Research Experiences for Students (RES) at University of North Texas

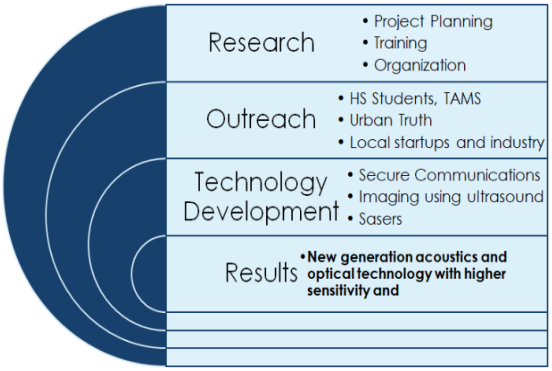
NewLAW: Nonreciprocal phononics and ultrasonic metamaterials

Well-qualified graduate, undergraduate and high school students are invited to apply for a summer research experience at the Department of Physics, University of North Texas sponsored by the National Science Foundation (NSF). The eight-week long program will be held from June 10, 2019 to August 2, 2019 for four graduate/undergraduate students, and a four-week long program for two high school students from July 8, 2019 to August 2, 2019. A stipend of $3,500 for the graduate students, $3000 for the undergraduate students, and up to $1000 for high school students. Additionally, room and board at UNT will be provided.

Fundamental and applied research to be undertaken as part of the RES program involves ultrasonic and optical wave propagation through acoustical metamaterials or and optical meta-surfaces. The REU program will engage students on research supported by the National Foundation of Sciences sponsored Emerging Frontier Research Initiative, one of the two emerging frontier multidisciplinary groups in Texas on promoting collaborative and cutting-edge research and educational activities. Some of the ongoing projects in UNT's EFRI program include- realization of acoustic diodes, SASERs – the acoustic analogue of LASERs, ultrasonic lens for deep tissue imaging, quantum and acoustic entanglement for signal processing, acoustic and optical metamaterials for control and propagation of electromagnetic and acoustic waves. The EFRI program utilizes additive manufacturing processes for the design and fabrication of ultrasonic metamaterial based devices.

The EFRI program fosters collaboration between the colleges of Engineering, Science, and Advanced Manufacturing and Materials Processing Institute at UNT, where experts from complementary disciplines work together to develop innovative scientific and engineering solutions to existing and emerging challenges in nano-photonics and meta-acoustics.

The RES program at UNT will engage high school and undergraduate students on research leading to the discovery of new knowledge, provide mentoring from a diverse research team, promote graduate study as a future professional goal, and provide instructive and appealing learning components. As part of the research experience, the participants will formulate a hypothesis, develop a research plan, carry out a research investigation, prepare progress reports using multiple technology-enriched approaches, present findings to a group of peers and research mentors through a variety of presentation modes, and reflect on achievements. In addition, specific periods will be set aside for structured learning and professional development activities designed to provide the participants with skills, tools, and training essential for success in research.



The RES program will provide industrial experience through visits to Tech Fort Worth and local industries in collaboration through NSF's academic liason with industry (GOALI program). UNT is a nationally ranked Tier I research University(e.g., Carnegie Classification). The university has nearly 40,000 students and embraces a Learn by Doing educational philosophy.

Students interested in applying to the program should indicate such interest by email by April 10, 2019 to Dr. Arup Neogi (arup@unt.edu) Professor of Physics or Dr. Ezekiel Walker (ezekiel.walker@echonovus.com). Dr. Neogi will send interested persons a formal application package directly. Applications will be reviewed starting April 15, and will continue until all ten research positions are filled. Graduate students who are interested in joining the EFRI research group will be encouraged. Program participants must be U.S. citizens, U.S. nationals, or permanent residents of the United States, per NSF requirements.