

<b>Scientific supervisor</b>	
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Department	Photonics Division
Laboratory	Laboratory for Optical Research of New Materials
Group webpage	<a href="http://zf.if.uj.edu.pl">zf.if.uj.edu.pl</a>
<b>Proposed research topic</b>	
<i>Photonic applications of color centers in diamond</i>	
<b>Short description (&lt; 1000 characters)</b>	
<p>Color centers in diamonds are a new photonic material with unique properties (strong, narrow and stable spectral lines, the possibility of convenient targeting with lasers and microwave fields, no toxicity enabling biological applications, etc.). Due to the crystallographic and electronic structure of the diamond, the color centers are not very sensitive to disturbances and have interesting optical and spin properties, e.g. paramagnetism. In particular, microwave spectroscopy of nitrogen-vacancy (NV-) centers allows for precise metrological applications, e.g. measurement of magnetic fields or temperature with micro- and nanometer spatial resolution and high accuracy at the same time.</p> <p>As part of the internship, it will be possible to test, among others, photonic optical fibers with nanodiamonds, or monocrystalline diamond samples with nitrogen-vacancy color centers. During this research, it will be possible to learn about various optical techniques including fluorescence microscopy, laser and microwave technologies, and magnetic resonance.</p>	
<b>Main research tool</b>	
<ul style="list-style-type: none"> <li>• lasers</li> <li>• wide-field and confocal fluorescence microscopy</li> <li>• magnetic resonance</li> </ul>	
<b>Additional requirements to the candidate</b>	
<ul style="list-style-type: none"> <li>• interest in experimental work</li> <li>• interest in optics</li> </ul>	
<b>Possibility to continue student internship in the form of:</b>	
Diploma thesis (master's or bachelor's degree)	X
PhD study	X