TRF Wants You! – to Propose and Lead a Topical Workshop

Submission Deadline: **8/1/24**

The Transducer Research Foundation* **solicits your ideas and leadership** for a topical workshop. The key goal of each Workshop is to engage stakeholders in forward-looking exchanges of ideas and strategies in different fields / applications of micro sensors, actuators, and microsystems, focusing on several Objectives:

⇒ Address current, pressing needs – societal, environmental, quality of life and health
⇒ Define critical gaps in the drive to impact and enable future priority applications
⇒ Brainstorm and explore new ideas for emerging fields and technologies, linking priorities and activities across disparate disciplines, articulating the impactful role of micro sensors, actuators, and microsystems
⇒ Broaden the extent and impact of knowledge transfer, inter-institutional networking, and technology infusion and commercialization for transducers and microsystems
⇒ Prepare a high-quality technical report/white paper that can serve as an authoritative document for government/industry leaders and policymakers

Workshop Parameters (all are open to revision):

- Dates: March – May 2026
- Duration: 2 – 3 days
- Size: 100 participants (± ~25%), international
- Location: organizers' choice, worldwide, readily accessible
- Target audience: industry leaders, policy makers, business development leaders, entrepreneurs, academics, program managers, students, researchers
- Format: single session, keynote + invited speakers, posters with "lightning" introductions,** breakout brainstorming sessions
- Logistics: meals and social time built into Workshop agenda and registration fee
- Partnering: TRF will assist as needed to refine your topic, suggest invited speakers, and actively participate in your workshop
- Assistance: TRF underwrites, provides organizational leadership, markets, publicizes, and handles logistics
- Outputs: Exchange of new ideas, networking, new colleagues, new ventures

Proposals invited now through **8/1/24 to workshop@transducer-research-foundation.org**.

All proposals must:

- Be 2 – 4 pages in length (12 pt., 2.5-cm margins)
- Describe your topic, emphasizing and explaining in detail how it responds to the Objectives, and the linkage to, and role of, sensors, actuators, microsystems

- Address the Workshop Parameters above
- Provide initial ideas for keynote/invited speakers and their likely topics
- Explain the communities this workshop will serve and why their members will be keen to participate
- Discuss the anticipated mix of academic, industry, and government attendees

Questions? email **workshop@transducer-research-foundation.org**

Possible topics include (but are not limited to) the **roles of, and impacts upon, transducers and microsystems relevant to**:

⇒ **Chips Act**: impact, ramifications, opportunities
⇒ **Climate change** – managing the consequences, tracking our environment
⇒ **Additive manufacturing**: new and emerging micro-scale applications
⇒ (3D) **hybrid and heterogeneous integration**
⇒ Preparing for the **next pandemic**
⇒ **Cutting-edge diagnostics** including CRISPR
⇒ **Bioelectronics/bioengineering**
⇒ **Artificial intelligence and machine learning** and their role in future smart microsystems
⇒ **Quantum sensing, communication, computing**
⇒ **5G, 6G, *n*G**: communication, networking
⇒ Transducers for a **smart metaverse**
⇒ **Vehicle autonomy** needs MEMS
⇒ Microsystems-enabled **last-mile and shared transportation** solutions
⇒ Microsystems and transducers for **agriculture, space** & other **extreme environments**
⇒ MEMS to the Rescue: **Human/machine interfaces** need even more sensors
⇒ **Microbots and nanobots**
⇒ Workforce **training and education**, including the impact of digitalization
⇒ **Security**: food & water safety, information/identity security, trusted electronics
⇒ **Green MEMS** / green transducers and the enablement of **Green Tech**
⇒ The path to **successful startups** in MEMS and microsystems
⇒ **Plasmonics** and **photonics**
⇒ **MEMS Inside:** publicizing the secret life of micro-transducers
⇒ **Useless MEMS**: artistic, inspiring, elegant, educational
⇒ **The Next Big Thing:** unimagined applications, orders of magnitude improvements

The TRF-sponsored workshop winners for 2024 and 2025 are: Drs. David Horsley and Matteo Rinaldi, Northeastern University, ***"Hybrid and Heterogeneous Microsystems"*** and Dr. Jacopo Iannacci, Fondazione Bruno Kessler (FBK), Italy, ***"MEMS/NEMS Sensors, Actuators and Transducers as Enablers of 6G and Future Networks."*** See page 3 for workshop descriptions and save the dates, additional information will be forthcoming. We encourage you to get in touch with the key organizers of these meetings.

*The Transducer Research Foundation (TRF) is a nonprofit organization whose mission is to stimulate research, development, and networking in the science and engineering of transducers, microsystems, and nanosystems, fostering the exchange of ideas and information between academic, industrial, and government researchers worldwide. More information available at: https://transducer-research-foundation.org/

**A lightning introduction is a brief (0.5 – 3 min) oral presentation to stimulate interest in the presenter's topic, enticing workshop participants to visit the poster and engage the author in discussion.

Hybrid and Heterogeneous Microsystems

Northeastern University Oakland Campus
Oakland, California

October 7-9, 2024

This workshop will bring together researchers, engineers, and industry experts to exchange ideas and strategies for future microsystems technologies based on hybrid and heterogeneous integration of CMOS, MEMS, 2D semiconductors, silicon photonics, spintronics, and non-silicon semiconductors (e.g. GaN, SiC, and others). Areas of interest include heterogeneous microsystems, materials and devices, and packaging and hybrid integration technologies (e.g. exfoliation of 2D materials, layer transfer, wafer bonding, and chip-to-wafer bonding). Attendees will be drawn from academia, industry, government agencies and laboratories, and the start-up and venture investment communities. A unique aspect of this workshop will be the inclusion of start-up founders and early-stage investors who will share their perspectives on the challenges and opportunities for microsystems technologies and the potential impact of the CHIPS Act on the field.

MEMS and NEMS as Enablers of 6G, Future Networks and Edge Intelligence

Fondazione Bruno Kessler – FBK
Trento, Italy

April 7-9, 2025

This workshop will bring together participants from academia, industry, government and funding agencies to inclusively and constructively gather visions, needs, and points of view on MEMS and NEMS as enablers of 6G, Future Networks and Edge Intelligence. The workshop seeks to trigger an unprecedented bottom-up thinking-and-development approach, from the most basic hardware components, such as sensors, actuators, and transducers, to high-level applications and services, capitalizing maximally on Microtechnologies and Nanotechnologies. This approach is envisaged as a key enabler of pervasive services and intelligence. A new generation of *software-resemblant*, autonomous, self-reacting, miniaturized, low-complexity, low-cost hardware components is now being fostered for the pivotal transition to 6G, Future Networks, and Edge Intelligence. Areas of interest include, Brain-Type Communications, Affective Computing, energy-autonomous devices, heterogeneous integration, and Computing In Memory.

Following the workshops, the organizers and key stakeholders will prepare a high-quality technical report/white paper that can serve as an authoritative document for government and industry leaders and policymakers to identify critical funding needs.