

PHYSICS

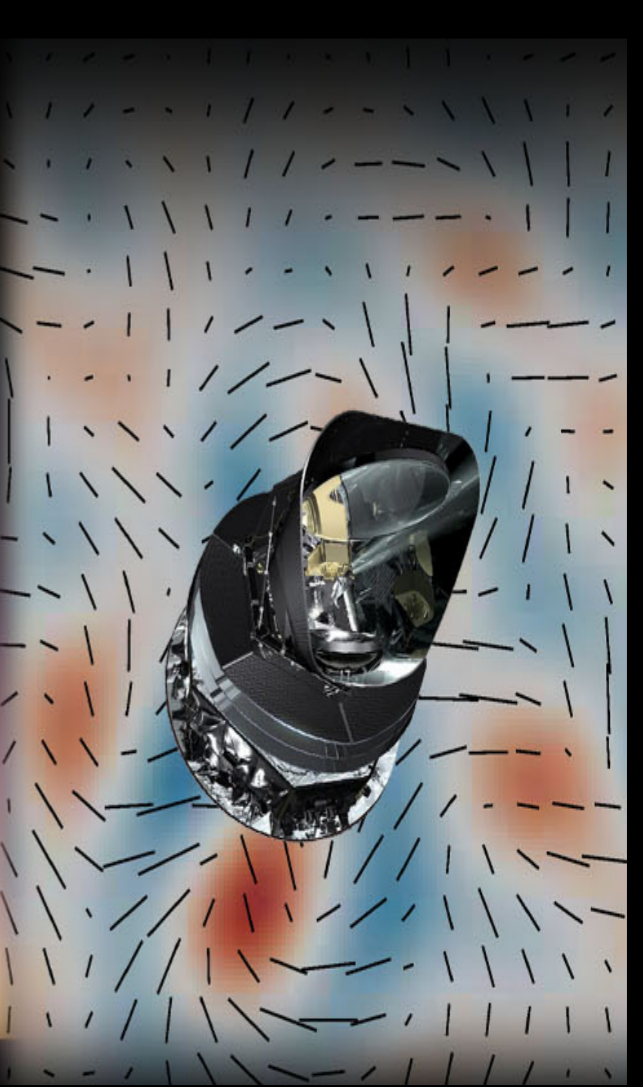
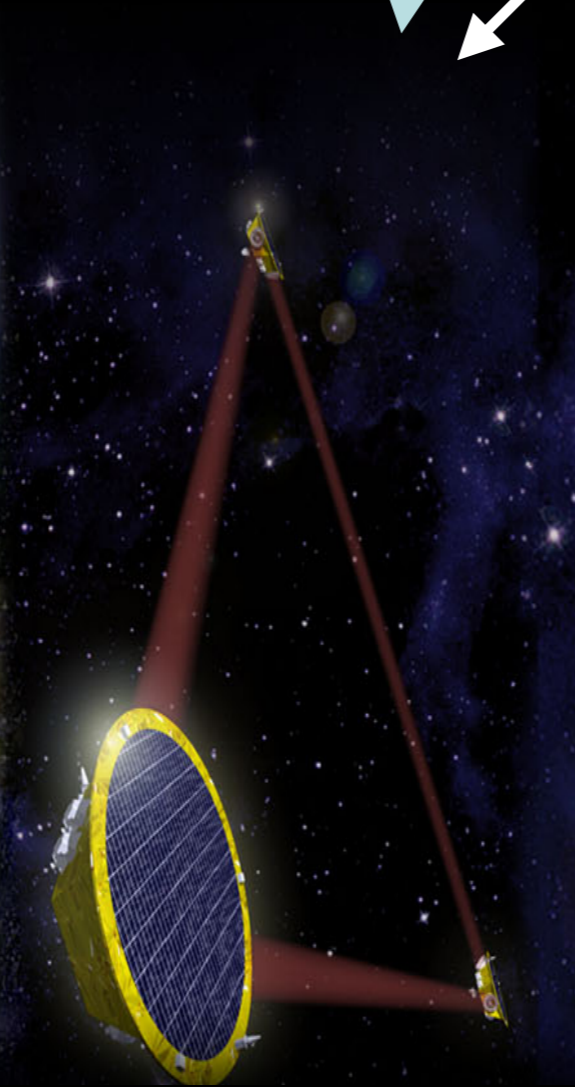
U B C DEPARTMENT OF  
ASTRONOMY



LIGO

LISA

PTAs  
CHIME



Gravitational Wave Periods

# Update from the CHIME/pulsar team

(Courtesy of Ingrid Stairs, Mark Halpern, et al. at UBC)

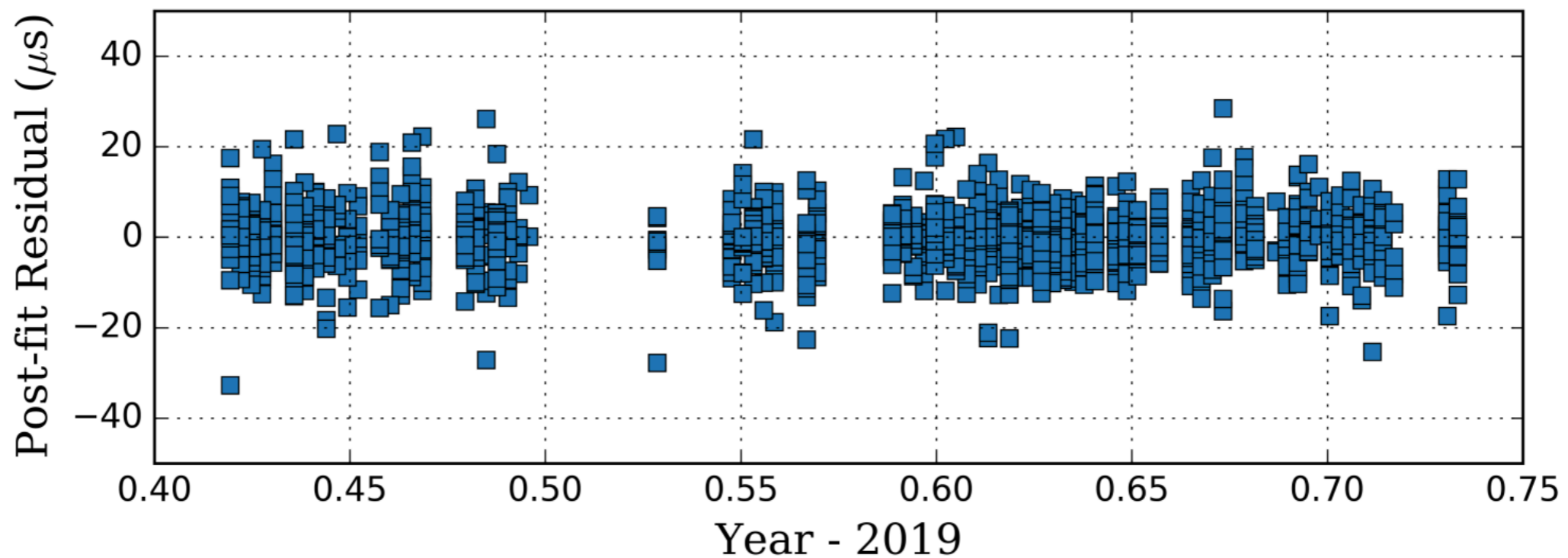
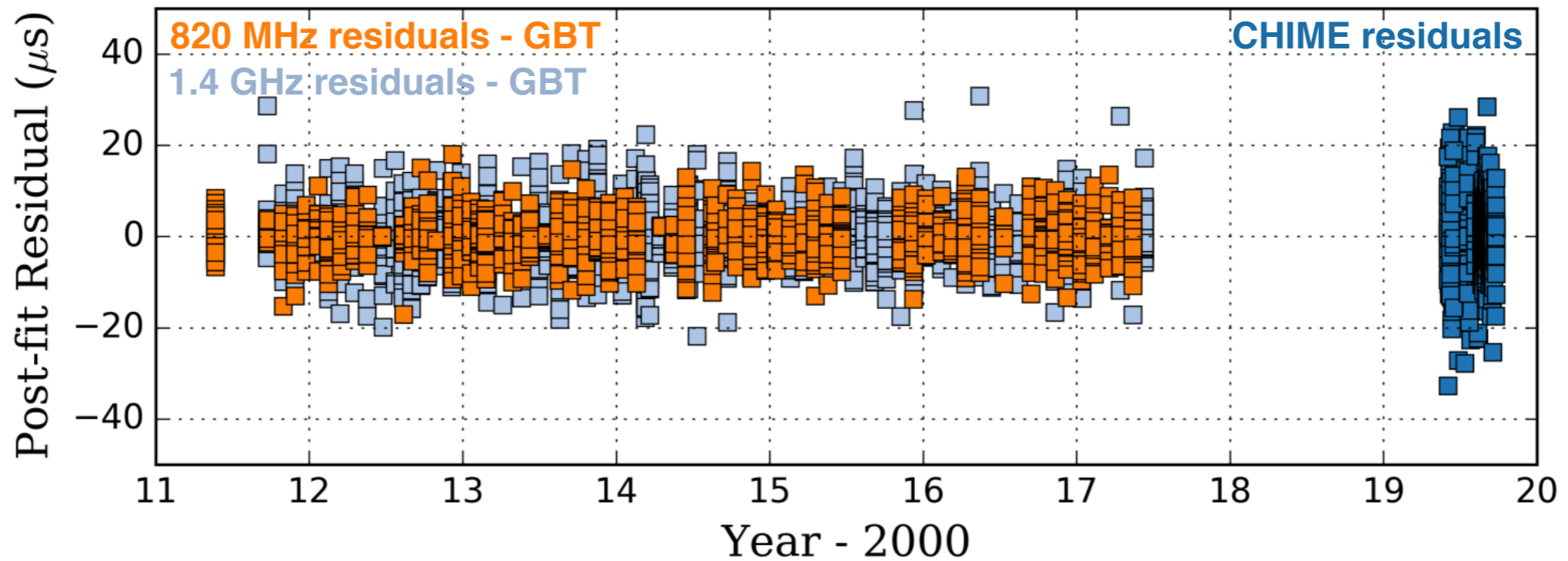


Canadian Hydrogen Intensity Mapping Experiment



Photos by the CHIME collaboration

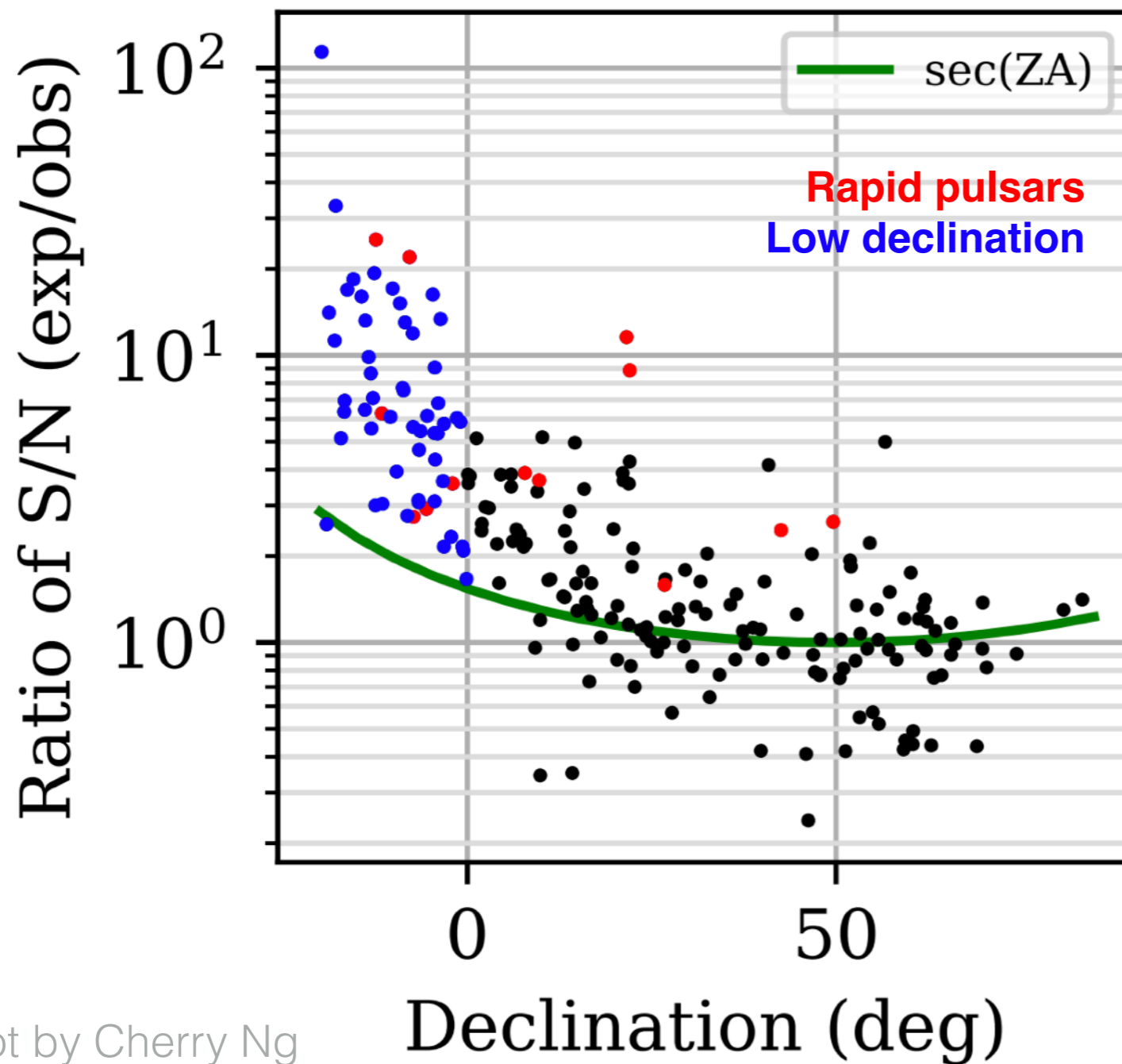
# NANOGrav and CHIME/Pulsar observations of PSR J0645+515



Plot by Emmanuel Fonseca

Paper in prep - CHIME team

# Update from the CHIME/pulsar team



Plot by Cherry Ng  
Paper in prep - CHIME team

Measured SNR is as expected for hundreds of Galactic pulsars, measured with a daily cadence

# UBC has joined the LIGO Scientific Collaboration

[lsc.ubc.ca](http://lsc.ubc.ca)

The LIGO group at UBC

[Home](#)

[About the UBC LIGO Group](#)

[Get Involved](#)

[Publications](#)



## About the LIGO group at UBC

UBC is now part of the [LIGO Scientific Collaboration](#).

Senior LSC members at UBC include:

- [Jess McIver \(UBC Physics & Astronomy\)](#)
- [Evan Goetz \(UBC Physics & Astronomy\)](#)
- [Curtis Berlinguette \(UBC Chemistry\)](#)
- [Minkyun Noh \(UBC Mechanical Engineering\)](#)
- [Joerg Rottler \(UBC Physics & Astronomy\)](#)
- [Jeff Young \(UBC Physics & Astronomy\)](#)
- [Ke Zou \(UBC Physics & Astronomy\)](#)

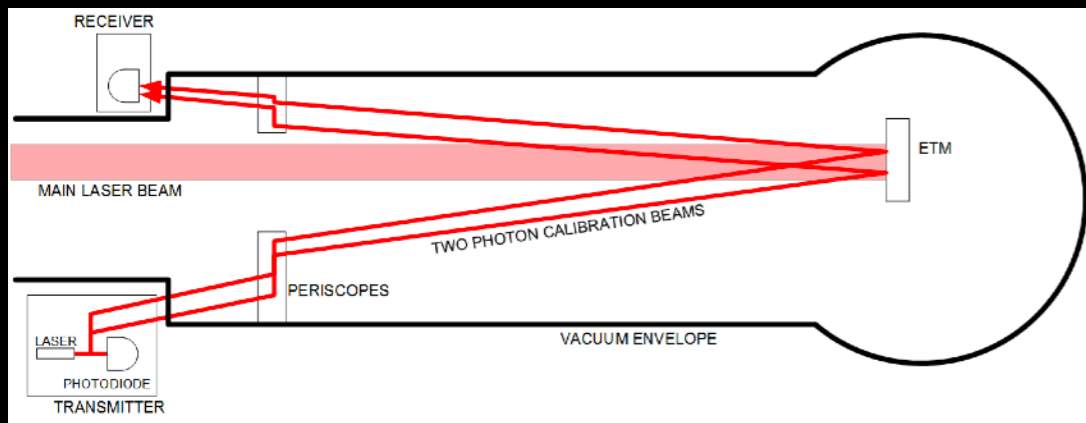
Updates to come soon!

## Recent Updates

- [Discovery of the heaviest neutron star, or lightest black hole, ever observed](#)
- [UBC researchers visit LIGO Livingston](#)
- [Glimpsing harmonics in gravitational waves](#)
- [GW190425: detecting the second merger of two](#)

# The (LIGO-band) GWs group at UBC

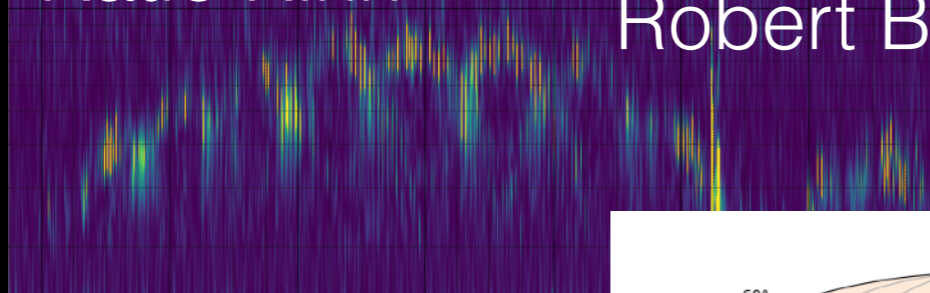
Evan Goetz



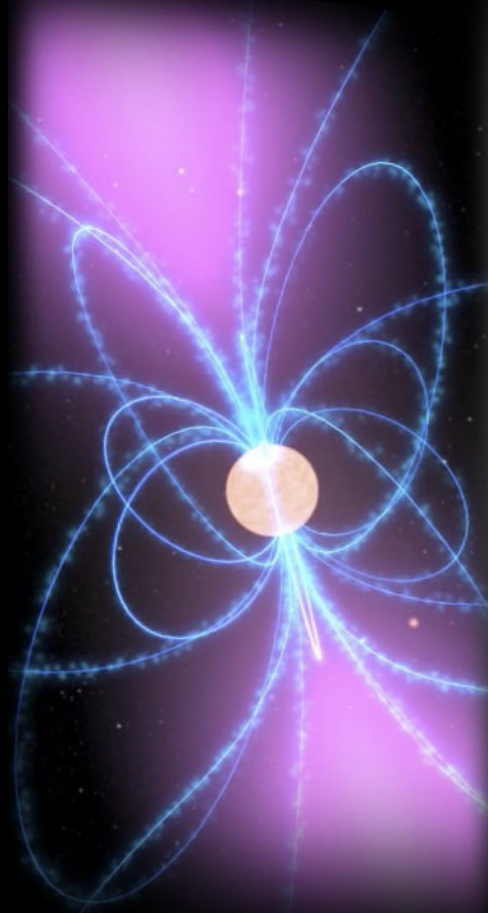
Evan Goetz  
Katie Rink  
Robert Beda



Evan Goetz  
Katie Rink  
Maryum Sayeed  
Robert Beda



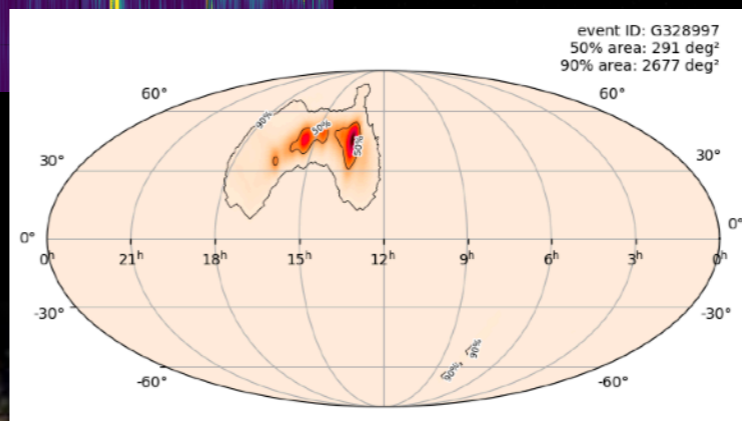
Evan Goetz



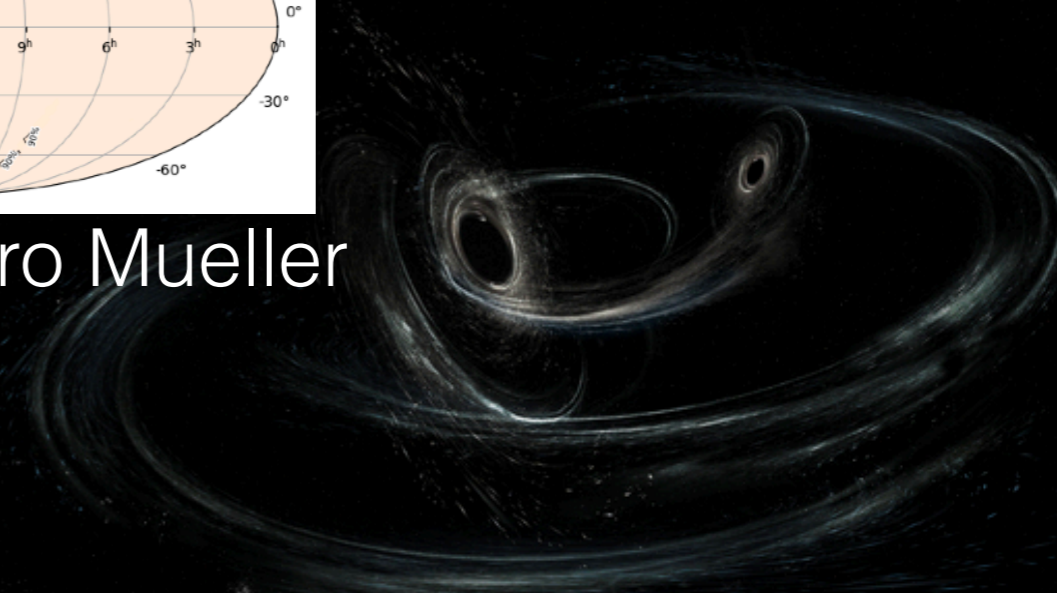
Nayyer Raza



Miriam Cabero Mueller  
Alan Knee  
Maryum Sayeed

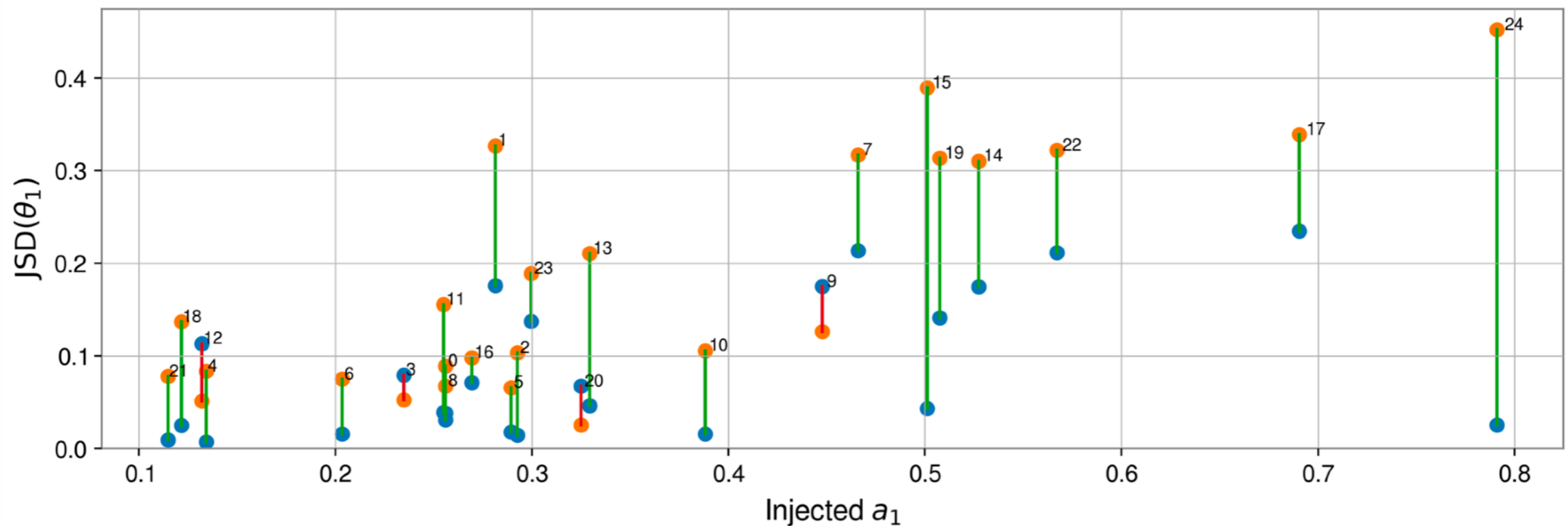
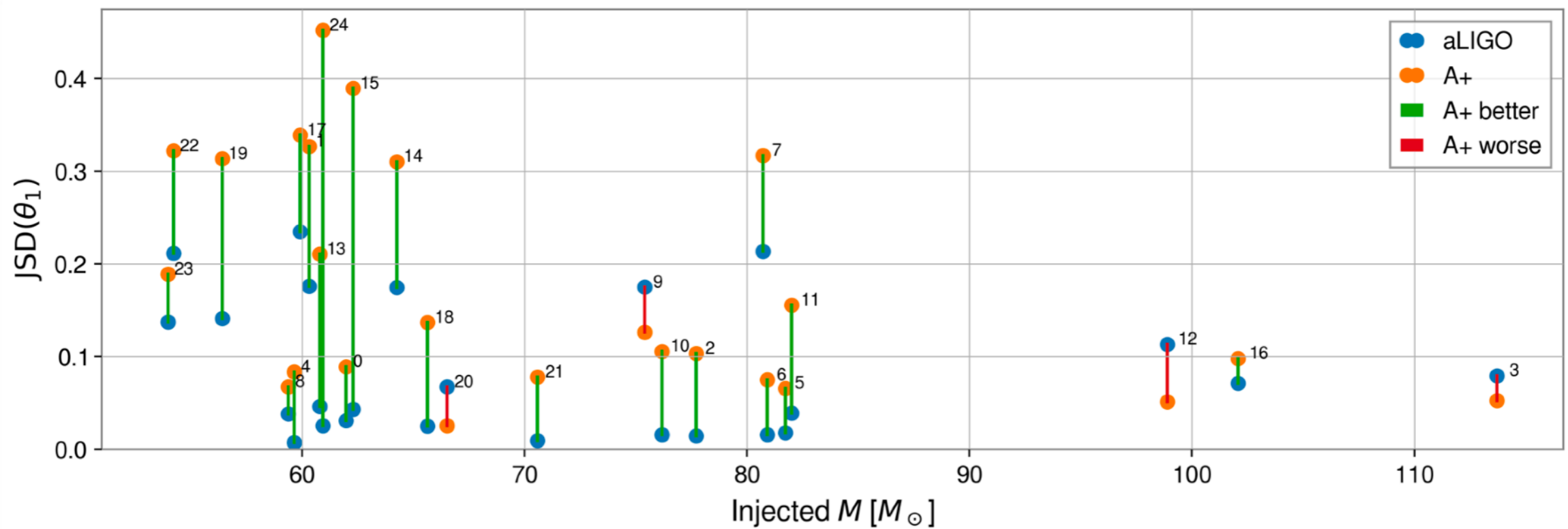


Miriam Cabero Mueller



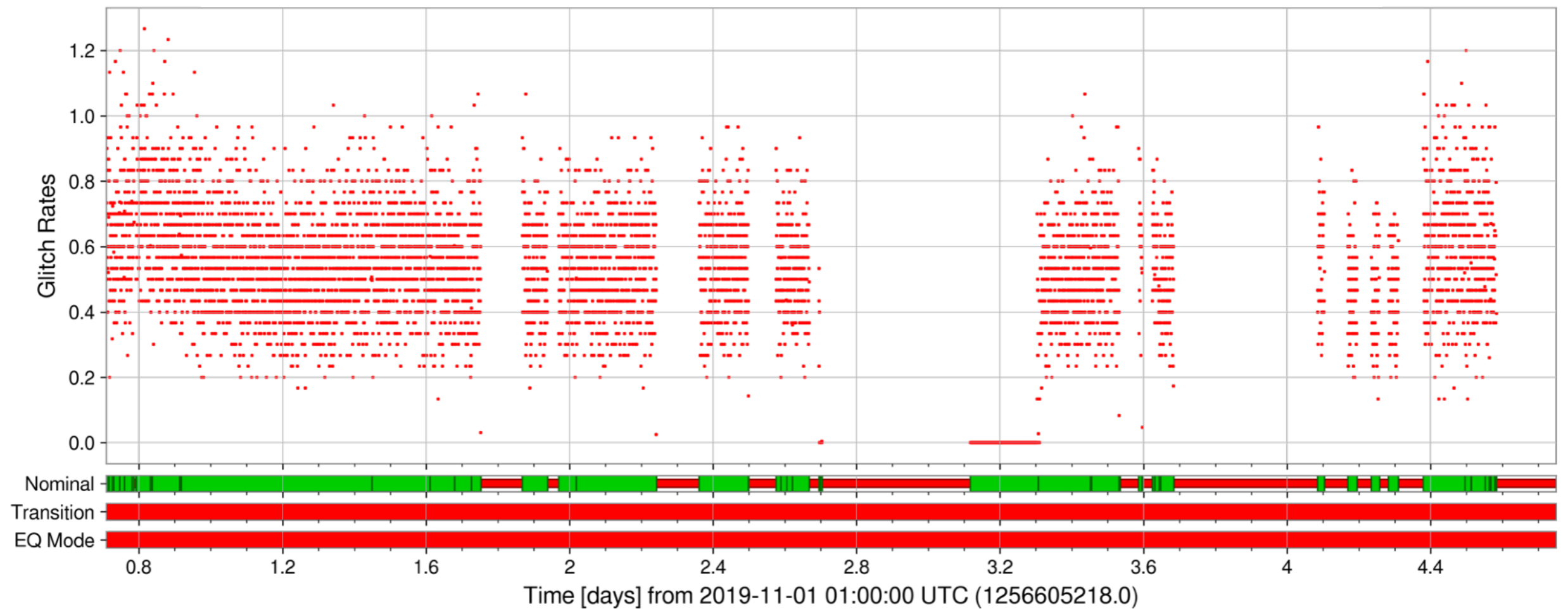
# How much better can we resolve spin tilt with A+?

Alan Knee, Miriam Cabero Mueller, JM



# Post-run LIGO detector characterization

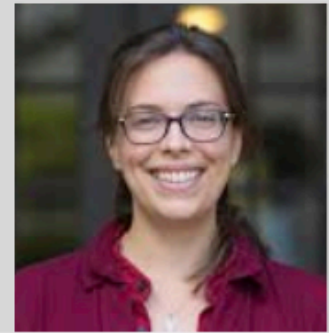
Impact of EQ mode on DQ: **Robert Beda**, Katie Rink, Evan Goetz, JM



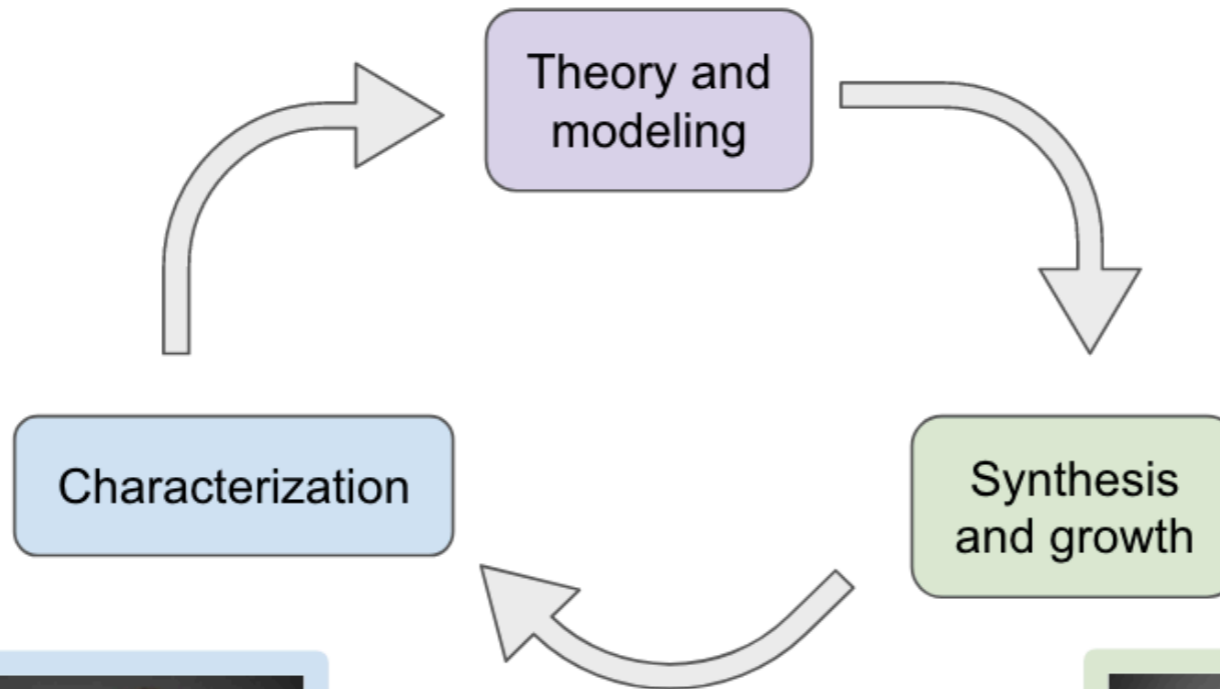


# UBC's GW detector coating team

Exploring optic coatings for ground-based GW detectors beyond Advanced LIGO (Voyager, Cosmic Explorer, Einstein Telescope).



Jess McIver, leader of the LIGO detector characterization effort, will co-liaise with the LIGO collaboration and GW community.



Joerg Rottler's group will perform **atomistic simulations** to predict the internal friction and mechanical loss of oxide glasses of interest for GW detector coatings.



Jeff Young's group will build a **high-throughput optical cryostat** to perform direct measurements of mechanical loss of synthesized materials.



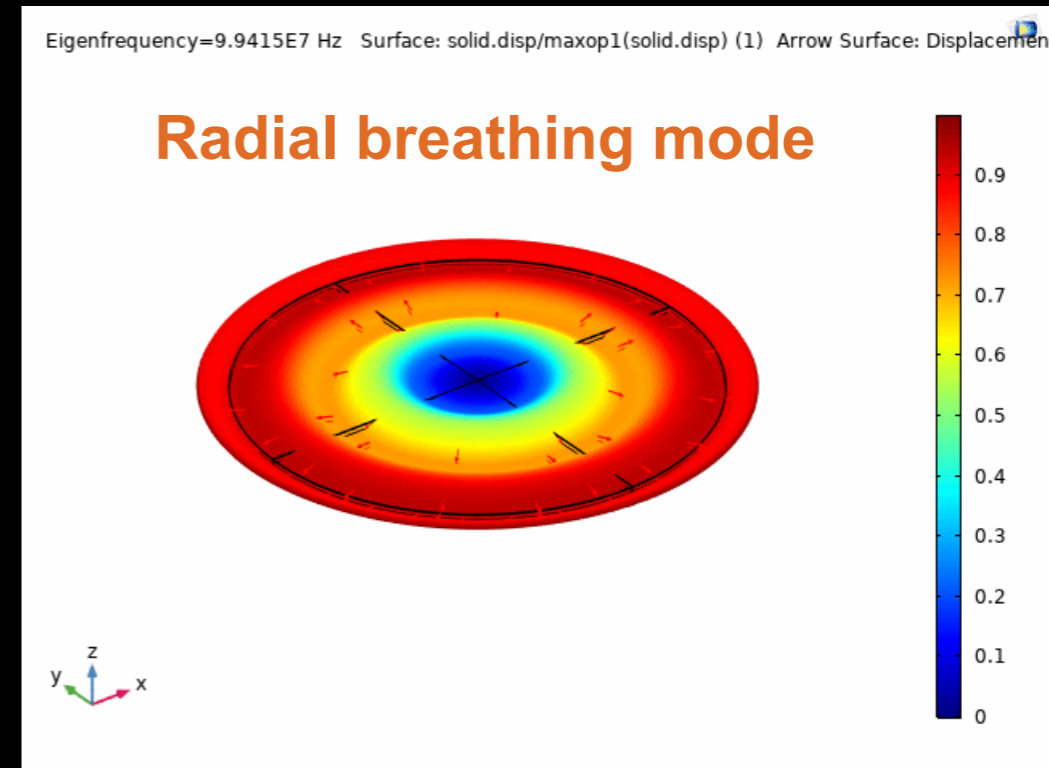
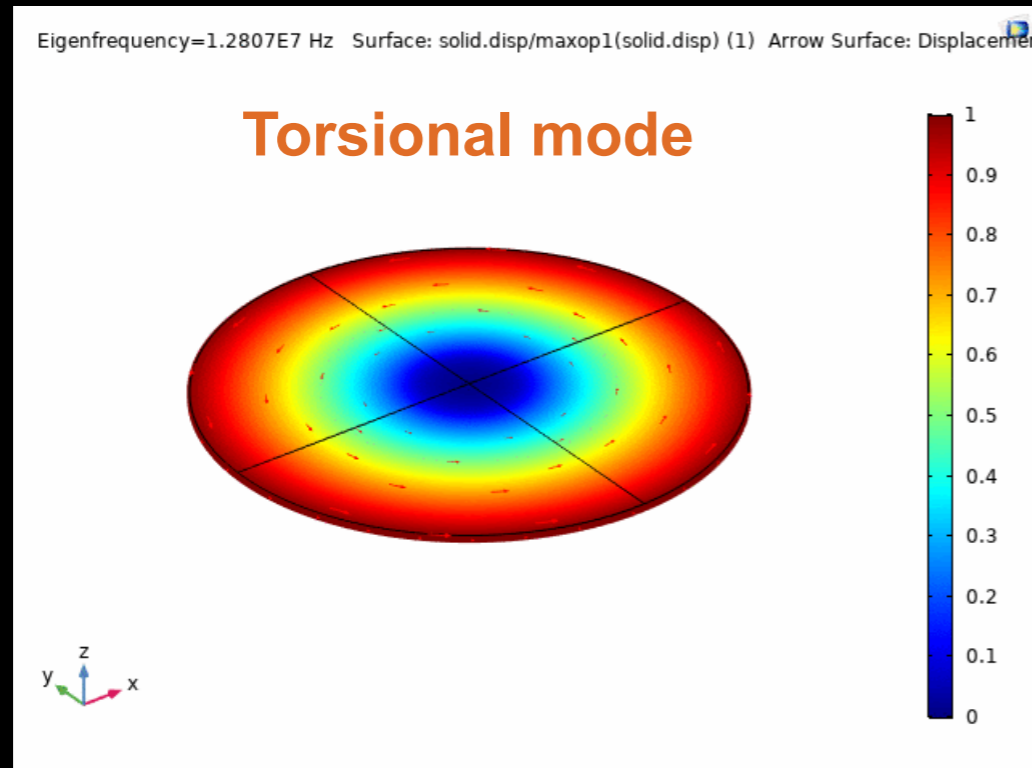
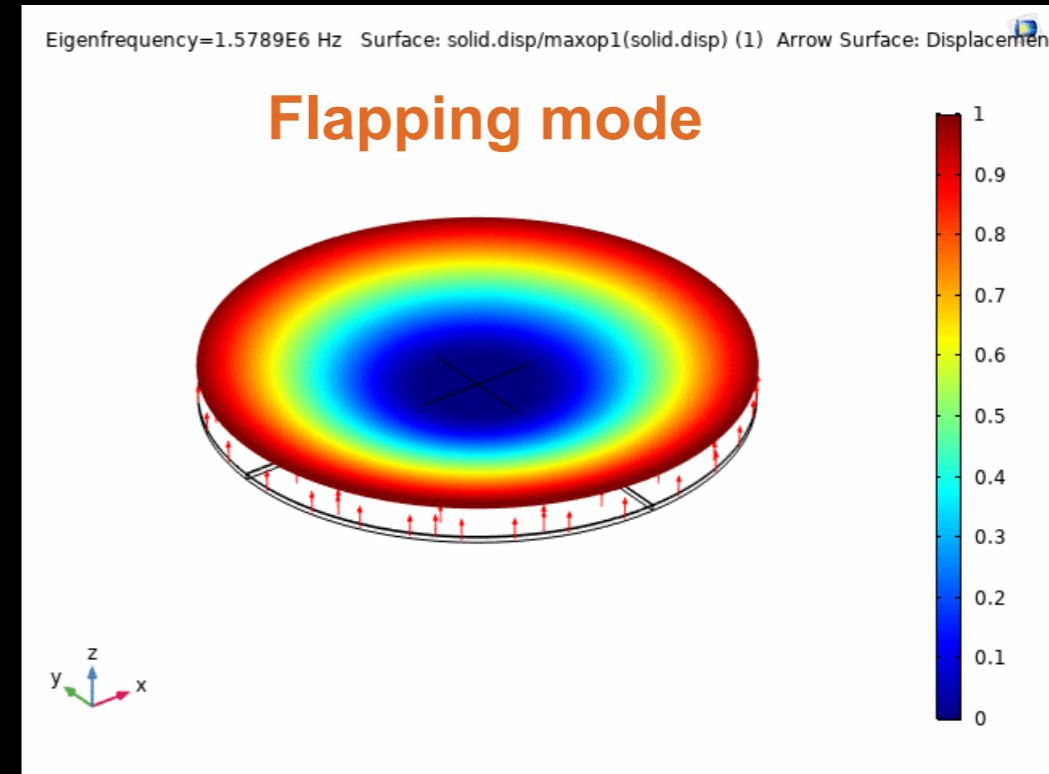
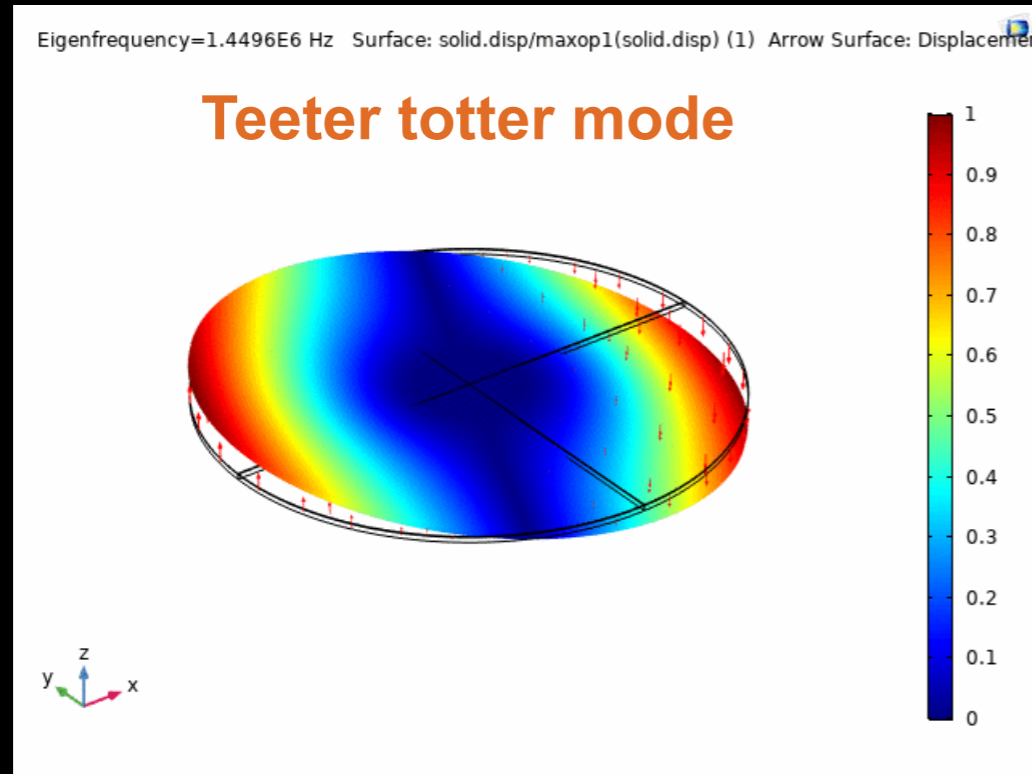
Curtis Berlinguette's group will synthesize state-of-the-art **amorphous metal oxide films** and explore a wide range of metal oxide layered structures.



Ke Zou's group will use **molecular beam epitaxy (MBE)** to synthesize amorphous and crystalline oxide candidate materials.

# Coating characterization: modeling mechanical microresonators

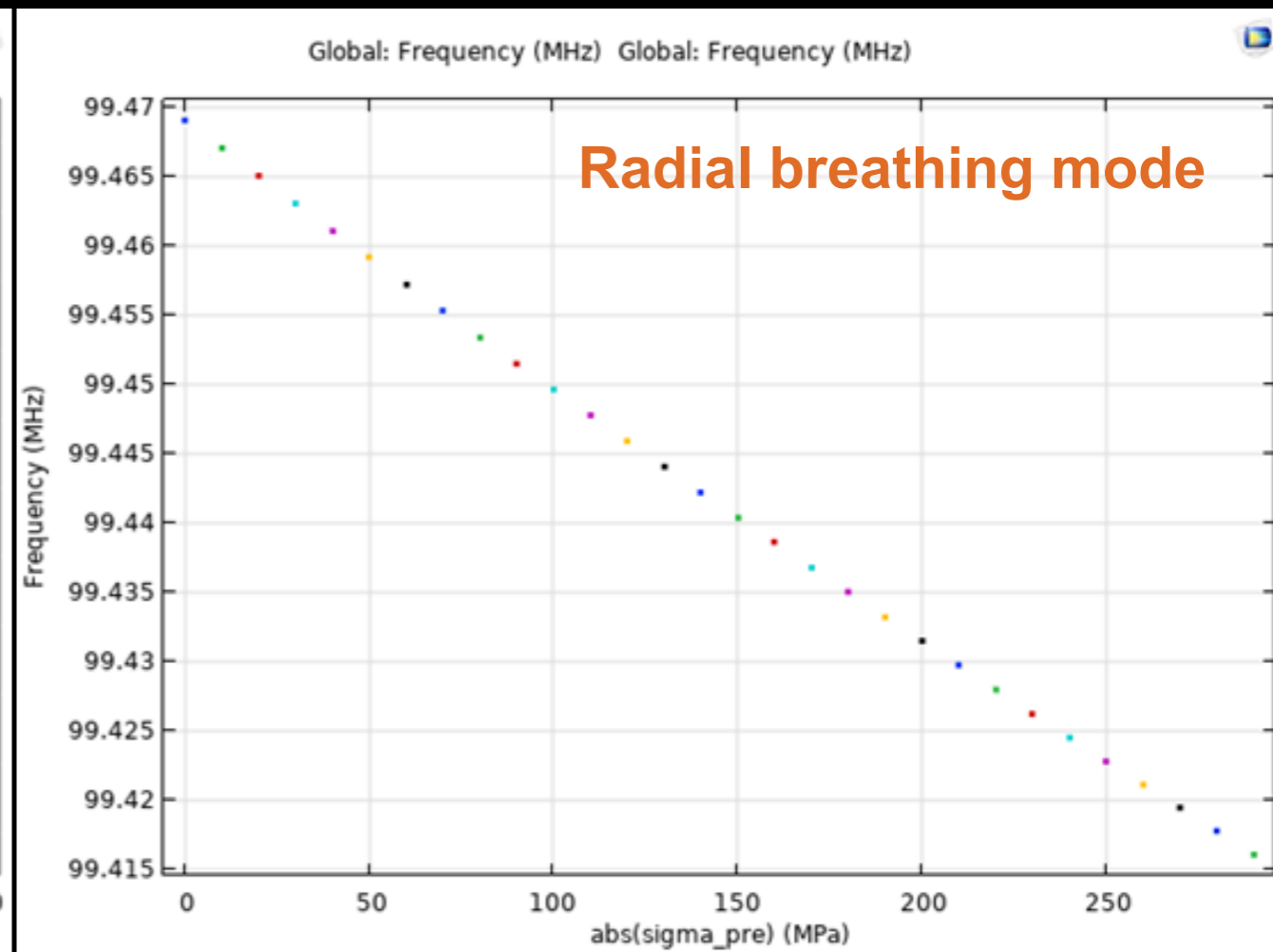
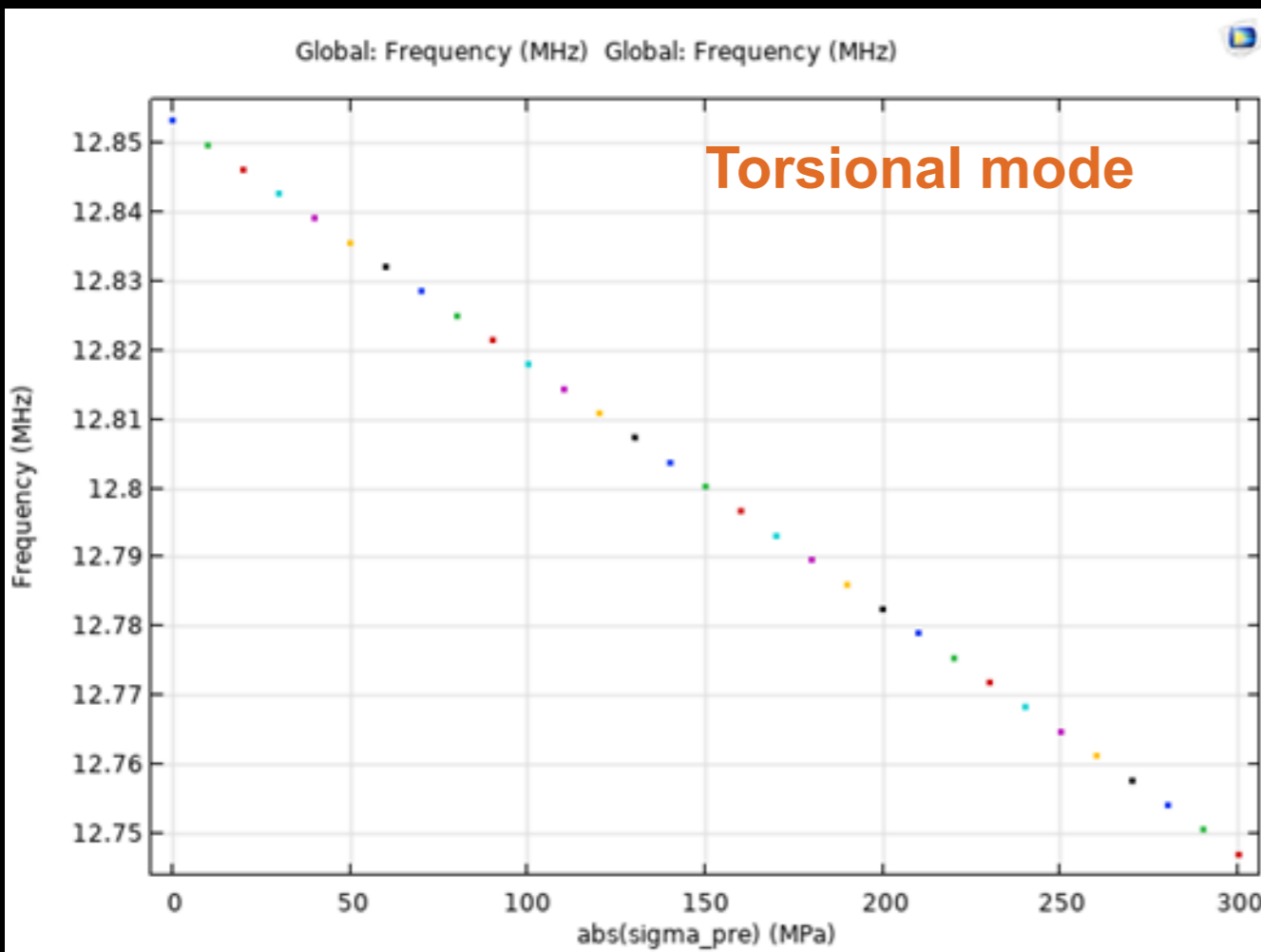
Ned Booker, Matthew Mitchell, Jeff Young, et al.



# Coating characterization: modeling mechanical microresonators

Ned Booker, Matthew Mitchell, Jeff Young, et al.

## Modeling resonance frequency vs. compressive stress



# Research in the era of covid-19

