

Departament Aparatury i Technik Jądrowych DTJ

Lokalizacja: PNT (sala EWA)

Termin: 13.09.2024r.

Godz. : 11.30

Prelegent: dr Muhammad Danang Birowosuto

Afiliacja: Research Network Łukasiewicz – PORT Polish Center for Technology Development, Photonic Materials and Structures Group

Temat: " Beyond Perovskite Scintillators: Practical Applications, Purcell-Enhanced Properties, and Future Prospects "

Streszczenie:

Scintillating materials aim to detect ionizing radiations and are currently widely used in many detection systems addressing different fields, such as medical imaging, homeland security, high energy physics (HEP) calorimetry, industrial control, and oil drilling exploration. Quality criteria for these materials span over several parameters, three of which are of primary importance: the scintillation yield, the density, and the timing response. Solution-processable perovskite scintillators have been shown to be the solution for the replacements for the current expensive lanthanide scintillators as they share the same or even better properties for state-of-the-art imaging and detection applications. Among all perovskite materials, two-dimensional lead halide perovskites have shown remarkable environmental and thermal stability, a large Stokes' shift, usually coupled with very broad emission compared to their three-dimensional and quantum dot counterparts. I will show the progress for the research towards applications since the beginning of our activities with perovskite scintillators. Moreover, I will discuss our approaches to tackle problems in some perovskite materials through energy sharing concept and nanophotonic structures. The latter will bring faster and brighter scintillators through Purcell enhancements while I will demonstrate how we can reach this goal through photonic crystals and plasmonic structures.