



# Computation, Cognition, and the Brain

Wednesday, May 30th – Friday, June 1st, 2018

Academic Bldg EAST (Rm 2400), College Ave Campus  
15 Seminary Pl, New Brunswick, NJ 08901

## Wednesday, May 30th

08:30 – 09:00 *Coffee and Light Breakfast (Provided)*

09:00 – 09:15 Opening Remarks

### **Processing Levels: What mechanisms for encoding experiential statistics operate at the circuit versus cellular levels?**

Moderator: David Vicario

09:15 – 09:45 David Vicario (Rutgers): Introduction to the topic

09:45 – 10:25 Daniel Margoliash (U of Chicago): Birdsong from ion channels through nonlinear dynamics to behavior: Some answers, many questions

10:25 – 10:40 *Coffee Break*

10:40 – 11:20 Michael Long (NYU School of Medicine): Uncovering circuit principles that enable robust behavioral sequences

11:20 – 12:10 Open Discussion

12:10 – 02:00 *Lunch Break (Not Provided)*

### **Decision Making: How is accumulating evidence represented and how are decisions based on those representations?**

Moderator: Randy Gallistel

02:00 – 02:40 Konrad Kording (UPenn): Rate fluctuations not steps dominate LIP activity during decision-making

02:40 – 03:20 Jonathan Pillow (Princeton): Latent models of stepping and ramping: an update on the debate over single-trial dynamics in LIP

03:20 – 03:30 *Coffee*

03:30 – 04:10 Michael Shadlen (Columbia): I haven't decided yet

04:10 – 05:00 Open Discussion

05:00 – 05:20 Daily wrap up

## Thursday, May 31st

08:30 – 9:00 *Coffee and Light Breakfast (Provided)*

09:00 – 9:15 Opening Remarks

### **Space and Time: How are simple quantities coded in neural firing and stored in memory for subsequent access?**

Moderator: John McGann

09:15 – 09:55 Randy Gallistel (Rutgers): Finding numbers in the brain

09:55 – 10:35 Russell Epstein (UPenn): Anchoring the cognitive map: Neural mechanisms for landmark-based navigation

10:35 – 10:50 *Coffee Break*

10:50 – 11:30 David Huber (UMass): A memory retrieval model of grid cells: The function of grid cells may be something other than spatial position

11:30 – 12:20 Open Discussion

12:20 – 02:00 *Lunch Break (Not Provided)*

### **Higher Visual Perception: How do visual statistics subserve object encoding in the brain?**

Moderator: Dimitris Metaxas

02:00 – 02:40 Anitha Pasupathy (U of Washington): Encoding things and stuff: multiplexed form and texture signals in primate V4

02:40 – 03:20 Jack Gallant (Berkeley): A deep convolutional energy model of ventral stream areas V1, V2 and V4

03:20 – 03:30 *Coffee*

03:30 – 04:10 James DiCarlo (MIT): Reverse engineering human visual intelligence

04:10 – 05:00 Open Discussion/Daily Wrap up

05:00 – 07:00 *Evening Cocktail Reception (Provided)*

## Friday, June 1st

08:30 – 9:00 *Coffee and Light Breakfast (Provided)*

09:00 – 9:15 Opening Remarks

### **Encoding Theory: What are computational mechanisms for information processing in the brain?**

Moderator: Pernille Hemmer

09:15 – 09:55 Aurel Lazar (Columbia): Representation and processing mechanisms in the early olfactory and visual systems of the fruit fly

09:55 – 10:35 Eero Simoncelli (NYU): Efficient distribution of resources in neural populations provides an embedding of environmental statistics

10:35 – 10:50 Coffee Break

10:50 – 11:30 Tatyana Sharpee (Salk): Cortical representation of natural stimuli

11:30 – 12:20 Open Discussion

12:20 – 12:30 Closing Remarks

12:30 – 02:00 *Conclusion Lunch Reception (Provided)*

\*\*\*\*\*Conference Abstracts can be viewed [HERE](#)\*\*\*\*\*

Organizers: Randy Gallistel, Brian McLaughlin, Dimitris Metaxas, Sara Pixley, and David Vicario.

This event was funded by the generous contributions from the School of Arts and Science at Rutgers University. It was hosted by the Departments of Psychology and Computer Science, as well as the Center for Cognitive Science.

### **To Stay Connected:**

Email to join our mailing list:

[talks@ruccs.rutgers.edu](mailto:talks@ruccs.rutgers.edu)

Follow us on Twitter:

<https://twitter.com/RutgersCCS>

Follow us on Facebook:

<https://www.facebook.com/Rutgers.RuCCS/>

Visit the RuCCS Website:

<http://ruccs.rutgers.edu>

Visit the Psychology Website:

<http://psych.rutgers.edu>

Visit the Computational Biomedicine, Imaging and Modeling Website:

<http://cbim.rutgers.edu>