



From left to right: Two generations of CNS visionaries—David Van Essen, Christopher Koch, John Hopfield, and Carver Mead.

## *Computation and Neural Systems: A Birthday Bash to Celebrate the First 15 Years*

In 1986, a unique confluence of ideas, people, and recent scientific and technological developments came together at Caltech, giving rise to a new interdisciplinary graduate program: Computation and Neural Systems ([CNS](#)). The CNS program concentrates on the fascinating problems at the interface between cellular biology, neurobiology, electrical engineering, computer science, and physics. Its unifying theme is the relationship between the physical structure of a computational system (physical or biological hardware), the dynamics of its operation, and the problems that it can solve. CNS students and faculty have carried out groundbreaking work in a range of fields, including computer science, electrical and neuromorphic engineering, neural networks, robotics, biophysics, neurophysiology, and artificial life.

Over the weekend of September 30th, Carver Mead (BS '56, MS '57, PhD '60, Moore Professor of Engineering and Applied Science, Emeritus), John Hopfield (Dickinson Professor of Chemistry and Biology, Emeritus), and David Van Essen (BS '67, Edison Professor of Neurobiology at Washington University in St. Louis)—the visionaries who created

and shaped CNS into what would become the first program of its kind, spawning intellectual tentacles that now reach worldwide—brought their unique world views back to campus, re-inspiring two generations of students and colleagues to continue with the revolutionary work incubated at Caltech just 15 years ago. Along with dozens of alumni who were in town for the two-day birthday bash, current students, faculty, and friends (over 130 in all) shared meals, shared stories, and “talked shop.”

“This turned out to be a wonderful opportunity to bring everybody back to campus and to hear about achievements over the past 15 years,” observed Christof Koch, Troendle Professor of Cognitive and Behavioral Biology and Professor of Computation and Neural Systems. Professor Koch was responsible for organizing the event and noted that he was pleased so many people made the trek back to campus to meet with old friends and share ideas.

Many alumni gave talks on topics ranging from the very technical—“Neuromimetic Vision Algorithms”—to the very topical—“Five Jobs in Five Years: A View from the Trenches in Silicon Valley.”



Among those giving presentations were Alex Backer (MS '98, currently working on his PhD); Vance Bjorn (MS '95, now with Digital Persona, a company which he co-founded); Tobi Delbruck (PhD '93, currently at the Institute of Neuroinformatics in Zurich); Dawei Dong (PhD '91, currently teaching and doing research at the Center for Complex Systems and Brain Sciences in Boca Raton, Florida); Laurent Itti (PhD '00, now assistant professor of Computer Science at the University of Southern California); Sanjoy Mahajan (PhD '98, currently doing post-doctoral work in physics at the University of Cambridge); David McKay (PhD '92, currently a Reader in the Department of Physics at Cambridge University); Bill Softky (PhD '93, emeritus of five Silicon Valley companies in five years); and Jiajun Dale Wen (PhD '00, currently with Oracle Corporation).

Erik Winfree (PhD '98), Assistant Professor of Computer Science at Caltech, gave a talk entitled "From Neurons to Molecules: Computing the Natural Way." Also speaking were visiting professor Heinz Schuster (Chair for Theoretical Physics at the University of Kiel and regular visiting faculty member

at Caltech every second year) and Dr. Chris Adami (Faculty Associate in Computation and Neural Systems at Caltech and Research Scientist at JPL).

On hand as well was Professor Thanos Siapas, who will shortly be moving from MIT to Caltech to take an assistant professorship. He will be a member of both the Division of Engineering and Applied Science and the Division of Biology. His presentation was titled "The Organization of Network Interactions Across Cortico-Hippocampal Circuits and Their Role in Memory Formation," and his expertise involves recording and analyzing the neural activity of hundreds of individual neurons in parts of the mammalian brain thought to be involved in memory and spatial orientation.



**A photo gallery containing images from the CNS birthday bash is available on-line at**

<http://www.anniversary.cns.caltech.edu>