



## **BrainModes 2010**

**Noise, oscillations and frequency locking in neural systems**

**BrainModes Conference and DCAMM Course**

***Copenhagen, December 9–11, 2010***

**Further information and registration:**

<http://www.mat.dtu.dk/people/J.Starke/brainmodes.html>

**Location:**

Technical University of Denmark  
Department of Mathematics  
Matematiktorvet, Bdg. 303 N, Lecture hall 49  
DK-2800 Kongens Lyngby  
Denmark

**Date:**

9.-11.12.2010

**Organization:**

Jens Starke (Technical University of Denmark)  
Andreas Daffertshofer (VU University, The Netherlands)  
Michael Breakspear (University of New South Wales, Australia)  
Petra Ritter (Charité Berlin and Bernstein Center for Computational Neuroscience, Germany)

**Aims:**

The BrainModes meeting is an annual meeting which seeks to explore innovative means of understanding complex brain activity and multimodal neuroscience data sets. The inaugural BrainModes meeting was held in Berlin in 2007, followed by Amsterdam in 2008, Bristol in 2009. The objective of these meetings is to foster informal discussion of brain modeling and multivariate data analysis (EEG, MEG, fMRI, etc). The central motif is that of “modes” that is, understanding how complex brain activity is organized around low dimensional manifolds. The IVth event in this tradition will take place in December 2010 at the Technical University of Denmark in Lyngby (north Copenhagen).

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**Thursday, 9. December 2010**

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**Models and Oscillations**

09:00–09:45 Michael Breakspear (University of New South Wales, Australia)  
*Nonlinear models of neuronal dynamics: From spiking neurons to neural masses and fields*

09:45–10:30 Ole Jensen (Centre for Cognitive Neuroimaging, The Netherlands)  
*Shaping functional architecture by oscillatory alpha activity: gating by inhibition*

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10:30–11:15 **Discussion** and afterwards tea & coffee

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11:15–12:00 Rosalyn Moran (Wellcome Trust Centre for Neuroimaging, UK)  
*A Consistent Spectral Estimation Approach for Nonlinear Dynamic Causal Modelling of Steady State Responses*

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12:00–14:00 Lunch break with **discussion**, tea & coffee

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**Contributed Talks**

14:00–14:30 Bernadette C.M. van Wijk (VU University Amsterdam)  
*Characterizing complex brain networks using graph theory*

14:30–15:00 Frank Schilder (Technical University of Denmark, Denmark)  
*A Matlab Continuation Toolbox for Response Tracking in Experiments*

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15:00–15:45 **Discussion** and afterwards tea & coffee

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**Systems**

15:45–16:30 Jens Midtgaard (University of Copenhagen, Denmark)  
*Olfaction as a model for sensory brain function*

16:30–17:15 J. Leo van Hemmen (TU Munich, Germany)  
*Snake Infrared Vision: How to make neuronal sense out of totally blurred input*

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19:00–21:00 Dinner

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**Friday, 10. December 2010**

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**Noise and Networks**

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09:00–09:45 Andreas Daffertshofer (VU University, The Netherlands)  
*Neurons, Networks and Noise*

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09:45–10:30 Alain Destexhe (UNIC & CNRS, France)  
*Microscopic and macroscopic scales of neuronal noise: from single cells to local field potentials*

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10:30–11:15 **Discussion** and afterwards tea & coffee

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11:15–12:00 Hans Crauel (University of Frankfurt, Germany)  
*Generalizations of the Concept of Bifurcation to Stochastic Systems*

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12:00–14:00 Lunch break with **discussion**, tea & coffee

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**Contributed Talks**

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14:00–14:30 Marc Goodfellow (University of Manchester, UK)  
*Spatially extended neural mass modelling of absence seizures*

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14:30–15:00 Frank Freyer (Charité – University Medicine Berlin, Germany)  
*Dynamic mechanisms of multistability in resting state cortical rhythms*

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15:00–15:45 **Discussion** and afterwards tea & coffee

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15:45–16:30 Markus Dahlem (TU Berlin, Germany)  
*On the onset of excitability in spatially extended systems and its relevance for migraine therapy*

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16:30– **Discussion** and drinks

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**Saturday, 11. December 2010**

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**Mathematical Techniques in Nonlinear Dynamics**

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09:00–09:45 Hinke Osinga (University of Bristol, UK)  
*Slow manifolds and mixed-mode oscillations*

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09:45–10:30 Bernd Krauskopf (University of Bristol, UK)  
*The geometry of mixed-mode oscillations in the 4D Olsen model*

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10:30–11:15 **Discussion** and afterwards tea & coffee

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**Linking Experiments and Models**

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11:15–12:00 Petra Ritter (Charité Berlin, Germany)  
*Modes, models and multimodal measures*

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12:00–12:45 Viktor Jirsa (CNRS, France)  
*Emergence of function from network dynamics*

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12:45–14:00 **Final discussion**, lunch break and transportation to the center of Copenhagen

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**Science, History, and Excursion**

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14:00–16:00 Hans True (Technical University of Denmark)  
*A nonlinear, complex but deterministic guided walking tour through the Latin Quarter of the old Copenhagen*

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16:00– Amusement Park Tivoli (<http://www.tivoli.dk>) with Christmas Market

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