Full Program

Sunday
4:00 pm - 8:00 pm  Arrival and Check-in
6:00 pm  Dinner
7:30 pm - 7:40 pm  Welcome / Introductory Comments by GRC Site Staff
7:40 pm - 9:30 pm  **Metals and Biological Signalling**
   Discussion Leader: **Emily Weinert** (Emory University, USA)
   7:40 pm - 8:20 pm  **Michael Marletta** (University of California, Berkeley, USA)
      "Selective Sensing of Nitric Oxide in Biology"
   8:20 pm - 8:35 pm  Discussion
   8:35 pm - 9:15 pm  **Thomas O'Halloran** (Northwestern University, USA)
      "Zinc Receptors, Fluxes and Switches in Control of Cell Fate Decisions"
   9:15 pm - 9:30 pm  Discussion

Monday
7:30 am - 8:30 am  Breakfast
8:30 am  Group Photo
9:00 am - 12:30 pm  **Metal Ion Homostasis, Proteins and Nucleic Acids**
   Discussion Leader: **Sheila David** (University of California, Davis, USA)
   9:00 am - 9:30 am  **Victoria DeRose** (University of Oregon, USA)
      "Platinum interactions across the cell: new players and pathways"
   9:30 am - 9:45 am  Discussion
   9:45 am - 10:15 am  **Lauren Waters** (University of Wisconsin Oshkosh, USA)
      "Regulation of Mn metabolism in bacteria: from a small RNA to a small protein to riboswitches"
   10:15 am - 10:30 am  Discussion
   10:30 am - 11:00 am  Coffee Break
   11:00 am - 11:30 am  **Walter Chazin** (Vanderbilt University, USA)
      "What are those Fe-S clusters doing in genome maintenance proteins?"
   11:30 am - 11:45 am  Discussion
   11:45 am - 12:15 pm  **David Giedroc** (Indiana University, USA)
      "Structural mechanisms of transition metal homeostasis in bacteria"
   12:15 pm - 12:30 pm  Discussion
 12:30 pm  Lunch
 1:30 pm - 4:00 pm  Free Time
 4:00 pm - 6:00 pm  **Poster Session**
 6:00 pm  Dinner

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Metal Ion Regulation and Human Health

Discussion Leader: **Celia Goulding** (University of California, Irvine, USA)

7:30 pm - 8:00 pm **Ashley Bush** (Florey Institute of Neuroscience & Mental Health, Australia)  
"Iron and ferroptosis in brain disease"

8:00 pm - 8:10 pm Discussion

8:10 pm - 8:40 pm **Guenter Schwarz** (University of Cologne, Germany)  
"New Functions Of Molybdenum Enzymes In Neurodegeneration And Nitric Oxide Synthesis"

8:40 pm - 8:50 pm Discussion

8:50 pm - 9:20 pm **Dianne Newman** (California Institute of Technology / Howard Hughes Medical Institute, USA)  
"Selective Degradation of an Extracellular Electron Shuttle Abrogates Biofilm Development"

Tuesday

7:30 am - 8:30 am Breakfast

9:00 am - 12:30 pm *Global Chemical Cycles: Nitrogen*

Discussion Leader: **Yilin Hu** (University of California, Irvine, USA)

9:00 am - 9:30 am **Jonas Peters** (California Institute of Technology, USA)  
"Synthetic Single-Site Fe N2-ases"

9:30 am - 9:45 am Discussion

9:45 am - 10:15 am **Serena Debeer** (Max Planck Institute for Chemical Energy Conversion, Germany)  
"From FeMoco to FeVco: Heterometal Contributions to Nitrogenase Reactivity"

10:15 am - 10:30 am Discussion

10:30 am - 11:00 am Coffee Break

11:00 am - 11:30 am **Leslie Murray** (University of Florida, USA)  
"Towards understanding how metal ions cooperate to activate dinitrogen"

11:30 am - 11:45 am Discussion

11:45 am - 12:15 pm **Lance Seefeldt** (Utah State University, USA)  
"Light-driven N2 reduction catalyzed by a CdS-nitrogenase MoFe protein hybrid"

12:15 pm - 12:30 pm Discussion

12:30 pm Lunch

1:30 pm - 4:00 pm Free Time

4:00 pm - 6:00 pm **Poster Session**

6:00 pm Dinner

7:30 pm - 9:30 pm *Global Chemical Cycles: Energy*

Discussion Leader: **Anne Jones** (Arizona State University, USA)

7:30 pm - 8:00 pm **Fraser Armstrong** (Oxford University, United Kingdom)  
"New insights into Hydrogenase Catalysis"
8:10 pm - 8:40 pm  Michael Rose  (The University of Texas at Austin, USA)  
"Functional Models of Mono-[Fe] Hydrogenase using an Anthracene-based Ligand Scaffold"

8:40 pm - 8:50 pm  Discussion

8:50 pm - 9:20 pm  Leslie Dutton  (University of Pennsylvania, USA)  
"Toward biogenesis of first-principle design and engineering of light- and redox- active proteins working in cells"

9:20 pm - 9:30 pm  Discussion

Wednesday

7:30 am - 8:30 am  Breakfast

9:00 am - 12:30 pm  Metalloenzymes: Mechanisms and Models
Discussion Leader: Michael Green  (University of California, Irvine, USA)

9:00 am - 9:30 am  Steve Yu  (Academia Sinica, Taiwan)  
"Selective Oxidation of Aromatics and Mechanisms Mediated by Iron Monooxygenases (AlkB, XylM and/or Cytochrome P450)."

9:30 am - 9:45 am  Discussion

9:45 am - 10:15 am  Joseph Martin Bollinger  (Pennsylvania State University, USA)  
"Emerging diversity in the chemistry of iron- and 2-oxoglutarate-dependent oxygenases"

10:15 am - 10:30 am  Discussion

10:30 am - 11:00 am  Coffee Break

11:00 am - 11:30 am  Judith Klinman  (University of California, USA)  
"Lipoxygenase: An Enzyme for All Seasons"

11:30 am - 11:45 am  Discussion

11:45 am - 12:15 pm  John Peters  (Montana State University, USA)  
"New Insights into the Mechanism of Electron Bifurcating NADH-Dependent Reduced Ferredoxin:NADP Oxidoreductase"

12:15 pm - 12:30 pm  Discussion

12:30 pm  Lunch

1:30 pm - 4:00 pm  Free Time

4:00 pm - 6:00 pm  Poster Session

6:00 pm  Dinner

7:00 pm - 7:30 pm  Business Meeting

Nominations for the Next Vice Chair; Fill in Conference Evaluation Forms; Discuss Future Site and Scheduling Preferences; Election of the Next Vice Chair

7:30 pm - 9:30 pm  Metals and the Environment, from the Deep Past to Today
Discussion Leader: William Casey  (University of California, Davis, USA)

7:30 pm - 8:00 pm  Alison Butler  (University of California, Santa Barbara, USA)  
"Biological Wet Adhesion to Mineral Surfaces: Mussels, Siderophores and the Catechol-Cation Synergy"

8:00 pm - 8:10 pm  Discussion
8:10 pm - 8:40 pm  
**Dan Rothman** (Massachusetts Institute of Technology, USA)  
"Nickel-Driven Methanogenic Burst Accompanying Earth's Greatest Extinction"

8:40 pm - 8:50 pm  
Discussion

8:50 pm - 9:20 pm  
**Thomas Spiro** (University of Washington, USA)  
"How bacteria use a multicopper oxidase to close the environmental Mn cycle by producing MnO$_2$ biomineral"

9:20 pm - 9:30 pm  
Discussion

**Thursday**

7:30 am - 8:30 am  
Breakfast

9:00 am - 12:30 pm  
**Water Oxidation/Oxygen Evolution**

  Discussion Leader: **Richard Debus** (University of California, Riverside, USA)

9:00 am - 9:30 am  
**Woodward Fischer** (California Institute of Technology, USA)  
"A geobiological perspective on the role of Mn in the evolution of photosynthesis"

9:30 am - 9:45 am  
Discussion

9:45 am - 10:15 am  
**Victor Batista** (Yale University, USA)  
"Studies of Oxomanganese Complexes for Natural and Artificial Photosynthesis"

10:15 am - 10:30 am  
Discussion

10:30 am - 11:00 am  
Coffee Break

11:00 am - 11:30 am  
**Nicholas Cox** (Max Planck Institute for Chemical Energy Conversion, Germany)  
"High-Field Pulse EPR: A New Biophysical Tool for the Study of the Oxygen Evolving Complex"

11:30 am - 11:45 am  
Discussion

11:45 am - 12:15 pm  
**Petra Fromme** (Arizona State University, USA)  
"New Insights into the water splitting mechanism of Photosystem II by time-resolved Femtosecond Nanocrystallography"

12:15 pm - 12:30 pm  
Discussion

12:30 pm  
Lunch

1:30 pm - 4:00 pm  
Free Time

4:00 pm - 6:00 pm  
**Poster Session**

6:00 pm  
Dinner

7:30 pm - 9:30 pm  
**Oxygen, Life in the Balance**

  Discussion Leader: **Kara Bren** (University of Rochester, USA)

7:30 pm - 8:00 pm  
Short Talk Selected from Poster Abstracts

8:00 pm - 8:15 pm  
Discussion

8:15 pm - 9:15 pm  
**Harry Gray** (California Institute of Technology, USA)  
"Living with Oxygen"

9:15 pm - 9:30 pm  
Discussion

**Friday**

7:30 am - 8:30 am  
Breakfast
9:00 am  Departure