

Telluride Workshop on Proton Transfer in Biology, July 16-20th 2024

Telluride Intermediate School

725 W Colorado Avenue

Organizers: Joachim Heberle, Brian Dyer, and Jessica Swanson

Local TSRC Host: Mark Kozak (970-708-4426)

July 15th Monday

5:00-6:30 (pm)

All-Telluride Science Meet and Greet

Location: [Alibi](#) (157 S. Fir Street, Telluride)

** there will be drinks and badges – hope to see you there!*

July 16th Tuesday

Discussion Leader: Jessica & Brian

7:30-8:00 (am)

Registration & “Grab & Go” Breakfast in coffee break area

8:00-8:10

Introduction **Mark Kozak**, TSRC Director + Organizers

8:10-8:50

Brian Dyer Emory University
Proton coupled electron transfer in hydrogenases

8:50-9:30

Katherine White University of Notre Dame
Spatiotemporal pH dynamics in biology: New tools and molecular insights

9:30-10:10

Katie Henzler-Wildman University of Wisconsin - Madison
Proton coupling versus proton leak in the Small Multidrug Resistance transporters

10:10-10:40

Coffee Break

10:40-11:20

Rob Burnap Oklahoma State
Coupling CO₂ hydration with cyclic photosynthetic electron flow via specialized NDH-1 complexes in cyanobacteria

11:20-12:00

Jessica Swanson University of Utah
Unraveling the Role of Kinetic Selection in Channels and Transporters

12:00-12:40

Robert B Gennis University of Illinois
Structure and Mechanism of the Energy-coupled Transhydrogenase from E. coli

2:30-4:30 (pm)

Hike to the oxidase waterfall in honor of Mårten Wikström

6:30-7:30 (pm)

Town Talk (Telluride Conference Center, 580 Mountain Village Blvd, Mountain Village, CO 81435)

Cash bar starts at 6:00pm

Title: *Methane: Supercharging Nature’s Solution to Reverse Climate Change*

Speaker: Jessica Swanson

Moderators: Judy Muller (ABC) & George Lewis (NBC)

July 17th Wednesday	Discussion Leader: Huong Kratochvil	
7:30-8:00 (am)	Breakfast (Telluride Intermediate School)	
8:00-8:40	Ramona Schlesinger	Freie Universität, Berlin <i>Charge transfer in the heterologously expressed voltage-gated proton channel kHV1 from <i>Karodinium veneficum</i></i>
8:40-9:20	Helmut Grubmüller	Max Planck Institute for Multidisciplinary Sciences <i>Solvation shell thermodynamics and constant pH simulations with FMM electrostatics</i>
9:20-10:00	Greg Voth	University of Chicago <i>Multiscale Simulation and Kinetic Modeling of Proton Transport in Biomolecular Systems</i>
10:00-10:30	Coffee Break	
10:30-11:10	Sylvie Roke	EPFL <i>Imaging / spectroscopy experiments on protons in water at membrane interfaces</i>
11:10-11:50	Ville Kaila	Stockholm University <i>Deciphering long-range proton transfer mechanisms in complex bioenergetic machines</i>
11:50-12:30	Marilyn Gunner	City College of New York <i>Following the protons in complex I using MCCE microstate analysis</i>
5:30-7:30 (pm)	All Telluride Science Picnic Free BBQ, Beer, Wine, and Non-Alcoholic Beverages. Friends and Family are invited free of charge. Location: Tent behind the Intermediate School	
July 18th Thursday	Discussion Leader: Ville Kaila	
7:30-8:00 (am)	Breakfast (Telluride Intermediate School)	
8:00-8:40	Noam Agmon	The Hebrew University of Jerusalem <i>Cation and proton diffusion at the membrane water interface</i>
8:40-9:20	Ana-Nicoleta Bondar	University of Bucharest <i>Conserved hydrogen-bonding and hydrophobic interaction networks in families of membrane receptors and transporters</i>
9:20-10:00	Kalina Hristova	Johns Hopkins University

Bias in transmembrane signal transduction by single pass receptors

10:00-10:30

Coffee Break

10:30-11:10

Gustav Beggren

Uppsala University

Exploring proton transfer in hydrogen catalysis – lesson learned from [FeFe] hydrogenase diversity

11:10-11:50

Huong Kratochvil

University of North Carolina at Chapel Hill

Proton transport mechanism through the lens of de novo protein design

11:50-12:30

William Wimley

Tulane University School of Medicine

Structural Determinants of pH-responsive Peptide Nanopores

July 19th Friday

Discussion Leader: Kalina Hristova

7:30-8:00

Breakfast (Telluride Intermediate School)

8:00-8:40

Petra Hellwig

University of Strasbourg

Reactivity of oxygen reducing enzymes, insights from electrocatalysis and vibrational spectroscopies

8:40-9:20

Boris Musset

PMU Nuremberg

Mutations in the Voltage-Gated Proton Channel Raise New Questions

9:20-10:00

Ruibin Liang

Texas Tech University

Understanding the Multifaceted Mechanism of Compound I Formation and Reactivity in Unspecific Peroxygenases through Multiscale Simulations

10:00-10:30

Coffee Break

10:30-11:10

Keiichi Inoue

The University of Tokyo

Proton Transfer in Ion-transporting Microbial Rhodopsin

11:10-11:50

Joachim Heberle

Freie Universität, Berlin

Proton transfer in LOV domains

11:50-12:30

General Discussion/Meeting Wrap Up (Planning for 2026)

July 20th Saturday

Hiking, Departure