

# 39<sup>th</sup> WPI IIIS Seminar

## “Imaging hippocampal neural circuit dynamics during behavior in virtual reality”

The Canadian psychologist Donald Hebb decades ago proposed the theory of “cell assembly”, in which he postulated neurons acting together are arranged into groups to form the brain basis of mental representation. Using a set of technologies such as transgenic mice that express new fluorescent calcium indicator proteins, a virtual reality set-up for head-fixed mice and automated image analysis, we directly visualize the activity of large populations of hippocampal CA1 pyramidal cells with two-photon microscopy while the mice perform spatial behavioral tasks in virtual environments. In this talk, I will present our recent findings that the operation of hippocampal neuronal circuits can be highly dynamic in both short-term and long-term. I would also like to discuss possible application of these techniques to sleep research.



### Speaker: Dr. Masaaki Sato

PRESTO “Design and Control of Cellular Functions”  
Japan Science and Technology Agency /  
RIKEN Brain Science Institute

**Date:** Tuesday, August 5, 2014

**Time:** 12:00-13:00

**Venue:** Room #402, 4F, Health and Medical Science Innovation  
Laboratory, University of Tsukuba

☆Light refreshments will be served.



# IIIS

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