



THE OHIO STATE
UNIVERSITY

2022 Ohio Inorganic Weekend

November 4-5, 2022
The Ohio State University
Columbus, OH

Friday, Nov. 4

Poster Session (5:00 – 8:00 pm)
CBEC Lobby (Pizza and beverages will be provided)
5:00 – 6:30 pm Poster Numbers 1-44
6:30 – 8:00 pm Poster Numbers 44-87

Saturday, Nov. 5

Oral Presentations (8:30 am – 3:30 pm)
McPherson Laboratory, Room 1000
8:00 – 8:20 Coffee and bagels/pastries
8:20 – 8:30 Welcome and opening remarks
8:30 – 10:00 Session I: Coordination Chemistry
10:00 – 10:30 Break
10:30 – 12:00 Session II: Catalysis and Bioinorganic Chemistry
12:00 – 2:00 Lunch
2:00 – 3:30 Session III: Solid-state Chemistry

Organizers:

Shiyu Zhang (zhang.8941@osu.edu)
Casey Wade (wade.521@osu.edu)

Locations:

✘ **Friday evening poster session: CBEC Lobby**
(Chemical and Biomolecular Engineering and Chemistry, 151 W Woodruff Ave)

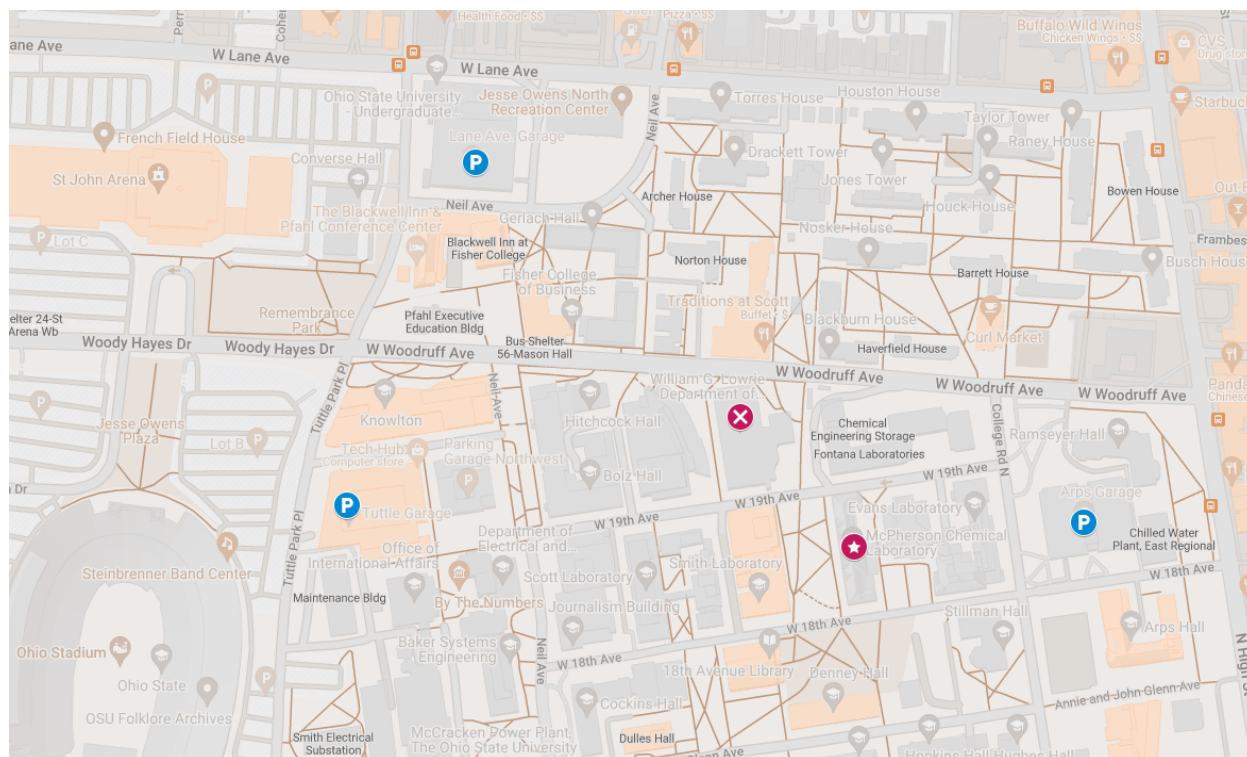
★ **Saturday Oral presentations: McPherson Laboratory, Room 1000**
(140 W 18th Ave)

P **Visitor Parking Garages:**

Tuttle Garage, 2050 Tuttle Park Pl
(<https://osu.campusparc.com/find-parking/tuttle-garage/>)

Arps Garage, 1950 College Rd N
(<https://osu.campusparc.com/find-parking/arps-garage/>)

Lane Avenue Garage, 2105 Neil Avenue
(<https://osu.campusparc.com/find-parking/lane-avenue-garage/>)



Thanks to the following sponsors for their generous support of OIW 2022:



Schedule of Oral Presentations:

Session I: Synthesis and Coordination Chemistry

Session Chair: Jianbing "Jimmy" Jiang (University of Cincinnati)

- 8:30 - 8:45** **Emalyn Delgado Rosario** (Case Western Reserve University, Protasiewicz Group)
Organophosphorus Bifunctional Lithium Borate Salts
- 8:45 - 9:00** **Umesh Kaluarachchige Don** (Wayne State University, Groysman Group)
Synthesis and Reactivity of Xanthene based Heterobimetallic Systems for CO Oxidation
- 9:00 - 9:15** **Daniel Beagan** (University of Michigan, Szymczak Group)
A bidentate ligand featuring bifurcated Lewis acids in the second-sphere for substrate capture and activation
- 9:15 - 9:30** **Bedraj Pandey Pandey** (University of Cincinnati, Guan Group)
Additive-Free Dehydrogenation of Formic Acid Using an Iron Catalyst
- 9:30 - 9:45** **Jose Rodriguez** (West Virginia University, Millsmann Group)
Synthesis and Characterization of Intermediate Spin Fe(II)-Carbene Complexes Supported by Pyridine-Dipyrrolidine Ligands
- 9:45 - 10:00** **Nilanka Sirikkathuge** (Wayne State University, Winter Group)
Deposition of Magnesium Metal Films using Bis(1,4-di-tert-butyl-1,3-diazadienyl)magnesium Precursor

Session II: Electrochemistry and Bioinorganic Chemistry

Session Chair: Alexis Ostrowski (Bowling Green State University)

- 10:30 - 10:45** **Abigail Bracken** (University of Michigan, Lehnert Group)
Exploring secondary coordination sphere effects in flavodiiron nitric oxide reductase model complexes
- 10:45 - 11:00** **Samantha Carter** (The Ohio State University, Zhang Group)
Application of the secondary coordination sphere to enhance the reactivity of bimetallic copper complexes.
- 11:00 - 11:15** **Josephine Gan** (The Ohio State University, Shafaat Group)
Probing O₂ activation and in vivo metalation of a Mn/Fe oxidase
- 11:15 - 11:30** **Manu Gautam** (University of Louisville, Spurgeon Group)
The Effect of Flue Gas Contaminants on Electrochemical Reduction of CO₂ to Methyl Formate in a Dual Methanol/Water Electrolysis System
- 11:30 - 11:45** **Kaili Yan** (University of Cincinnati, Sun Group)
Electrosynthesis of amino acids from biomass-derived α -hydroxyl acids
- 11:45 - 12:00** **Libo Yao** (University of Michigan, McCrory Group)
Translating Catalyst-Polymer Composites to CO₂RR Gas Diffusion Electrode (GDE): Identifying and Bridging the Knowledge Gaps
- 12:00 – 2:00** **Lunch**

Session III: Solid-state Chemistry

Session Chair: Michal Marszewski (University of Toledo)

- 2:00 – 2:15** **Mezbah Hossain** (Ball State University, Li Group)
Comparison of physicochemical properties and photodegradation activities among different divalent transition metal tungstate nanoparticles at different calcinated temperatures.
- 2:15 – 2:30** **Livina Iheme** (University of Toledo, Marszewski Group)
Soft Template Synthesis of Titania using Non-Hydrolytic Sol-Gel Method
- 2:30 – 2:45** **Andrew Ochs** (The Ohio State University, Goldberger Group)
Expanding the Library of Goniopolar Materials
- 2:45 - 3:00** **Rose Pham** (University of Kentucky, Guiton Group)
Investigating the Stability of Thermoelectric Composite Interfaces via In Situ Microscopy
- 3:00 – 3:15** **Riti Sen** (University of Pittsburgh, Millstone Group)
Connecting Cation Exchange and Metal Deposition Outcomes Via Hume-Rothery Like Design Rules Using Copper Selenide Nanoparticles
- 3:15 – 3:30** **Cory Sims** (Bowling Green State University, Furgal Group)
Tri-Cure Hybrid Organo-Silicon Coatings

Poster List:

1. Abhishek Saini, The Ohio State University, Shafaat Group
Developing H₂ production catalysts by strategic installation of a synthetic cobalt core in protein scaffolds
2. Adam Jenkins, The Ohio State University, Shafaat Group
A Computational Investigation into Bioinorganic Inverted Ligand Fields
3. Alexander Olivelli, University of Kentucky, Huckaba Group
Oxidation of Nonactivated C-H Bonds Using Bioinspired Copper Catalysts
4. Alexander Stone, Case Western Reserve University, Protasiewicz Group
Investigating hydrogen bonding interactions between NH-containing systems and bis(NHCs).
5. Alexia Marques Silva, The Ohio State University, Turro Group
Rational Design of Ru(II) Polypyridyl Complexes with Extended π -System Ligands to Achieve Long-Lived Triplet Excited States
6. Alice Atkins, University of Michigan, Szymczak Group
Appended Lewis acid-assisted reactivity of small molecules on a group 6 metal TACN complex
7. Andrea Batchev, Wayne State University, Allen Group
Europium(II/III)-containing complexes encapsulated in a per-fluorocarbon nanoemulsion for imaging oxygen using ¹⁹F-magnetic resonance imaging.
8. Andrew LaDuca, University of Michigan, Szymczak Group
Secondary Sphere Hydrogen Bonds Enable Dioxygen Activation at Iron and Allow Observation of Hydroxyl Radical Transfer
9. Andrew Kollar, The Ohio State University, Wade Group
CoP₂N₂ complexes for selective dimerization of terminal alkynes
10. Ankita Mishra, University of Toledo, Young Group
Pd(II)-Catalyzed gamma-Alkynylation of Allylamines
11. Archibald Williams, The Ohio State University, Goldberger Group
Exploration of the magnetic and electronic properties of the novel van der Waals compounds, Mn₂Ga₂S₅ and Mn₂In₂Se₅
12. Asanka Dissanayake, Wayne State University, Groysman Group
Increasing the Stability of Monomeric Methylene Diphenyl Diisocyanate (4,4'-MDI) Using N-Heterocyclic Carbene (NHC) Systems
13. Ashlee Wertz, The Ohio State University, Shafaat Group
Looking Past the Secondary Sphere: Relating Dynamics to Catalytic Activity in Nickel-Substituted Rubredoxin, a Model Hydrogenase
14. Benjamin Farris, University of Michigan, Szymczak Group
Efforts to Improve Ruthenium-Catalyzed Guerbet Chemistry

15. Brett Barden, The Ohio State University, Thomas Group
Determining the pka and BDFE of bound substrates on Zr/Co tris(phosphinoamide) heterobimetallic complexes
16. Callie Gernand, Indiana State University, Van Hoveln Group
Enantio- and chemoselective copper-catalyzed reduction of ketones using a disilane as the reductant
17. Christopher Woodley, University of Michigan, Bartlett Group
Effects of Trace Metal Contamination from the Li-Ion Battery Recycling Process on the Structure and Composition of LiNi_{0.6}Mn_{0.2}Co_{0.2} (NMC622)
18. Cullen Irvine, The Ohio State University, Goldberger Group
The Synthesis of PdSe₂ Nanomaterials for Goniopolar Photocatalysis
19. Daniel Beagan, University of Michigan, Szymczak Group
A bidentate ligand featuring bifurcated Lewis acids in the second-sphere for substrate capture and activation
20. Dilsha Wickramasinghe, Wright State University, Arumugam Group
Design and synthesis of Naphthoquinone-based Redox-active N-Heterocyclic Carbenes (NHCs) for gold (Au) complexation studies.
21. Drew Culley, Indiana State University, Van Hoveln Group
Enantio- and chemoselective copper-catalyzed reduction of ketones using a disilane as the reductant
22. Elizabeth Manickas, University of Michigan, Lehnert Group
Synthesis of Model Systems for Reactive Intermediates in Cytochrome P450_{nor}
23. Emma Pollock, The Ohio State University, Woodward Group
Exploring Oxide Perovskite Derivatives as Potential Hosts for Exotic Spins States
24. Esme DenOtter, University of Michigan, Lehnert Group
Synthesis, Characterization, and Hydrogen Evolution Activity of Cobalt[Pyridinethiolate N-Oxide]₂
25. Eva Mwakazi, Wayne State University, Verani Group
Coordination Studies of Nickel(II) Recovery by Ion Flotation
26. Fathima Shabna Mohamed Nazim, Bowling Green State University, Ostrowski Group
In-Situ synthesis of silver nanoparticles on vanadium coordinated hydrogels for antimicrobial applications
27. Gibson Kirui, Wayne State University, Verani Group
Studies On Molecular Rectification Through Iodo-Substituted Bisphenolate Iron(III) Surfactants
28. Guanqun Han, University of Cincinnati, Sun Group
Two-photon-absorbing ruthenium complexes enable near infrared light-driven photocatalysis
29. Hannah Hassoun, Case Western Reserve University, Protasiewicz Group
Synthesis and Characterization of a New Benzodioxaphosphole-Tungsten Pentacarbonyl Complex
30. Herenia Espitia, Bowling Green State University, Furgal Group
Photo-responsive Cr(III)-Supramolecular Siloxane Polymers with Self-healing potential

31. Indunil Alahakoon, University of Toledo, Young Group
Rhodium catalyzed intermolecular aziridination using carbohydrate-derived sulfamates
32. Irene Baraza, Bowling Green State University, Ostrowski Group
Correlating Photo response to mechanical property changes in Metallosupramolecular polymers.
33. Isuri Jayasooriya, Michigan State University, Warren Group
Copper(II) Thiolate Mediated Catalytic sp^3 C-H Thioetherification
34. Jake O'Hara, University of Michigan, Bartlett Group
Insight into composition of manganese oxide electrocatalysts to study OER selectivity
35. Jeremiah Stevens, The Ohio State University, Thomas Group
Si-H Bond Activation by a Tetradentate Bis(amido)bis(phosphine) Iron(II) Complex
36. Jess Fletcher, The Ohio State University, Thomas Group
Synthesis of Main Group Metal Complexes Supported by a Tetradentate Bis(amide)bis(phosphine) Ligand
37. Jessica Vandevord, The Ohio State University, Turro Group
Examination of the effect of monodentate leaving ligands on Ru (II) polypyridyl complexes
38. Jonathan McHenry, The Ohio State University, Shafaat Group
Investigating the substrate binding pocket in the heterobimetallic Mn/Fe R2lox protein
39. Jordon Hilliard, The Ohio State University, Wade Group
Postsynthetic modification of metal-organic frameworks for heterogeneous catalysis
40. Josalyne Beringer, Michigan State University, Warren Group
Bimetallic Complexes in the Interconversion of N_2 and NH_3
41. Justin Miller, The Ohio State University, Thomas Group
Synthesis and Characterization of Square Planar (PNNP)Co(II) Complexes
42. Kalpana Sampath, Wright State University, Arumugam Group
Development of Tetrathiafulvalene (TTF) fused Imidazolium salts for Redox Flow Battery (RFB) Applications
43. Karl Koster, The Ohio State University, Goldberger Group
Materials with Axis-Dependent Conduction Polarity make Transverse Thermoelectric Generators a reality
44. Kathryn Pitton, University of Kentucky, Guiton Group
Probing Electronic Properties of Emergent Quantum Phenomena of Layered Materials with Scanning Probes
45. Khalil Mudarmah, Kent State University, Huang Group
Synthesis and Characterization of Zn Complex of an 8-Hydroxyquinoline Derivative as a Zinc Transport-Facilitating Agent to kill Multidrug-resistant Staphylococcus aureus

46. Kumari Walpita, Miami University, Tierney Group
Paramagnetic Resonance of High-Spin Co(II) in Biologically-Relevant Environments
47. Kura Gamage Chamod Dharmadasa, Wayne State University, Winter Group
Synthesis of Zn(I) Dimers for use as Potential Precursors in Metal ALD Processes
48. Lakshani Wathsala Kulathungage, Wayne State University, Groysman Group
Cyclopropanation Catalyzed by Iron(II) Complexes in Bulky Alkoxide Ligand Environments
49. Leah Oliemuller, The Ohio State University, Thomas Group
Synthesis of a pincer-ligated manganese carbonyl complex featuring an N-heterocyclic phosphonium moiety and its reactivity toward N=N double bonds
50. Levi Wolff, University of Kentucky, Huckaba Group
Development of Novel Carbonic Anhydrase Biomimetic Zn-Complexes for Carbonyl Hydration
51. Luke Hargrave, Indiana State University, Van Hoveln Group
Synthesis and functionalization of potassium bis(ethyleneglycol)organosilicates
52. Man Kshetri, Kent State University, Zheng Group
Cytotoxicity and Stability of Liposomal Nanoparticles of Near-Infrared Activable Platinum(IV) Prodrugs
53. Manjula Madde Kandage, University of Toledo, Marszewski Group
Modified Pechini Method: Developing Surface Area and Pore Volume of Catalyst Supports
54. Margaret Ball, The Ohio State University, Zhang Group
C-H Trifluoromethylation with a Formally Cu(III)-CF₃ Complex
55. Marisa Tordella, West Virginia University, Milsmann Group
Functionalization of Pyridinedipyrroloide Supported Zirconium Photosensitizer with Polar Groups
56. Matt Gordon, Indiana University - Bloomington, Skrabalak Group
Single-Source Precursors for the Controlled Aqueous Synthesis of Bismuth Oxyhalides
57. Matthew Fitzsimmons, The Ohio State University, Thomas Group
Catalytic hydroelementation of terminal alkenes by a (PPP) pincer-ligated cobalt(II) complex
58. Matthew Grindle, Miami University, Tierney Group
Solution Dynamics of Cobalt-Based Single Ionic Magnets
59. May Cheline, Kent State University, Zheng Group
Fluorophore Imaging and Cancer Therapy by Reduction-Triggered Platinum(IV) Prodrug-conjugated Fluorescein Monitor
60. Md Mamunur Rashid, Wayne State University, Allen Group
Systemic Delivery of Divalent Europium with Implications to Direct Imaging Hypoxia
61. Md Sydul Islam, Wayne State University, Allen Group
Investigation of the Kinetic and Electrochemical Features of Eu(II)-Based Macrocyclic Complexes
62. Michael Lengel, University of Michigan, Lehnert Group
Synthesis and characterization of non-heme iron hyponitrite complexes

63. Mikal Lange, Indiana State University, Zuo Group
Optimization of NiFe electrocatalysts for water-splitting reactions
64. Nathanael Hunter, The Ohio State University, Thomas Group
Synthesis and Characterization of Phosphinoamide-Supported Group 4/Cobalt Heterobimetallic Compounds
65. Nilanka Sirikkathuge, Wayne State University, Winter Group
Synthesis of Amino Alkoxide Alanes for Atomic Layer Deposition of Aluminum Metal
66. Nuwangi Kulasekara, Wayne State University, Allen Group
Ligands on solid support resin for separation of rare earth elements
67. Olutayo Farinde, University of Toledo, Young Group
Selective Mizoroki–Heck Reactions on Allylamines
68. Piyush Gupta, The Ohio State University, Turro Group
Heteroleptic dirhodium(II,II) paddlewheel complexes for proton reduction
69. Ramiro Barraza, Wayne State University, Allen Group
Properties of amine-containing ligands that are necessary for visible-light-promoted catalysis with divalent europium
70. Riley Stein, The Ohio State University, Shafaat Group
Experimental Insights on the Mechanism of Nickel-Substituted Rubredoxin
71. Ryan Nelson, The Ohio State University, Goldberger Group
Axis-dependent conduction polarity in bulk crystals of PdSe₂, an air-stable 2D semiconductor
72. Sang gyu Seo, University of Michigan, Szymczak Group
Lewis acid-imparted divergent reactivity of nickel imido and related species
73. sara worku, Wayne State University, Allen Group
Strategic transposition: non-selective lanthanide binding followed by sequential release enables efficient recovery of rare-earth elements
74. Sathesh Vanaparathi, The University of Toledo, Young Group
A Self-supported Dirhodium(II) Heterogeneous Catalyst: An Efficient Nitrene Transfer
75. Sergely Steephen Bokouende, Wayne State University, Allen Group
Solid-State and Solution-Phase Characterization of SmII-Aza[2.2.2]cryptate and its Methylated Analogue
76. Shannon Cooney, University of Rochester, Matson Group
Hydrogen atom transfer from an aquo-adduct of a reduced polyoxovanadate cluster
77. Siqi Li, University of Michigan, Bartlett Group
Photoelectrocatalytic and Electrocatalytic Chloride Mediated Selective Ethanol Oxidation in Solvent-free and Aqueous Conditions

78. Spencer Burton, The Ohio State University, Turro Group
Earth abundant elements as photosensitizers; cyclometallation as a strategy for extending excited state lifetimes
79. Ting-An Chen, Michigan State University, Warren Group
Copper Catalyzed sp^3 C-H Functionalization for C-C Bond Formation
80. Uran Iwata, Michigan State University, Warren Group
Optimization of copper complexes for the study of the use of ammonia as a fuel
81. Vahdat Jahed, Ohio University, Jensen Group
Length vs. strength of the three-center $M\cdots B-H$ bond in the heteroleptic scorpionate complexes $[(Tp3R,5R)M(Bp3R',5R')]$ ($R = Me, Ph$; $R' = H, Me, Ph$; $M = Mn, Fe, Co, Ni$)
82. Virginia Larson, University of Michigan, Lehnert Group
Elucidating the structure of a reactive $Ni(IV)(O)(TAML)$ species with spectroscopy and density functional theory calculations
83. Wanrui Xie, University of Michigan, Bartlett Group
Synthesize and Photocatalytic Study of Colloidal Zinc Cobalt Nanocrystal Prepared from A Solvothermal Method
84. Wjdan Jogadi, Kent State University, Zheng Group
Near Infrared-Activatable Platinum-Based Anticancer Agents
85. Yuri Lee, The Ohio State University, Shafaat Group
Elucidating Structures of Mn/Fe Metallocofactors in Point-Mutated Active Sites of the R2lox Protein
86. Md Estak Ahmed, Michigan State University, Warren Group
Electrocatalytic Ammonia Oxidation by a Low Coordinate Copper Complex
87. Pokhraj Ghosh, Michigan State University, Warren Group
Copper (II) Mediated Reduction of Nitrate to Nitric Oxide by Thiols and H_2S as Biologically Relevant Reductants