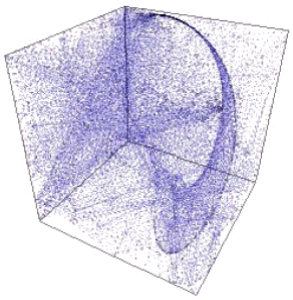
# PRINCIPLES OF AUTONOMOUS NEURODYNAMICS 2009
## La Jolla, California
## July 27-29, 2009

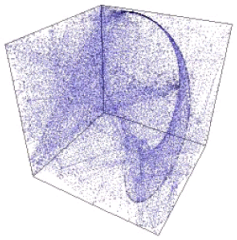


**6th Annual Meeting of the Society for Autonomous Neurodynamics (SAND)**

**Location:**
Monday July 27 - UCSD, Cognitive Science Building, Room 180
Tuesday July 28 - UCSD, Cognitive Science Building, Room 180
Wednesday July 29 - The Salk Institute for Biological Studies, Parker Room

**Supporting Institutes and Programs:**
The Institute for Neural Computation (INC), University of California San Diego (UCSD)
Laboratory for Cognitive Neuroscience (LCN), The Salk Institute for Biological Studies
Computational Neurobiology Laboratory (CNL), The Salk Institute for Biological Studies
Department of Cognitive Science, University of California San Diego (UCSD)
Society for Comprehensive Epilepsy Care (SCEC), University of Saskatchewan
University of Toronto Epilepsy Research Program (UTERP)
Collaborative Program in Neuroscience (PIN), University of Toronto
Stichting Epilepsie Instellingen Nederland (SEIN)

**www.utoronto.ca/sand/PAND2009/**



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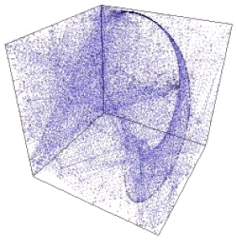
## La Jolla, California - July 27-29, 2009

### Monday, July 27th - UCSD, Cognitive Science Building, Room 180

| | | | |
|---|---|---|---|
| | Registration | 9:00 - 9:30 | |
| KEYNOTE SPEAKER: Stiliyan Kalitzin, Epilepsy Institute of the Netherlands (SEIN) | | | |
| Ping Wang | Welcome | 9:30 - 9:35 | |
| Elan Liss Ohayon | Introduction | 9:35 - 9:40 | |
| Stiliyan Kalitzin | Control of state transitions in the (epileptic) brain | 9:40 - 10:00 | *p.1* |
| THEME: Clinical Dimensions & Behavioral Dynamics | Chair: Ping Wang | | |
| Leanne Chukoskie | Nonlinear Group Dynamics: How science networks are greater than the sum of their parts | 10:00 - 10:20 | *p.2* |
| Ann Lam | Brainstem dynamics: short and long term changes in seizures and behavior | 10:20 - 10:40 | *p.2* |
| Jay S. Coggan | Simple rules for complex spike behavior during demyelination | 10:40 - 11:00 | *p.3* |
| | Group discussion | 11:00 - 11:10 | |
| | Coffee break | 11:10 - 11:20 | |
| THEME: Synapses & Cellular Communications | Chair: Collins Assisi | | |
| Justin Kinney | Generating high-quality reconstructions of neural tissue for morphometric analysis and modeling | 11:20 - 11:40 | *p.3* |
| Suhita Nadkarni | Astrocytes optimize synaptic transmission of information | 11:40 - 12:00 | *p.4* |
| Janina Hesse | Wiring up the brain with optimal gap junction conductances | 12:00 - 12:20 | *p.5* |
| | Group discussion | 12:20 - 12:30 | |
| | Lunch | 12:30 - 01:30 | |
| THEME: Structure & Dynamics | Chair: Suhita Nadkarni | | |
| Samat Moldakarimov | Role of recurrent connections in visual processing | 1:30 - 1:50 | *p.6* |
| Collins Assisi | Structural constraints on the dynamics of neuronal networks | 1:50 - 2:10 | *p.6* |
| Vladislav Volman | Signal processing in neuronal circuits - New vistas for plasticity and noise? | 2:10 - 2:30 | *p.7* |
| | Group discussion | 2:30 - 2:40 | |
| | Coffee break | 2:40 - 2:50 | |
| THEME: The Loss of Autonomy and its Recovery: Addiction, Allostasis, Agency, Art | Chair: Elan Liss Ohayon | | |
| Yariv Z. Levy | Ceasing the use of narcotics without treatments in the context of a multiscale computational model of addiction | 2:50 - 3:10 | *p.8* |
| Ioan Muntean | A Dynamical Aspect Of Autonomy: Allostasis | 3:10 - 3:30 | *p.9* |
| Lakshminarayan Srinivasan | Fast responses without false starts: Dorsal anterior cingulate cortex in simple reactive behavior | 3:30 - 3:50 | *p.9* |
| Thomas Nadelhoffer | The threat of shrinking agency | 3:50 - 4:10 | *p.10* |
| | Group discussion | 4:10 - 4:20 | |
| Ariel Garten | Dynamic thought creates dynamic world | 4:20 - 4:40 | *p.10* |
| Ping Wang | Closing remarks and announcements | 4:40 - 4:50 | |
| Dinner: Rock Bottom, La Jolla | | | |
| | Social & Dinner | 6:00 - 9:00 | |



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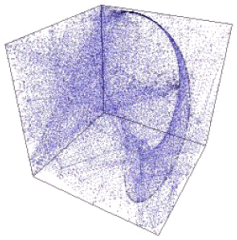
### Tuesday, July 28th - UCSD, Cognitive Science Building, Room 180

| | | | |
|---|---|---|---|
| **THEME: Transitions: Mechanisms & Measurement** | | **Chair: Yariv Z. Levy** | |
| Ann Lam | Introduction | 9:30-9:40 | |
| Mikhail Rabinovich | Metastability and transients in brain dynamics | 9:40-10:00 | *p.11* |
| Jen-Yung Chen | Interneuron mediated inhibition synchronizes neuronal activity during slow sleep oscillations | 10:00-10:20 | *p.12* |
| Arnold Mandell | Intermittent vorticity, power spectral scaling and dynamical measures on resting brain magnetic fields fluctuations | 10:20-10:40 | *p.13* |
| Elan Liss Ohayon | Pathways to deep symmetry breaking: Beating the odds through heterogeneous development | 10:40-11:00 | *p.14* |
| | Group discussion | 11:00-11:10 | |
| | Coffee break | 11:10-11:20 | |
| **THEME: Scales** | | **Chair: Ann Lam** | |
| Corinne Teeter | How would you describe a neuron? Insights from neural scaling laws | 11:20 - 11:40 | *p.15* |
| Stephen D. Larson | Multi-scale modeling in neuroscience: the knowledge management problem | 11:40 - 12:00 | *p.15* |
| | Group discussion | 12:00 - 12:10 | |
| **THEME: Context & Social Factors** | | **Chair: Elan Ohayon** | |
| Nadav Goldschmied | The underdog effect: definition, limitations, and motivations. Why do we support those at a competitive disadvantage? | 12:10 - 12:30 | *p.16* |
| | Lunch | 12:30 - 1:30 | |
| **THEME: Development & Evolution** | | **Chair: Stiliyan Kalitzin** | |
| Stiliyan Kalitzin | SAND's development & evolution | 1:30 - 1:40 | |
| Gedeon O. Deák | The development of 'social attention' in human infants: Implications for communication and social cognition | 1:40 - 2:00 | *p.17* |
| James B. Aimone | The role of new neurons throughout a lifetime | 2:00 - 2:20 | *p.17* |
| | Group discussion | 2:20 - 2:30 | |
| | Coffee break | 2:30 - 2:40 | |
| **THEME: Information & Coding Dynamics** | | **Chair: Janina Hesse** | |
| Ping Wang | Optimal synchrony in neural coding: Balancing timing and energy | 2:40 - 3:00 | *p.18* |
| Tatyana Sharpee | Optimization of neuronal nonlinearities | 3:00 - 3:20 | *p.19* |
| | Group discussion | 3:20 - 3:30 | |
| **THEME: Building Brains** | | **Chair: Ping Wang** | |
| Gert Cauwenberghs | Continuous neurodynamics in analog VLSI microchips | 3:30 - 3:50 | *p.20* |
| Marian Stewart Bartlett | Information maximization in face processing | 3:50 - 4:20 | *p.20* |
| | Group discussion | 4:20 - 4:30 | |
| | Closing remarks and announcements | 4:30 - 4:40 | |
| **SAND on Sand Social: La Jolla Shores, La Jolla** | | | |
| | Surfing, Snorkeling, Science by a Bonfire | 6:00 - 10:00 | |



## PRINCIPLES OF AUTONOMOUS NEURODYNAMICS 2009
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**Wednesday, July 29th - The Salk Institute, Parker Room**

FEATURED SPEAKER: Terrence Sejnowski, the Salk Institute for Biological Studies

| | | | |
|---|---|---|---|
| Ping Wang | Introduction | 9:30-9:35 | |
| Terrence Sejnowski | Homeostatic synaptic scaling can destabilize deafferented cortex | 9:35-9:50 | *p.21* |
| | Discussion | 9:50-10:00 | |

SPECIAL SESSION: Laboratory for Cognitive Neuroscience - Williams Syndrome

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|---|---|---|---|
| Ann Lam | Introduction | 10:00-10:05 | |
| Ursula Bellugi | Williams syndrome:<br>Linking genes, neural systems and cognitive/social functions | 10:05-10:20 | *p.21* |
| Inna Fishman | What can individuals with Williams syndrome tell us about social brain:<br>Results of event-related potentials studies | 10:20-10:40 | *p.22* |
| | Group discussion | 10:40-10:50 | |
| | Coffee break | 10:50-11:00 | |

ROUNDTABLE DISCUSSION: Development & Evolution
Chairs: Ping Wang, Ann Lam & Elan Liss Ohayon

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|---|---|---|
| *Round Table* | The Evolution, Development, Loss and Regaining of Autonomy | 11:00 - 11:50 |
| Ping Wang | Closing Remarks | 11:55 - 12:00 |
| | Lunch by the Salk waterfall | 12:00 - 1:00 |

POST-PRESENTATION EVENTS
SAND Scientific Retreat: Thursday July 30 - Saturday, August 1, 2009