MID-INFRARED QUANTUM TECHNOLOGY FOR SENSING HOP-ON (MIRAQLS-HOP-ON)
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To increase our ability to sense the changes in the environment around us, we must understand how to control the quantum properties of light and matter at the fundamental limits of their interaction. As such, quantum sensing is poised to bring paradigm-shifting transformations to how precision measurements are performed. Given the central role that MIR spectroscopy plays on many of the pressing issues facing modern society, there is an urgent need for systematic investments into the innovation and development of MIR quantum technologies for sensing applications. MIRAQLS has recently brought together an interdisciplinary team of European and Canadian researchers, together with industry partners, who share a long-term vision for the development of MIR quantum photonic technologies for sensing applications.Within this Hop-On scheme we propose to incorporate the group of Dr Michal Karpinski at the University of Warsaw, Poland, into the MIRAQLS consortium. Dr Karpinski is one of the world leaders in experimental coherent time-frequency transformations of quantum light pulses. Within MIRAQLS, his group, in partnership with existing consortium members, will develop such transformations for the MIR spectral region, and apply them to enhance the properties of sources and detectors of MIR quantum light. These developments will enable better matching of the generated single photons to the probed samples and will improve the timing resolution of detectors, enhancing the R&I impact of MIRAQLS. Simultaneously, this Hop-On proposal will contribute to spreading of excellence to widening countries. Whereas Dr Karpinski's group has initial experience in classical optics in the MIR spectral region (2 um), he is not recognized as a leader in MIR optics. The transfer of expertise within the extended MIRAQLS consortium will enable him and his group to establish and lead the MIR quantum expertise in Poland and the central-eastern European region.