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NYU  
DEPARTMENT OF  
CHEMISTRY

## CHEMISTRY Notes

WINTER 2019 | ISSUE 4



ISSUE **4**

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## welcome

### LETTER FROM THE CHAIR



With 2020 on the horizon, we are happy to provide this update on happenings in NYU Chemistry. We continue to work diligently in support of our over-arching goal of recruiting and enabling outstanding faculty and researcher personnel that are poised to provide excellent education and training to our students at all levels.

As I write this, exciting new lab space renovations and construction of new labs are proceeding at an accelerated pace. We have already completed renovated space for the research group of Nick Geacintov as well as a newly refurbished laboratory for our advanced undergraduate lab courses including Experimental Physical Chemistry, Experimental Biochemistry, and Analytical Chemistry. The latter two courses are highlighted elsewhere in this letter that emphasizes new curricular developments as well as some of the recent accomplishments by our community of scholars. New chemistry department offices (which are moving to make way for added research space) and the first of two new research labs will come online in Fall 2020, and two large additional research lab spaces will be completed by Fall 2021. As you can see, things are moving quickly! We would love to hear from you! Please keep us updated at [chemistry@nyu.edu](mailto:chemistry@nyu.edu). We welcome your news and, of course, your support. To find ways that you can support NYU Chemistry, please visit the following web site: [as.nyu.edu/chemistry/alumni/giving-opportunities](http://as.nyu.edu/chemistry/alumni/giving-opportunities)

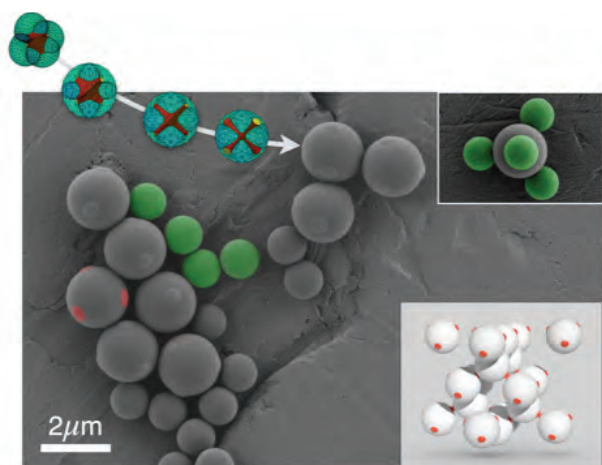
**James Canary**

*Professor of Chemistry and Department Chair*

# Feature: **STEFANO SACANNA** Wins Soft Matter Prize



Congratulations to **Associate Professor Stefano Sacanna**, who recently received the Early Career Award for Soft Matter Research from the American Physical Society. Sponsored by the Solvay corporation, this \$5000 award recognizes outstanding and sustained contributions by a young researcher to the field of Soft Matter. Since joining the Department of Chemistry and its Molecular Design Institute in 2013, Stefano has brought magic to colloid science through unprecedented ways to fabricate and assemble colloid particles. Nowhere is the sleight of hand more evident than the Sacanna group's demonstration of colloid particles that "shape-shift" on demand as a consequence of dewetting forces between an oil phase and solid colloidal substrates. Add to the portfolio of accomplishments colloid particle microswimmers that mimic the collective phototactic behavior of algae in solution and self-powered colloidal microgears talk to each other and synchronize into dynamical superstructures. These phenomena all rely on particle engineering, illustrated by example in the accompanying figure.



Colloidal particles with sticky patches were designed to mimic atomic building blocks, and computer simulations revealed deformation pathways that transformed particle clusters into spherical "patchy-particles." The electron micrograph shows polymer particles with soft, sticky patches (red) to which target particles (green) stick on contact, forming well-defined architectures (insert). These microscopic units can be programmed to self-assemble into crystalline lattices and microstructured bulk materials. Collectively, the Sacanna group is making strides toward a new class of materials, with applications ranging from optics to micromachines to drug delivery to cosmetics. ■

To appreciate the colloidal systems and their dynamics more fully, visit the Sacanna Lab video tutorials at [youtube.com/channel/UCT6gTHX182dXtgzywm7BI2w/](https://youtube.com/channel/UCT6gTHX182dXtgzywm7BI2w/) videos, see colloidal particles assembling through Lock-and-Key interactions at [youtube.com/watch?v=AfQK9TQrMT0](https://youtube.com/watch?v=AfQK9TQrMT0), or tour the Sacanna group site at [sacanna-group.com/home](http://sacanna-group.com/home). To watch is to be amazed!



@NYUChemistry



# DEPARTMENT NEWS AND EVENTS

Chemistry Research Retreat 2019

## Pre-semester News

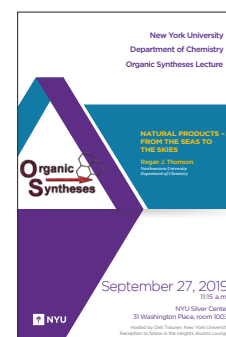
- Professor **Marcus Weck** received the 2019 CAS Golden Dozen Teaching Award.
- After more than 30 years as a beloved and integral member of the department, Instrumentation Specialist **Ron McLurkin** retired in August 2019.
- Doctoral Student **Gordon Brown** won the 2019 CAS Dean's Outstanding Teaching Award.
- The New York University Department of Chemistry hosted its inaugural overnight Research Retreat in June at beautiful Honor's Haven Resort in The Catskill Mountains. The agenda included student presentations, a poster session, a research integrity talk, a wellness conversation, and lots of eating, schmoozing and R&R. Attended by approximately 70 faculty, grad students and postdocs, the event was organized by doctoral students **Tommy Lazarou** (Buccella Group) and **Katharina Huell** (Trauner Group).

## Fall News

- **Bart Kahr** was selected as a Fellow of the American Association for the Advancement of Science.
- **Dirk Trauner** was the 2019 Boehringer-Ingelheim Lecturer at UCLA, pictured with faculty host (NYU Distinguished Alumnus!) **Neil Garg**.



- **Stefano Sacanna** received the 2020 Early Career Award in Soft Matter Research, given by the American Physical Society.
- NYU Chemistry announced the Organic Syntheses Lecture Series, with the inaugural seminar on September 27, 2019 featuring speaker **Regan J. Thomson** from Northwestern University. This lectureship series is made possible by a grant from Organic Syntheses, Inc. and is hosted by **Dirk Trauner**.



- September's **Chemistry Infonight** saw an unprecedented turnout of undergrads interested in learning about our program from faculty, staff, alumni and students.

## Alumni News

- Alumnus **Bowen Yang** is a smash on SNL this season!



## Alumni Reception

April 24, 2020  
4:30 - 6:30 p.m.



save the date



# DEPARTMENT RESEARCH

We love to hear from alumni!

Please send us your news!  
If nothing is new, tell us what's  
old! Write to:

chemistry@nyu.edu

# Hello!

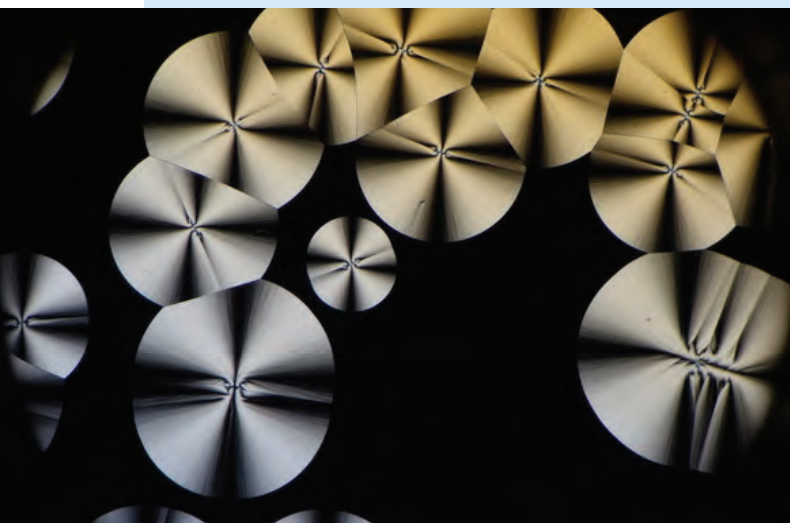
- **The Ward Group** in the Molecular Design Institute has reported on molecular frameworks, built from two-dimensional hydrogen-bonded networks, that are capable of encapsulating a wide range of guests, developing a toolkit for synthetic chemists. The article, entitled “Hydrogen-Bonded Frameworks for Molecular Structure Determination,” appeared in *Nature Communications*, authored by graduate students **Yuantao Li** and **Anna Yusov**, NYU undergraduate **Shishuang Tang**, visiting students **James Rose** and **Andre Nyberg Borrforss**, and NYU Chemistry X-Ray Crystallographer **Chunhua “Tony” Hu**.
- **The Trauner Group** and colleagues published a biomimetic total synthesis of the natural product preuisolactone A in the *Journal of the American Chemical Society*. They synthesized the highly complex natural product in a mere three steps, and showed that preuisolactone A is likely a polyketide, and not a terpenoid, as previously thought. Graduate student **Alexander Novak** and NYU REU student **Claire Grigglestone** worked on the study called “A Biomimetic Synthesis Elucidates the Origin of Preuisolactone A,” which was highlighted by *Chemical & Engineering News*.
- Continuing the pursuit of safe rechargeable batteries, **Alexej Jerschow** and postdoctoral fellow **Konstantin Romanenko** published their findings in an article called “Distortion-free inside-out imaging for rapid diagnostics of rechargeable Li-ion cells” in the *Proceedings of the National Academy of Science*.
- **The Hamilton Group** published a piece in *Organic Letters* entitled, “Heterofunctionalized Cavitands by Macrocyclization of Sequence-Defined Foldamers” which was selected as an ACS Editor’s Choice paper. The authors are postdoctoral fellow **Joseph W. Meisel**, X-Ray Crystallographer **Chunhua T. Hu** and Professor (not to mention President of NYU!) **Andrew D. Hamilton**.
- **The Traaseth Group** published a study entitled, “Inducing conformational preference of the membrane protein transporter EmrE through conservative mutations” in *eLife*. NYU Research highlighted the study, noting that “the study—conducted using *E. coli* bacteria—can help researchers to better understand the evolution of transporter proteins and their role in drug resistance.” The authors of the work include postdoctoral fellow and alumna **Maureen Leninger** and graduate student **Ampon Sae Her**.

## Featured Publications

- The National Science Foundation produced a video called **Synthetic Proteins Science Nations**, which features **Kent Kirshenbaum** explaining the basics of proteins and the biomimetic research he conducts in his lab. The video includes shots of graduate student **James Eastwood**, REU student **Zakiyyah Jones**, and X-Ray Crystallographer **Chunhua (Tony) Hu**.



NSF Facebook: [facebook.com/US.NSF/videos/vb.30037047899/785855831789591/?type=2&theater](https://www.facebook.com/US.NSF/videos/vb.30037047899/785855831789591/?type=2&theater)



DDT crystal structure by Xiaolong Zhu

- The Ward and Kahr Groups in the Molecular Design Institute published a study in the *Journal of the American Chemical Society* called, “Manipulating Solid Forms of Contact Insecticides for Infectious Disease Prevention,” which looks at a compound developed by German scientists before World War II and its potential to fight Malaria with reduced environmental impact. The author list includes NYU’s **Xiaolong Zhu** (graduate student), **Jingxiang Yang** (postdoctoral fellow), **Mengdi Qiu** (under-graduate), **Chunhua Hu** (NYU Chemistry crystallographer) and **Leo A. Joyce**, a Merck collaborator, as well as group leaders **Michael D. Ward** and **Bart Kahr**. The story was picked up by the *New York Times* and was featured on the front page of the October 22 Tuesday *Science Times* as “Old Mix to Fight Malaria.”

## EDUCATION *feature*

A new **Analytical Chemistry Course** was developed by **Marc Walters** and **Trina Mandal**. This course familiarizes students with modern methods and instrumentations of chemical analysis. The lecture portion of the course elaborates on the scientific basis and principles of analysis. The laboratory portion provides students with hands on experience of operating scientific instruments that they will likely encounter later in a work environment or in research laboratories. The welcome addition of this course fleshed out the department’s course selection in an area of growing interest.

More exciting curriculum news is the revision of **Experimental Biochemistry**, a one-semester laboratory course offered to chemistry and biochemistry majors. The lab curriculum takes a hands-on approach to expose students to the process of scientific discovery. Specifically, it emphasizes research-based learning by guiding students through a “hypothesis-driven” scientific quest allowing students to test key biochemical concepts learnt in the classroom. **Rohini Qamra** and **Somdeb Mitra** have collaborated with **Paramjit Arora** and **Nate Traaseth** to extend ongoing research projects into the curriculum of the teaching laboratories. Students in Experimental Biochemistry, therefore, work on ‘real’ research projects

while they learn crucial techniques involving protein purification, characterization, and crystallization of novel protein-protein interactions. Consequently, the curriculum bridges the two most important aspects of an academic institution: teaching and scientific research. These enhancements in the lab curriculum have provided students with an opportunity to tackle “actual” scientific problems in the classroom. This has further increased learning as students apply their problem-solving skills while encountering complex biochemical problems in the lab. Collaborations have also been established with **Kent Kirshenbaum** to incorporate current research projects as a teaching module on enzymology and drug inhibition. The enhanced lab curriculum allows for opportunities to collaborate with researchers at the NYU School of Medicine and further increase the scope of student learning. **We gratefully acknowledge that this extensive progressive course revision was made possible by general gifts from alumni.**

Clinical Professor and alumna (Seeman Group) **Yoel Ohayon** was spotlighted in CAS “Proud to be First” Newsletter as a research mentor to first-generation student **Dennis Tang**.



# GLOBAL *News Bite*

The mission of the **NYU-ECNU Center for Computational Chemistry** at **NYU Shanghai** is to provide a platform for world-class research, for training students and young scientists, and for international collaboration in computational chemistry. The Center's Director is **John Zhang**, and other affiliated faculty from New York include **Zlatko Bacic**, **Glen Hocky**, **Tamar Schlick**, **Mark Tuckerman** and **Yingkai Zhang**. Former Department of Chemistry Chair **Nicholas Geacintov** is the Vice Dean of Science at NYU Shanghai, so the two campuses are intimately connected, with the Center providing an exceptional hub. The Center carries out a variety of academic activities, including a seminar series featuring international and domestic speakers who are leading scientists in frontier research, symposiums and workshops, and a visiting scientist program. The unique synergy of the center in international scientific exchange and collaboration provides a strong foundation for researchers to carry out truly challenging and innovative research at a premier international center for computational research in chemistry and related fields.



MRSEC students Cicely Shillingford and Anna Yusov demonstrating at the World Science Festival



ACS National Chemistry Week student volunteers in Washington Square Park



New York Nanoscience Discussion Group speakers from the October Session

## Applications to the **FALL 2021 DOCTORAL PROGRAM**

The deadline for applications to the **doctoral program in Chemistry** at NYU is **December 12, 2020**. For full consideration, get your application in by the deadline date, when we will begin our review! The application is available on the department website and also on the Graduate School of Arts and Science Admissions Resource Page: [gsas.nyu.edu/page/grad.admissionsapplication](https://gsas.nyu.edu/page/grad.admissionsapplication)



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