

Resources, Activities, and Support from ALPhA for Advanced Laboratory Education

Xin Du, PhD

Assistant Professor, Widener University

ALPHA Board of Directors



Looking for resources
and support for advanced
physics lab teaching?

Join ALPhA!
Scan to learn more



www.advlab.org

Let ALPhA Help You!

- **Goals**

- Fostering communication and collaboration among instructors
- Supporting and enhancing advanced experimental physics education

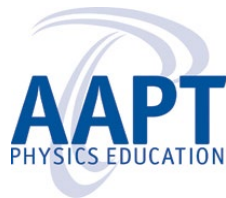
- **Organizational structure**

- 4 officers + 8 board members
- 19 regions - a region for each continents (6 Regions), a region in Canada, and regions in US based on the APS sections (10 Regions).
- 300 members worldwide
- Starting from 2007

- **Partners**



**Jonathan F. Reichert
Foundation**



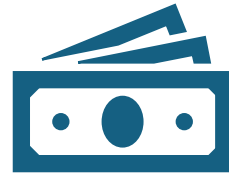
**JOIN OUR ROBUST, BROAD-
BASED AND PASSIONATE
COMMUNITY!**

Challenges in Advanced Laboratory Education



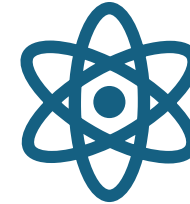
Faculty Time and Expertise Constraints

- Need support and communications across institutions



Tight Funding and Space

- Often requires smaller student group sizes and more equipment
- High Cost of Modernization



Uncertainty about the value of the lab course

- Goals of Physics Lab courses?
- How to address the student preparedness gaps?

What we do?

ALPhA achieves its mission by:

- **Immersion: faculty share expertise**
Hosting multi-day training sessions for faculty members
- **Generating funding and resources: overcoming the funding limitation**
Curricular Resources on Compadre and at AAPT, Equipment Giveaways, Single Photon Detector Initiative etc.
- **Conferences: discuss the learning objectives of advanced lab education**
Providing conferences and workshops on advanced experimental instruction

And more...

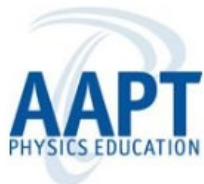
Laboratory Immersions

Goal:

Learn a new advanced laboratory experiment well enough to teach it - with confidence!

Format:

- 2-3 days of intensive hands-on work with a single advanced lab experiment.
- Less than 10 participants per immersion.
- Max 2 attendees per experiment setup
- Various locations across US



Examples of Immersion Modules in 2026

University of South Dakota, Vermillion, SD

Inexpensive Solder-Free Radiation Detection Systems with CsI + SiPM Detectors

Dates: **July 29, 2026** to **July 31, 2026**

Number of setups available: 10

Maximum number of participants: 10

Austin Peay State University, Clarksville, TN

Surface Plasmon Resonance Sensing

June 11, 2026 to **June 13, 2026**

Number of setups available: 3

Maximum number of participants: 6

Immersions 2026



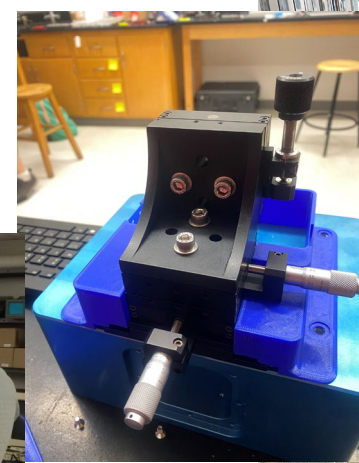
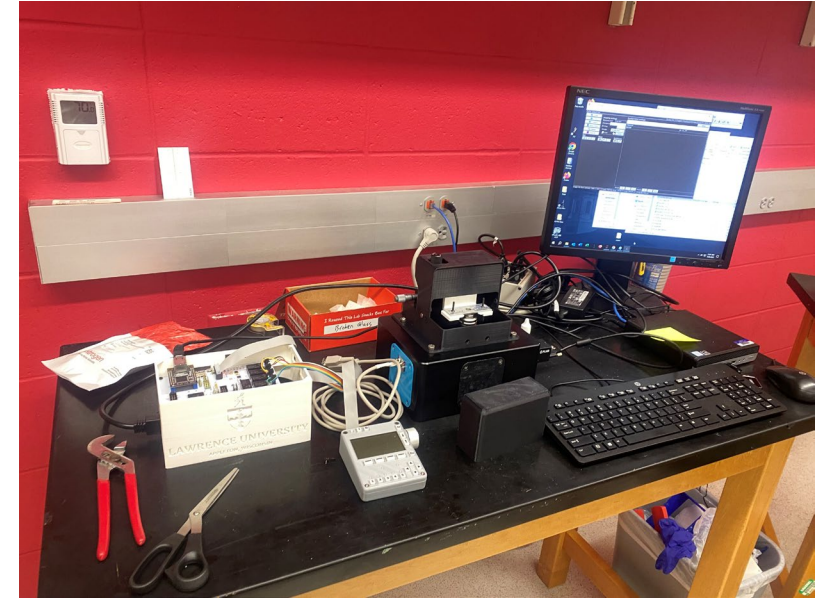
Laboratory Immersions

Advantages:

- Equipment grants are available to Immersion participants. Reichert Foundation may support up to 50% of the cost of the laboratory equipment.
- Detailed and Feasible Teaching Materials. Ready to implement the laboratory modules in your teaching
- Ongoing collaboration beyond the workshop. Long-term support networks with hosts and past/future participants

**Attend or Host an Immersion to
Share your Expertise!!**

*Photos of the Microscopy Immersion
at Lawrence University in 2025*



Laboratory Immersions – Summer 2026

Registration is Opening!

University of South Dakota (SD), July 27-29 and 29-31, 2026

Mentor: Jing Liu

- [Geant4 Simulation of Radiation Detection](#) (July 27- morning of July 29)
 - [Inexpensive Solder-Free Radiation Detection System](#) (afternoon of July 29 - July 31)
- (These two Immersions are designed to be taken back-to-back, if desired.)*

Austin Peay State University (TN), June 11-13, 2026

Mentors: Eugene Donev and Randy Peterson

- [Surface Plasmon Resonance Sensing](#)

Reed College (OR), July 13-14, 2026

Mentor: John Essick

- [Python in the Laboratory](#)

Caltech (CA), TBD, 2026

Mentor: Eric Black

- [TBD](#)

Loyola University of Maryland (MD), August 17-19, 2026

Mentors: Mary Lowe and David Hoe

- [Teaching Introductory Quantum Computing](#)

Ithaca College (NY), June 15-17, 2026

Mentors: Jerome Fung and Matthew Sullivan

- [1D Thermal Diffusion: Integrating Experiment, Theory, and Computational Modeling](#)

Immersion 2026



Winona State University (MN), July 9-11, 2026

Mentors: Adam Beardsley and Libby Berkhout

- [Galactic Dark Matter Evidence Measured with a Low-cost Radio Telescope](#)

Amherst College (MA), June 22-23, 2026

Mentor: Ashley Carter

- [Biophysics and Soft Matter Experiments - Atomic Force Microscope \(AFM\), RI Brownian Motion](#)

Colgate University (NY), July 28-30, 2026

Mentor: Enrique 'Kiko' Galvez

- [Quantum Optics Experiments with Single Photons](#)

Thorlabs (NJ), August 11-13, 2026

Mentors: Brandon Mitchell and Eric Kurywczak

- [Quantum Optics Educational Kit](#) **FULL! Register without paying to be on the waitlist!**

Virtual Immersion, August 11-13, 2026

Mentor: Jed Brody

- [Quantum Computing with IBM Quantum](#)

TeachSpin (Buffalo, NY), June 22-24 or 24-26, 2026

Mentors: Jonathan Reichert, David Lee, and David Van Baak

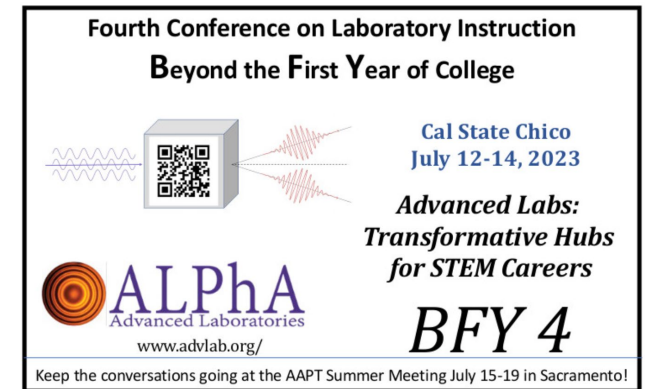
- [Quantum Control](#)
- [Condensed Matter Physics](#) (full week! June 22-26, 2026)
- [Faraday Rotation with lock-in detection and pulsed-current methods](#)
- [AntiMatter Matters](#)
- [Liquid Crystal Physics](#)

Conferences

Beyond First Year (BFY) Lab Conferences

- 3-day National Meeting
- 4-year cycle
- hands-on small-group workshops
- plenary talks
- panel discussions
- poster sessions
- networking events
- lab instructors walk away with hands-on experience

**Beyond First Year
Lab Conference 5
is coming in
summer 2027!!**



Conferences



Regional Meetings

- Offered in-person or virtually
- One-day events
- Held in non-BFY years
- Local gatherings to share and discuss advanced lab experiments, curriculum, and teaching practices
- **Suggestions for topics and themes are welcome**

ALPhA Sessions at AAPT National Meetings

Past Regional Meetings

[June 16, 2025 - ALPhA Coordinated Regional Meeting](#) on Zoom, June 16, 2025

[2025 New York Regional Meeting](#) at Siena University, June 16, 2025 in coordination

[2022 New York Regional Meeting](#) at SUNY New Paltz, June 17, 2022.

[2022 New England Regional Meeting](#) at Bridgewater State University, June 3, 2022.

[2021 vBFY](#) July 29, 2021 -- All Regional Meetings during the pandemic have been truncated. We anticipate Regional Meetings to resume after the pandemic.

[2020 New York Regional Meeting](#) June 12, 2020 -- Now a VIRTUAL meeting.

[2019 New England Regional Meeting](#) at Holy Cross, June 13, 2019.

[2017 New England Regional Meeting](#) at Amherst College, June 14, 2017.

Fundings and Resources



- **Jonathan F. Reichert Foundation- ALPhA Immersions Support**
- **Equipment Giveaways** - ALPhA works with companies and others to donate used physics laboratory equipment to members within the ALPhA community.

Current Giveaways:

- Check out the annual Minus K Technology Vibration Isolator Educational Giveaway to U.S. Colleges and Universities:
<https://www.minusk.com/content/edgiveaway.html>
- **Single Photon Detector Initiative**
- **Jonathan F. Reichert and Barbara Wolff-Reichert Award** for Excellence in Advanced Laboratory Instruction
- **SPS-AAPT-ALPhA Undergraduate Award** for Outstanding Laboratory Development

ALPHA Officers and Board of Directors



President
(2026-2028)

Sara Callori

CSU San Bernardino



Vice-President
(2026-2028)

Rachael Merritt

University of Colorado
Boulder



Secretary
(2026-2030)

Jerome Fung

Ithaca College



Treasurer
(2024-2028)

Daniel Borrero

Willamette
University

The Board of Directors:

L. Dana, Stanford University

Xin Du, Widener University

Jennifer Heath, Reed College

John Mann, Pepperdine University

Aaron McGowan, Rochester Institute of Technology

Chris Nakamura, Saginaw Valley State University

Kosta Popovic, Rose-Hulman Institute of Technology

Timothy Roach, College of the Holy Cross

webmaster@advlab.org

Summary

- Advanced labs are important and need a collaborative workforce
- ALPhA is the group that can help!
- ALPhA provides a robust, broad-based, and passionate community. Join today!
- BFY 5 conference is coming in summer 2027!
- Immersion summer 2026 sessions are opening now!
- Questions? webmaster@advlab.org

CSAAPT, AAPT-SEPS, NJAAPT
Spring 2026 Joint Meeting



Join ALPhA!
Scan to learn more
www.advlab.org



Abstract

Enhancing Advanced Laboratory Education: Resources, Activities, and Support from ALPhA

This talk introduces the Advanced Laboratory Physics Association (ALPhA), a group dedicated to supporting the advanced laboratory instruction. It is intended for physics faculty who are seeking for both technical and financial support to enhance their advanced laboratory courses. The presentation will provide an overview of ALPhA's mission, along with updated information on its recent and upcoming activities, including workshops, collaborative opportunities, and available funding programs. By highlighting these resources, the talk aims to connect physics faculty to strengthen advanced laboratory teaching and curriculum development.