Problem-driven projects

Project 1 – TA quantum analogies for QIS
(Leads: Pierre Deymier/UA and Arif Hasan/Wayne State University)

Project 2 – TA wave RF devices
(Leads: Andrea Alù/CUNY, Pierre Lucas/UA and Ethan Wang/UCLA)

Project 3 – TA sensing of the natural environment
(Leads: Susan Beck/UA and Massimo Ruzzene/CU Boulder)

Seed projects

Topological Biological Signals
(Leads: Minkyu Kim/UA and Xiaoyun Ding/CU Boulder)

Implementing Neuromorphic Protocol Using Phi-bits Data
(Leads: Xiaodong Yan/UA)

Image based optoacoustic tweezers for versatile manipulation and dynamic pattern of particles
(Leads: Xiaoyun Ding/CU Boulder, Yuebing Zheng/UT Austin and Andrea Alù/CUNY)

New Frontiers of Sound (NewFoS) Science and Technology Center is located at the University of Arizona.

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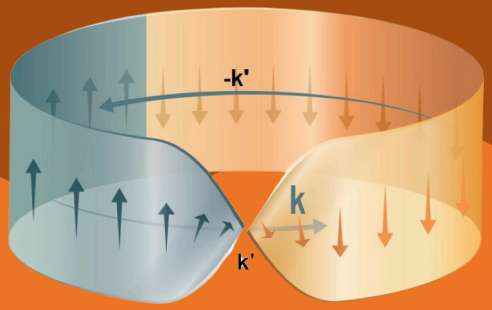

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NewFoS

NEW FRONTIERS OF SOUND
SCIENCE AND TECHNOLOGY CENTER

THE UNIVERSITY OF ARIZONA

NewFoS: Accelerating Innovation, Education, and Collaboration to Unlock the Full Potential of Topological Acoustics for Global Impact

The New Frontiers of Sound Science and Technology Center (STC) is funded by the National Science Foundation (NSF).

NewFoS is structured around three main components:

- **Research** is led by PI and Director Pierre Deymier, driving cutting-edge advancements in sound science and technology.

- **Education and Broadening Participation** are guided by Director Sara Chavarria.

- **Knowledge Transfer** is led by Director Keith Runge, focusing on the seamless exchange of scientific discoveries and innovations to industry and society.

MAKING WAVES!

Topological Acoustics (TA) Waves

Meet the Co-Principal Investigators

Andrea Alù, a Distinguished Professor and world-renowned expert in photonics and metamaterials, is the founding director of the Photonics Initiative at CUNY and an Einstein Professor of Physics and Electrical Engineering. He is also a co-PI of NewFoS. His research focuses on photonics and metamaterials.

Chiara Daraio, the G. Bradford Jones Professor of Mechanical Engineering and Applied Physics at Caltech, is a co-PI of NewFoS. She is a leading innovator in the development of advanced materials with applications in medical devices, robotics, and aerospace.

Massimo Ruzzene, Senior Vice Chancellor for Research and Innovation and Dean of the Institutes at the University of Colorado Boulder, is a Slade Professor in Engineering and a co-PI of NewFoS. His research focuses on smart materials and vibration reduction, with applications in transportation and structural systems.

Stakeholder Meeting January, 2025

Vision

NewFoS unites a multidisciplinary community that reveals the full realm of possibilities for **topological acoustics (TA)** and creates unprecedented acoustic technologies for US competitiveness and positive societal impacts.

Collaboration & accountability with **personalized** and innovative approaches

Commitment to **excellence** and integrity with flexibility, **agility** and entrepreneurial spirit

Partnership through honest, open and frequent **communication**

Education and mentoring, ensuring **global leadership**

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.

NewFoS is the only center where researchers work in the world of:

QUANTUM

MATERIALS

MICROFAB

ARCTIC WILDERNESS