

Computational Neuroscience
Initiative Basel presents:

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Dr. Sharpee's lab develops computational models to explain when and how different types of neural coding schemes are most informative. These models can be used to both interpret biological data and generate non-biological systems that process information about high-dimensional stimulus space optimally. She collaborates with experimentalists extensively leading to mechanistic and interpretive models to explain, for example, why and when retinal ganglion cells with similar feature selectivity split into functionally distinct groups; how *C. elegans* employ a maximally informative search strategy during foraging using a neural circuit that decodes environmental variability to generate contextually relevant decisions; why a trade-off exists between the complexity of a shape and the possible positions in which it can be, and still be recognized by neurons in visual cortex of primates. Moreover, some variability in biology (e.g. ion channel composition and membrane distribution, anatomical and functional neural sub-types) is important for neural computation but some is likely not. The Sharpee lab works on developing a systematic theoretical framework that addresses which types of variability can be used to optimally endow a system with maximizing information capacity and how different types of variability affect processing and behavior. Work from the Sharpee lab draws from Information Theory and Bayesian statistics as well as theories from physics such as the Theory of "Broken Symmetries".

VENUE / FRIEDRICH MIESCHER INSTITUTE
66 MAULBEERSTRASSE, BASEL

FRIDAY, SEPTEMBER 8, 2017,
ROOM 5.30

LECTURE /

11:30 - 12:30

PART 1: OPTIMIZING NEURAL INFORMATION CAPACITY

**PART 2: COMPLEX, NON-LINEAR FEATURE SELECTIVITY
AND POSITION INVARIANCE IN VISUAL CORTEX**

WORKSHOP /

12:45 - 14:45

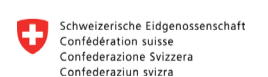
INTEGRATING COMPUTATIONAL AND EXPERIMENTAL WORK

Free workshop, lunch provided, please register at www.fmi.ch/CNIB

JOURNAL CLUB / PLEASE ALSO JOIN US ON

THURSDAY, SEPTEMBER 7, 2017,
17:00, ROOM 5.39

An Introduction to Information Theory from your CNIB Organizers.
All are welcome and encouraged to attend. Pizza and drinks will be provided.



— Project "Trinational NeuroCampus"
Program Interreg V Upper Rhine «Transcending borders with every project», Neurex, CNRS, INSERM, Université de Strasbourg, Région Grand Est, Département du Bas-Rhin, Département du Haut-Rhin, Eurométropole Strasbourg, Hôpitaux Universitaires de Strasbourg, Bernstein Center Freiburg, Klinik für Psychiatrie und Psychotherapie Freiburg, Neurozentrum Freiburg, Universität Freiburg, Universität Basel, Universitäre Psychiatrische Kliniken Basel, Kanton Basel-Stadt, Kanton Basel-Landschaft, Confédération suisse