

# Combining Light and Sound for Noninvasive Interrogation and Stimulation of the Brain

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Development of more efficient and less intrusive ways to alter and observe brain activity is instrumental towards tackling neurological diseases in an aging population and for advancing basic neuroscience research. Light- and ultrasound-based technologies are growingly used for brain interrogation, modulation of neural activity, and treatment of neurodegenerative and neuropsychiatric disorders. The talk thus focuses on our latest additions to the arsenal of multi-scale neuroimaging techniques, including functional optoacoustic neuro-tomography for whole-brain imaging [1,2], optoacoustic localization microangiography [3], large-field multifocal illumination microscopy [2,4], and super-resolution fluorescence localization imaging [5]. The new methods enable transcranial large-scale recordings of neural and hemodynamic activity and molecular agents at penetration depths and spatio-temporal resolution scales not covered with the existing micro- and macro-scopic functional neuroimaging techniques. Hybrid implementations have further been developed to allow for real-time monitoring of the effects of transcranial ultrasound stimulation of the living brain [6].

References:

## References

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