

# Neurophotonics

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## **Welcome to *Neurophotonics***

David Boas



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It is my great pleasure to introduce SPIE's new journal *Neurophotonics*, which is being launched in recognition that advanced optical methods are driving a revolution in the neurosciences. These optical methods for imaging and manipulation of brain structure and function span from visualization of intracellular organelles and protein assemblies to noninvasive macroscopic investigation of cortical activity in human subjects. The methods and applications are growing rapidly and are driving profound advances in understanding brain phenomena such as electrical excitability, neuroglial partnership, neurovascular signaling, metabolic activity, and hemodynamics in health and disease.

At the interface of the neurosciences and photonics, *Neurophotonics* provides a highly visible focal point to facilitate and accelerate the rapidly expanding impact of this discipline. A key goal is to foster a greater awareness and interaction among the photonics, neuroscience, and clinical communities that reflect the diversity of the discipline. As such, *Neurophotonics* covers advances in optical technology applicable to study of the brain as well as the impact of photonics methods on the basic and clinical neuroscience applications. *Neurophotonics* publishes peer-reviewed papers on a broad range of topics highlighting the impact of novel optical methods in the neurosciences including:

- Microscopic methods
- Super-resolution nanoscopic methods
- Optogenetics and other optical methods of manipulating cellular behavior
- Synthetic and genetically encoded optical reporters and actuators
- Optical clearing methods
- Methods to investigate neuroglial and vascular physiology
- Methods to investigate cellular energetics
- Noninvasive methods of measuring and imaging brain function and physiology
- Photoacoustic methods spanning optical to acoustic resolution
- Clinical and translation applications
- Computational methods relevant to understanding and interpreting optical measurements.

The response since the announced formation of *Neurophotonics* has been highly positive with universal acknowledgment of the need to bridge the gap between technology development and application. In the six months leading up to this inaugural issue, we have already received more than 30 submissions. The submitted papers span the journal's scope, covering topics such as functional near-infrared spectroscopy, optogenetics, photoacoustics, optical coherence tomography, laser speckle contrast imaging, neural stimulation, energy metabolism, Alzheimer's disease, and calcium dynamics, among others.

To help launch this journal, I am pleased to announce that it will be freely available online through the end of 2015 as part of the SPIE Digital Library. Issues will be printed quarterly at first, increasing in frequency as the journal grows. In addition, papers will be published online shortly after acceptance, with new papers added regularly to each online issue as they are approved for publication. Authors also have the option of obtaining permanent open access for their papers.

This first issue coincides with the launch of the BRAIN Initiative within the United States. New optical methods for imaging and manipulation of brain activity (and the underlying structure) will be at the forefront of this initiative. Therefore, we launch *Neurophotonics* with a collection of articles that lay out a vision for and provide examples of the impact that optics and photonics will have on advancing our understanding of how the brain works.

Three other special sections are currently planned for upcoming issues. A special section honoring a pioneer in neurophotonics, Lawrence Cohen, is being organized by Brian Salzberg and Dejan Zecevic. Professor Cohen has been the leading advocate of optical methods in neuroscience for more than four decades and can thus be thought of as the father of neurophotonics. The other two special sections will focus on causal control of biological systems with light organized by Christopher Moore and Itamar Kahn, and light microscopy of connectivity organized by Tim Murphy and Shaogun Zeng.

We strongly encourage all members of the neuroscience community to become active in *Neurophotonics* by suggesting and organizing new special sections and contributing your papers to the journal. Your ideas can be discussed with any of the *Neurophotonics* editors. These special sections and normal contributions will consist of several types of articles including regular research papers, letters, review papers, tutorials, outlook and opinion papers, and technical notes. More details about these article types can be found under author information at [spie.org/neurophotonics](http://spie.org/neurophotonics).

I am grateful to have the support of a broad group of associate editors who represent the breadth of the discipline. They are crucial to the development of this journal and guiding it to become the leading journal representing the discipline of neurophotonics. I wish to acknowledge the wonderful support of the SPIE publications staff in planning and launching *Neurophotonics*. The regular discussions with Karolyn Labes, Eric Pepper, Mary Summerfield, Rita Davis, and Gwen Weerts have been critical to the development of this journal. A special thanks goes to Lihong Wang, Bruce Tromberg, and James Fujimoto for encouraging and supporting me in launching this journal.

**David Boas**  
Editor-in-Chief