

Seminar über Biomedizinische Photonik

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Titel: Multiscale functional optoacoustic (photoacoustic) imaging

Optoacoustic (OA, photoacoustic) imaging has emerged as a transformative modality in life sciences by overcoming the fundamental depth limitations imposed by optical scattering in biological tissues. By converting photon absorption into acoustic signals, OA exploits the reduced scattering of ultrasound relative to light (~1000-fold lower) to enable high-resolution imaging of optical contrast at depths ranging from millimeters to centimeters. This unique hybrid physics provides access to rich anatomical, functional, and molecular information derived from both endogenous chromophores and a wide range of exogenous contrast agents. Beyond spatial resolution, OA imaging offers exceptional temporal resolution limited by the pulse repetition frequency of the laser source. As a result, OA occupies a unique position among biomedical imaging modalities, combining depth penetration, functional specificity, and high spatiotemporal resolution in a single platform. Recent advances have further expanded its capabilities, including super-resolution microangiography breaking through the acoustic diffraction limit (~1/200 of imaging depth) via localization and tracking of strongly absorbing particles. This seminar will review the basic principles of OA imaging and provide an overview of recent developments enabling multi-scale spatial and dynamic imaging of biology.

Zeit: Wednesday 18.2.2026, 10:15 Uhr

Ort: Room A97, ExWi, Sidlerstrasse 5, 3012 Bern