Natural Stimulus Statistics

October 22–25

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ARRANGED BY **S. Laughlin,** University of Cambridge, United Kingdom
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Introduction:
J.A. Witkowski, Banbury Center, Cold Spring Harbor Laboratory
S. Laughlin, University of Cambridge, United Kingdom,
P. Reinagel, Harvard Medical School, Boston, Massachusetts

SESSION 1
Chairperson: D.L. Donoho, Stanford University, California

W. Bialek, NEC Research Institute, Inc., Princeton, New Jersey: Finding relevant features in natural signals.
H. Barlow, University of Cambridge, United Kingdom: Help and hindrance from redundancy.
D. Mumford, Brown University, Providence, Rhode Island: Searching for an explicit stochastic model for natural scene image patches.
B. Olshausen, University of California, Davis: Sparse coding of natural images: Space, time, and color.
D. Tolhurst, University of Cambridge, United Kingdom: Measuring sparse coding: Definitions and confusions.

SESSION 2
Chairperson: S. Laughlin, University of Cambridge, United Kingdom

Y. Gousseau, CNRS-ENS Cachan, France: Morphological statistics of natural images.
E. Simoncelli, New York University, New York: Image statistics, Gaussian scale mixture models, and divisive normalization.
D.W. Dong, Florida Atlantic University, Boca Raton: Eye movements and spatiotemporal input statistics during free-viewing natural time-varying images.
K. Kording, Institute for Neuroinformatik, Zurich, Switzerland: What a cat sees and what algorithms can learn from this.
R. Kern, Universitat Bielefeld, Germany: Representation of behaviorally generated optic flow in a fly visual interneuron.
R. de Ruyter, NEC Research Institute, Inc., Princeton, New Jersey: Motion detection in the wild: Natural stimuli and information transmission in a blowfly motion-sensitive neuron.

B. Olshausen, H. Barlow, W. Geisler

SESSION 3
Chairperson: M. Meister, Harvard University, Cambridge, Massachusetts

A. Fairhall, NEC Research Institute, Inc., Princeton, New Jersey: Olfaction from the point of view of physics.
F. Grasso, Boston University Marine Program, Woods Hole, Massachusetts: Olfaction, turbulence, and odor plumes: Structure from concentration dynamics.
G. Laurent, California Institute of Technology, Pasadena: Reformatting and optimization of odor representations in the zebrafish olfactory bulb.
M.S. Lewicki, Carnegie-Mellon University, Pittsburgh, Pennsylvania: Learning efficient codes for natural scenes and sounds: A principle for sensory coding.
P. Penev, The Rockefeller University, New York: Factorial transmission of time-varying natural stimuli with sparse, interacting unitary events: Spiking for speech and movies.

SESSION 4
Chairperson: D.J. Field, Cornell University, Ithaca, New York

F. Theunissen, University of California, Berkeley: Analyzing auditory neurons with natural and synthetic sounds.
K. Sen, University of California, San Francisco: Hierarchical processing of natural sounds in the songbird auditory forebrain.
E. Nelken, Hebrew University-Hadassah Medical School, Jerusalem, Israel: Coding of foregrounds and backgrounds in auditory scenes.
P. Reinagel, Harvard Medical School, Boston, Massachusetts: Coding of temporal visual information by LGN neurons.
Y. Dan, University of California, Berkeley: Analysis of visual coding in the LGN and V1.
J.L. Gallant, University of California, Berkeley: Using natural scenes to reveal coding properties in visual cortex.

SESSION 5
Chairperson: D. Osorio, University of Sussex, Brighton, United Kingdom

W.S. Geisler, University of Texas, Austin: Perceptual grouping and the Bayesian co-occurrence statistics of features in natural images.
J. Malik, University of California, Berkeley: Ecological statistics of Gestalt grouping factors.
M. Vorobyev, University of Maryland, Baltimore: Color coding of signals and backgrounds.
E.H. Adelson, Massachusetts Institute of Technology, Cambridge: Statistical aspects of lightness estimation.

D. Field, E. Simoncelli