I2MTC Special Session: Multifunctional sensors and smart materials

This special session welcomes contributions that showcase materials, sensors, or sensing methods that offer sensing with some additional functionality. This additional functionality could include aesthetics, mechanical support, system stabilisation, actuation, energy storage or self-healing. Papers should draw particular focus to the design of new sensors or sensing methods, their characterisation, and/or their field deployment.

Demonstrating added value is essential in overcoming barriers to the industrial deployability of sensor technologies. *Multifunctional sensors* and *smart materials* offer this added value as they allow processes to be controlled, while they are simultaneously monitored.

Multifunctional materials are engineered to exhibit two or more properties or functions. These materials encompass composites, coatings, dispersions, multi-phase materials, and metamaterials. Conventional materials and phases of matter can also be made multifunctional by using an appropriate doping / sensor additive strategy, or novel methods of electronic and optical interrogation.

Examples of multifunctional sensing methods and materials that span medical and engineering fields across I2MTC2021 topics include:

- **Structural and Aerospace:** Self-sensing magnetorheological dampers, or smart composites in which glass (or carbon) fibres provide both a reinforcement and optical (electrical) monitoring pathway.
- **Medical:** Conformable electronic temporary tattoos, smart bandages and mechanically supportive printed hydrogels for human health monitoring.
- **Civil:** Self-sensing concrete repair materials, detectable grouts, tensoresitive sensor-enabled geogrids for soil stabilisation, online monitoring of electrodesalination.
- **Industrial processes:** Smart labels for packaging, online evaluation of laser ablative cleaning from scattered light.
- **Environmental:** Nanomaterials for simultaneous water purification and monitoring, and wearable sensor technologies.
- **Geological extraction and storage:** Smart drills, and smart drilling fluids.

Submit your papers to the special session here by 2nd November 2020