



2023 Workshop on Optically Pumped Magnetometers (WOPM 2023)

[Last updated August 25, 2023]

All talks are in the GTRI conference center. Coffee, food, and posters will be served adjacent to the conference room.

Streaming link: <https://gtri.webex.com/gtri/j.php?MTID=m3d71ead11098d2b66e50ee878fb9f071>
password: WOPM2023stream

Day 1 – August 28th

8:00 Check-in and breakfast

8:50 WOPM 2023 opening
Peter Schwindt, (*Sandia National Labs*)

Session 1: **Basic Optically Pumped Magnetometer Physics and Novel Designs 1**

9:00-9:30 Vector atomic gradiometer with laser-defined baseline
Michael Romalis, (*Princeton University*)

9:30-9:50 High-resolution magnetic field imaging at finite fields with a scalable Cs vapor cell
Dominic Hunter (*University of Strathclyde*)

9:50-10:10 Atomic Vector Magnetometry Using Electromagnetically Induced Transparency
Ying-Ju Wang, (*National Institute of Standards and Technology*)

10:10-10:30Coffee Break

Session 2: **Basic Optically Pumped Magnetometer Physics and Novel Designs 2**

10:30-11:00 Large-scale dual-chamber RF atomic magnetometer
Karen Sauer, (*George Mason University*)

11:00-11:20 Dual-axis Alkali-metal-noble-gas Comagnetometer with Pulsed Optical
Jingyao Wang (*Princeton University*)

11:20-11:40 Quantum enhanced magnetometry at optimal number density
Charikleia Troullinou, (*ICFO and Fraunhofer CAP*)

11:40-12:00 Accurate magnetic field extraction from FID signals
Dawson Hewatt, (*University of Colorado*)



12:00-1:20Lunch

Session 3: **Overviews**

1:20-1:50 Challenges for OPM in fundamental high-precision experiments
Georg Bison, (*Paul Scherrer Institut*)

1:50-2:10 Sensitive magnetometer applications at Los Alamos
Igor Savukov (*Los Alamos National Laboratory*)

2:10-2:30 Diamond magnetometers: sensitivity frontier
Victor Acosta, (*University of New Mexico*)

2:30-2:50Coffee Break

Session 4: **Rydberg sensors**

2:50-3:20 Rydberg atom sensors
Christopher Holloway, (*National Institute of Standards and Technology*)

3:20-3:40 Rydberg electrometry with multi-pass cells
Michael Romalis (*Princeton University*)

3:40-4:00 Detecting UHF-band electric fields with Rydberg atoms and electromagnetically-
induced transparency
Michael Viray (*Georgia Tech Research Institute*)

Poster Session

4:00-6:00Poster session

Day 2

8:00 Check-in and breakfast

Session 5: **Applications 1**

9:00-9:20 A vectorized Rb magnetometer for CubeSat missions
Michaela Ellmeier, (*University of Colorado Boulder*)

9:20-9:40 Decoding neural dynamics of face perception with optically pumped magnetometer
magnetoencephalography
Wei Xu (*Peking University*)

9:40-10:10 Multi-parameter quantum sensing and magnetic communications with a hybrid
dc/rf optically-pumped magnetometer
Aleksandra Sierant, (*ICFO - Instituto de Ciencias Fotonicas*)

10:10-10:30Coffee Break



Session 6: Novel Optically Pumped Magnetometer Designs

- 10:30-11:00 Rabi vector magnetometry
Christopher Kiehl, (*University of Colorado Boulder*)
- 11:00-11:30 Two-Photon Atomic Magnetometry for Ultra-Low Frequency Electromagnetic Induction Imaging
Benjamin Maddox (*University College London*)
- 11:30-11:50 Light shift effects in a Herriott-cavity-assisted scalar magnetometer using a single elliptically polarized beams
Ziping Xie, (*University of Science and Technology of China*)
- 11:50-1:00Lunch

Session 7: Applications - Biological

- 1:00-1:20 Dedicated OPM Design for Magnetomyography
Simon Nordenström, (*Physikalisch-Technische Bundesanstalt*)
- 1:20-1:40 Bedside magnetocardiography with scalar OPM arrays
Ethan Pratt (*SandboxAQ*)
- 1:40-2:00 One, two or three: What is the optimum number of magnetic field components to measure in MEG?
Lari Koponen, (*University of Birmingham, Centre for Human Brain Health*)
- 2:00-2:20 Next Generation Acquisition and Control for OPM-MEG
Holly Schofield, (*University of Nottingham*)
- 2:20-2:40Coffee Break
- 2:40-3:00 Unshielded magnetoencephalography in an office environment
Thomas Kornack, (*Twinleaf*)

Session 8: Enabling Technologies and Techniques

- 3:00-3:20 Localization of OPM sensors with large electromagnetic coils
Mikael Grön, (*Aalto University*)
- 3:20-3:40 Digital frequency estimation in self-oscillating OPM for high-precision portable DC magnetometry
Aurélien Chopinaud (*University of Strathclyde*)

Adjourn