Optics and Photonics Days 2027 – Academic Program

1. **Materials and Processing**
   This session explores one of the key building blocks of modern optics: the materials we use and the techniques required to fabricate them. We invite submissions detailing the synthesis, characterization, and structuring of optical materials that enable new functionalities. Topics include metamaterials and metasurfaces, 2D materials graphene, TMDs), nonlinear optical materials, plasmonic materials, and nano- and micro-fabrication techniques. Hybrid integration methods to combine different materials are also included in this category.

2. **Sensing, Imaging, and Communication**
   This session focuses on the applications of light to measure, detect, and visualize the world around us, from macro-scale remote sensing to nanoscale and quantum microscopy. We invite submissions in topics including spectroscopy, hyperspectral imaging, photonic sensors for physical and biochemical monitoring, super-resolution microscopy, biomedical imaging, LiDAR, and remote sensing. Also, the latest advancements in photonics-enabled data processing, machine learning and artificial intelligence, and optical communications are included in this session as are the utilization of quantum states for enhanced sensitivity (quantum sensing) and metrology.

3. **Fundamental Photonics (classical and quantum)**
   This theme covers all aspects of theoretical and experimental research dealing with fundamental understanding of both classical and quantum properties of light. The topics include studies on spatiotemporal fields, coherence, ultrafast optics, topological photonics, and light-matter interaction including optomechanics. This session also covers photonics aspects where quantum phenomena play a significant role, such as quantum entanglement, single-photon sources, cavity QED, and quantum information processing protocols.

4. **Novel Photonic Devices and Integration**
   Novel active and passive photonic materials and devices are key elements in the development of components and circuits with enhanced performance or new functionalities. This topic covers, for example, light modulators, detectors and solar cells, photonic integrated circuits (PICs), silicon photonics, micro-resonators, laser sources, optical interconnects, and on-chip optical signal processing. This session also covers topics related to integration and packaging, including monolithic, heterogeneous and hybrid integration, integration of novel materials on PICs, system-on-chip PICs, and advanced photonic packaging solutions.