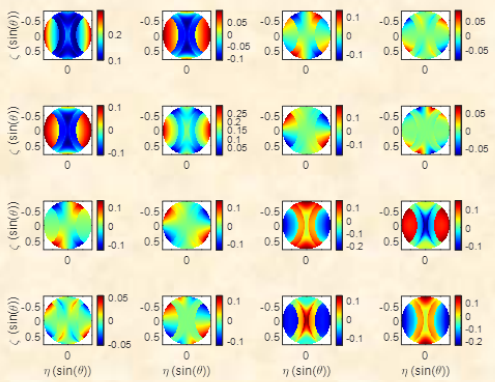
Workpackage 1: Far field metrology within the Rayleigh regime

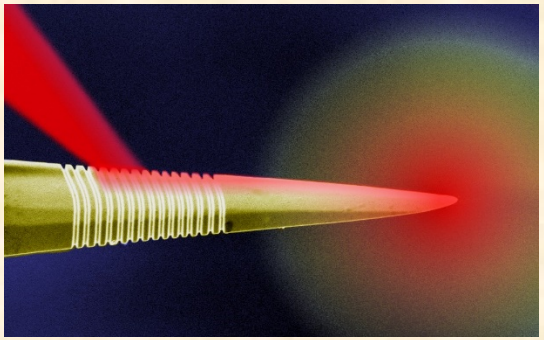
To select and exploit the essential information that can be extracted from the interaction of a light probe and an unknown object by taking advantage of all possible degrees of freedom that intervene in a light-matter interaction process.



T1.1: Multidimensional (spatial, spectral, polarization-based) techniques and structured illumination
T1.2: Inverse scattering, advanced inversion and inference methods
T1.3: Traceability for optical metrology within the Rayleigh regime

Workpackage 2: Inelastic, non-linear and resonant optical metrology

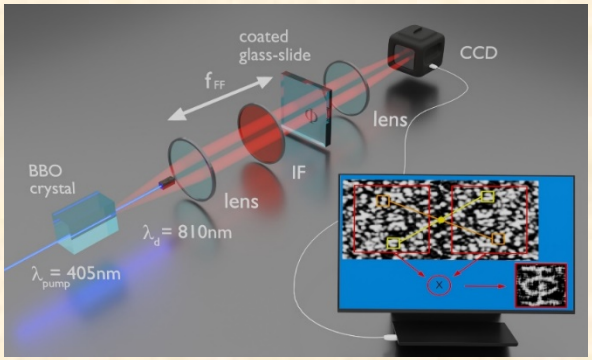
To exploit and make available the potential of inelastic, nonlinear and resonant processes to enhance diffraction-based optical methods, to provide novel or improved super-resolution microscopy methods for universal metrology applications.



T2.1: Metamaterials-enhanced and resonant scattering methods
T2.2: Super-resolution Raman imaging and Raman scatterometry
T2.3 Label-free super-resolution imaging
T2.4: Traceability for optical metrology within the inelastic scattering regime

Workpackage 3: Innovative imaging methods by light shaping in the classical and quantum domains

To exploit the spatial degree of freedom of a light field, both in the classical and quantum domains. Engineered states of light hold the potential to largely increase the sensitivity of measurements of specific geometrical or physical parameters of a nano-target.



T3.1: Quantitative phase retrieval in classical and quantum regime
T3.2: Quantum structured illumination
T3.3: Traceability for phase-sensitive optical metrology within the classical and quantum domains

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The EMPIR initiative is co-funded by the European Union's Horizon 2020 research and innovation programme and the EMPIR Participating States

Pushing bOundaries of nano-dimensional metrology by **Light**

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EMPIR/EURAMET Project 20FUN02

The goal of the project is be to develop new optical measurement techniques for the investigation of structures at the nanoscale with traceable spatial resolution beyond classical limits and sub-nanometre accuracy. Approaches to higher resolution systems include:

- the development of new “metamaterial” structures;
- near-field methods;
- quantum optics techniques that exploit photon entanglement;
- the decoding of other information contained in optical waves
- universal label-free super-resolution microscopy

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