

OPTOMECHANICAL SENSING FOR SUBATOMIC & ASTROPARTICLE PHYSICS

Welcome to Kingston

Workshop logistics & practical information

Wouter Van De Pontseele · Colorado School of Mines
Queen's University · McDonald Institute · 23–25 September 2026

The only schedule that counts: indico.global/event/18677/timetable

OSSAP 2026 · Queen's University, Kingston



Where we are

Queen's University is situated on the territory of the Haudenosaunee and Anishinaabek.

*Ne Queen's University e'tho nón:we nikanónhsote tsi nón:we ne Haudenosaunee táhnon Anishinaabek
tehatihsnonhsáhere ne onhwéntsya.*

Gimaakwe Gchi-gkinoomaagegamig atemagad Naadowe miinwaa Anishinaabe aking.

We are grateful to gather, learn and work on these lands this week as guests, and we recognize the Indigenous Peoples who have lived here since long before Kingston and Queen's existed, and who continue to live here today.

Wording from the Queen's Office of Indigenous Initiatives (queensu.ca/indigenous/land-acknowledgement)

My perspective



Cambridge, MA, 2019. A Harvard professor, Melissa Franklin, comes back from a visit to Yale and tells a room full of collider physicists that the most exciting new idea she has seen in a long time is a levitated sphere, looking for dark matter.

That was the first time I heard of any of this.

My day job: Ricochet, Project 8 and, lately, BeEST. Nothing in my lab floats. I am quite possibly the least levitated person in this room.

Seven years later I get to help bring the people behind those ideas into one room.

Thank you for coming — I look forward to be immersed!



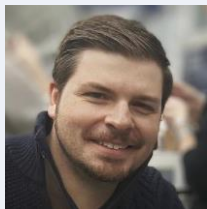
The people who sent each other ~300 emails



Louis Hamaide

JGU Mainz

Co-lead · joining in spirit



Kyle Leach

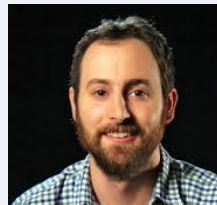
Queen's · McDonald
Institute

Local host



Dan Carney

LBNL



David Moore

Yale



**Wouter Van De
Pontseele**

Colorado School of Mines

Co-lead

Special thanks to Louis, who did a huge share of the invitations, Indico and announcements and can't be here this week. He is watching the Indico refresh from Mainz.

Further thanks to bringing this conference into existence:
Joe Formaggio (MIT) and Giorgio Gratta (Stanford).

The people who actually made it happen

Mark Richardson · Edward Thomas · Zach
Kenny

McDonald Institute — venue, rooms, food, poster,
Indico timetable

Who you will hear from (1/2)

Setting the stage

Zhen Liu

Wed 9:30 · overview
Broad scope & theory

David Moore

Yale · Thu 9:00 · overview
Modalities & experiments

Gravity & gravitational waves

Vivishek Sudhir

MIT · Wed
Quantum back-action on GW detectors

Andrew Laeuger

Caltech · Thu
Levitated sensors in Fabry–Pérot cavities

Andrew Geraci

Northwestern · Thu
Gravity, dark matter & axions

Superfluid helium

John Davis

Alberta · Wed
Tunable acoustic Weber bars

Jack Harris

Yale · Fri
A levitated superfluid drop

Who you will hear from (2/2)

Ultralight dark matter

Tejas Deshpande

Northwestern · Wed

Cryogenic sapphire cavities

Dalziel Wilson

Arizona · Thu

Membrane accelerometers, phase II

Levitated platforms & control

Massimiliano Rossi

TU Delft · Thu

Quantum-limited force & recoil sensing

Thomas Penny

Chalmers · Thu

Magnetic traps & levitated calorimetry

Mathieu Juan

Sherbrooke · Thu

Laser-free magnetomechanics

Nuclear decays & new sensors

Dan Kodroff

LBL · Fri

QULPS: sterile neutrinos via recoils

Samuele Sangiorgio *

LLNL · Wed

Levitated tritiated nanoparticles

Lucas Darroch *

Yale · Wed

Trapping solid noble gases

Andrew Buchanan *

Queen's · Wed

Dark photons via two-photon transitions

* contributed talks (15 + 5)

The three days at a glance

Wednesday 23

- 9:00** Welcome · Kyle & Art
- 9:15** This talk
- 9:30** Zhen Liu — overview
- 10:45** Sudhir · Davis
- 13:00** Deshpande · Buchanan · Sangiorgio · Darroch
- 14:40** Working session: free discussion + coffee, until 16:00
- evening** On your own — see next slide

Thursday 24

- 9:00** Dave Moore — overview
- 10:15** Geraci · Laeuger · Rossi
- 13:30** Penny · Juan
- 15:05** Wilson
- 15:45** Breakouts / free discussion
- evening** Workshop dinner — details Thu morning

Friday 25

- 9:00** Kodroff · Harris
- 10:35** Dan Carney — working groups
- 10:50** Breakout groups
- 11:50** Report back
- 12:30** Closing · Kyle
- 12:45** Out of the room, off to lunch

The only schedule you can trust: indico.global/event/18677/timetable

Every PDF, Google doc and Word file you have seen (including this slide) is archaeology.

House rules

1

We built in slack.

Finish your thought — nobody gets cut off mid-sentence. Session chairs will keep the day in shape; please don't make them work for it.

2

Slides go on Indico.

Upload your presentation to your contribution page before your talk.

3

Interrupt.

Slot lengths (60 / 40 / 20 min) already include discussion time. This is a workshop, not a conference: questions during talks are welcome.

I HAVE A QUESTION.

WELL, LESS OF A QUESTION
AND MORE OF A COMMENT.

I GUESS IT'S LESS OF A COMMENT
AND MORE OF AN UTTERANCE

REALLY IT'S LESS AN UTTERANCE,
MORE AN AIR PRESSURE WAVE.

IT'S LESS AN AIR PRESSURE WAVE
AND MORE A FRIENDLY HAND WAVE.

I GUESS IT'S LESS A FRIENDLY
WAVE THAN IT IS A FRIENDLY BUG.

I FOUND THIS BUG AND NOW WE'RE
FRIENDS. DO YOU WANT TO MEET IT?



Evenings

Wednesday · self-organized

Talks end 14:40, then a working session with coffee and free discussion until 16:00.

After that, no program — on purpose. Explore Queen's campus and the lakefront, walk into downtown Kingston, and have dinner in small groups.

Our local team knows where the good food is. Pull on them, they've agreed to be pulled on.

Suggested: form groups of 4–8 during the 4 pm coffee to find tables at restaurants.

Thursday · workshop dinner

All together, in town. Where and when: announced Thursday morning. A venue is currently being negotiated with — bring patience and an appetite.



Questions I will confidently answer wrong

- What's the Wi-Fi password?
- Where is the coffee, and is it bottomless?
- Is lunch here or somewhere else?
- Does the projector take USB-C, HDMI, or faith?
- When do I check out on Friday?
- Is there a vegan / gluten-free option tonight?
- How do I get to the train station / airport?
- Where is the nearest bathroom?



Ask the McDonald Institute team

Kyle · Mark · Edward · Zach

Check-in desk just outside the room.

I arrived by train last night and know exactly one street. Kyle knows all of them.

Friday: we plant some seeds



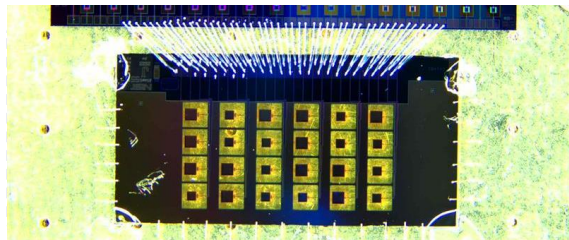
Start thinking now

- Which measurement would you build with the person sitting next to you?
- Which physics target is under-served by the sensors in this room?
- What does this community need that no single lab can provide?

The format is deliberately open.

Workshops like this one have a habit of producing new experiments and collaborations. No pressure — but the coffee breaks are where it starts.

Meanwhile, in Colorado



Quantum Engineering @ Mines

One of the first quantum-engineering graduate programs in the US, now with an undergraduate track. Physics $\times$ EE $\times$ CS, hands-on and cryogenic.

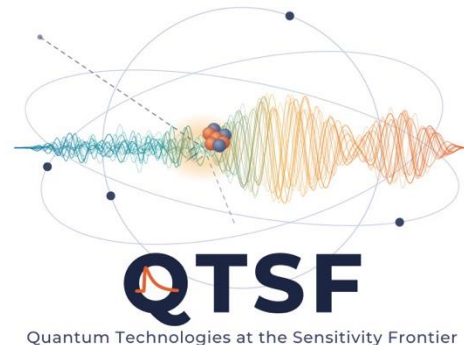
quantum.mines.edu



CURIE — the underground lab

Colorado Underground Research Institute, in the Edgar Mine. First cryolab ready for two dilution refrigerators; a second cavern being excavated. Low-background home for quantum devices and rare-event searches.

curie.mines.edu



My Research

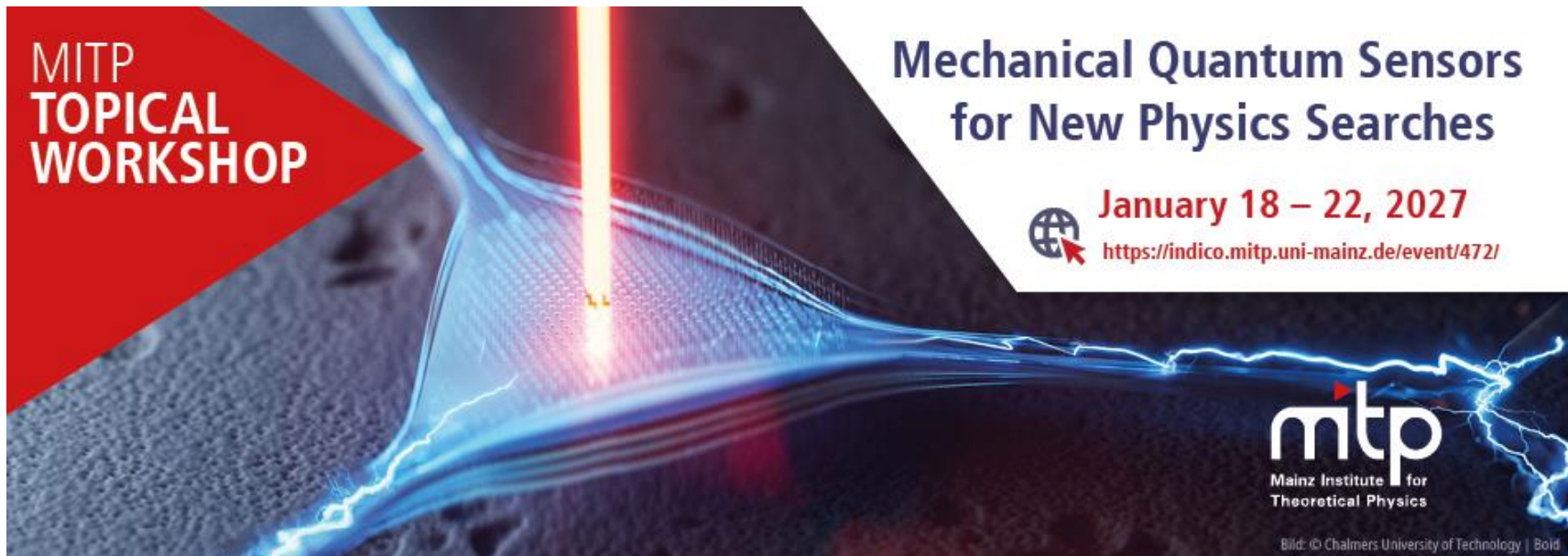
Ricochet (reactor CEvNS), Project 8 (neutrino mass), BeEST (superconducting-sensor decay spectroscopy). Cryogenic sensors, μ MUX readout, underground backgrounds.

qtsf.mines.edu



We are hiring — soon. A postdoc and a tenure-track faculty position at the boundary of subatomic physics and novel sensing. Not posted yet, so the application process is: come talk to me at a coffee break. Same for Ricochet, Project 8, BeEST or CURIE.

Next stop: Mainz, January 2027



**MITP
TOPICAL
WORKSHOP**

**Mechanical Quantum Sensors
for New Physics Searches**

January 18 – 22, 2027
 <https://indico.mitp.uni-mainz.de/event/472/>

mitp
Mainz Institute for
Theoretical Physics

Bild: © Chalmers University of Technology | Bold

Organized by **Hannah Banks (NYU)**, **Louis Hamaide (JGU Mainz)**, **Dmitry Budker (JGU Mainz)**,
Joachim Kopp (JGU Mainz) — *Louis couldn't be here this week; you can be there in his.*

indico.mitp.uni-mainz.de/event/472

MQS2027@uni-mainz.de



Have a great workshop.

Up next: Zhen Liu — Overview of broad scope and theory

indico.global/event/18677/timetable