INT Symposium on “Advanced Photonic Imaging in Neuroscience”

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Yevgenia (Genia) Kozorovitskiy obtained her BA and PhD in Neuroscience from Princeton University. Following her postdoctoral research in the laboratory of Bernardo Sabatini (Harvard Medical School), she moved to Northwestern University to start her laboratory in 2014. Her lab is focused on neuromodulatory signaling with some methods development, including new optical tools for rapid imaging with an emphasis on design simplification, low cost architecture, and open source techniques.

S2-L2 ‘*Scanned oblique plane illumination microscopy.*’

Manish Kumar, Yevgenia Kozorovitskiy*

Versatile, sterically accessible imaging systems capable of in vivo rapid volumetric functional and structural imaging deep in the brain continue to be a limiting factor in neuroscience research. Towards overcoming this obstacle, we present integrated one- and two-photon scanned oblique plane illumination (SOPi, /sōpī/) microscopy which uses a single front-facing microscope objective to provide light-sheet scanning based rapid volumetric imaging capability at subcellular resolution. Our planar scan-mirror based optimized light-sheet architecture allows for non-distorted scanning of volume samples, simplifying accurate reconstruction of the imaged volume. We demonstrate fast, deep, large volume imaging capability inside scattering tissue and develop a pipeline for multi-tile stitching for large scale 3D imaging in single objective light-sheet microscopy.