

# The Catalysis Club of Philadelphia

Thursday, Mar. 26<sup>th</sup>, 2026

Doubletree by Hilton Hotel Wilmington – Wilmington, Delaware

4727 Concord Pike, Wilmington, DE 19803

## ***Controlling Coordination, Unlocking Reactivity: Rational Strategies in Environmental Catalysis***

**Speaker: Prof. Fudong Liu**

*University of California Riverside*

## ***Tuning Fractionation of Lipid-Rich Lignocellulosic Waste Streams for Drop-In Sustainable Aviation Fuel Production: A Spent Coffee Grounds Case Study***

**Student Speaker: Christopher Acquah**

*Rowan University*

### **Meeting Agenda:**

*Social Hour* ..... 5:30 PM  
*Dinner* ..... 6:30 PM  
*Meeting* ..... 7:30 PM

### **Meeting Registration:**

*Members:* \$45.00  
*Non-Members:* \$55.00  
*Stud. & Retired Members:* \$35.00

Please register online for this In-person meeting by **March 20<sup>th</sup>** at CCP website [In-person Meeting Registration — Catalysis Club of Philadelphia](#).

### **Meal Selection (Included):**

Please make one selection for your dinner (included in registration) when you sign-up for the meeting from the following options:

1. Grilled pork chop with apple & raisin chutney.
2. Boneless beef short rib with peppercorn demi glace.
3. Winter vegetable stew (vegan).

Starter: Butternut squash bisque, toasted pumpkin seeds, dried cranberry  
Side: Farro or wild rice and roasted zucchini with yellow squash and peppers

### **Membership Registration:**

Membership dues for CCP 2025-26 meeting season will be \$25 (\$5 for the local chapter and \$20 for the national club). Dues for students, post-docs and retirees will be \$10 (\$5 for the local club and \$5 for the national club). Please sign-up membership ([Link](#)) for more benefits on meeting registrations and networking events!

Please contact our Treasurer Steve Hardwick ([sjh.wilm.de@gmail.com](mailto:sjh.wilm.de@gmail.com)) or Chair Jinsuo Xu ([JinsuoXu@dow.com](mailto:JinsuoXu@dow.com)) or Program Chair Brandon Bukowski ([bbukows1@jhu.edu](mailto:bbukows1@jhu.edu)) if you need any assistance

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## ***Controlling Coordination, Unlocking Reactivity: Rational Strategies in Environmental Catalysis***

**Prof. Fudong Liu**

*University of California Riverside*

Supported metal single-atom catalysts (SACs) and fully exposed cluster catalysts have emerged as powerful platforms in heterogeneous catalysis, enabling near-complete utilization of supported metals, an especially critical advantage for high-cost noble elements. The intrinsic catalytic performance of these systems is governed by the local coordination environment of isolated or ensembled metal atoms. However, achieving precise control over metal coordination structures, particularly on industrially relevant supports, and optimizing their intrinsic activity for practical environmental applications remain formidable challenges. This talk will present strategies to tailor the coordination environment of metal centers and to direct the structural evolution of single atoms into more stable and catalytically robust active sites, while simultaneously modulating the local reaction atmosphere to enhance performance. These approaches deliver markedly improved activity in key environmental reactions, including CO, NH<sub>3</sub>, and hydrocarbon oxidation, as well as nitrogen oxides reduction. The mechanistic insights gained establish a foundation for precise control of active-site coordination and reaction microenvironments, advancing the goal of uniting full atomic utilization with maximized intrinsic activity for targeted environmental applications.

**Speaker Bio:** Dr. Fudong Liu has been working in heterogeneous catalysis, environmental catalysis, pollution control, greenhouse gas reduction/utilization, hydrogen production, and synchrotron-based technique (X-ray absorption spectroscopy) for material characterization for more than 20 years, in both academia (Tsinghua University, Chinese Academy of Sciences, University of California, Berkeley/Lawrence Berkeley National Laboratory, University of Central Florida, University of California, Riverside as a tenured associate professor) and industry (BASF [catalysisclubphilly.org](http://catalysisclubphilly.org))

Corporation). He has published 170+ peer reviewed papers with 14,200+ citations and H-index of 62 (Google Scholar), applied 40+ patents with 24 granted so far, and published 5 book chapters in heterogenous catalysis field. Dr. Liu's group has been funded by US DOE, US EPA, NSF, BASF Coporation etc. Dr. Liu received the 2009 CAS P&G Scholarship, 2010 CAS President Scholarship, 2011 CAS Excellent Doctoral Dissertation Award, 2012 International Association of Catalysis Societies (IACS) Young Scientist Award, 2013 Lu Jiayi Young Talent Award, 2014 National Science & Technology Progress Award, 2019 National Natural Science Award, China, 2020 TechConnect Defense Innovation Award, 2023 Research Incentive Award at University of Central Florida, 2024 RINENG (Results in Engineering, Elsevier) Distinguished Scientist Award, 2024 CAPEES-Carina Frontier Research Award, 2025 CAPEES Founding President Best Paper Award, and 2025 Team Award from The U.S. Department of Energy's Vehicle Technologies Office (VTO) etc.



***Tuning Fractionation of Lipid-Rich Lignocellulosic Waste Streams for Drop-In Sustainable Aviation Fuel Production: A Spent Coffee Grounds Case Study***

**Christopher Acquah**

*Rowan University*

The growing demand for sustainable aviation fuel (SAF) requires new strategies for valorizing complex waste biomass into fuels that are compatible with existing aviation infrastructure. Lipid-containing waste lignocellulosic biomass is particularly promising because its lipids, carbohydrates, and lignin can each contribute to established SAF production pathways, including hydroprocessed esters and fatty acids (HEFA), ethanol-to-jet (ETJ), and hydrodeoxygenation (HDO) of lignin-derived streams. However, conventional processing often targets only one fraction and leaves the remaining components underutilized. In this talk, we present an alcohol-based fractionation strategy for generating multiple SAF-relevant streams from these feedstocks, using spent coffee grounds as a case study to illustrate the broader concept. By tuning solvent systems and fractionation conditions, the process is designed to control lipid extraction, lignin extraction

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and solubilization, and carbohydrate retention, enabling more integrated whole-biomass utilization. The approach also supports process circularity by directing each recovered fraction to a complementary upgrading route and by creating opportunities for internal solvent recirculation within a waste-to-fuel biorefinery. Overall, this work highlights fractionation as a key step toward feedstock-flexible, integrated, and circular waste-to-SAF biorefineries.

**Speaker Bio:** Christopher Acquah is a third year Ph.D. candidate in the Chemical Engineering Department at Rowan University working under Dr. Jun Hee Jang. His research focuses on catalytic and fractionation strategies for converting lignocellulosic biomass into sustainable fuels, chemicals, and materials.

