



Physics Opportunities with the Gamma Factory

MITP Workshop
November 30-December 4, 2020

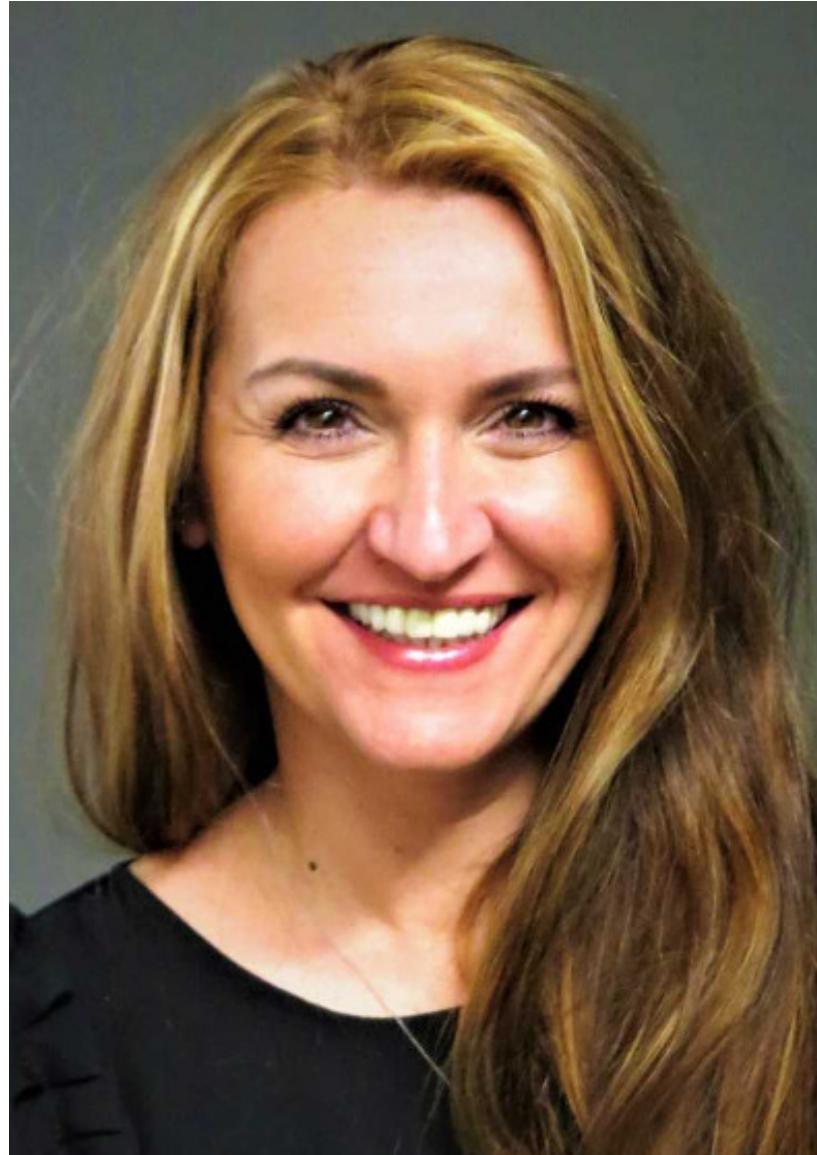


Prof. Dr. Adriana Palfy



Please send your file(s)
to zeh@uni-mainz.de
before the first session (14:00)
on the day
your talk is scheduled

Olga (Olly) Zeeh-Sourli, MITP



<https://indico.mitp.uni-mainz.de/event/214/>



Discussion time

- Planned every day
- At day end (except Tu)
- 1-2 slides to **fire it up!**



WE WANT YOUR
Ideas
Criticism
Dreams
(even wild)

Mainz Physics Colloquium

Tuesday, 01st of December 2020, 4:15 pm

[Zoom Remote Seminar](#)

Zoom Meeting ID: 940 3969 9984

Password: 833720



Prof. Dr. Eli Zeldov

*Department of Condensed Matter Physics, Weizmann Institute of Science,
Israel*

"Nanoscale thermal imaging: Glimpse into dissipation in quantum systems down to atomic scale"

Energy dissipation is a fundamental process governing the dynamics of classical and quantum systems. Despite its vital importance, direct imaging and microscopy of dissipation in quantum systems is currently mostly inaccessible because the existing thermal imaging methods lack the necessary sensitivity and are unsuitable for low temperature operation. We developed a scanning nanoSQUID that resides at the apex of a sharp pipette acting simultaneously as nanomagnetometer with single spin sensitivity and as nanothermometer providing cryogenic thermal imaging with four orders of magnitude improved thermal sensitivity of below 1 μK [1]. The non-contact non-invasive thermometry enables direct visualization and control of the minute heat generated by electrons scattering off a single atomic defect in graphene [2]. By further combining the scanning nanothermometry with simultaneous scanning gate microscopy we demonstrate independent imaging of work and dissipation and reveal the microscopic mechanisms that conceal the true topological protection in the quantum Hall state in graphene [3].

[1] D. Halbertal, J. Cuppens, M. Ben Shalom, L. Embon, N. Shadmi, Y. Anahory, H. R. Naren, J. Sarkar, A. Uri, Y. Ronen, Y. Myasoedov, L. S. Levitov, E. Joselevich, A. K. Geim, and E. Zeldov, *Nature* **539**, 407 (2016).

[2] D. Halbertal, M. Ben Shalom, A. Uri, K. Bagani, A.Y. Meltzer, I. Marcus, Y. Myasoedov, J. Birkbeck, L.S. Levitov, A.K. Geim, and E. Zeldov, *Science* **358**, 1303 (2017).

[3] A. Marguerite, J. Birkbeck, A. Aharon-Steinberg, D. Halbertal, K. Bagani, I. Marcus, Y. Myasoedov, A.K. Geim, D.J. Perello, and E. Zeldov, *Nature* **575**, 628 (2019).

Workshop “Excursion”

- Tuesday, 16:15
- [Zoom Remote Seminar](#)

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Special Joint QUANTUM talk

- **Andrey Surzhykov:**
Atomic Physics
@ the GF at CERN
- Thursday, 14:15



<https://indico.mitp.uni-mainz.de/event/214/>



Submission deadline: April 1st, 2021

Scope:

- Accelerator developments
- Atomic and fundamental physics
- Search for Dark Matter
- Nuclear and particle physics
- Rare isotopes and isomers
- Nuclear-physics applications
- Studies with primary, secondary and tertiary beams
- Gamma Factory in a global landscape

About the journal:

Annalen der Physik (IF 3.317) is one of the world's renowned physics journals with an over 225 years' tradition of excellence. It comprises all areas of physics, from fundamental research to forefront applications including interdisciplinary fields.

Research articles (ca. 6-8 pages): new results of general interest.

Reviews (ca. 15-25 pages): a snapshot of recent progress and particularly relevant aspects with possibly open or controversially discussed questions.

Online submission at
www.editorialmanager.com/adp-journal

Contact Editor: Nadezda Panarina

Guest Editors

Dmitry Budker
Mikhail Gorshteyn
Witold Krasny
Adriana Palfy
Andrey Surzhikov

- AdP (since 1799); IF = 3.3
- Not “proceedings”
- Research Articles or Reviews
- Interest: by December 15th
- Submit m/s by April 1, 2021

- Submission category:
'Gamma Factory'