Ella Orion Lachman, Ph.D.

ellal@berkeley.edu
http://ellachman.github.io/

Postdoctoral researcher at UC Berkeley, an experimental physicist (condensed matter, materials) and a creative puzzle solver with enthusiasm for tinkering.

Education

2012 – 2017 **Ph.D., Weizmann Institute of Science, Israel** in Condensed Matter Physics.
Thesis title: *Study of magnetically doped topological insulators using a scanning SQUID-On-Tip microscope*
Advisor: Prof. Eli Zeldov

2009 – 2012 **M.Sc. Physics, Weizmann Institute of Science, Israel**
Thesis title: *Study of Vortex Dynamics in Type-II Superconductors by SOT microscopy*.
Advisor: Prof. Eli Zeldov

2006 – 2009 **B.Sc. Physics and Chemistry (Exact-Sciences program), Hebrew University of Jerusalem, Israel.**
magna cum lauda

Experience

Physics research

since 2017 **Postdoctoral researcher.** Quantum Materials Laboratory, UC Berkeley.

2017 **Postdoctoral researcher.** Zeldov group, Weizmann Institute of Science.

2008 – 2009 **Student Position.** Hebrew University of Jerusalem
Advisor: Prof. Uri Banin
Research topic: *Microscopy and Spectroscopy of fluorescent single nano particles.*

Science communication

since 2016 **Editor** LittleBig Science:
Editing and commenting on team members' writing, suggesting writing topics and keeping track of team members' posts.
https://lbscience.org/about/
https://www.facebook.com/MadaGB

2016 – 2017 **Contributing writer.** Davidson Institute's website:
http://davidson.weizmann.ac.il (student position).

2011 – 2012 **Visitors' guide.** Clore Garden of Science, Weizmann Institute of Science (student position).

Skills

Languages — Strong reading, writing and speaking competencies for English, Hebrew (native).

Experimental — Cryogenics, Scanning probe microscopy, micropipette handling and SQUID-On-Tip fabrication, evaporation and sputtering, design and automation of experiments (LabView), data analysis (MatLab, Python), Arduino programing and interfacing with chip evaluation boards, crystal growths.

3D part design — table-top scale (SPM system), high precision mm sized parts for CNC fabrication, micron-sized sample masks for e-beam and optical lithography.
Using Autodesk Inventor, Layout Editor and Eagle Cad.

Skills (continued)

Outreach and teaching

- Guiding groups of all ages (K-12 to seniors) and education levels (non-scientific to physics undergraduates) through physics exhibits at the Clore garden of science.
  Public speaking in both Hebrew and English about the wonders of superconductivity and topological phases.
  Writing about scientific subjects to the general public (mainly Hebrew).

Selected Research Publications

Journal Articles

1. **Lachman**, **E.**, Mogi, M., Sarkar, J., Uri, A., Bagani, K., Anahory, Y., … Zeldov, E. (2017, December). Observation of superparamagnetism in coexistence with quantum anomalous Hall $C = \pm 1$ and $C = 0$ Chern states. *npj Quantum Materials*, *2*(1), 70. doi:10.1038/s41535-017-0072-1
2. Embon, L., Anahory, Y., Jelić, Ž., **Lachman**, **E.**, Myasoedov, Y., Huber, M. E., … Zeldov, E. (2017, July). Imaging of super-fast dynamics and flow instabilities of superconducting vortices. *Nature Communications*, *8*(1), 85. doi:10.1038/s41467-017-00089-3. arXiv: 1706.00628
3. Uri, A., Meltzer, A. Y., Anahory, Y., Embon, L., **Lachman**, **E.**, Halbertal, D., … Zeldov, E. (2016, November). Electrically Tunable Multiterminal SQUID-on-Tip. *Nano Letters*, *16*(11), 6910–6915. doi:10.1021/acs.nanolett.6b02841. arXiv: 1606.05088
4. **Lachman**, **E.**, Young, A. F., Richardella, A., Cuppens, J., Naren, H. R., Anahory, Y., … Zeldov, E. (2015, November). Visualization of superparamagnetic dynamics in magnetic topological insulators. *Science Advances*, *1*(10), e1500740–e1500740. doi:10.1126/sciadv.1500740
5. Finkler, A., Vasyukov, D., Segev, Y., Ne'eman, L., **Lachman**, **E.**, Rappaport, M. L., … Huber, M. E. (2012, July). Scanning superconducting quantum interference device on a tip for magnetic imaging of nanoscale phenomena. *The Review of scientific instruments*, *83*(7), 073702. doi:10.1063/1.4731656
6. Yoskovitz, E., Menagen, G., Sitt, A., **Lachman**, **E.**, & Banin, U. (2010, August). Nanoscale Near-Field Imaging of Excitons in Single Heterostructured Nanorods. *Nano Letters*, *10*(8), 3068–3072. doi:10.1021/nl101614s

Seminars and Talks

Invited Talks

Dec 2015 — **The Israel Physical Society Conference 2015, (BIU, Israel)**, Visualization of superparamagnetic dynamics in magnetic topological insulators.

Seminars

Mar 23rd 2016 — **GLAM Special Seminar, (Stanford, USA)**, SQUID-On-Tip microscopy of magnetically doped topological insulators.

Oct 19th 2017 — **ABC…z seminar, (UC Santa Barbara, USA)**, Magnetism in magnetically doped topological insulators revealed by SQUID-On-Tip microscopy.

Contributed talks

Mar 2016 — **American Physical Society March meeting (Baltimore, USA)**, Visualization of superparamagnetic dynamics in magnetic topological insulators.

Mar 2018 — **American Physical Society March meeting (Los Angeles, USA)**, Observation of Superparamagnetism in Coexistence with Quantum Anomalous Hall $C = \pm 1$ and $C = 0$ Chern States.

Awards and distinctions

2018-9 Awardee of the Weizmann Institute of Science - National Postdoctoral Award Program for Advancing Women in Science.

2009 Graduated *magna cum lauda*.

Extra Curricular

- Fellow physicist and editor at "Mada Gadol Baktana", the largest independent science outreach group in Israel. `http://lbscience.org/`
- Co-organizer, Weizmann Condensed Matter student journal club (2014).
- In charge of the Zeldov Group website and blog
- A member of the Israeli Physics Society (since 2012).
- A member of the American Physics Society (since 2015).
- Member of the Weizmann Institute's theater ensemble (2015-2017)