

WELCOME

Use this link to join our Discord!

THE DEEP TENSOR LAB

FOR COMPUTATIONAL MEDICINE



Summer 2025 Fellowship Launch

June 18, 2025

Advancing Medicine through Machine Learning

AGENDA

Our Mission

02

Our Team

03

Med Mentors

04

Faculty

05

Timeline

06

Projects

07

Breakouts

TODAY'S SCHEDULE



6-7 PM PT

- Program introduction and schedule
- Introduction to the Med Mentors
- Faculty Mentor project overviews
- This week's to-do's
- Overview of breakout rooms

7-8 PM PT

- Faculty mentor visits (7-7:10)
- Breakout rooms (5 x 10 minutes) (7:10-8:00)

MISSION

Our mission is to identify underexplored problems within medicine and rigorously investigate them using modern analytical tools. We empower fellows to lead high-impact research by combining technical skill with medical mentorship. By cultivating a culture of curiosity, integrity, and translational focus, we aim to generate work that both contributes to academic knowledge and shapes real-world clinical practice.

MEET THE DIRECTORS



Aaron Ge

Director, Founder

Medical Student - UMSOM



Matt Allen

Director, Founder

Medical Student - UCSF



Chy Murali

Director

Medical Student - UMSOM

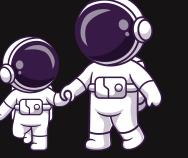


Gavin Shu

Director

Medical Student - UCSF

MED MENTORS



Aaron

Ge

UMSOM



Matt

Allen

UCSF



Chy

Murali

UMSOM



Gavin

Shu

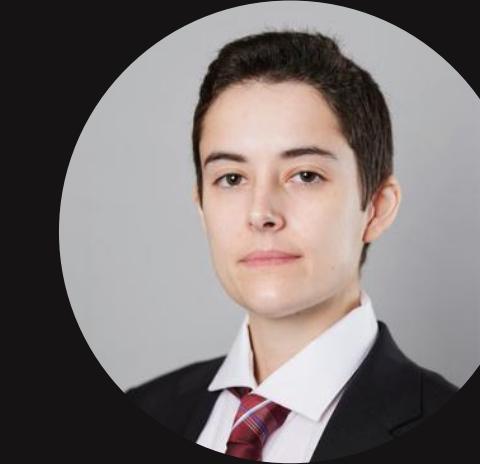
UCSF



Richard

Liu

TUCOM



Braxton

Morrison

UCSF



Diem My

Hoang

Ballad Health
Physician



Laura

Chen

UCSF



Connie
Chang-Chien

UCSF



Griffith
Hughes

UCSF



Rahul
Kumar

UMass



Tiffany
Chen

UCSF



Matt
Kim

UCSF



Josh
Devier

UCSF

June 16-21: Launch Week



- Meet the cohort
- **06/18:** Orientation and hear a curated set of real clinical gaps sourced by physicians
- **06/19:** Literature Review Debrief
- Begin exploring project ideas, brainstorming directions, and decide whether to pursue projects independently or in teams with assistance of med student mentors (mentor assignment and contact info will be included in follow-up email)

Deliverables: Team and project rankings due 06/22

June 23-28: Scoping Week

- Fellows conduct literature reviews, assess data feasibility, and draft a focused research question with assistance from PIs and med student mentors
- Prepare project proposal to faculty mentors to validate their project idea, refine clinical framing, and ensure feasibility

Deliverables: Project proposal due 06/29



June 30 – August 18: Build Phase



- Build and iterate projects
- Weekly full-cohort meetings for progress sharing, peer feedback, and troubleshooting.
- Optional biweekly check-ins with clinical mentors for guidance and refinement.
- Submit mid-summer progress report and brief update presentation to their faculty and med student mentor

Deliverables: Progress reports due date TBD

August 19–25: Finalization

- Fellows prepare final posters and presentations for symposium
- Practice sessions, final feedback from mentors

Deliverables: Finalize presentations



WRAPPING UP

(08/26-08/31)



Virtual Symposium (Date TBD)

Live symposium (with invited guests from academia and industry)

Optional post-program mentorship for publication or abstract submission



Awards

- Best Technical Model
- Most Clinically Impactful
- Most Creative Use of Multimodal Data
- Excellence in Team Collaboration



More details to follow!

Further details to follow in the coming weeks about the exact date, setup, etc. so keep on the lookout for communications from us!



Licensing

01

Tensor Lab is a collective of students, researchers, and physicians who volunteer their time, skills, and passion for medical research.

02

To ensure all work remains accessible and benefits everyone, we operate under an [open-source policy](#).

03

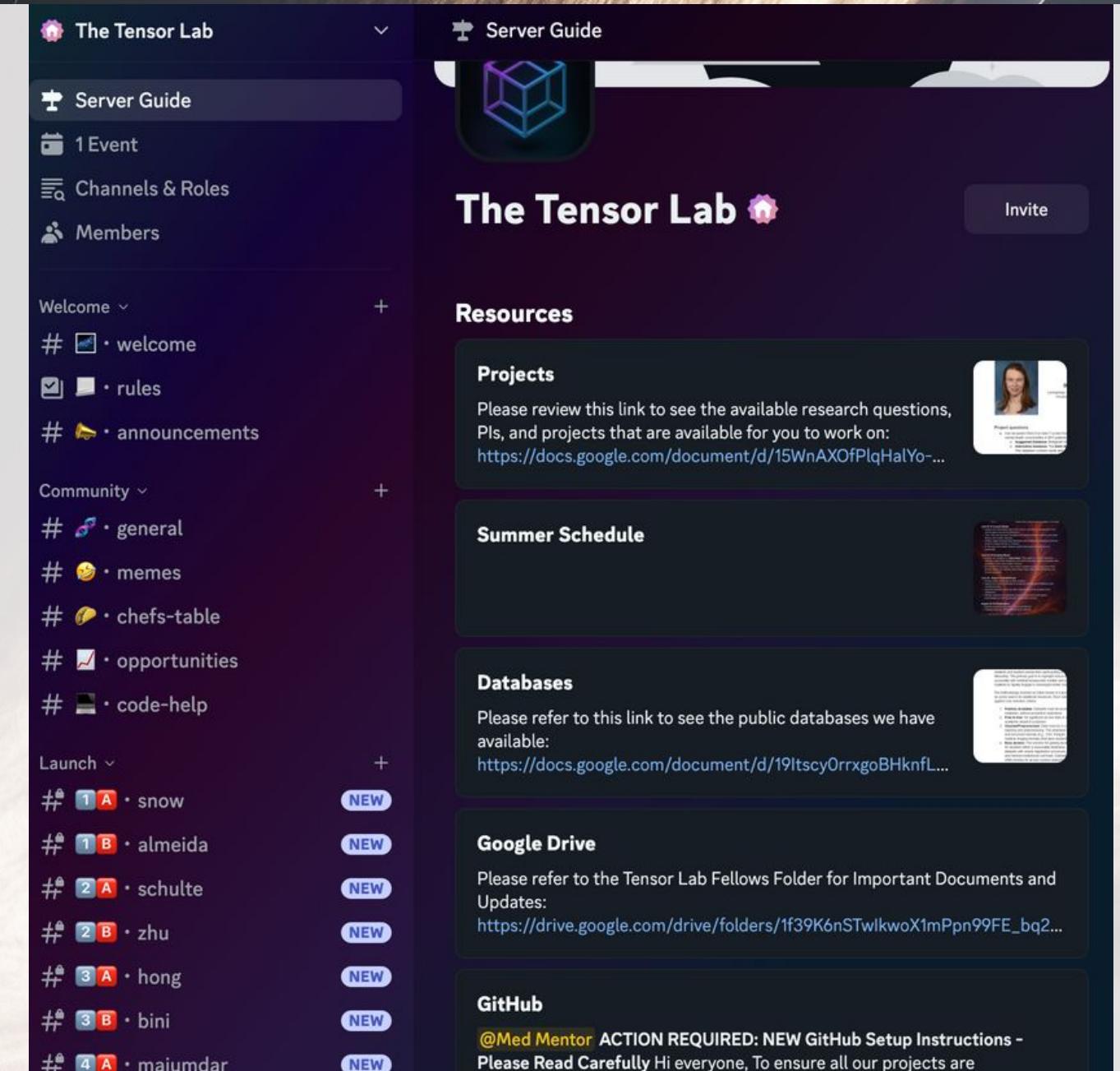
Unless other arrangements are made with your project specific PI, contributions of code, software, documentation, or other copyrightable work product ("Contributions") will be licensed under the [MIT License](#).

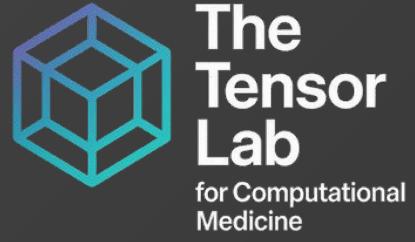


open source

RESOURCES

You can find the most up-to-date information and resources on the Server Guide located in the Discord sidebar.





FACULTY ADVISORS



**Assistant Professor,
Head and Neck Surgery**

UMSOM

Dr. Grace Snow, MD

🌙 PREDICTION

Predict depression and anxiety scores from voice recordings in ENT patients.

🌙 PREDICTION

Train models to classify respiratory disease from cough audio data.

🌙 CLASSIFICATION

Classify otoscopic images into diagnostic categories using convolutional neural networks.



**Chief Data Scientist,
Epidemiology and Genetics**
National Cancer Institute

Dr. Jonas De Almeida, PhD

🌙 EMBEDDINGS

Investigate how embedding spaces retain biomedical signal data like ECGs.

🌙 DEEP LEARNING

Build a fractal-based representation of the genome for deep learning risk models.

🌙 PREDICTION

Use large language models to predict patient risks from structured and unstructured EHR data.



**Medical Director, Sarcoma Program
Hematology/Oncology**
UCSF

Dr. Brian Schulte, MD



LLM

Simplify complex clinical trial consent forms using language models.



LLM

Build an AI assistant to summarize and harmonize oncology treatment guidelines.



SPEECH

Develop a voice-enabled assistant to manage and explain medication side effects.



Instructor,
Genitourinary Medical Oncology
UCSF

Dr. Xiaolin Zhu, MD/PhD

🌙 PREDICTION

Analyze cancer genomic data to identify clinically actionable patterns and predictors.

🌙 MODELING

Correlate pathology slides with genomic data and outcomes for cancer prognosis modeling.

🌙 CLASSIFICATION

Use single-cell sequencing data to identify tumor-specific expression profiles.



Dr. Julian Hong, MD/MS



PREDICTION

Can we predict the likelihood of a palliative care consult or DNR order in cancer patients admitted to the ICU, and explain the drivers of that decision?



CLASSIFICATION

Can unsupervised learning on discharge summaries identify distinct morbidity or risk phenotypes among cancer patients admitted to the ICU?

**Associate Professor and Medical
Director, Informatics Radiation
Oncology**
UCSF



**Professor & Chief Technology Officer,
Orthopaedic Surgery**
UCSF

Dr. Stefano Bini, MD

🌙 PREDICTION

Identify high-risk phenotypes in “negative” trials by uncovering subgroup patterns masked by averages.

🌙 PREDICTION

Use wearable activity data to predict osteoarthritis onset and discover early activity phenotypes.

🌙 PREDICTION

Re-examine infection and hip fracture datasets to identify consistent risk factors and treatment response patterns.



Dr. Sharmila Majumdar, PhD

🌙 IMAGE SEGMENTATION

Use segment-anything models to extract organ and body composition features from abdominal MRIs.

🌙 GENERALIZABILITY

Train MRI models to generalize across different scanners and acquisition protocols.

**Vice Chair for Research in Advanced Imaging,
Radiology and Biomedical Imaging**
UCSF

Dr. Andreas Rauschecker, MD/PhD



**Clinical Director, Center for
Intelligent Imaging
Neuroradiology**
UCSF



IMAGE SEGMENTATION

Improve segmentation accuracy for small lesions in Multiple Sclerosis and brain cancer metastasis on MRI.



SYNTHETIC DATA

Generate synthetic brain MRIs with varied lesions to support model training and education.



**Founder, Zero Hour Medical Consulting
Emergency Medicine**

Kaiser Permanente

Dr. Scott Campbell, MD MPH

🌙 PREDICTION

Develop a breast cancer outcome predictor from digital pathology and clinical data.

🌙 PREDICTION

Use biomarkers and clinical data to predict prostate cancer progression for imaging decisions.



**Chief of Social Medicine
Emergency Medicine**

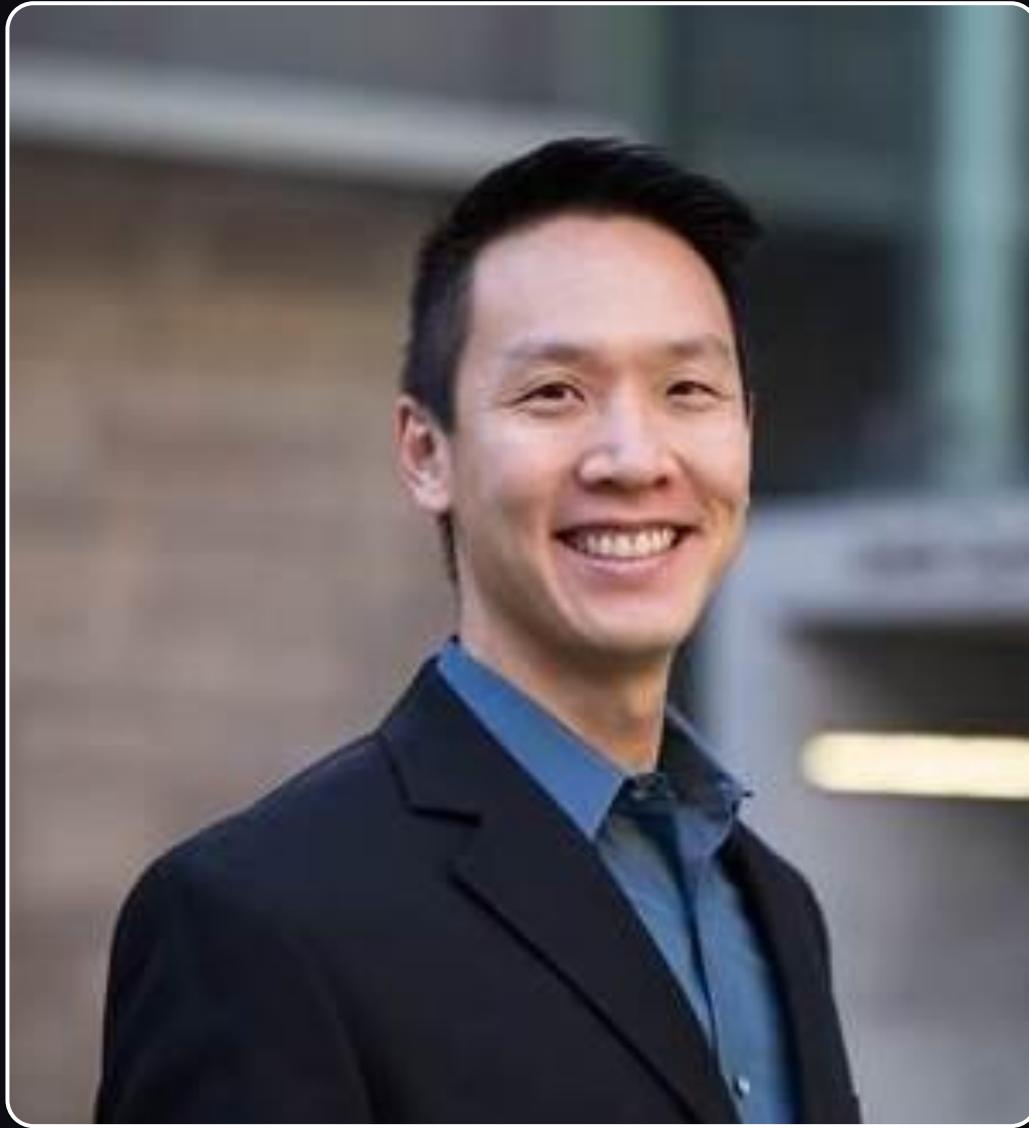
Kaiser Permanente

Dr. Ian McLachlan, MD MPH

PREDICTION

Predict hospital admission at triage using structured vitals and chief complaint text.

Dr. Geoff Tison, MD MPH



**Associate Professor, Co-Director for UCSF Center for
Biosignal Research
Cardiology**
UCSF



SIGNAL PROCESSING

How can we reduce false positives in continuous ECG monitoring by leveraging AI to account for low disease prevalence and physiologic noise?



TIME SERIES

Can unsupervised learning uncover latent phenotypes or early warning signatures in long-term ECG telemetry or EHR time-series data?



LLMS

Can large language models make sense of heterogeneous EHR data streams to support real-time clinical decision-making?



THIS WEEK'S TO-DO'S:

- Submit **Breakout Room Reviews** by noon PT tomorrow (low effort, we'll talk about this in a moment)
- Discord channels have been set up for each faculty mentor. Connect with other fellows and med mentors to discuss projects you might be interested working on!
- By Friday, June 20: submit your project preferences via Google Forms

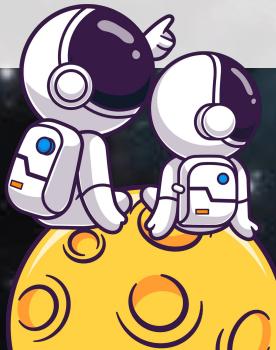
Launch	+
# 1 A · snow	NEW
# 1 B · almeida	NEW
# 2 A · schulte	NEW
# 2 B · zhu	NEW
# 3 A · hong	NEW
# 3 B · bini	NEW
# 4 A · majumdar	NEW
# 4 B · rauschecker	NEW
# 5 A · campbell	NEW
# 5 B · mclachlan	NEW



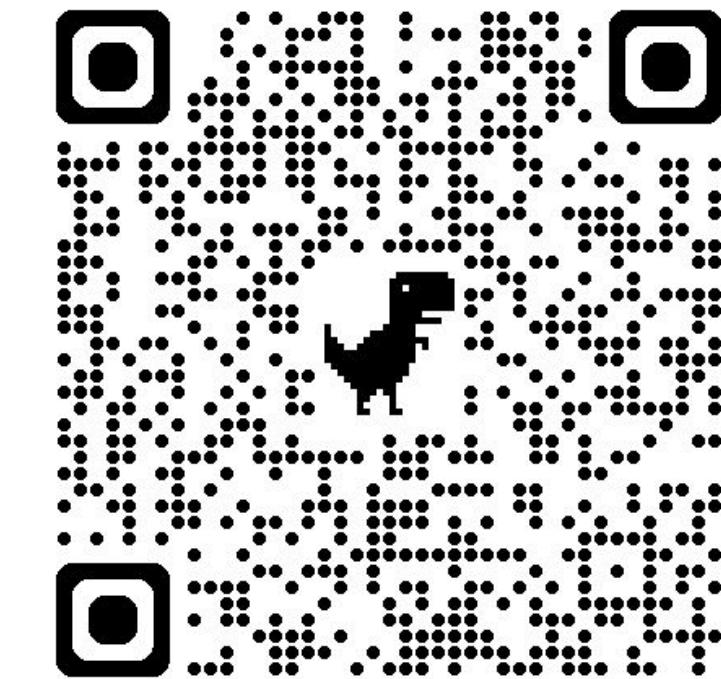


LOOKING FORWARD:

- Project assignments will be finalized by **next Monday**
- **Next week is Lit Review Week!**
 - Your med mentors can help you with this.
 - We will also post a guide on conducting a preliminary lit review utilizing AI tools.
 - Goal: contextualize your problem and consider project methodology. This does not need to be perfect!
- **Start meeting with your faculty mentors to introduce yourselves!**
- We will have a **full cohort meeting** next week. We will post a scheduling link in Discord's #announcements channel



BREAKOUT ROOM INSTRUCTION

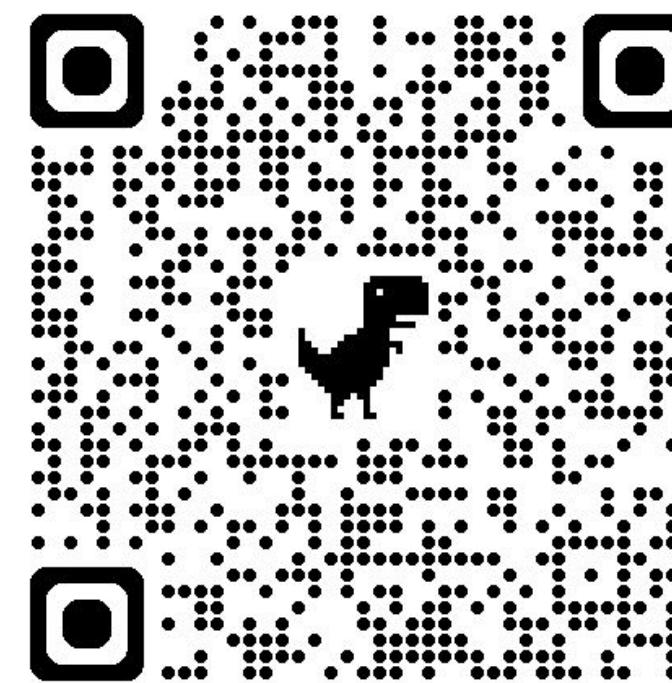


ROOM REVIEW FORM

You will now rotate between breakout rooms. This is an opportunity to learn a bit more about the projects you are interested in and chat with med mentors!

- There are **5 breakout rooms**, each covering 2-3 faculty mentors
- You will have the opportunity to ask the med mentor(s) in the room about the projects you are interested in
- Each rotation is **10 minutes**, and we will provide a **1-minute warning**. At the end, you will switch to the next room (e.g. if you are in Room 5, go to Room 1)
- **These are brief Q&A sessions! If you are interested in learning more, you can reach to the med mentor by Discord or email to clarify any questions.**

BREAKOUT ROOM INSTRUCTION



ROOM REVIEW FORM

Breakout room number?

- 1
- 2
- 3
- 4
- 5

General Impressions & Key Takeaways from this room: Any projects/ideas/concepts that you found particularly compelling? *What questions or potential challenges come to mind?* *

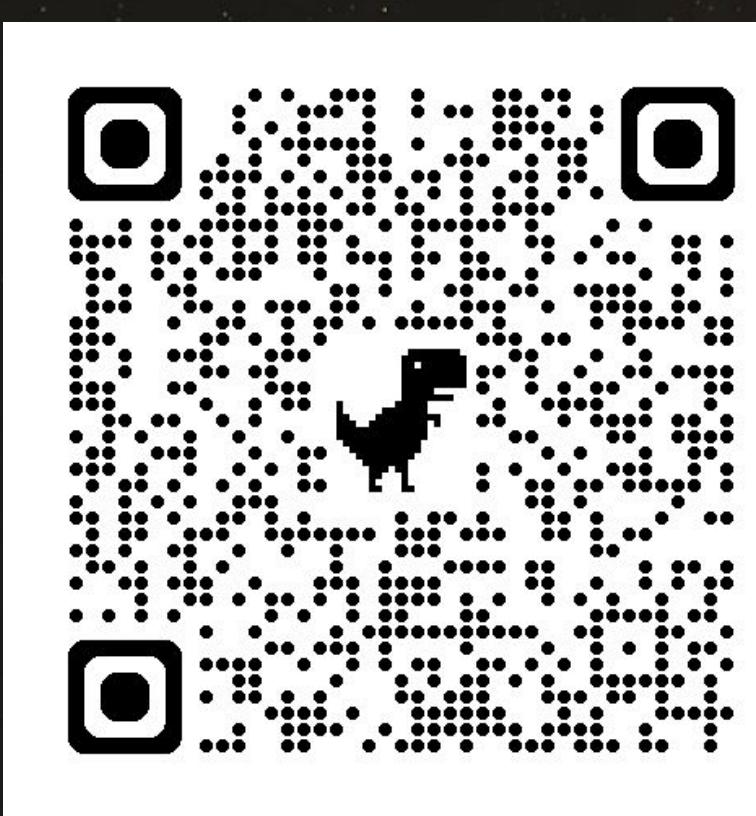
Your answer

	Room 1	Room 2	Room 3	Room 4	Room 5	
Faculty Mentor A	Dr. Grace Snow Head and Neck Surgery	Dr. Brian Schulte Hematology-Oncology	Dr. Julian Hong Radiation Oncology	Dr. Sharmila Majumdar Radiology	Dr. Scott Campbell Emergency Medicine	Faculty Mentor A
Faculty Mentor B	Dr. Jonas De Almeida Genetics and Epidemiology	Dr. Xiaolin Zhu Oncology and Genomics	Dr. Stefano Bini Orthopaedic Surgery	Dr. Andreas Rauschecker Neuroradiology	Dr. Ian McLachlan Emergency Medicine	Faculty Mentor B
Faculty Mentor C					Dr. Geoff Tison Cardiology	Faculty Mentor C

For Faculty Member A, classify your interest level. *

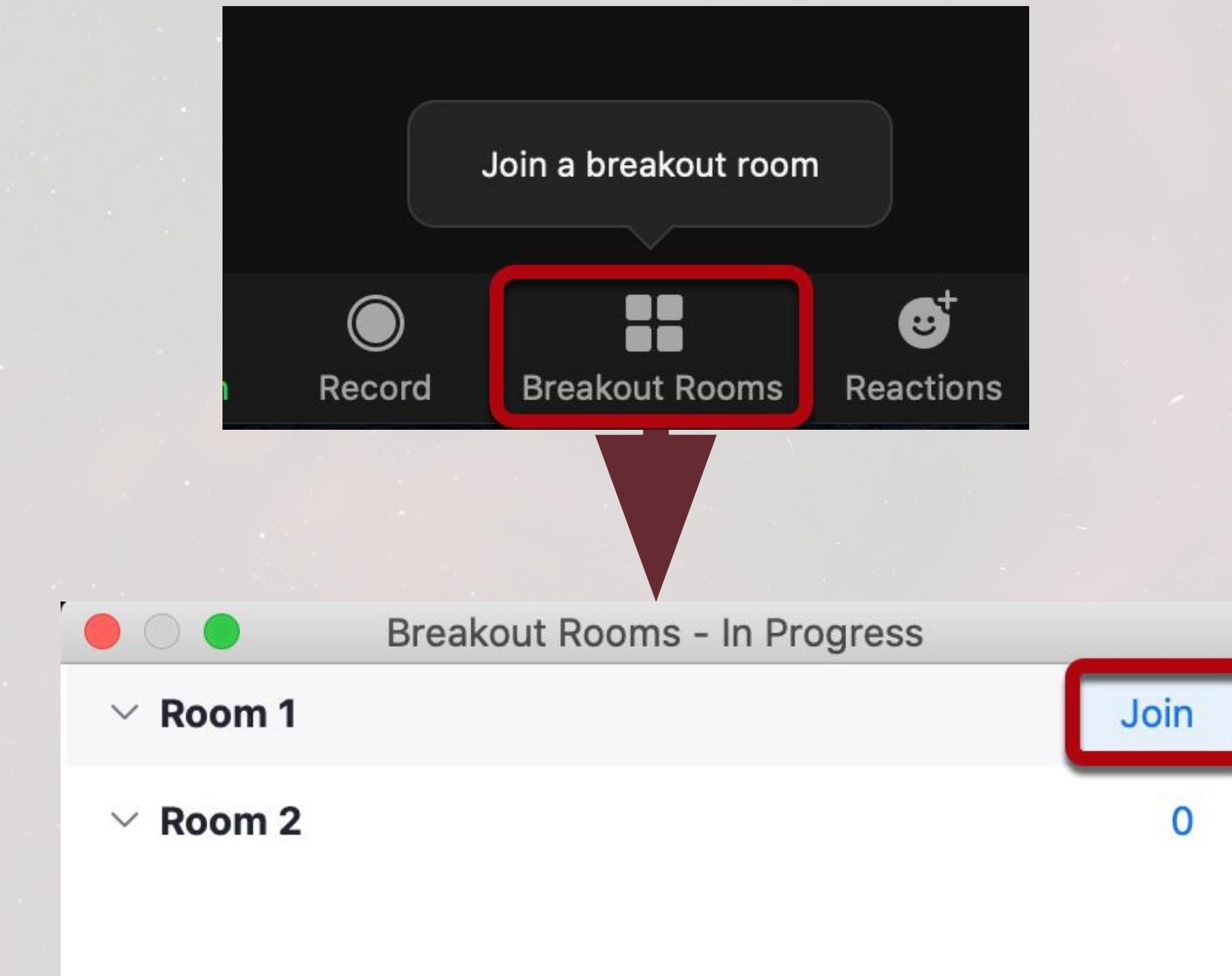
- Extremely interested
- Moderately interested
- Interested

BREAKOUT ROOM INSTRUCTION



ROOM REVIEW FORM

Switching rooms:





**THANK
Questions?
YOU**

