

# Liam T. Schmidt

Department of Physics, Northeastern University, Boston, MA 02115

[schmidt.lia@northeastern.edu](mailto:schmidt.lia@northeastern.edu) · [ORCID: 0000-0001-7927-4300](https://orcid.org/0000-0001-7927-4300) · [G Scholar](#)

## EDUCATION

---

### Ph.D., Condensed Matter Physics

2023 – Expected 2027

Northeastern University · Advisor: Prof. Alberto De La Torre

Thesis: *Emergent Excitations in Unconventional Magnets Probed by X-ray Spectroscopies*

### B.S., Mathematical Physics and Mathematics

2019 – 2023

Binghamton University · *Summa Cum Laude* · GPA: 3.84 · Phi Beta Kappa · Pi Mu Epsilon

## RESEARCH EXPERIENCE

---

### Graduate Research Assistant, De La Torre Lab, Northeastern University

2023 – Present

- Revealed strain- and symmetry-controlled anomalous Hall effect in altermagnetic  $\alpha$ -MnTe thin films; resolved chirality-split magnons, providing direct evidence for strain-tunable magnon chirality via RIXS, XMCD, EXAFS, and spin-wave theory.
- Established the foundations for magnetic excitations in altermagnetic CrSb and MnTe
- Elucidated magnetic excitations in van der Waals magnets  $\text{CuCrP}_2\text{S}_6$  and  $\text{AgCrP}_2\text{S}_6$  through RIXS, XMCD, EXAFS, and DFT-informed multiplet simulations (EDRIXS, Quanty).
- Designed and commissioned rotational-anisotropy SHG and transient absorption systems for symmetry-resolved and ultrafast optical pre-screening between synchrotron campaigns.
- Led collaborative investigations with Harvard (J. Mundy group) on chiral excitations in  $\text{Tb}_2\text{Ti}_2\text{O}_7/\text{TbInO}_3$ , magnetocaloric  $\text{AlFe}_2\text{B}_2$ , pyrochlore  $\text{Gd}_2\text{Mo}_2\text{O}_7$ , and  $\text{Y}_2\text{V}_2\text{O}_7$  at NSLS-II.
- Performed Higgs spectroscopy in  $\text{LiTi}_2\text{O}_4$ , THz-driven magnetic ordering in  $\text{K}_2\text{IrCl}_6$ , tr-RIXS on Kitaev spin liquid  $\text{H}_3\text{LiIr}_2\text{O}_6$ , and tr-THz absorption at FERMI FEL.
- Trained ML models on  $>10^4$  EDRIXS simulations to extract crystal-field parameters from XAS spectra, accelerating spectral analysis by orders of magnitude.

### Undergraduate Research Assistant, Binghamton University

2021 – 2023

- Implemented phase-retrieval algorithms for phase-contrast imaging of gas filamentation; executed DFT calculations in VASP and Quantum ESPRESSO.

## SELECTED PUBLICATIONS

---

[1] J. Kim, . . . , **L.T. Schmidt**, *et al.* *Opt. Mater. Express* **15**(7), 1395 (2025). [**Invited**]

[2] S. Bey, . . . , **L.T. Schmidt**, *et al.* “Conductivity scaling of the anomalous Hall effect in the altermagnetic semiconductor  $\alpha$ -MnTe.” arXiv (2026).

+ 6 manuscripts in preparation.

## TECHNICAL SKILLS

---

**Synchrotron:** RIXS, XMCD, XAS (TEY/FY), EXAFS, XRD, RIXS-MCD, Epics, Bluesky, Globus

**Optical:** RA-SHG (built), transient absorption (built), THz pump-probe, THz THG, tr-THz absorption

**Computation:** Python (NumPy, SciPy, PyTorch, scikit-learn), MATLAB (SpinW), Julia; EDRIXS, Quanty, VASP, Crispy, Demeter

**Lab:** Cryostats (300 mK–300 K), UHV, superconducting magnets (0–15 T), sub-100 nm polishing, in-situ strain/cleave

## TEACHING, MENTORING & SERVICE

---

TA for E&M II, Electronics Lab, Statistical Thermodynamics, Life Sciences Physics, Engineering Physics (2023–25). Mentored 6 undergraduates to co-authored publications at ASEE 2026. Biweekly research mentoring in spectroscopy techniques (2024). Organizing Committee, IEEE ATC-ATG Magnetism Conference (2025). Physics Nights assistant organizer (2023–present).