

**Computational Mathematics, Science and Engineering**  
Colleges of Engineering and Natural Science

**Colloquium by Mark Reimers**

**Neuroscience Program**  
**Michigan State University**

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**April 18, 2016, 4:00 PM; A116 Wells Hall**

**“Big Data Comes to Neuroscience”**

New optical imaging technologies are bringing high-throughput data to experimental neuroscience, as big data came to genomics at the turn of the century. The BRAIN Initiative aims to accelerate neuroscience data acquisition by several orders of magnitude. This talk will discuss several emerging issues in analysis of high-throughput neuroscience data, and illustrate them with recently published work, as well as vignettes drawn from current research at MSU.

This talk will discuss four kinds of issues in analyzing high-throughput data, with special attention to, but not limited to, wide-field optical imaging. These issues include: pre-processing to remove artifacts and reduce noise; exploratory analysis and visualization; characterizing state-space dynamics; and inference of network connections and communication. The talk will wrap up with a discussion of data analysis challenges for the next generation of optical imaging, integrating activity, cellular and connections data.

Professor Jingfang Huang is a full professor in the Department of Mathematics at the University of North Carolina at Chapel Hill. He works on the fast algorithms, integral equations, potential theory and their applications in electro-magnetics, solid and fluid dynamics, molecular mechanics and quantum chemistry. He obtained his doctoral degree in 1997 from the Courant Institute of Mathematical Sciences at New York University. For more information, check his website at: <http://huang.web.unc.edu/>.

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