

# Thorlabs Mobile Photonics

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**Bill Warger, PhD**

**Director of Photonics Education**

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**THORLABS**

Serving the  
Intellectually Curious



# Thorlabs and Photonics Learning

## THORLABS

- ◆ Photonics company whose mission is to transform the world by identifying, enabling, and accelerating key photonics technologies.
- ◆ Headquarters in Newton, New Jersey with >2,800 employees across 22 locations around the world designing and manufacturing equipment to serve the photonics industry.



- ◆ Thorlabs Photonics Learning
  - ◆ Group solely focused on educational outreach.
  - ◆ Our vision is to accelerate the development of the photonics community through immersive educational platforms that cultivate **awareness, access,** and **advancement** to empower a diverse workforce qualified to research, design, manufacture, and innovate the technologies of the future.
    - Awareness of the photonics field and how it touches our lives everyday.
    - Access to the equipment and people working in the industry.
    - Advancement to join programs, build skills, and become part of the photonics community.



The science and technology that creates, uses, and measures light (photons).

# Thorlabs Mobile Photonics Lab



- ◆ Self-sustained lab outfitted with over 3000 lbs of photonics equipment including two 3'x6' optical tables.
- ◆ Free onboard photonics Experiences to introduce the field, access the equipment, and improve lab skills.
- ◆ External tent with information about careers, academic programs at the location, and continued employee access.





# Inside the Thorlabs Mobile Photonics Lab



## ◆ Capacity

- ◆ Interior capacity up to 15 individuals at one time
- ◆ Generally guide groups of 4 at each station

## ◆ Power Requirements

- ◆ 100% self-sufficient with a battery and solar system to ensure lab remains quiet

## ◆ Laser Safety

- ◆ Assessable laser beams below 2 mW
- ◆ Laser safety equipment provided when Experiences require class 3 lasers

# Intro to Photonics Experience

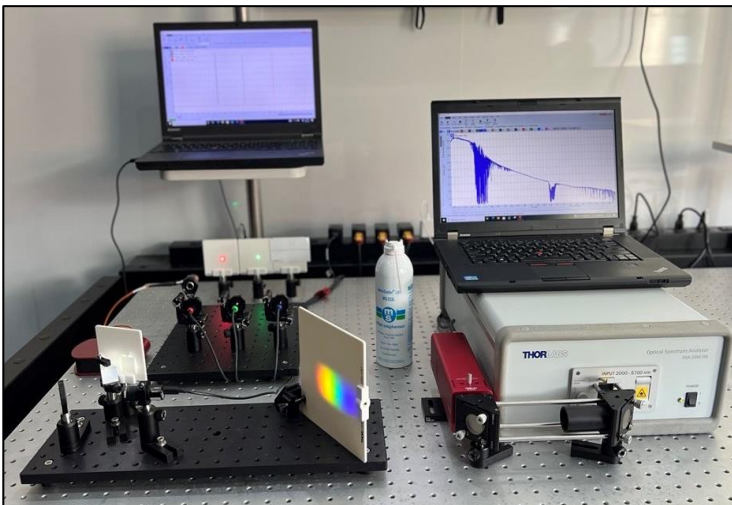
## Biomedical Optics & Imaging



- ◆ Biomedical Optics and Imaging
- ◆ Image inside fingers and nails with live OCT system

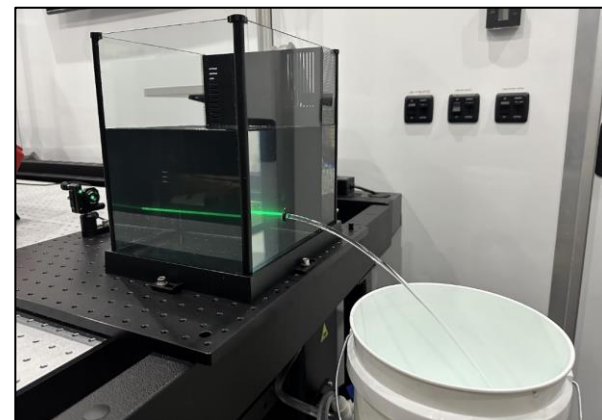
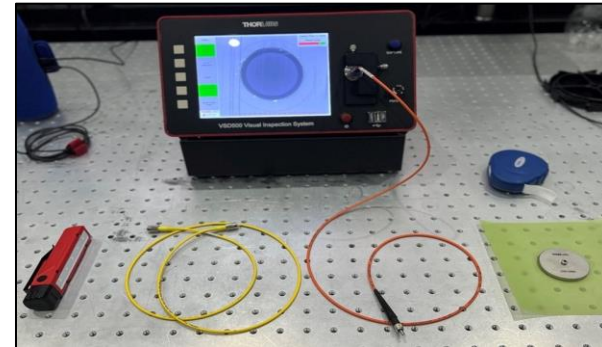
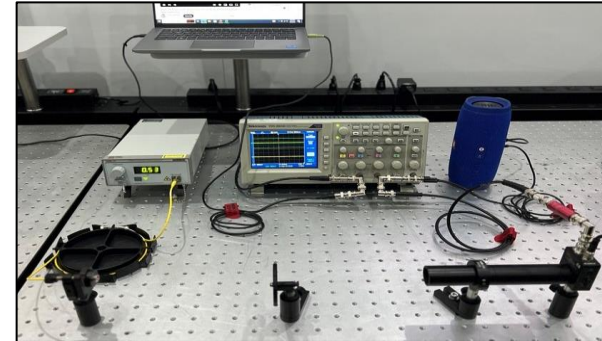
- ◆ Spectroscopy
- ◆ Correlate color with wavelength
- ◆ Visualize H<sub>2</sub>O and CO<sub>2</sub> absorption lines in room air

## Spectroscopy



- ◆ Optical Communications
- ◆ Transmit music with a laser beam
- ◆ Demonstrate how light can be guided by water and relate to optical fiber

## Optical Communications





# Additional Experiences

## ◆ Quantum Optics (EDU kit)

- ◆ Generate and detect single photons
- ◆ Measure coincidences to compare classical and quantum sources

## ◆ OCT Imaging

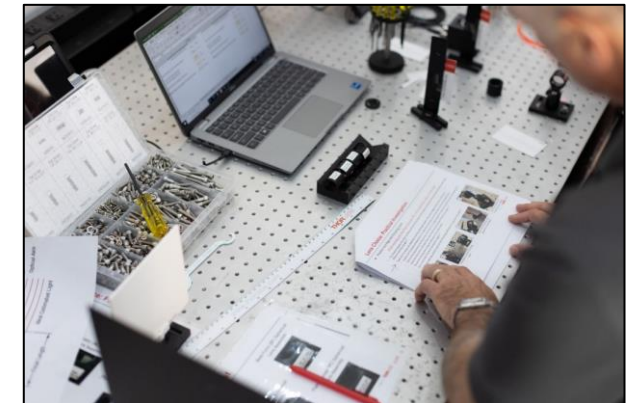
- ◆ Time domain interferometer
- ◆ Frequency domain interferometer
- ◆ Live system to demonstrate artifacts/imaging tradeoffs

## ◆ Lab Basics

- ◆ How lens direction/shape affect spherical aberration in collimated beams
- ◆ Collimating LED sources
- ◆ Coupling light into single mode fiber

## ◆ Fiber Processing

- ◆ Lensing fiber: ball lens, GRIN fiber, lensed tip
- ◆ Cleaving specialty fiber and tapering



# Mobile Photonics Lab Experience Events

## **New Jersey: 8 Visits**

Sussex Community College  
Stevens Institute of Technology  
Sussex County Day  
Rowan College of South Jersey  
Rowan University  
Rutgers University  
High Point High School  
Newton High School

## **Rochester: 2 Visits**

Monroe Community College  
Brighton High School

## **Boston Area: 4 Visits**

Cambridge Science Festival  
Stonehill College  
Pinkerton Academy  
Northeastern University

## **North Carolina: 1 Visit**

University of North Carolina at Charlotte

## **South Carolina: 4 Visits**

Clemson University  
Daniel High School  
University of South Carolina  
Lexington Two Innovation Center

Sept 2023 – May 2024



*10,000+ Miles Traveled*

*5,700+ Students Impacted*

*30+ Visits*

## **Arizona: 1 Visit**

Optical Sciences Winter School

## **California: 6 Visits**

University of California Merced  
Buhach Colony High School  
UCSB  
Pasadena City College  
Optical Society Meeting  
Samueli Academy

## **SPIE Photonics West**

## **New Mexico: 2 Visits**

Miyamura High School  
Central NM Community College

## **Colorado: 2 Visits**

Colorado School of Mines  
Front Range Community College

# Collaborative Community Events

- ◆ Collaborating with multiple groups to better visualize the community and real career path
- ◆ Front Range Community College (CO)
  - ◆ Local high schools invited to see photonics technology and career possibilities in mobile lab and tour college labs and speak to program representatives.
- ◆ QuantumFest (Albuquerque Photonics Cluster)
  - ◆ Community Event brought us together with local community colleges, universities, Sandia National Lab, Air Force, and SparQCS (K-12 quantum outreach).
- ◆ Cambridge Science Festival (MA)
  - ◆ Parked outside Cambridge Public Library and presented with Boston University Optica/SPIE student chapter.
- ◆ Class trips to Thorlabs offices
  - ◆ Local high schools invited to see photonics technology in the mobile lab and tour the manufacturing facility.





# Quotes & Observations

"This trailer is dope not gonna lie."

"That's so cool!"

"I know the job opportunities are for the students, but I took a look myself."

"That's the guy from the OCT demo!"

"Do I need a graduate degree?"

"Dad, that's the dog you have on your shirts."

"Made me genuinely excited to graduate and hopefully do things like this after graduation."

"Loved the light in the water that was pretty LIT LOL"

"EEEWWWW!" right before they put their finger back under the OCT head.

"Are you hiring?"

"Neil deGrasse Tyson said that photons act differently if we observe them, can you explain what that means?"

Professors and CEOs brought their kids

"Best trailer I've seen in awhile."

"I saw this on YouTube and they said it was fake, but it's not fake!!!"

"It was eye opening to see real world applications of what we just had on our midterm."

"I wish I could do this but I have class." Many find a way to come back later.

"How did you get started at Thorlabs?"

Kids begged parents for shirts that do not fit.

# International Mobile Photonics

United States



- ◆ Mobile Photonics Lab
  - ◆ 1 round trip around US
  - ◆ 32 universities, colleges, high schools, and community events.

Germany



- ◆ Mobile Photonics Bike
  - ◆ 77 km tour around Munich
  - ◆ 3 universities and 1 company

China



- ◆ Mobile Photonics Tent
  - ◆ 1 university event in Shanghai



# Contacts



[mobilelab@thorlabs.com](mailto:mobilelab@thorlabs.com)



[www.thorlabs.com/mobilelab](http://www.thorlabs.com/mobilelab)



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