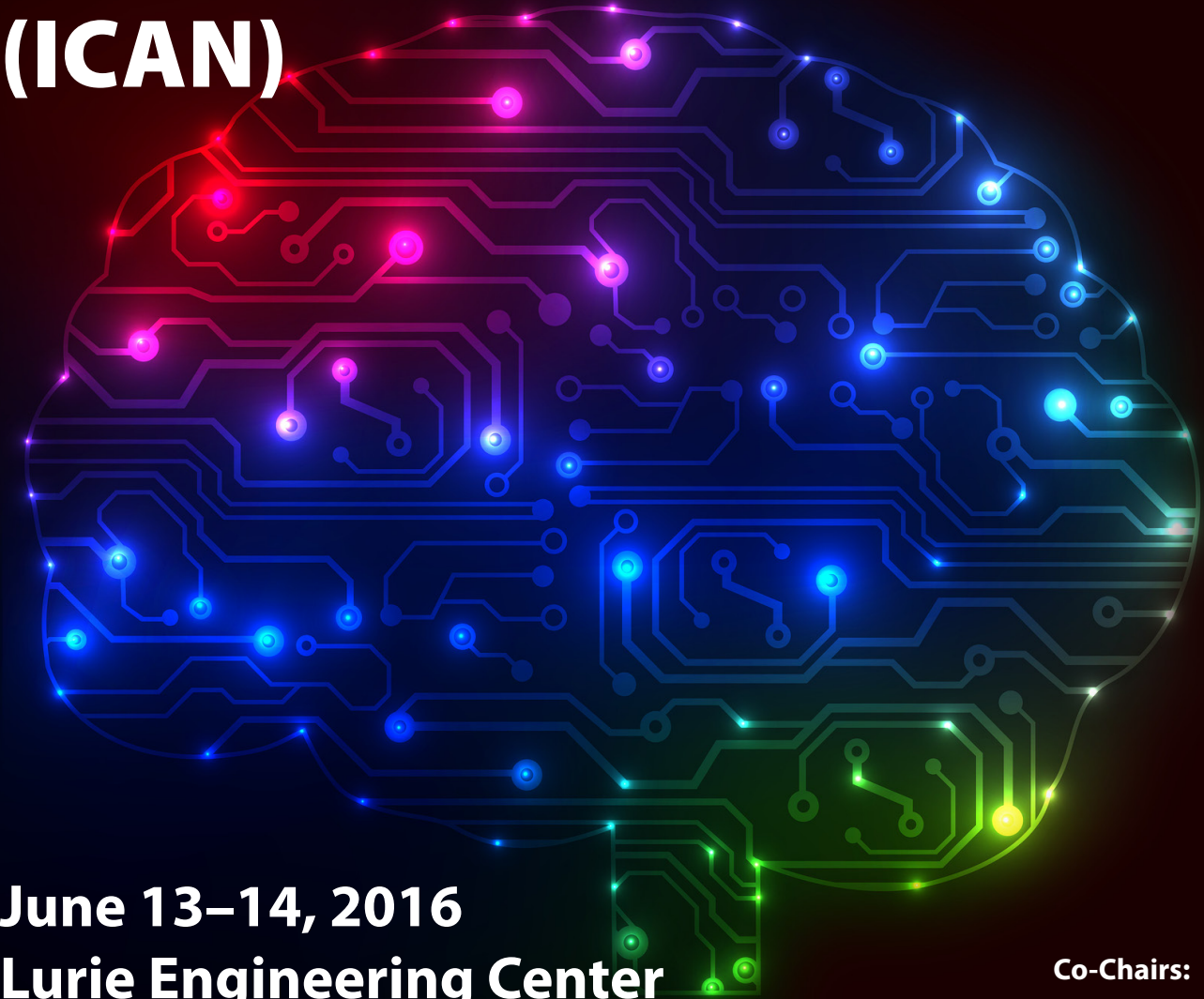# International Conference for Advanced Neurotechnology (ICAN)

**June 13–14, 2016
Lurie Engineering Center
University of Michigan**
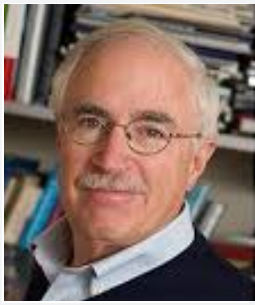
Co-Chairs:

**Euisik Yoon (U-M)
György Buzsáki (NYU)**

In the past decades significant new advances have been brought on the joint problems of scaling neuroscience tools to interface with entire neuronal circuits and defining elemental cell types, but not sufficient yet to accelerate neuroscience. This is an inaugural conference to bring engineers and neuroscientists together to review the recent advancement in neurotechnology and neuroscience, define the need for next-generation tools to move neuroscience forward, and enhance translation of technology to science community.

Keynote Speakers

Ken Wise
University of Michigan
The Rocky Road to Neurotechnology:
A Retrospective

Howard Eichenbaum
Boston University
The BRAIN Initiative: What Do We Do With All That Data?

Charles Lieber
Harvard University
Nanoelectronic Tools for Brain Science

György Buzsáki
New York University

Ileana Hanganu-Opatz
University of Hamburg

Tim Harris
Janelia Farm, HMMI

Oliver Paul
BrainLinks-BrainTools
University of Freiburg

Greg Quirk
University of Puerto Rico

Il-Joo Cho
KIST, Korea

Albert Lee
Janelia Farm, HMMI

Wei Lu
University of Michigan

Kenneth Harris
University College London

Euisik Yoon
University of Michigan

Sponsors

NSF International Program for the
Advancement of Neurotechnology (IPAN)

Integrated Neuromorphic Electronics and Microsystems (INEMS)

UNIVERSITY OF MICHIGAN

http://www.eecs.umich.edu/ipan/

Agenda

June 12, 2016

6:30 - 8:30 pm **Reception**   Room (TBD)
Holiday Inn, North Campus

June 13, 2016

8:00 **Registration**
Johnson Rooms, 3rd Floor, LEC

8:30 **Opening**
Euisik Yoon & György Buzsáki

8:35 **Welcoming Remarks (TBD)**
Martha Pollack (Provost) Jack
Hu (VP of Research)

8:40 **Welcoming Remarks (TBD)**
NSF Program Director, Kavli Foundation

Keynote Presentation (Chair: Euisik Yoon)

8:50 The Rocky Road to Neurotechnology:
A Retrospective
Ken Wise, U. Michigan

9:45 The BRAIN initiative: What Do We Do With All
That Data?
Howard Eichenbaum, Boston U.

10:40 Break

Session 1: Where Are We? (Chair: Ed Stuenkel)

10:50 Why Do We Need So Many Neurons?
György Buzsáki, NYU

11:20 Neonatal Brain Rhythms in Health and Disease
Ieana Hanganu-Opatz, U. Hamburg

11:50 A Performance Comparison of Active vs.
Passive and Switched vs. Unswitched in a
Chronic 384-channel Si Probe
Tim Harris, Janelia Farm

12:20 Lunch by Fountain (outside)

*Session 2: What is Recent Advancement?
(Chair: Ken Wise)*

1:50 MEMS Tools for Bidirectional Brain-machine
Interfaces
Oliver Paul, BrainLinks-BrainTools, U. Freiburg

2:20 Investigating Circuits of Conditioned Fear
and Avoidance
Greg Quirk, UPR

2:50 A Multifunctional MEMS Neural Probe Array
for Mapping Brain Circuits
Il-Joo Cho, KIST, Korea

3:20 Extracellular Population Recording and the
Structure of Memory Representations
Albert Lee, Janelia Farm

3:50 Break

Panel Discussion (Moderator: Huda Akil)

4:00-
5:30 What should the next-generation neurotech-
nology be to advance neuroscience? What is
needed in the neuroscience user community?
What are the challenges for engineers? The
end of engineering research is the beginning
of neuroscience application. How do we nar-
row the gap for translation? How to best train
the next generation of student scientists to
apply new technology and to identify future
technology needs based on brain science?

6:30 Dinner (Invitation only)   Gandy Dancer

June 14, 2016

8:30 Continental Breakfast   Johnson Rooms

Keynote Presentation (Chair: György Buzsáki)

9:00 Announcement
György Buzsáki

9:05 Nanoelectronic Tools for Brain Science
Charles Lieber, Harvard

10:00 Break

Session 3: What is Next? (Chair: Oliver Paul)

10:00 A Bio-inspired Neuromorhpic Chip for Efficient
Computing and Bio-interface
Wei Lu, U. Michigan

10:30 Hardware and Software for Next-generation
Neuronal Population Recording
Kenneth Harris, UCL

11:00 Toward High-density Optoelectrodes:
Bringing Light to Neural Probes
Euisik Yoon, U. Michigan

Poster Session (Chair: John Seymour)

11:30 Posters and Lunch   EECS Atrium

1:30 Workout Session (IPAN Partners Only)
WIMS^2 Conference Room

3:30 Adjourn