Prof. Christoph Koch

Faculty of Mathematics and Natural Sciences
Department of Physics
Experimental Physics



Expertise
The structure research and electron microscopy group at the HU of Berlin actively develops and applies a broad spectrum of techniques for the analysis of small volumes of material by transmission electron microscopy (TEM), scanning transmission electron microscopy (STEM), scanning electron microscopy (SEM), and also light microscopy. Know-how which we can offer to external partners is based on the development of radically new electron diffraction techniques for ab-initio determination of atomic structure in (nano-) crystalline materials, and also the development of inline holographic techniques for the TEM as well as the optical microscope. The inline holographic techniques developed within the group are applied in the TEM for mapping electrostatic potentials, charge density distributions, and also strain in semiconductors and ceramics. In the optical microscope we apply these techniques for quantitative phase microscopy of living cells or mapping the topography of surfaces with nm resolution along the optical axis.

Scientific Services
Transmission electron microscopes:

- JEOL JEM2200FS FEG-(S)TEM equipped with an in-column energy filter for electron energy-loss spectroscopy, HAADF- and BF-STEM detectors, EDX spectrometer for local elemental analysis, NanoMegas ASTAR precession unit for phase mapping and electron crystallography, electrostatic biprism for off-axis holography, Instrument control software for Large-Angle Rocking-Beam Electron Diffraction (LARBED)
- Hitachi H-8110 (S)TEM with LaB6 cathode, equipped with HAADF- and BF-STEM detectors

Scanning electron microscope:

- Zeiss GeminiSEM 500 with a field-emission source, equipped with a multi-segment STEM detector, an EDX-Spectrometer, and an E-beam lithography unit (RAITH-Elphy)

Testimonials
- Within a cooperation agreement with a leading provider of optical products, Prof. Koch has developed novel techniques for analysing series of images.

Topics / Trends
Optics
Pharma(ceuticals)
Software Development

Scientific Institution
IRIS Adlershof

Industries
Optical Instruments & Precision Engineering

Humboldt-Innovation GmbH
Innovation Management

Eleonora Frühwirt
Transfer Manager
+49 30 2093 70769
eleonora.fruehwirt@humboldt-innovation.de

Jan Eggert
Innovation Manager
+49 30 2093 70764
jan.eggert@humboldt-innovation.de

HUMBOLDT INNOVATION
RESEARCH CREATING REALITY.