

# BLACK HOLES

AT ALL SCALES

**EIGHTH ANNUAL  
GIANT MAGELLAN TELESCOPE COMMUNITY SCIENCE MEETING**  
AUGUST 31 – SEPTEMBER 2, 2022  SEDONA, ARIZONA



Sponsored by  
**GMTO Corporation**

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# BLACK HOLES

AT ALL SCALES

## Welcome to the Eighth Annual GMT Community Science Meeting

Black holes are among the most extraordinary objects in the Universe. Pivotal new results include the detection of gravitational radiation from merging black holes and the imaging of event horizon scale regions. These discoveries have revolutionized the field while demonstrating how much remains to be learned about black hole demographics, formation and evolution, and interactions with their environment. This conference will focus on dynamics as a way to probe and learn about black holes across all mass scales, and topics will include the environment around Sgr A\*, black hole mass measurements, demographics, rates for gravitational wave events, accretion disk dynamics around single and binary black holes, and tidal disruption events. Experts across this wide range of subfields will be brought together to canvass observational and theoretical progress, highlight key unanswered questions, and motivate future directions, particularly in the era of extremely large telescopes.

### Conference Support

Karla Russell (626) 429-9445

Bob Goodrich (808) 854-7779

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# MEETING INFO

## GENERAL INFORMATION

- ★ Presentations will be in the **Canyon Ballroom**
- ★ Lunch will be provided in the **Canyon Patio**
- ★ Snacks, coffee, and tea will be available during the meeting
- ★ Photos taken at the meeting will be available at [www.gmtconference.org/gallery](http://www.gmtconference.org/gallery)

## SPEAKER INFORMATION

- ★ Please provide your talk on a USB stick to Bob Goodrich no later than the break before your session. You will not be able to project from your personal laptop.
- ★ Files can be in PowerPoint, Keynote, or PDF format. Please transfer or embed any video files.

## SOCIAL MEDIA CONTEST

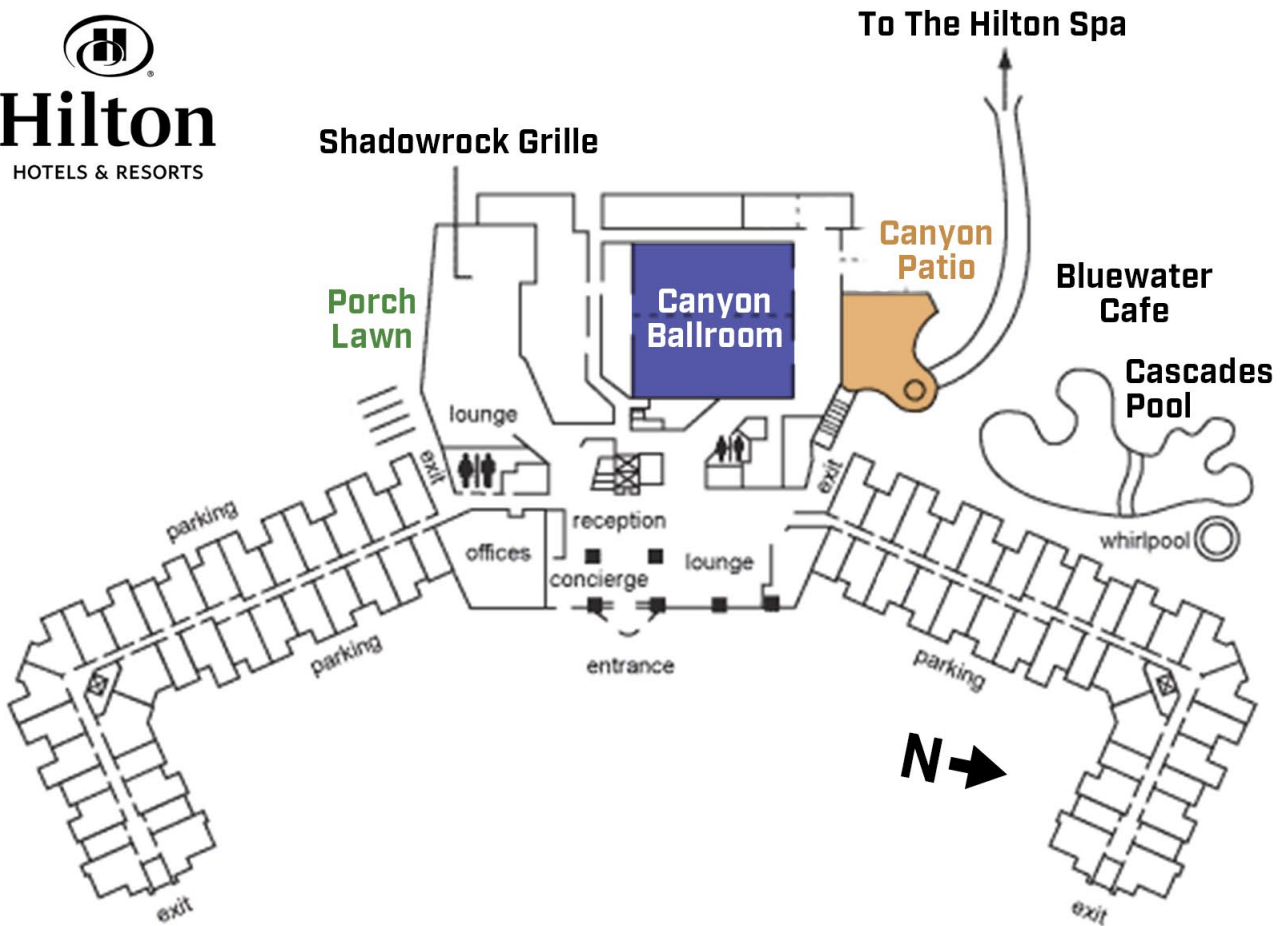
- ★ Follow us on Twitter and Instagram [@GiantMagellan](https://twitter.com/GiantMagellan) for CSM updates and announcements and tag us in your CSM posts
- ★ Be sure to use hashtags [#GiantMagellan2022](https://twitter.com/GiantMagellan2022) and [#BlackHoles](https://twitter.com/BlackHoles).
- ★ The most engaged post between Tuesday, August 30th and Thursday, September 1st will receive a chunk of glass from the Giant Magellan Telescope's 6th primary mirror segment!
- ★ Winner will receive details via direct message to claim their prize





# VENUE MAP

## HILTON SEDONA RESORT AT BELL ROCK



# MEETING AGENDA

2022.08.30

## TUESDAY

7:00 – 9:00 pm

### Welcome Reception (Porch Lawn near Shadowrock Grille)

Drinks & Hors d'oeuvres

2022.08.31

## WEDNESDAY

7:30 – 9:00 am

### Breakfast (Canyon Patio)

9:00 – 9:10 am

### Welcome & Announcements

9:10 – 9:35 am

### Rebecca Bernstein

GMT Overview & Status

## Session 1

### The Galactic Center

Session Chair: Monica Valluri

9:35 – 10:00 am

### Smadar Naoz

Mergers and Collisions at the Center of Galaxies

10:00 – 10:15 am

### Abhimat Gautam

Investigations of Black Hole Astrophysics in the Galactic Center Laboratory with Extremely Large Telescopes

10:15 – 10:30 am

### Michal Zajacek

Dust-enshrouded Objects in the Galactic Center: Stars, Clouds or Something More Exotic?

10:30 – 10:45 am

### Rodrigo Nemmen [remote]

Gamma-ray observations of Sagittarius A and Low-luminosity AGNs

10:45 – 11:15 am

### Coffee Break

## Session 2

### Accretion Disk Dynamics & Properties

Session Chair: Ben Boizelle

11:15 – 11:40 am

### Richard Anantua

A SANE-MAD Dichotomy in Polarized Accretion Flows in JAB Systems

11:40 – 11:55 am

### Shumel Gilbaum

Feedback Dominated Accretion Flows

# MEETING AGENDA

2022.08.31

## WEDNESDAY

11:55 – 12:10 pm

**Ruth Daly**

Black Hole Spin and Accretion Disk Properties Obtained with a New Method

12:10 – 12:25 pm

**Samuel Lai**

Measuring Quasar Mass and Orientation from the SED and Variability Structure Function

12:25 – 1:50 pm

**Lunch [Canyon Patio]**

### Session 3

### Tidal Disruption Events

Session Chair: Kayhan Gultekin

1:50 – 2:15 pm

**Suvi Gezari (remote)**

Tidal Disruption Events As Effective Probes of Massive Black Hole Demographics

2:15 – 2:40 pm

**Morgan Macleod**

Tidal Disruption Events in Galactic Centers

2:40 – 2:55 pm

**Odelia Teboul**

Loss Cone Shielding

2:55 – 3:10 pm

**Christian Hannah**

Black Hole Demographics in Low-Mass Galaxies:  
Improving Tidal Disruption Event Rate Estimations

3:10 - 3:20 pm

**Community Science Meeting Group Photo**

3:20 - 3:45 pm

**Coffee Break**

3:45 - 4:05 pm

**Poster Talks I (see page 11)**

Session Chair: Aklant Bhowmick

4:05 - 4:45 pm

**Discussion**

Session Chairs: Misty Bentz and Chung-Pei Ma

4:45 - 5:05 pm

**Poster Talks II (see page 11)**

Session Chair: Aklant Bhowmick

6:00 - 9:00 pm

**Dinner [Porch Lawn near Shadowrock Grille]**

# MEETING AGENDA

2022.09.01

## THURSDAY

7:30 – 8:30 am **Breakfast [Canyon Patio]**

### **Session 4 [Relics of] Black Hole Formation (cont.)**

Session Chair: Kyle Kremer

8:30 – 8:55 am **Jillian Bellovary**  
Seeking Relics of Massive Black Holes in the Local Universe

8:55 – 9:10 am **Aklant Bhowmick**  
Unveiling the First Seeds of Supermassive Black Holes Using Cosmological Simulations

9:10 – 9:35 am **Nora Luetzgendorf**  
Intermediate-Mass Black Holes in Globular Clusters – An Overview

9:35 – 9:50 am **Danielle Berg**  
Searching for IMBHs in Extreme Emission Line Galaxies

9:50 – 10:15 am **Amy Reines (remote)**  
Dwarf Galaxies and the Smallest Supermassive Black Holes

10:15 – 10:45 am **Coffee Break**

### **Session 4 [Relics of] Black Hole Formation (cont.)**

Session Chair: Laura Blecha

10:45 – 11:00 am **Weizhe Liu**  
Probing AGN Feedback in Dwarf Galaxies

11:00 – 11:15 am **Archana Aravindan**  
An Integral Field Spectroscopy Study of Gas Dynamics In Dwarf Galaxies:  
A New Tool To Detect Elusive Black Holes

### **Session 6 Black Holes/Galaxy Co-evolution**

Session Chair: Laura Blecha

11:15 – 11:40 am **Misty Bentz**  
Reverberation Mapping of Active Galactic Nuclei

11:40 – 12:05 pm **Kayhan Gultekin**  
Measuring Black Hole Masses and What They Can Tell Us

12:05 – 12:20 pm **Huanqing Chen**  
Constrain Quasar Lifetimes by Recovering the Temperature Profile on Megaparsec Scales

12:20 – 12:35 pm **Pallavi Patil**  
A Study of Luminous, Heavily Obscured WISE-NVSS Selected Quasars  
with Young Radio Jets at  $z \sim 2$



2022.09.01

## THURSDAY

12:35 – 2:00 pm **Lunch [Canyon Patio]**

### **Session 7** **Extragalactic Dynamics & Black Hole Mass Measurements**

Session Chair: Jonelle Walsh

- 2:00 – 2:25 pm **Chung-Pei Ma**  
Measuring Black Hole Masses and Galaxy Intrinsic Shapes via Stellar Dynamics
- 2:25 – 2:40 pm **Sabine Thater (remote)**  
Expanding the Extreme Ends of the Massive Black Hole Scaling Relations with Dynamical Modeling
- 2:40 – 2:55 pm **Emily Liepold**  
A Duet of Black Holes from the TriOS (Triaxial Orbit Superposition) Code
- 2:55 – 3:10 pm **Monica Valluri**  
Black Holes in Barred Galaxies

3:10 – 3:40 pm **Coffee Break**

### **Session 7** **Extragalactic Dynamics & Black Hole Mass Measurements (cont.)**

Session Chair: Pallavi Patil

- 3:40 – 3:55 pm **Jonelle Walsh**  
Addressing a Bias in the Galaxies with Dynamical Black Hole Mass Measurements
- 3:55 – 4:10 pm **Benjamin Boizelle**  
Wrangling the Beast: Precision Supermassive Black Hole Mass Measurement With ALMA
- 4:10 – 4:25 pm **Jonathan Cohn**  
ALMA Gas-dynamical Mass Measurements of Supermassive Black Holes in Red Nugget Relic Galaxies
- 4:25 – 5:10 pm **Discussion**  
Session Chair: Aaron Barth and Jenny Greene

6:00 – 9:00 pm **Dinner [Canyon Patio]**

# MEETING AGENDA

2022.09.02

## FRIDAY

7:00 – 8:30 am **Breakfast [Canyon Patio]**

### Session 8 **Gravitational Waves**

Session Chair: Jillian Bellovary

8:30 – 8:55 am **Chiara Mingarelli**  
Pulsar Timing Arrays: The Next Window to Open on the Gravitational-Wave Universe

8:55 – 9:20 am **Maya Fishbach**  
Astrophysical implications of LIGO-Virgo-KAGRA's Black Holes

9:20 – 9:35 am **Kyle Kremer**  
The Dynamics of Black Holes in Dense Star Clusters

9:35 – 9:50 am **Tomoya Kinugawa**  
Gravitational Waves from Population III Binary Black Holes are Consistent with LIGO/Virgo O3a Data for the Chirp Mass Larger Than  $\sim 20 M_{\text{sun}}$

9:50 – 10:15 am **Coffee Break**

### Session 9 **Multiplicity**

Session Chair: Smadar Naoz

10:15 – 10:40 am **Jessie Runnoe**  
Electromagnetic Signatures of Supermassive Black Hole Binaries

10:40 – 11:05 am **Laura Blecha**  
Supermassive Black Hole Binary (and Triple) Dynamics

11:05 – 11:20 am **Kate Pitchford**  
Luminous Merger Between Two Star-forming Galaxies 1.7 Billion Years After the Big Bang

11:20 – 11:35 am **Natalia Nazarova [remote]**  
The Impact of Stellar Envelopes' Binding Energy on the Formation of Merging Compact-object Binaries

11:35 – 11:50 am **Eduardo Mario Gutierrez [remote]**  
Bringing Supermassive Black Hole Binaries to Light

11:50 – 12:15 pm **Jenny Greene**  
Summary Talk

12:15 pm **Take-away Lunch**



## POSTER TALKS: PART I

Session Chair: Aklant Bhowmick

### **Simone Abeni**

#### **Fitsum Beyene**

Understanding Supermassive Black Holes and Their Host Galaxies Through Scaling Relations

#### **Floor Broekgaarden**

Rates of Stellar Mass Black Hole Mergers

#### **Douglas Carlos**

Gamma-rays from Little Monsters: AGN In Dwarf Galaxies

#### **Silvana Delgado Andrade**

#### **Rajib Ganguly**

Toward a Complete Description of Quasar Outflows Selected with NV

#### **Muryel Guolo**

#### **Kyle Kasabares**

Dynamical Mass Measurements of Supermassive Black Holes With ALMA

## POSTER TALKS: PART II

Session Chair: Aklant Bhowmick

#### **Mayalen Laker**

Warped Disk Models using ALMA CO Observations of NGC 3557

#### **Lucas Augusto Leardini Siconato**

An investigation of Gamma-ray Emissions from Sagittarius A\*

#### **Trevor Mendel**

Resolving the Galaxy-scale Metallicity Field at Cosmic Noon with GMTIFS

#### **Pedro Motta**

GRMHD Simulations of Hard to Soft State Transition in Black Hole Binaries

#### **Polina Petrov**

Mapping the Host Galaxies of Nanohertz Gravitational Wave Sources

#### **Rob Sharp**

The Giant Magellan Telescope Integral Field Spectrograph, GMTIFS

#### **Joan Wrobel**

Toward Astrometric Constraints on a Supermassive Black Hole Binary in the Early-type Galaxy NGC 4472

#### **Zhefu Yu**

Black Hole Masses from the OzDES Reverberation Mapping Project

#### **Kyler Kuehn**

Science Enabled by the Many-Instrument Fibre System (MANIFEST)

## IN-PERSON PARTICIPANTS

**Simone Abeni** University of Milano-Bicocca (Italy) • **Ivan Almeida** University of São Paulo • **Richard Anantua** University of Texas at San Antonio  
**Archana Aravindan** UC Riverside • **Aaron Barth** UC Irvine • **Jill Bellovary** CUNY • **Misty Bentz** Georgia State University  
**Danielle Berg** The University of Texas at Austin • **Rebecca Bernstein** GMTO • **Fitsum Beyene** INAOE  
**Aklant Bhowmick** University of Florida • **Laura Blecha** University of Florida • **Bob Blum** Rubin Observatory/NSF's NOIRLab  
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**Shmuel Gilbaum** Hebrew University of Jerusalem • **Bob Goodrich** GMTO • **Paola Grandi** INAF • **Jenny Greene** Princeton University  
**Kayhan Gultekin** University of Michigan • **Muryel Guolo** Johns Hopkins University • **Christian Hannah** University of Utah  
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**Rob Sharp** Australian National University • **Yanjun Sheng** Australian National University • **Breann Sitarski** GMTO<sup>a</sup>  
**Odelia Teboul** The Hebrew University of Jerusalem • **Monica Valluri** University of Michigan • **Jonelle Walsh** Texas A&M University  
**Joan Wrobel** National Radio Astronomy Observatory • **Zhefu Yu** The Ohio State University • **Michal Zajacek** Masaryk University

## REMOTE PARTICIPANTS

**Yash Aggarwal** Lamont-Doherty Earth Observatory of Columbia University • **Seo-Won Chang** Seoul National University  
**Suvi Gezari** STScI/JHU • **Sohan Ghodla** University of Auckland, NZ • **Eduardo Mario Gutierrez** Instituto Argentino de Radioastronomía  
**Martine Joy Irog** Ateneo de Manila University • **Hyunsung Jun** Seoul National University • **Stephanie Juneau** NOIRLab  
**Arun Kanchibotla** UCSD • **Simranjeet Kaur** Indian Institute of Science Education and Research, Mohali  
**Yongjung Kim** Kyungpook National University • **Dohyeong Kim** Pusan National University • **Minjin Kim** Kyungpook National University  
**Sungho Lee** Korea Astronomy and Space Science Institute • **Natalia Nazarova** Scuola Internazionale Superiore di Studi Avanzati (SISSA)  
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