



**NewFoS**  
NEW FRONTIERS OF SOUND  
SCIENCE AND TECHNOLOGY CENTER



# STAKEHOLDER MEETING 2026



**UCLA**



# Welcome!

## Welcome to the 2026 New Frontiers of Sound Science & Technology Center (NewFoS) Stakeholder Meeting!

We are thrilled to have you join us for this important gathering. The Stakeholder Meeting represents a special opportunity to celebrate collaboration, innovation, and the remarkable progress we continue to achieve together. Your participation plays a vital role in strengthening partnerships and advancing the mission of NewFoS.

Over the day, you will have the chance to connect with fellow stakeholders, students, staff, and researchers through presentations, discussions, and collaborative activities designed to spark new ideas and shape the future of our initiatives. Your insights and expertise are essential as we work together to address global challenges through science, technology, and innovation.

Your contribution is an invaluable part of this collaborative effort, and we look forward to learning from your experiences and perspectives throughout the meeting.

Together, we can continue building a legacy of transformative solutions and impactful advancements in topological acoustics (TA).

Thank you for your ongoing support of NewFoS. Welcome to our home—we look forward to an inspiring and productive 2026 Stakeholder Meeting!



A handwritten signature in black ink, appearing to read "P. Deymier".

PIERRE DEYMIER  
Director of NewFoS

# Overview

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**The New Frontiers of Sound STC is pioneering next-generation technologies through cutting-edge research, education, and impactful knowledge transfer to industry and society.**



**Research is spearheaded by Center PI and Director Dr. Pierre Deymier**, who leads pioneering investigations into the physics and engineering of sound with transformative potential for sensing, communication, and information processing.

- **Education and Broadening** Participation efforts at **NewFoS** are led by **Co-Principal Investigator Dr. Sara Chavarria**, who ensures that NewFoS cultivates a globally competitive next-generation workforce through innovative education, mentorship, and outreach programs.

- **Knowledge Transfer**, under the leadership of **Dr. Keith Runge**, bridges research and real-world application, translating scientific discoveries into technologies and practices that benefit industry and society at large.





The Grand Challenges Research Building is a state-of-the-art facility designed to address society's most urgent challenges in fields such as engineering, medicine, planetary science, and optics. It proudly serves as the home of New Frontiers of Sound (NewFoS), a transformative center poised to reshape the future.

### **New Frontiers of Sound (NewFoS)**

Founded in 2023 with a \$30 million grant from the National Science Foundation, NewFoS is at the forefront of innovation, bridging research in topological acoustics to revolutionize technology, enhance daily life, and foster sustainability. The center unites leading experts from partner institutions, including the California Institute of Technology, the City University of New York, the University of Vermont, Spelman College, the University of Alaska Fairbanks, the University of California, Los Angeles, the University of Colorado Boulder, and Wayne State University.

### **Research and Applications**

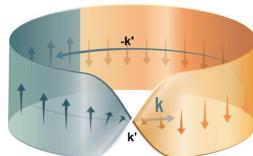
For 150 years, sound science has given rise to indispensable technologies such as loudspeakers, microphones, radio frequency (RF) devices in smartphones, sonar, and medical ultrasound imaging. Today, the emerging field of topological acoustics (TA) is revolutionizing sound science and advancing new frontiers. TA reveals that sound waves can now support quantum-like degrees of freedom—such as **geometric phase** or spin—that were previously "hidden."

NewFoS is dedicated to advancing this groundbreaking field, with applications ranging from next-generation telecommunications and medical devices to environmental sustainability. By harnessing the power of topological acoustics, NewFoS is driving technological innovation and creating a more sustainable, resilient future.



### NewFoS mission statement takes the form of value propositions:

- NewFoS integrates teams of researchers, educators and stakeholders to accelerate the scientific, technological and educational promises of TA and its applications in information science, telecom and sensing.
- NewFoS provides the 10-year perspective to fully realize the discoveries, technological innovations and societal impact of TA.
- NewFoS educates and trains the workforce with scale necessary to grow a new economy based on TA science and technologies.



### Legacies—technological and societal impacts.

NewFoS has the breadth, depth, and integration for intellectual, infrastructure, technology, human, economic, and academic legacies. NewFoS' intellectual legacy will be an established, executable common scientific and technical language critical for productive transdisciplinary advances in the TA field and societal applications.

# MEET THE CENTER LEADERSHIP TEAM



## ANDREA ALÙ, CUNY

Dr. Andrea Alù, Distinguished Professor and founding director of the Photonics Initiative at CUNY, is renowned for bridging physics and electrical engineering. As an Einstein Professor and co-PI of NewFoS, his groundbreaking work in photonic metamaterials has earned him the prestigious IEEE Photonics Society William Streifer Scientific Achievement Award, celebrating his transformative contributions and visionary leadership in advancing photonics.



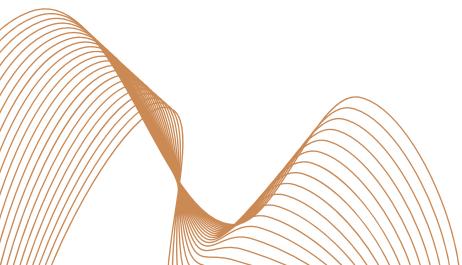
## CHIARA DARAIO, CALTECH

Dr. Chiara Daraio, G. Bradford Jones Professor of Mechanical Engineering and Applied Physics at Caltech and co-PI of NewFoS, develops advanced materials for medical devices, robotics, and aerospace. Her innovations in acoustic imaging and thermal sensing bridge mechanics, materials science, and nanofabrication. Committed to STEM diversity, Chiara mentors future innovators and has led initiatives supporting women in science.



## MASSIMO RUZZENE, CU BOULDER

Dr. Massimo Ruzzene, Slade Professor in Engineering, Vice Chancellor for Research and Innovation, and co-PI of NewFoS, leads research on smart materials and vibration reduction for applications in transportation and structural systems. His work on "metastructures" explores new ways to mitigate vibrations and direct waves for improved performance in noise isolation and stress wave mitigation.



# Driving innovation, collaboration, and vision at the forefront of topological acoustics



## **KEITH RUNGE, UA**

Dr. Keith Runge is the Knowledge Transfer (KT) Director at NewFoS. With a Ph.D. in Physics from the University of Florida and over 20 years of industry experience, he founded and operated BWD Associates, LLC. Now, he leads efforts to achieve NewFoS's three key KT objectives: integrating research and education among members, translating breakthroughs into technologies with industry, and informing society and policymakers to address critical needs.

## **SARA CHAVARRIA, UA**

Dr. Sara Chavarria is one of the co-Principal Investigators of NewFoS. She directs NewFoS's education and broadening participation (E&BP) initiatives, drawing on extensive NSF-funded program experience to promote equitable STEM access. The NewFoS E&BP program integrates research with education and outreach through four activities, including a convergence education program and a mentoring ecosystem.

## **LYNN FRAZIER, UA**

Lynn Frazier is the Center Manager at NewFoS. In this role, she serves as the administrative lead. Lynn is a Certified Research Administrator with over 35 years of experience in a variety of administrative positions including providing pre-award support as a Grants and Contracts Manager for the University of Arizona Cancer Center and the College of Agriculture, Life & Environmental Sciences.

# STAKEHOLDERS

**Meet expert leaders in the field,  
entrepreneurs, innovation stakeholders,  
and key members of the tech  
community.**

BRIAN ADAIR, UNIVERSITY OF ARIZONA

CARLA LINEBARGER, BWD

CASEY CARRILLO, UACI

CHING-YU (JOHNNY) YANG, JSEDM

DALILA PEREZ, PIMA GOV

DARREN LONG, ELEVATE SOUTH WEST

DERICK MAGGARD, TLA

DOUG HOCKSTAD, TLA

DREW ALLEN, FSU

FRANK LEDERMAN

JACK RUD, BC AUTOMATION

JENNY HOFFMAN, HARVARD

KEITH NAGARA, 3DS

LIDYA KENNEDY, SATEC

MANNY TERAN, IR LABS

MIKE MORGAN, MIKE-LLC

MIKE GARRET, L3HARRIS

SCOTT ZENTACK, TLA

SONIA VOHNOUT, OPPSSPOT, LLC

SRINI RAGHAVAN, PROSYSMEG

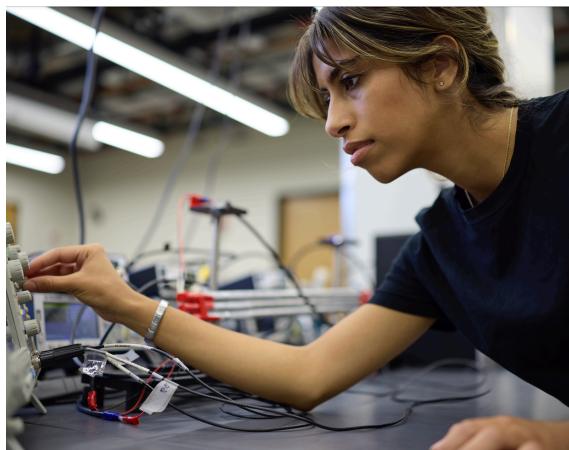
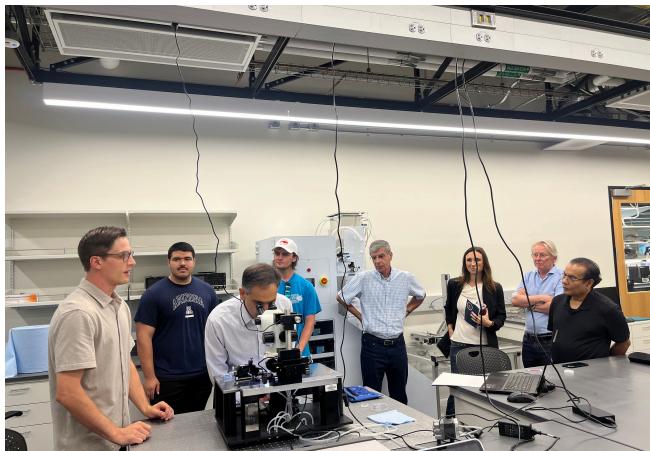
SUE OLIVER, PIMA COMMUNITY COLLEGE

TAEHWA LEE, TOYOTA

THOMAS SCHWIETERS, BC AUTOMATION

TSUNG-HSUN (TONY) YANG, JSEDM

WEN-LING (Winnie) CHANG, JSEDM



# AGENDA

## NewFoS Stakeholder Meeting 2026

Date: Monday, January 12, 2026

Time: 8:00 AM – 6:00 PM MST

Location: Grand Challenges Research Building (GCRB), 1st Floor

### CHECK-IN & LIGHT BREAKFAST

8:00–9:00 AM

Start the day with a light breakfast.

### WELCOME & INTRODUCTIONS

9:00–9:15 AM

**Speakers:** Keith Runge (Knowledge Transfer Director) & Araceli Hernández-Granados (Knowledge Transfer Research Scientist)  
Opening remarks and brief participant introductions.

### OVERVIEW OF NEWFOS

9:15–9:30 AM

**Speaker:** Pierre Deymier (Director)  
Introduction to NewFoS' mission as an NSF \$30M Science & Technology Center and its current research initiatives.

## MORNING SESSION: STUDENT LIGHTNING TALKS

### STUDENT LIGHTNING TALKS: ROUND 1

9:30–10:00 AM

Six 5-minute presentations highlighting student research (full agenda page # 14-15).

### COFFEE BREAK & NETWORKING

10:00–10:15 AM

### STUDENT LIGHTNING TALKS: ROUND 2

10:15–10:45 AM

Six 5-minute presentations highlighting student research (full agenda page # 14-15).

### GEOMETRIC PHASE SOFTWARE DEVELOPMENT

10:45–11:15 AM

**Speakers:** Zhuocheng (Leo) Huang & I-Ting (Andy) Ho, UA  
Explore the development and application of software tools for Geometric Phase research. This session will include demonstrations of computational methods, visualization techniques, and user-friendly platforms that support experimental design and data analysis.

### GROUP PHOTO

11:15–11:30 AM

**Lead:** Araceli Hernández-Granados

### NEWFOS FACILITIES TOUR (6TH FLOOR, GCRB) 11:30–12:00 PM

**Host:** Pierre Deymier (for external members)

Concurrent summary and reflections on morning talks.

### LUNCH & POSTER SESSION

12:00–1:00 PM

**Leads:** Araceli Hernández-Granados & Keith Runge

Explore student posters highlighting NewFoS research while enjoying lunch, (full details of the poster presentations page # 12-13).

# AGENDA

## NewFoS Stakeholder Meeting 2026

Date: Monday, January 12, 2026

Time: 8:00 AM – 5:00 PM MST

Location: Grand Challenges Research Building (GCRB), 1st Floor

### AFTERNOON SESSION: COLLABORATION & KNOWLEDGE TRANSFER

#### STUDENT LIGHTNING TALKS: ROUND 3

1:00–1:30 PM

Five 5-minute presentations highlighting student research (full agenda page #14-15).

#### KNOWLEDGE TRANSFER PROCESS

1:30–2:00 PM

**Speakers:** Keith Runge & Araceli Hernández-Granados

Explore how NewFoS research is shared, applied, and transitioned to real-world impact, including data management, interdisciplinary collaboration, and technology translation.

#### NEWFOS INDUSTRY SPOTLIGHT – DASSAULT SYSTÈMES

2:00–2:15 PM

**Speaker:** Keith Nagara, Strategic Academia Partnerships & Centers of Excellence Director from Dassault Systèmes.

#### INDUSTRY & ACADEMIA ROUNDTABLE: COLLABORATING FOR IMPACT

2:15–3:00 PM

**Speakers:** Brian Adair (University of Arizona), Manny Teran (IR Labs), Thomas Schwieters (BC Automation) & Sonia Vohnout (OppsSpot) | **Moderator:** Elizabeth Whitney (University of Alaska, Fairbanks).

This panel brings together leaders from industry and academia to examine effective models of collaboration. The discussion focuses on aligning academic research with industry needs, identifying essential workforce skills, advancing pathways to commercialization, and supporting innovation in STEM.

#### COFFEE BREAK & NETWORKING

3:00–3:30 PM

#### ENTREPRENEURSHIP & BRIGHT IDEAS: FROM CONCEPT TO COMMUNITY IMPACT

3:30–4:00 PM

**Speakers:** Casey Carrillo (UACI) & Dalila Perez (PIMA GOV) | **Moderator:** Keith Runge.

Panelists share insights on transforming ideas into viable ventures, building startup ecosystems, and leveraging workforce development and data-informed strategies to support founders.

#### CLOSING REMARKS

4:00–4:30 PM

**Speakers:** Pierre Deymier & Keith Runge

Summary of key takeaways, appreciation for participants, and next steps.

#### CELEBRATION OF THE WEEK OF SOUND

4:30–5:00 PM

#### DINNER & NETWORKING

5:00–6:00 PM



Online option

# Poster Presentations

## 01 Wataru Takeda, UA

Reconfigurable Non-Volatile Acoustic Devices Using Phase Change Materials.

## 02 Xiaoxiao (Alice) Xiong, Caltech

Nonlinear Dynamics in 1D Polycatenated Ring Chains.

## 03 Young Hyun Noh, UA

Integrated Acoustic Stress Activates Cellular Response: Long-term Exposure Risk.

## 04 Howard Yawit, UA

Fabrication and Characterization of Reconfigurable Surface Acoustic Wave Radiofrequency Testbed Devices on Lithium Niobate.

## 05 Hujie (Henry) Yan, Caltech

Quasi-particle view for rheological behaviors of chainmail.

## 06 Anwar Gatto, UA

Low-Temperature Fabrication of Multilayer Chalcogenide Films.

## 07 Sean Chen, UCLA

Frequency-Controlled Energy Absorption in Parametric Mixing.

## 08 Ace Cook, UA

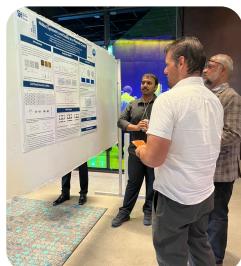
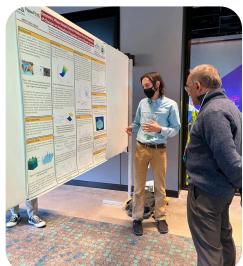
Engineered Topological Acoustic Quantum Analogue Computer.

## 09 Arturo Whipple, UA

Experimental Realization and Characterization of Edge Mode Localization in a Macroscale SSH Mechanical Analogue.

## 10 Maham Khalid, UA

Shared Leadership in Co-Creating Multidisciplinary Textbooks: Strategies for Fostering Innovation and Transformative Education.



# Poster Presentations

## 11 Maham Khalid, UA

Evaluating Student-centered Leadership Training in an Emerging Science Field.

## 12 Maham Khalid, UA

Examining the Factor Structure and Reliability of a Survey Instrument for Student-Centered, Asset-Based Mentoring Across All Populations.

## 13 I-Tzu Huang, UA

Forest type detection from ambient seismic noise.

## 14 Alexander Wendt, UA

An Electrically-Injected, Solid-State, Surface Acoustic Wave Phonon Laser.

## 15 Abhirup Basu, UA

Quasi-particle view for rheological behaviors of chainmail.

## 16 Bingxu Luo, UA

Advancing volcanic dynamics monitoring through geometric phase sensing using seismic waves at Kīlauea

## 17 Samarjith Biswas, UA

Exploring Topological Acoustics Using Phase-Change Metamaterials.

## 18 Kazi Tahsin Mahmood, Wayne State University

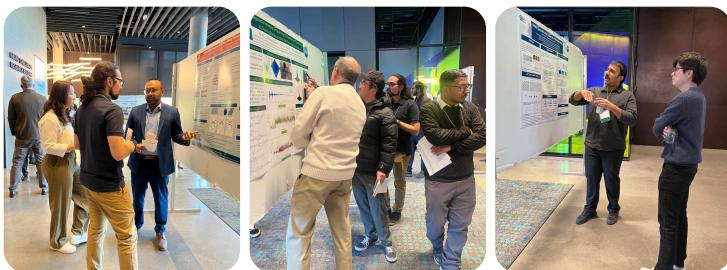
Quantum Realm in Classical Mechanics: A New Basis of Topological Computing.

## 19 Harry Mayrhofer, UA

Geometric Phase-based Inverse Problems for the Prediction of Changes in Permafrost Properties Due to Climate Change.

## 20 David Cavalluzzi, UA

Operations on a Mechanical System: Acoustic Analogues of Qubits.



# Student Lightning Talks

## 01 Howard Yawit, UA

Fabrication and Characterization of Reconfigurable Surface Acoustic Wave Radiofrequency Testbed Devices on Lithium Niobate.

## 03 Xiaoxiao (Alice) Xiong, Caltech

Nonlinear Dynamics in 1D Polycatenated Ring Chains.

## 02 Akinsanmi Ige, UA

Engineering topological acoustic analogue of quantum computer.

## 05 I-Ting (Andy) Ho, UA

Defect Detection and Quantification for Structural Materials via Acoustic Geometric Phase Sensing.

## 04 Elizabeth Whitney, University of Alaska Fairbanks

Seeing the forest for the trees: Using topological acoustics for sensing characteristics and patterns within interior Alaska's boreal forest.

## 07 Panagiotis Koutsogiannakis, CU Boulder

Wave manipulation via Gaussian Curvature.

## 06 Zhuocheng (Leo) Huang, UA

Time-Series to Geometric Phase: A Web-Based Platform.

## 08 Ilia Kuk, UA

Topological acoustic phase bits for Shor's algorithm.

## 09 Hujie (Henry) Yan, Caltech

Quasi-particle view for rheological behaviors of chainmail.

## 10 Kentaro Yumigeta, UA

Topological Terahertz Acoustic Laser in Graphene.



# Student Lightning Talks

## 11 Abhirup Basu, UA

Geometric phase in two coupled SSH chains.

## 12 Samarjith Biswas, UA

Topological Acoustics : From RF Devices to Quantum Computing.

## 13 Jacob Lewton, CU Boulder

Scattering Matrix Zeros and Poles In Open Resonators.

## 14 Ace Cook, UA

Engineered Topological Acoustic Quantum Analogue Computer.

## 15 Yan Jean Wei, UCLA

Design of a FBAR Balun and Integration with Microwave Circuitry.

## 16 Arturo Whipple, UA

Experimental Realization and Characterization of Edge Mode Localization in a Macroscale SSH Mechanical Analogue.

## 17 Farrukh Najmi, UA

Advanced Superlattice Architectures to manipulate surface acoustic waves (SAW) for next generation telecommunication devices.





## The giving menu

**Empower Innovation: Invest in the Future of Sound Science.**

Your support helps the New Frontiers of Sound (NewFoS) Science and Technology Center – funded by the National Science Foundation and based at the University of Arizona in Tucson – continue advancing groundbreaking research, expanding student opportunities, and driving the innovations in topological acoustics (TA) that will shape the future of sensing, telecommunications, and information science.

### DONOR LEVEL

### CONTRIBUTION

### IMPACT

Platinum	\$60,000	Supports a <b>Graduate Student Researcher</b> , advancing cutting-edge research.
Gold	\$8,500	Funds a <b>Research Experience &amp; Mentoring (REM) Undergraduate Student</b> .
Silver	\$8,000	Supports an <b>Undergraduate Student Researcher</b> gaining hands-on research experience.
Bronze	\$600	Funds a <b>Community College Workshop Undergraduate Student</b> , providing early STEM exposure.

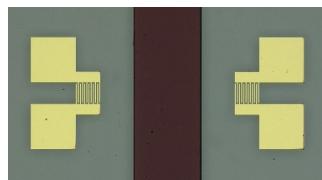
# NEWFOS BREAKTHROUGHS



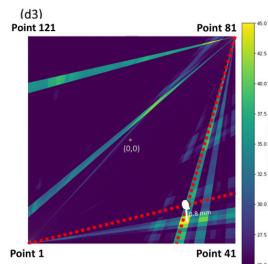
- ✓ World-first ambient operations tabletop 50 phi-bit quantum-inspired information processing platform.



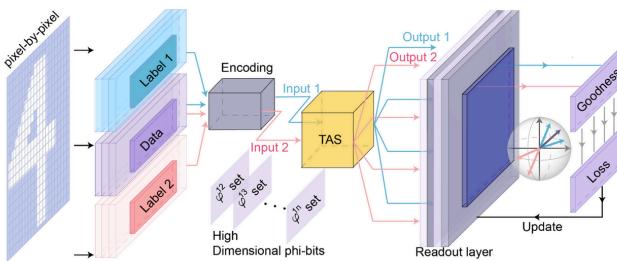
- ✓ First Topological Acoustic Surface-Acoustic-Wave Radio-Frequency Device to achieve high filtering performance without increasing footprint.



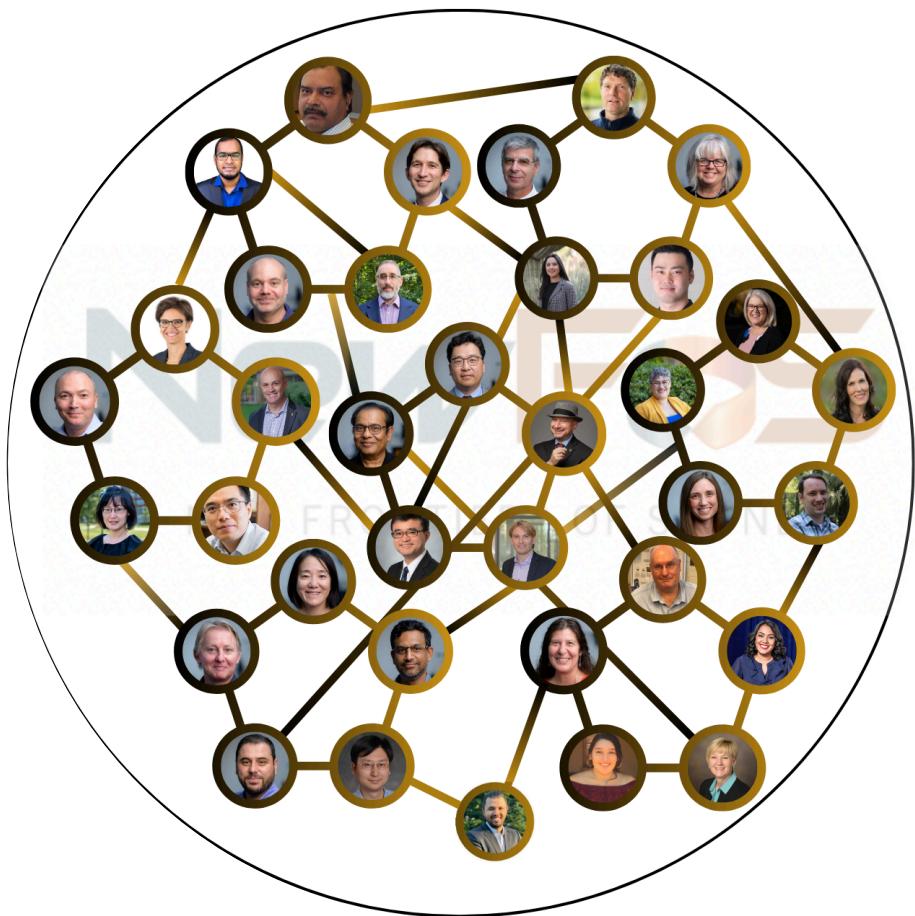
- ✓ Practical, predictive, high-sensitivity, multi-scale low-cost TA-based sensing modalities for non-destructive evaluation of engineered structures.



- ✓ Acoustic Neuromorphic computing/AI.



# my notes



<https://newfos.arizona.edu/>

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