

TSRC - Quantum Frontiers in Molecular Science (6/6/2022-6/10/2022)

Organizers: Ignacio Franco (ignacio.franco@rochester.edu) and Joel Yuen-Zhou (jyuenzhou@ucsd.edu)

Updated: 6/8/22

Website <https://tinyurl.com/2p9cv4sd>

Slack Channel <https://tinyurl.com/bdcv6ekn>

Meeting times: Meeting begins at 8 AM California (PDT) / 9 AM Telluride (MDT) / 11 AM New York (EDT) / 5 PM Brussels (GMT+2) / 11 PM China (GMT+8)
Meeting will be held throughout 6/6-6/10 from 9 to 11:30 AM MDT (Telluride, Colorado time zone).

Dynamics:

1. This will be a remote meeting run via Zoom. The virtual address will be shared by email with the participants.
2. There are 5 tutorial talks (40 min each) that will be uploaded in advance for everyone to watch asynchronously. The authors of these tutorials will also have 25 min allocated for a synchronous summary of the tutorial talk (10 min) followed by an open discussion (15 min).
3. All other talks will be held synchronously (20 min presentation + 5 min discussion).
4. There will be 1 min teasers of contributed presentations on Tuesday.
5. To enhance discussions during the sessions and beyond we have created a Slack channel. This will be the place to have the equivalent of hallway/bar/dinner/Colorado Ave. discussions.

PROGRAM

MONDAY 6/6

Analog Quantum Simulation

Chairs: Joel Yuen (UCSD) & Ignacio Franco (U. Rochester)

Tutorial Talk

Ivan Kassal (USydney)

Analog Quantum Simulation of Molecular Systems

8:45-9:00 MDT
9:00-9:25 MDT
9:25-9:50 MDT

Opening Remarks
Ivan Kassal (USydney)
Chang Woo Kim (ChonnamU)

Tutorial discussion
Analog Quantum Simulation of Open Quantum Systems

Open Quantum Systems

Chairs: Joel Yuen (UCSD) & Ignacio Franco (U. Rochester)

9:50-10:15 MDT
10:15-10:40 MDT
10:40-11:05 MDT

Nancy Makri (UIUC)
Doran Bennett (SMU)
Daniel Finkelstein-Shapiro (UNAM)

Real-time path integral simulations of excitation energy transfer in large molecular aggregates
Mesoscale quantum dynamics in molecular materials
Continuous transformations between non-Hermitian and dissipative dynamics
Capturing, predicting, and understanding optical signals: Harnessing machine learning to tackle energy dissipation in the condensed phase

11:05-11:30 MDT
11:30-12:00 MDT

Andrés Montoya-Castillo (CU Boulder)
Breakout/Slack Discussions

TUESDAY 6/7

Molecular Polaritonics

Chair: Justin Caram (UCLA)

Tutorial Talk

Wei Xiong (UCSD)

Ultrafast Dynamics of Molecular Vibrational Polaritons For Chemistry and Quantum Simulation

9:00-9:25 MDT
9:25-9:50 MDT

Wei Xiong (UCSD)
Jonathan Keeling (St Andrews)

Tutorial discussion
Modelling realistic open quantum systems: applications to molecular polaritons

9:50-10:15 MDT Raphael Ribeiro (Emory) Quantum energy diffusion in optical microcavities
10:15-10:40 MDT Marissa Weichman (Princeton) Molecules in Optical Cavities: Precision Spectroscopy & Strong Light-Matter Interactions
10:40-11:05 MDT Ágnes Vibok (Debrecen) Signature of a light-induced conical intersection in radiative emission from the lower polaritonic surface

11:05-11:30 MDT 1 min teasers Contributed Presentations (see list below)
11:30-12:00 MDT Breakout/Slack Discussions

WEDNESDAY 6/8

Tutorial Talk

Quantum information

Chair: Raphael Ribeiro (Emory)

Artur Izmaylov (UToronto)

Quantum Computing Approaches for the Electronic Structure Problem

9:00-9:25 MDT Artur Izmaylov (UToronto) Tutorial discussion
9:25-9:50 MDT Sabre Kais (Purdue) Quantum Machine Learning for Complex Chemical Systems on Quantum Devices
9:50-10:15 MDT Ben Sussman (NRC/Ottawa) Ultrafast Quantum Sensing: From Ranging to 3D Scene Reconstruction

Molecular Spectroscopy

Chair: Raphael Ribeiro (Emory)

10:15-10:40 MDT Justin Caram (UCLA) Design principles for highly diagonal molecular transitions and ultranarrow linewidths

10:40-11:05 MDT Ulrich Kleinekathoefer (Bremen) Multi-scale modelling of spectral densities and absorption spectra from different light-harvesting complexes
11:05-11:30 MDT Greg Engel (UChicago) Ultrafast excitonic exchange between valleys in monolayer MoS₂ limits optical valleytronic applications
11:30-12:00 MDT Breakout/Slack Discussions

THURSDAY 6/9

Chirality in Light Matter Interactions

Chair: Bing Gu (UCI/Westlake)

Tutorial Talk

Olga Smirnova (MBI)

Geometric magnetism and new enantio-sensitive observables in photoionization of chiral molecules

9:00-9:25 MDT Olga Smirnova (MBI) Tutorial discussion
9:25-9:50 MDT Melanie Schnell (DESY/UKiel) Coherent microwave excitations for enantiomer-selective population transfer in chiral molecules
9:50-10:15 MDT Hendrike Braun (UKassel) Circular dichroism in the ion yield of chiral molecules
10:15-10:40 MDT Joel Yuen-Zhou (UC San Diego) Unconventional nonlinear light-matter interactions

Quantum Control with Few Cycle Lasers

Chair: Bing Gu (UCI/Westlake)

10:40-11:05 MDT Tyler Coker (Michigan State U) Lightwave-driven scanning tunneling spectroscopy on the atomic scale
11:05-11:30 MDT Christian Heide (SLAC/Stanford) Light-field driven electron dynamics in solids
11:30-12:00 MDT Breakout/Slack Discussions

FRIDAY 6/10

Emerging Motifs in Quantum Control

Chair: Marissa Weichman (Princeton)

Tutorial Talk

Prineha Narang (Harvard/UCLA)

Cavity control of nonlinearities in molecular matter

9:00-9:25 MDT	Prineha Narang (Harvard/UCLA)	Tutorial discussion
9:25-9:50 MDT	Jianshu Cao (MIT)	Emerging Phenomena in Light-matter Interactions
9:50-10:15 MDT	Ignacio Franco (Rochester)	Light field control of real and virtual charge carriers
10:15-10:40 MDT	Bing Gu (UCI/Westlake)	Control of quantum interference in molecular two-photon absorption by entangled light
10:40-11:05 MDT	Paul Brumer (UToronto)	Quantum Control of Scattering at Cold and Ultracold Temperatures
11:05-11:30 MDT	Overall Discussion	
11:30-12:00 MDT	Zoom Beer Hour	

Presentation Order

Contributed Presentations

1 Leonardo Calderon (Toronto)	Nonadiabatic sunlight harvesting
2 Singh Davinder (Toronto)	Dissipation, flux and fluctuations in a driven open quantum system
3 Claire Dickerson (UCLA)	Designing and Predicting Ultranarrow Yb(III) Molecular Transitions
4 Piper Fowler-Wright (St. Andrews)	Efficient many-body non-Markovian dynamics of organic polaritons
5 Antonio Garzón (Rochester/McGill)	The Stark Control of Electrons at Interfaces (SCELI)
6 Zixuan (Andrew) Hu (Purdue)	The quantum condition space
7 Arghadip Koner (UCSD)	High precision measurements using cavity enhanced backaction evading Raman spectroscopy
8 Kai Liu (Duke)	Improved Efficiency of Open Quantum System Simulations Using Matrix Products States in the Interaction Picture
9 Nicola Mayer (MBI)	Control of achiral and chiral media using synthetic chiral light
10 Federico Mellini (UCSD)	The role of dark states in energy transfer dynamics between entangled molecules
11 Masato Morita (Toronto)	Quantum scattering calculation for the cold and ultracold $\text{Li}(2S) + \text{LiNa}(a3\Sigma^+) \rightarrow \text{Li}_2(a3\Sigma^+) + \text{Na}(2S)$ reaction
12 Sindhana Pannir-Sivajothi (UCSD)	Driving chemical reactions with polariton condensates
13 Kai Schwennicke (UCSD)	Enantioselective Topological Frequency Conversion
14 Philipp Stegmann (MIT)	Quantum Corrections in the Higher-Order Photon Counting Statistics
15 Vishal Tiwari (Rochester)	Floquet engineering optical properties of solids
16 Otabek Umarov (Debrecen)	Topological aspects of light-induced degeneracies in polyatomic molecules
17 Manas Sajjan (Purdue)	Quantum machine learning for materials and molecules
18 Adrien Devolder (Toronto)	Coherent control of total cross section: Coherent optical theorem
19 Tengting Chen (UCSD)	Cavity-Enabled Enhancement of Ultrafast Intramolecular Vibrational Redistribution over Pseudorotation

TSRC - Quantum Frontiers in Molecular Science (7/20/2020-7/24/2020)

Organizers: Ignacio Franco (ignacio.franco@rochester.edu) and Joel Yuen-Zhou (jyuenzhou@ucsd.edu)

Updated: July 15, 2020

Website

<https://tinyurl.com/ybnvpmnp>

Slack Channel

https://join.slack.com/t/quantumfronti-elp4592/shared_invite/zt-g690ooog-xUI0pxr6kwTF6wL1T8kTUA

Meeting times:

Meeting begins at 8 AM California (PDT) / 9 AM Telluride (MDT)/ 11 AM New York (EDT)/ 5 PM Brussels (GMT+2)
Meeting will be held throughout 7/20-7/24 from 9 to 11:30 AM MDT (Telluride, Colorado time zone).

Dynamics:

1. Owing to the Covid-19 pandemic, this will be a remote meeting run via Zoom. The virtual address will be shared by email with the participants.
2. There are 5 tutorial talks (40 min each) that will be uploaded in advance for everyone to watch asynchronously. The authors of these tutorials will also have 25 min allocated for a synchronous summary of the tutorial talk (10 min) followed by an open discussion (15 min).
3. All other talks will be held synchronously (20 min presentation + 5 min discussion).
4. There will be 1 min teasers of contributed presentations on Tuesday and Thursday.
5. To enhance discussions during the sessions and beyond we have created a Slack channel. This will be the place to have the equivalent of hallway/bar/dinner/Colorado Ave. discussions.

Pre-meeting Event: Telluride Science Lecture Series

FRIDAY 7/17

10:00 MDT

Alexandra Olaya-Castro, (UC London)

11:00 MDT

Tom Weinacht (Stony Brook)

<https://tinyurl.com/yaahyaoo>

Vibronic Coherence and Synchronisation of Molecular Motions

Time-Resolved Spectroscopy of Molecular Dynamics: Comparing Different Approaches

PROGRAM

MONDAY 7/20

Quantum Coherence & Control

Chairs: Joel Yuen (UCSD) & Ignacio Franco (U. Rochester)

Tutorial Talk

Christiane Koch (FU Berlin)

What chiral molecules can teach us about quantum control

8:45-9:00 MDT

Opening Remarks

Tutorial discussion

9:00-9:25 MDT

Christiane Koch (FU Berlin)

Coherent control of internal conversion in strong field molecular ionization

9:25-9:50 MDT

Tom Weinacht (Stony Brook)

Dissipative dynamics of emitters strongly coupled to localized surface plasmons

9:50-10:15 MDT

Daniel Finkelstein Shapiro (Lund)

Quantum Coherence in Chemistry: Tackling the Decoherence Challenge

10:15-10:40 MDT

Ignacio Franco (Rochester)

A New Formulation of Quantum Mechanics using Complex Trajectories: Application to

10:40-11:05 MDT

David Tannor (Weizmann)

Wavepacket Revivals, Optical Excitation and High Harmonic Generation

11:05-11:30 MDT

Craig Martens (UC Irvine)

Zombie cats at the quantum-classical frontier: Coherent quantum dynamics in the

11:30-12:00 MDT

Breakout/Slack Discussions

semiclassical limit—and beyond

TUESDAY 7/21

Quantum Sensing and Metrology

Chair: Johannes Flick (Simons Foundation)

Tutorial Talk

9:00-9:25 MDT

9:25-9:50 MDT

9:50-10:15 MDT

10:15-10:40 MDT

10:40-11:05 MDT

11:05-11:30 MDT

11:30-12:00 MDT

Andrew Jordan (Rochester)

Andrew Jordan (Rochester)

Alexandra Olaya (University College London)

Ben Sussman (NRC)

Scott Cushing (Caltech)

Eric Bittner (Houston)

1 min teasers

Breakout/Slack Discussions

WEDNESDAY 7/22

**Quantum Electrodynamics:
Molecular Polaritonics****Tutorial Talk**

9:00-9:25 MDT

9:25-9:50 MDT

9:50-10:15 MDT

10:15-10:40 MDT

10:40-11:05 MDT

11:05-11:30 MDT

11:30-12:00 MDT

Jonathan Keeling (St. Andrews)

Jonathan Keeling (St. Andrews)

Joel Yuen (UC San Diego)

Randall Goldsmith (Wisconsin)

Johannes Flick (Simons Foundation)

Agnes Vibok (Debrecen)

Frank Huo (Rochester)

Breakout/Slack Discussions

THURSDAY 7/23

Quantum Probes in Biosystems**Tutorial Talk**

9:00-9:25 MDT

9:25-9:50 MDT

9:50-10:15 MDT

10:15-10:40 MDT

10:40-11:05 MDT

11:05-11:30 MDT

11:30-12:00 MDT

Paul Brumer (Toronto)

Paul Brumer (Toronto)

Vladimiro Mujica (Arizona State)

David Beratan (Duke)

Jianshu Cao (MIT)

Ulrich Kleinekathofer (Bremen)

Overall Discussion

Zoom Beer Hour

FRIDAY 7/24

Quantum Information and Chemistry**Quantum measurement - recent developments**

Tutorial discussion

Quantum optical signatures of vibronic coherence in biomolecules

Quantum sensing and processing with ultrafast light

Entangled light-matter interactions and spectroscopy

Measuring many-body correlations and collective dynamics with quantum light

Contributed Presentations (see list below)

Chair: Daniel Finkelstein Shapiro (Lund U)**Modelling organic polariton condensates**

Tutorial discussion

Polariton chemistry: thermally-activated and photoinduced scenarios

Photonic materials for studying and altering molecular behavior

First-principle approaches to strong light-matter coupling in molecular and extended systems

Light-induced conical intersections in diatomic and polyatomic systems

Polarized Fock states and the gauge invariance in molecular cavity quantum electrodynamics

Chair: Scott Cushing (Caltech)**Excitation of Biomolecules with Incoherent Light: A Paradigm Shift and a Return to Nature**

Tutorial discussion

Reservoir Engineering: Preserving Coherence in Biological Electron Transfer Reactions.

Bifurcating Electrons Without Invoking Maxwell's Demon

Coherence in non-equilibrium transport: symmetry and polaron effects

A time-dependent view on energy transfer in protein-pigment complexes

Chair: Frank Huo (U. Rochester)

Tutorial Talk

9:00-9:25 MDT

Mike Wasielewski (Northwestern)

Mike Wasielewski (Northwestern)

9:25-9:50 MDT

Sabre Kais (Purdue)

9:50-10:15 MDT

Felix Fischer (UC Berkeley)

Charge and Energy Transfer

10:15-10:40 MDT

Seogjoo Jang (CUNY)

10:40-11:05 MDT

Eric Heller (Harvard)

11:05-11:30 MDT

Final Remarks/Overall Discussion

Exploiting chemistry and chemical systems for quantum information science

Tutorial discussion

A quantum algorithm for evolving open quantum dynamics on quantum computing devices

The road from Semiconductors to Metals: Controlling Quantum Effects in Nanographene

Mechanistic investigation of non-Förster resonance energy transfer dynamics in donor-bridge-acceptor system

Blochbusters: new foundations of electrical resistivity

Contributed Presentations

Kristin Arnardottir (St. Andrews)

Finite size effects in organic polariton condensation

Sutirtha Chowdhury (Rochester)

State-Dependent Ring Polymer MolecularDynamics for Investigating Excited Nonadiabatic Dynamics

Georg Engelhardt (Beijing)

Floquet response theory and spectroscopy of periodically-driven systems: semiclassical and quantum light

Marwa Farag (Rochester)

Polariton Induced Conical Intersection and Berry Phase

Gerald Fux (St. Andrews)

Tensor networks for non-Markovian open quantum systems

Antonio Garzón Ramírez (Rochester)

Stark Control of Electrons at Interfaces (SCELI)

Chang Woo Kim (Rochester)

Decomposing the dissipation in open quantum systems

Arkajit Mandal (Rochester)

Polariton Mediated Electron Transfer

Leopoldo Mejia (Rochester)

Incoherent transport through molecular junctions

Feng Pan (U. Wisconsin)

Elucidating energy dynamics and tailoring plasmonic-photonic interaction in a coupled cavity

Sindhana S. Pannir Sivajothi (UC San Diego)

Enantioselective distillation using incoherent pumping

Juan Perez (UC San Diego)

Photon down-conversion via nonadiabatic dynamics in molecular polaritons

Dominic Rouse (St. Andrews)

An organic quantum battery

Michael Sabatini Mattei (U. Wisconsin)

Additive Manufacturing of Topological Photonic Crystals and their Applications in Molecular Spectroscopy

Kai Schwennicke (UC San Diego)

Optical Activity due to the Exciton Aharonov-Bohm Effect: a Floquet Engineering Approach

Jesus Valdiviezo (Duke)

Switching electron transport between flickering resonance and incoherent mechanisms in nucleic acids

Jing Yang (Rochester)

Heat transport across a weakly nonlinear chain in the strong-coupling regime

Quantum frontiers in molecular science
June 26-29, 2018
Telluride Science Research Center

Telluride Intermediate School
725 West Colorado Ave Telluride, CO 81435

[Click Here for Directions](#)

Organizers: Ignacio Franco (U. Rochester)
Joel Yuen-Zhou (UC San Diego)

Schedule - updated June 19, 2018

Monday		25-Jun
6:00-8:00 PM	Informal gathering at "Phoenix Bean" 221 W. Colorado Ave Main Street	
Tuesday		26-Jun
9:20-9:35 AM	Opening Remarks	
	Cavities I	
9:35-10:10	Vahid Sandoghdar (Max Planck Institute for the Science of Light, Germany) <i>Organic molecules coming of age for quantum optics</i>	
10:10-10:45	Jonathan Keeling (St. Andrews, UK) <i>Orientational alignment in Cavity Quantum Electrodynamics</i>	
10:45-11:05	COFFEE BREAK	
11:05-11:40	Heiko Appel (Max Planck Institute for the Structure and Dynamics of Matter, Germany) <i>Time-dependent density-functional theory for QED: an ab initio framework for modeling light-matter interactions</i>	
11:40-12:15 PM	Frank Huo (U. Rochester, USA) <i>Theoretical investigations of New Chemical Reactivity Enabled by Intrinsically Quantum Mechanical Behavior</i>	
12:15-2:00	LUNCH BREAK	
	Quantum Dynamics and Spectroscopy I	
2:00-2:35	Ralph Ernstorfer (Fritz Haber Institute, Germany) <i>Beyond the molecular movie: ultrafast dynamics of bands, bonds and excitons investigated with trARPES</i>	
2:35-3:10	Marcus Kowalewski (Stockholm U., Sweden) <i>Coherent Signatures of Conical Intersections in Ultrafast X-Ray Spectroscopy</i>	
3:10-3:45	Sophya Garashchuk (U. South Carolina, USA)	

Quantum trajectory dynamics: theme and variations

- 3:45-4:20 COFFEE BREAK
- 4:20-4:55 Eberhard Gross (Max Planck Institute of Microstructure Physics, Germany)
Nuclear-velocity perturbation theory: A systematic approach to electron-nuclear correlation beyond Born-Oppenheimer
- 4:55-5:30 Eric Bittner (U. Houston, USA)
Excitonic quantum logic gates
- 6:30-7:15 **Town Talk - 2018 R. Stephen Berry Lecture**
Sir Fraser Stoddart – 2016 Nobel Laureate, Northwestern University
Telluride Conference Center in Mountain Village
Free Admission, Cash Bar starts at 6:00PM.

Wednesday

27-Jun

Control and Strong Field Dynamics I

- 9:00-9:35 AM Albert Stolow (U. Ottawa, Canada)
Non-perturbative quantum control and strong field ionization of molecules
- 9:35-10:10 Regina de Vivie-Riedle (Ludwig-Maximilians-Universität, Germany)
Photostability of uracil affected by cellular environment and controlled with shaped light fields
- 10:10-10:45 Ignacio Franco (U. Rochester, USA)
Stark Control of Electrons

10:45-11:05 COFFEE BREAK

Quantum Dynamics and Spectroscopy II

- 11:05-11:40 Andy Marcus (U. Oregon USA)
Broadband entangled photon pairs for nonlinear molecular spectroscopy
- 11:40-12:15 PM Mike Reppert (U. Toronto, Canada)
Quantum or Classical?: The case of 2D Vibrational Spectroscopy

12:15-2:00 LUNCH BREAK

Transport/Open Systems

- 2:00-2:35 Jianshu Cao (MIT, USA)
Engineering exciton and charge transport: From photosynthesis to molecular electronics
- 2:35-3:10 Ivan Kassal (U. Sydney, Australia)
Quantum coherence in light-harvesting systems and organic semiconductors
- 3:10-3:45 Semion Saikin (Harvard, USA)
Molecular aggregates -- a testbed for topological excitonics

- 3:45-4:20 COFFEE BREAK
- 4:20-4:55 Ulrich Kleinekathofer (Jacobs U. Bremen, Germany)
Charge and energy transfer in molecular systems: A time-dependent view
- Special Seminar**
- 4:55-5:30 Evi Goldfield (NSF, USA)
Enabling Quantum Leap: an NSF Big Idea. What it means for chemistry
- 6:00-8:00 Picnic@TSRC Tent
Telluride Intermediate School, 725 W Colorado Avenue.

Thursday 28-Jun

Cavities II

- 9:00-9:35 AM Stephane Kena-Cohen (Polytechnique Montreal, Canada)
Nonlinear phenomena and devices in the strong exciton-photon coupling regime
- 9:35-10:10 Joel Yuen-Zhou (UC San Diego, USA)
Polariton assisted photochemistry and photophysics
- 10:10-10:45 Felipe Herrera (U. Santiago de Chile, Chile)
Holstein-Tavis-Cummings theory of organic polaritons: Spectroscopy and chemistry
- 10:45-11:05 COFFEE BREAK
- 11:05-11:40 Johannes Feist (U. Autónoma de Madrid, Spain)
Manipulating molecules by strong light-matter coupling in cavities
- 11:40-12:15 PM David Masiello (U. Washington, USA)
Optimizing the Hybridization between Localized Surface Plasmons and Photonic Cavity Modes in a Photothermal Absorption Spectrometer
- 12:15-2:00 LUNCH BREAK

Control and Strong Field Dynamics II

- 2:00-2:35 Alicia Palacios (U. Autónoma de Madrid, Spain)
Imaging ultrafast molecular dynamics using attosecond pulses. A theoretical outlook
- 2:35-3:10 David Ayuso (Max Born Institute, Germany)
Chiral discrimination using high harmonic generation: a giant macroscopic electric dipole response
- 3:10-3:45 Christian Heide (U. Erlangen, Germany)
Coherent light-field-driven electron dynamics in graphene
- 3:45-4:20 COFFEE BREAK

Quantum Dynamics and Spectroscopy III

- 4:20-4:55 Christiane Koch (U. Kassel, Germany)
Quantum effects in the dynamics of molecular systems
- 4:55-5:30 Zlatko Bacic (NYU, USA)
Explaining the symmetry breaking observed in the solid endofullerenes $M@C60$ ($M = H2, HF, H2O$) and its spectroscopic manifestations
- 6:00-8:00 Conference dinner. Location TBD

Friday

29-Jun

Cavities III

- 9:00-9:35 AM Javier Aizpurúa (U. País Vasco, San Sebastián)
Quantum descriptions of plasmon-assisted molecular spectroscopy
- 9:35-10:10 Prineha Narang (Harvard, USA)
Cavity correlated electron-nuclear dynamics
- 10:10-10:30 COFFEE BREAK

Quantum Dynamics and Spectroscopy IV

- 10:30-11:05 Jeffrey Cina (U. Oregon, USA)
Wave-packet interferometry for electronic excitation transfer
- 11:05-11:40 Jacob Krich (U. Ottawa, Canada)
Frequency domain wavepackets for nonlinear optical spectroscopies
- 11:40-12:15 PM Thorsten Hansen (U. Copenhagen, Denmark)
Keldysh contour based approaches to coherent spectroscopy and electron dynamics
- 12:15-12:30 Final Remarks
- Afternoon Scientific Discussions/ Hike

Notes:

- **All talks are 25 minutes plus 10 minutes for discussion.**
- Breakfast is included in the registration fee and will be served at the meeting site from 8:30am-9:00am.
- Lunch/dinner is not provided – a variety of restaurants are locally available.
- Each session will have a coffee break between sets of speakers.
- Any questions about the schedule should be directed to the workshop organizers: Ignacio Franco (ignacio.franco@rochester.edu) or Joel Yuen-Zhou (joelyuen@ucsd.edu).
- Any questions about logistics should be directed to TSRC Director Mark Kozak, (mark@telluridescience.org) 970-708-4426, or for lodging questions to Kristen Redd (kristen@telluridescience.org) 970-708-0827.