ICTS ICTP

WINTER SCHOOL ON QUANTITATIVE SYSTEMS BIOLOGY

SENSORIMOTOR CONTROL *(ONLINE)*

How organisms sense the world and generate behaviors is an exciting question that has motivated neuroscientists for more than a century. The neural command for generating behavioral output arises from operations at multiple scales, ranging from the flip-flops of ion channels to dynamics in circuits comprising ensembles of neurons. New tools to genetically manipulate organisms, monitor, and perturb neural activity, and advanced microscopy that enables large-scale imaging of neurons in vivo have yielded a hitherto unprecedented quantum of data with high resolution. Quantitative approaches are needed to mine these data sets for generating testable hypotheses regarding nervous system function.

The tenth edition of the ICTP-ICTS winter school on Quantitative Systems Biology is focussed on Sensorimotor Control. The aim of this School is to expose students from different backgrounds to the latest research in systems neuroscience, with an emphasis on the usage of quantitative methods and theory. The school will begin with a brief introduction to neuroscience, including the electrical properties of neuronal membranes and single neuronal biophysics. With this foundation in place, the school will delve into how circuit dynamics emerge in diverse circuits using invertebrate and vertebrate model organisms as examples. Questions in population coding, variability and stochasticity, and plasticity will then be covered. Students will then be introduced to applications of quantitative tools to neuroscience such as whole-brain imaging data sets or behavioral clustering data sets. Throughout, the school will also explore how theory can contribute to a normative understanding of various phenomena, and motivate future experiments.

6 – 17 DECEMBER, 2021

Application deadline
October 31, 2021

icts.res.in/program/qsb2021

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Image credit: Surya Prakash, Thirumalai Lab, NCBS