weinberg College Committee on Undergraduate Academic Excellence:

| <u>Student</u> | <u>Advisor</u> |
|-------------------|-------------------|
| Ananya Agrawal | SonBinh Nguyen |
| Sophie Brauer | Kimbery Gray |
| Zer Chia | Thomas Meade |
| Ryan Evenson | Richard Silverman |
| Mengtan Liu | SonBinh Nguyen |
| Colin Lynch | Thomas Meade |
| Abigail Schroeter | Brian Hoffman |

Opportunities

3M is seeking a Research Specialist for the Inorganic and Ceramics Cluster of the Corporate Research Materials Laboratory located in Maplewood, MN. At 3M, you can apply your talent in bold ways that matter.

Job Summary:

The person hired for the position of Research Specialist will develop advanced technologies and products in Inorganic and Ceramics Cluster of 3M's Corporate Research Materials Laboratory. The primary focus of this position will be to develop new thermal management materials for the automotive electrification market space. At 3M, our researchers leverage our 46 technology platforms and capabilities to develop new technologies and products that solve customer problems across many businesses and markets. 3M offers over 55,000 products that are helping customers are used in consumer electronics, hospitals and clinics, industrial manufacturing, and safety products. 3M core material technologies and expertise include advanced polymers, nanotechnology, biotechnology, and ceramics that are used in adhesive tapes, protective coatings, film technologies, non-wovens, abrasives, and respirators. 3M is applying Science to Life.

Primary Responsibilities include but are not limited to the following:

- Leverage expertise to develop and advance technologies that can be used for new product commercialization opportunities in the area of thermal management materials.
- Protect 3M intellectual property through the filing of new patent applications, publish in top-tier journals, and present at appropriate conferences.
- Collaborate with research teams from corporate research and business labs on building capabilities and applications that use his/her scientific, mathematical, and computational skills.
- Active participation in 3M's Tech Forum
- Collaboration with international laboratories for technology and product transfers.

Basic Qualifications:

- Possess or in the last year of pursuing a Doctoral degree or Post-Doctoral fellow in a Science or Engineering discipline from an accredited university
- Research & development experience in thermal management materials

Preferred Qualifications:

- Ph.D. degree in chemistry, chemical engineering, material science or related discipline with an emphasis on Thermal Management Materials
- Previous experience (3-5 years) in thermal management materials and solutions for the automotive and/or electronics products market space.
- Good skills in data analysis and the use of designed experiments
- Strong scientific and technical acumen, with demonstrated interest and ability to make connections between science/technology and real-world concerns
- Strong problem-solving skills
- Ability to deal with the ambiguity of early-stage scouting and evaluation of new opportunities and the flexibility to change direction as additional information becomes available
- Leadership and networking skills
- Self-motivated and self-directed
- Excellent communication skills (oral, written and presentation)

Location: Maplewood, MN

<https://3m.recsolu.com/jobs/qE7mmzOBAqGWwNXOee7aMQ>

University of Michigan, Flint Chemistry and Biochemistry Department has a posting for a LEO Lecturer 1 – Chemistry and Biochemistry.

Required Qualifications:

Minimum of a MS in Chemistry or Biochemistry or related science degree with extensive chemistry experience. Minimum of 2 years' experience in an instructional or research laboratory in chemistry or related field is also required. Preference will be given to those who are able to teach organic chemistry laboratory and with prior experience doing so. Familiarization with academic laboratory operations, safety protocols, and modern equipment and techniques is desirable. http://careers.umich.edu/job_detail/158584/leo_lecturer_i_-_chemistry_biochemistry

Send an application letter, CV, transcripts, and names (with contact information) for three (3) references, as soon as possible. Please mail or e-mail your materials to:

Dr. Jessica Tischler, Associate Professor
Chemistry and Biochemistry Department
The University of Michigan-Flint
303 East Kearsley St., 556 MSB
Flint, MI 48502-1950
e-mail: jtisch@umflint.edu

NU-ACCESS Postdoctoral Research Scholarship: Nanoscale Characterization of Reaction Boundaries and Pathways for Metal Carboxylates in Oil Paints

The Northwestern University / Art Institute of Chicago Center for Scientific Studies in the Arts (NUACCESS) is offering a two-year postdoctoral research scholarship (possibly extendable for a third year) to study the chemistry of zinc soaps: organic/inorganic compounds that form by reaction of the Zn oxide pigment with an oil-based (lipidic) binding medium. The postdoctoral position is funded through the NSF grant Partnership in International Research and Education (PIRE): Computationally-Based Imaging of Structure in Materials (CuBISM) (NSF-OISE: 2018-2023). The grant activities overall aim to develop computational and experimental tools needed to understand how artworks undergo change over long periods of time. To accomplish this task a research network has been established between Northwestern University and leaders in cultural heritage science from the Rijksmuseum in the Netherlands, the National Research Council in Italy, and the Sychrtron Soleil in France. Therefore, as part of this project, you will join a vibrant community of graduate and undergraduate students at Northwestern University all working on cultural heritage science projects, an experience enhanced by multi-pronged opportunities for extended periods of international exchange and research (<http://www.cubism.northwestern.edu/>).

The specific project is a collaboration between Prof. Richard P. Van Duyne at Northwestern University, Dr. Francesca Casadio at the Art Institute of Chicago and Dr. Katrien Keune at the Rijksmuseum/ University of Amsterdam (UvA). While the main place of work will be the laboratories of the Van Duyne group at Northwestern University, the position includes 2/3 residencies of up to 2 months each in the Netherlands, to work with the Keune group. In other words, Research will be undertaken at both NU and UvA, allowing the use of the analytical, library and other resources at both institutions.

One of the fundamental phenomena of deterioration of bio-based coatings used in art making is the formation of metal carboxylate salts ("metal soaps"). It is estimated that around 70% of paintings in museum collections are affected by some form of metal soap-related degradation phenomena. The Netherlands has longstanding expertise in the study of material degradation of paintings, especially in the area of metal soaps in art, yet, despite extensive scrutiny many open questions remain.

With this project we aim to answer the following fundamental questions:

1) What are the reaction kinetics of the formation and crystallization of Zn soaps in oil? What is the influence of environmental (T, RH%) and anthropic (solvents) parameters on such reaction pathways and kinetics?

2) What happens at reaction boundaries between zinc oxide particles and the organic medium? Can we determine the structure (crystalline, amorphous, type of organic acid) and possible orientation of the newly formed zinc soaps at the nanoscale, from vibrational data?

While working mostly with model systems, this project aims to ultimately develop the Quartz Crystal Microbalance (QCM) as a tool to probe reaction kinetics for these organic/inorganic systems in real time. We also aim to connect the micro-mechanical properties of the studied systems with their chemistry, probed with ultra-high sensitivity and nanometer spatial resolution with tip-enhanced Raman spectroscopy (TERS). By solving new scientific problems relevant to cultural heritage science, we can further push the limits of using TERS for complex heterogeneous mixtures of non-resonant molecules. and overall broaden its general use as a nanoscale analytical technique.

Applicants should have a completed Ph.D. in chemistry or a related discipline, and have demonstrated expertise in the use of Raman spectroscopy, SERS, TERS or related spectroscopic techniques, and familiarity with complementary analytical techniques including SEM/EDX, TEM and FTIR microspectroscopy. Ability for self-directed research and a demonstrated record of peer-reviewed publications are essential requirements of the job. Previous work experience in the cultural heritage field is an advantage; an enthusiasm for studying works of art and historic artefacts is essential.

The application, including cover letter, CV, list of publications, and contact information for two references, should be submitted to nu-access@northwestern.edu. For inquiries please contact Francesca Casadio (fcasadio@artic.edu)

The deadline for application is June 30 2018, with a start date anticipated by September 2018. Northwestern University is an Equal Opportunity, Affirmative Action Employer of all protected classes, including veterans and individuals with disabilities. Women, underrepresented racial and ethnic minorities, individuals with disabilities, and veterans are encouraged to apply. Hiring is contingent upon eligibility to work in the United States.

North Park University, The Chemistry Department seeks a responsible and skillful Director of Chemistry Laboratories. A full-time, 12-month position, the Director of Chemistry Laboratories will oversee chemistry laboratory teaching support needs, including chemical preparations, laboratory equipment set-up, and lab clean-up. The Director provides maintenance support services for all Chemistry Department instrumentation, computers, and technologies. The Director is expected to consistently teach some laboratory sections for 1000-level chemistry classes and to teach General Chemistry I & II during each summer term.

Essential Responsibilities:

- Oversees chemistry laboratory chemical preparations, equipment set-up, and lab clean-up for all chemistry laboratory classes on a year-around basis
- Required to teach CHEM 1150: General Chemistry I with lab and CHEM 1160: General Chemistry II with lab during June and July summer terms, respectively
- Required to teach at least one section each of our 1000-level introductory laboratory sections (CHEM 1011/1021/1031/1150/1160) during the school year.
- Directly assists the Department Chair in supervising and training adjunct faculty who will teach other 1000-level introductory laboratory sections.
- Contribute to the on-going development and pedagogical improvement of introductory laboratory experiments

- Oversees chemistry instrumentation, including regular and preventative maintenance and software/firmware updates
- Performs weekly liquid nitrogen fills of the department NMR and quarterly liquid helium fills
- Ensures all chemistry department computers and iPads are regularly updated
- Ensures department LabQuest handheld computers are updated and all associated probes and sensors are in working condition and repaired in a timely manner
- Supervises and helps direct departmental student laboratory assistants
- Works closely with Chemical Hygiene officer/Laboratory Safety Officer (CHO/LSO) to ensure that laboratory conditions are in compliance with all hygiene and safety laws, regulations, and best practices
- Assists Departmental Chair, CHO/LSO, and Science Division Office Manager with Chemistry Department orders and deliveries
- Works with Physical Plant to ensure that chemistry laboratories are in proper working condition
- Manages chemical stockroom inventory
- Complete other duties as assigned by the Department Chair

Essential Qualifications:

- Master's Degree or higher in Chemistry or Biochemistry, Ph.D. preferred.
- Experience teaching introductory college-level chemistry laboratories
- Experience teaching college-level General Chemistry course sequence and must be willing to commit to teaching General Chemistry during summer term
- Experience working with others (including students) in a laboratory setting
- Experience maintaining instrumentation and computers
- Excellent time management and organizational skills
- An eagerness to learn and master the wide variety of essential responsibilities listed above.
- Understanding of and personal commitment to North Park's mission of Christian higher education.

NOTE: Nothing in this job description restricts the supervisor's right to assign or reassign duties and responsibilities to this job at any time.

<https://www.northpark.edu/employmentapplication>

University of Calgary Postdoctoral Fellowship, Cost-Effective CO₂ Reduction Catalyst

Development, Canada First Research Excellence Fund As part of the implementation of its CFREF scientific strategy and to address the Grand Challenge aiming to develop next generation of CO₂ conversion catalysis, a project in the production climate neutral synthetic fuels through electrocatalytic carbon dioxide reduction is seeking a team member at the Postdoctoral level.

The successful candidate will work within a multidisciplinary team of synthetic chemists, electrochemists, surface scientists and engineers consisting of 5-7 PI's, 5 PDFs and a similar number of graduate students. The primary aim will be to develop new, selective CO₂ conversion catalysts supported on novel conducting materials. While initially CO will be targeted as a product, other potential fuels will also be within scope.

Accordingly, we seek applications from qualified candidates within two to four years of their Ph.D. degree to fill a Postdoctoral Fellow position with the following specific qualifications:
 Synthetic inorganic chemistry: Ph.D. in inorganic chemistry with an emphasis on the synthesis and characterization of organometallic and coordination compounds, particularly of the first row transition series. The ability to prepare and manipulate air and moisture sensitive compounds, and characterize them using a suite of modern spectroscopic and analytical techniques. Working knowledge of electrochemistry and electrocatalysis is also strongly desired.

The appointment will be for two years with a \$55,000/year salary (CND dollars); the position also comes with sufficient research support to be managed by the candidate in consultation with the PI members of

the team. In addition, the candidate will be required to work within a team environment and so excellent communication skills and the ability to work effectively with a diverse group of interdisciplinary researchers is a must. As a PDF team member, strong leadership in project management is also expected. Applications should consist of a current CV, a list of two to three referees with contact information and a cover letter indicating you are applying for a position with the *Synthetic Fuels* team as a synthetic inorganic chemist. Please also indicate your availability. The search will continue until the position is filled, preferably by September 1, 2018.

To be eligible as a Postdoctoral scholar at the University of Calgary, the candidate must have been awarded a PhD or equivalent within the five (5) years immediately preceding the appointment. Please review the [Eligibility](#) page for more information prior to applying for this position

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