

Photonic phenomena and luminescence in spherical microdroplet resonators

Supervisor: dr hab. inż. Daniel Jakubczyk, e-mail: jakub@ifpan.edu.pl

Co-supervisor: dr inż. Mariusz Woźniak, e-mail: mwozniak@ifpan.edu.pl

Research description

The goal of the research is to analyse the spectral properties of evaporating microdroplets of various suspensions containing dielectric (e.g. silica or titanium dioxide) or plasmonic (e.g. gold or silver nanoparticles) inclusions. We aim also to study the final aggregates built in this process. Additionally, we will utilize the luminescence of nanoparticles of gadolinium oxide doped with rare earth ions to probe the internal structure of evaporating microdroplets and to investigate the phenomenon of luminescence in a spherical resonator. The research aim is to study the aggregation phenomena in detail and to develop methods of tailoring optical properties of materials for potential applications.