



# BrainModes 2019 Pokhara, Nepal

December 11 - 13



Exploring Unified Principles of Brain Connectivity and Dynamics

BrainModes 2019, December 12 – 13. [BrainModes](#) is an annual meeting that brings together international experts from various disciplines and seeks to explore innovative means of understanding complex brain activity and multimodal neuroscience data sets. This year's meeting with oral and poster presentations will focus on exploring "Unified Principles of Brain Connectivity and Dynamics".

[BrainModes 2019 Pre-Conference Educational Course, December 11](#). The pre-conference course is intended to provide participants with the foundations of neuroimaging and computational neuroscience.

[Conference Venue and Travel Agency-Logistics Partner](#). Hotel Barahi, Pokhara and Makalu Travels (<https://brainmodes.makalutravels.com/>).

### Organizers.

Mukesh Dhamala, Georgia State University, Atlanta, USA

Daniele Marinazzo, Ghent University, Ghent, Belgium

Petra Ritter, Charité University, Berlin, Germany

### Full Program

BrainModes 2019 Events: Course (Dec 11), Main Meeting (Dec 12 - 13), Hiking (Dec 14)

#### Wednesday, December 11: Educational Course in Hotel Barahi, Lakeside, Pokhara

<b>8:45 AM</b>	<b>Coffee</b> (Intro by: Ritter, Dhamala, Marinazzo (Session Chair))
9:00 AM	<a href="#">Michael Breakspear</a> : <b>Introduction to brain connectivity and neuroimaging</b>
10:00 AM	<a href="#">Viktor Jirsa</a> : <b>Virtual Brain Theory</b>
11:00 AM	<a href="#">Petra Ritter</a> : <b>Virtual Brain Applications</b>
<b>12:00 PM</b>	<b>Lunch</b> (Chair: Dhamala)
1:30 PM	<a href="#">Mukesh Dhamala</a> : <b>Granger Causality Theory and Applications to Neuroscience</b>
2:30 PM	<a href="#">Daniele Marinazzo</a> : <b>Information-Theoretic Measures and Applications</b>
<b>3:30 PM</b>	<b>Coffee</b> (Chair: Ritter)
3:45 PM	<a href="#">Karl Friston</a> : <b>Dynamic Causal Modelling of Synaptopathy</b>
4:45 PM	<a href="#">Peter Robinson</a> : <b>Multiscale Brain Structure and Dynamics via Neural Field Theory</b>

Thursday, December 12: Main Meeting in Hotel Barahi, Lakeside, Pokhara

<b>8:30 - 8:35 AM</b>	<b>Welcome and opening remarks</b> (by Ritter, Marinazzo, Dhamala)
8:35 - 9:15 AM	<b>Karl Friston: The graphical brain and deep (active) inference</b>
9:15 - 9:55 AM	<b>Petra Ritter: Multi-scale principles of brain function</b>
9:55 - 10:35 AM	<b>Viktor Jirsa: Brain network recovery</b>
<b>10:35 - 10:50 AM</b>	<b>Coffee</b> (Chair: Marinazzo)
10:50 - 11:30 AM	<b>Peter Robinson: Structure-function relationships via eigenmodes</b>
11:30 - 12:10 PM	<b>Lucina Uddin: Brain dynamics and flexible behaviors</b>
12:10 - 12:50 PM	<b>Dipanjan Roy: Metastable brain dynamics and cognitive flexibility with aging</b>
<b>1:00 - 2:30 PM</b>	<b>Lunch</b> (Chair: Wassenhove)
2:30 - 3:10 PM	<b>Arpan Banerjee: A decoherence theory of perception</b>
3:10 - 3:50 PM	<b>Romy Lorenz: Neuroadaptive Bayesian optimization in cognitive neuroscience</b>
<b>3:50 - 4:05 PM</b>	<b>Coffee</b> (Chair: A. Singer)
4:05 - 4:45 PM	<b>Natsue Yoshimura: Large scale brain networks and motion decoding</b>
4:45 - 5:25 PM	<b>Michael Breakspear: Large-scale brain modes reorganize between infant sleep states and carry prognostic information for preterms</b>
<b>5:45 - 7: 30 PM</b>	<b>Poster Session</b> (list on the next page)
<b>7:30 PM -</b>	<b>Dinner</b>

Friday, December 13: Main Meeting in Hotel Barahi, Lakeside, Pokhara (Chair: Lorenz)

8:35 - 9:15 AM	<b>Elizabeth Buffalo: Hippocampal networks for memory formation</b>
9:15 - 9:55 AM	<b>Annabelle Singer: Decoding Memory in Health and Alzheimer's Disease</b>
9:55 - 10:35 AM	<b>Ana Solodkin: A mechanistic approach to Alzheimer's disease</b>
<b>10:35 - 10:50 AM</b>	<b>Coffee</b> (Chair: Uddin)
10:50 - 11:30 AM	<b>Dimitri Van De Ville: Structure-function coupling probed by graph signal processing</b>
11:30 - 12:10 PM	<b>Daniele Marinazzo: Relevance of the resting state hemodynamic response function for personalized brain modelling</b>
12:10 - 12:50 PM	<b>Sarah Garfinkel: Clinical neuroscience and the heart-brain axis</b>
<b>1:00 - 2:30 PM</b>	<b>Lunch</b> (Chair: Garfinkel)
2:30 - 3:10 PM	<b>Pedro Valdes-Sosa: Statistical Inference in MEEG source connectivity</b>
3:10 - 3:50 PM	<b>Qing Cai: Brain networks and language lateralization</b>
<b>3:50 - 4:05 PM</b>	<b>Coffee</b> (Chair: Ritter)
4:05 - 4:45 PM	<b>Virginie van Wassenhove: From timing to meaning through phase synchronization</b>
4:45 - 5:25 PM	<b>Wolf Singer: Computing in high-dimensional state space</b>
<b>5:25 PM -</b>	<b>Closing remarks</b> (by Dhamala and Ritter)

Bus Pick Up Time	Saturday, December 14: Pokhara Hiking jointly with Winter School in AI
7:30am - 8:0am	Pokhara->Kande->Australian Camp->Dhampus->Phedi->Pokhara
@Hotel Barahi	(Hiking starts at Kande and ends at Phedi, which may take about 8 hours)

## List of Posters

Number	Title/Authors
1	<b>A scale-integrated approach to understanding brain states; from single neuron biophysics to macroscopic dynamics</b> Jennifer S. Goldman, Lionel Kusch, Viktor K. Jirsa, Trang-Anh E. Nghiem, and Alain Destexhe
2	<b>Dynamic causal modelling of corticostriatal connections after TBI &amp; methylphenidate treatment</b> Maria Balaet
3	<b>Epileptic seizures lead to a loss of near-critical brain organisation in the zebrafish brain</b> Rosch RE*, Burrows D*, Samarut É, Bassett DS, Meyer MP * equal contribution
4	<b>Eigenmode analysis of brain activity in a convoluted cortex via neural field theory</b> K. N. Mukta, P. A. Robinson, J. C. Pagès, and Xiao Gao
5	<b>Brain Structural and Functional Basis of Musical Improvisation: a dMRI and fMRI Study</b> Kiran Dhakal, Mukesh Dhamala
6	<b>On the perspectives of applying the Janashia-Lagvilava matrix spectral factorization algorithm in neuroscience</b> Mukesh Dhamala, <a href="#">Lasha Ephremidze</a> and Ilya Spitkovsky
7	<b>Brain Network Constraints and Recurrent Neural Networks reproduce unique Trajectories and State Transitions seen over the span of minutes in resting state fMRI</b> Amrit Kashyap and Shella Keilholz
8	<b>Using dimensionality reduction to study individual differences in brain activity during rich stimulation</b> Aahana Bajracharya, Rhodri Cusack , Jonathan E. Peelle
9	<b>Beneficial effects of video game-playing: a look into the brain functional connectivity during perceptual decision-making</b> Timothy Jordan and Mukesh Dhamala
10	<b>A Simple Model of Attentional Blink</b> Nadav Amir
11	<b>Modal analysis of connectivity fluctuations in synaptic depression using neural field theory</b> Nipa Roy

12	<b>Modeling Electroencephalogram data using a network of complex-valued neural oscillators</b>
	V. Srinivasa Chakravarthy, Dipayan Biswas, Sooriyakiran Pallikkulath, Asit Tarsode
13	<b>Multiscale decomposition of information transfer in the midcingulate cortex</b>
	Nigel Colenbier, Daniele Marinazzo
14	<b>Towards a mesoscale investigation of functional brain dynamics with graph signal processing</b>
	Thomas A. W. Bolton
15	<b>Rhythm-based expectation modulates neural activity via non-specific gain increase</b>
	Ryszard Auksztulewicz, Nicholas E. Myers, Jan W. Schnupp, Anna C. Nobre
16	<b>Whole brain modeling using Metastability and Intrinsic Ignition to unresolve the brain dynamics in schizophrenia patients</b>
	Karthik S
17	<b>Spatially resolved time-frequency framework for the estimation of brain connectivity and nonlinearities in neural dynamics</b>
	Ying Wang, Deirel Paz-Linares, Min Li, Ariosky Areces-Gonzales, Jorge Bosch-Bayard, Maria Luisa Bringas-Vega and Pedro A. Valdés-Sosa
18	<b>Identifying the “Effective dynamics” of high dimensional Neural Mass systems</b>
	Anisleidy González Mitjansi, Pedro A. Valdes-Sosa
19	<b>A differential-algebraic formulation of Neural Mass Models with applications to distributed axons delays</b>
	Anisleidy González Mitjans and Pedro Valdes-Sosa
20	<b>MRI-DWI-MEEG pipeline for individualized insilico Brain preparation</b>
	Deirel Paz-Linares, Ariosky Areces-Gonzalez, Ying Wang, Anisleidy González-Mitjans, Zakarya Ahmed, Usama Riaz, Qin Wang, Jorge Bosch-Bayard and Pedro A. Valdés-Sosa
21	<b>Flexibility of patterns of avalanches in source-reconstructed magnetoencephalography</b>
	Pierpaolo Sorrentino, Rosaria Rucco, Fabio Baselice, Anna Lardone, Laura Mandolesi <sup>6</sup> , Rosa De Micco, Alessandro Tessitore, Michael Breakspear, Giuseppe Sorrentino, and Leonardo Gollo
22	<b>On the contributions of the hemodynamic response in fMRI brain fingerprinting</b>
	Enrico Amico, Guo-rong Wu , Joaquín Goñi and Daniele Marinazzo