

# International Seminar Causality, Information Transfer and Dynamical Networks

• 12 May - 04 July 2014 •

Embedded workshop • 16 - 20 June 2014

## Scientific coordination:

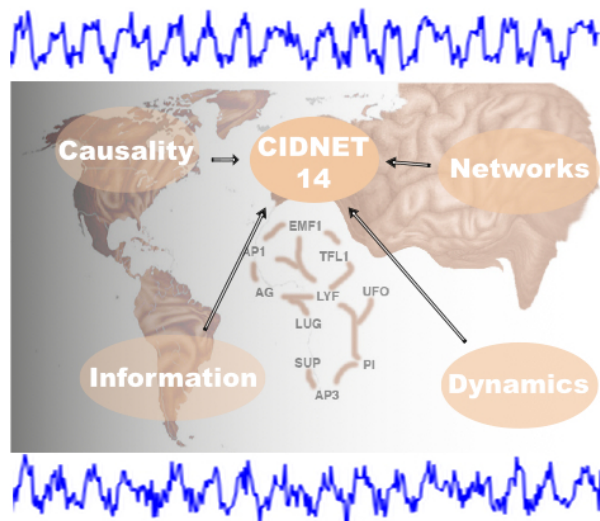
**Jörn Davidsen**  
University of Calgary  
Canada

**Peter Grassberger**  
FZ Jülich  
Germany

**Björn Schelter**  
University of Aberdeen  
United Kingdom

## Organisation:

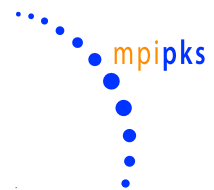
**Claudia Pönisch**



## PROGRAM



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<http://www.pks.mpg.de/~cidnet14>



The program will be continuously updated during the event.  
This version was printed on **July 2, 2014**.

## Seminar outline

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Research overview talks should give a brief overview of research interests related to the topic of the seminar program with a specific focus on open questions and challenges, which could lead to joint projects with other participants. These talks should not be confused with regular seminar talks, which will be scheduled for the following weeks. The research overview talks can be quite informal and should be no longer than 20min but they can certainly be much shorter. We will allow for plenty of time for discussions between these talks.

The structured program for the following weeks (week 2 - 4) will consist of a mixture of mini-lectures on different topics, research overview talks by newly arriving participants, round table discussions to specific topics and some regular seminar talks. The specific details will be worked out in discussion with the participants during the first few days of the seminar program. We will have ample time for actual research work and scientific discussions in smaller groups - these unstructured activities are at the core of the seminar program.

Please note that we will likely schedule the majority of the regular seminar talks during the week before and after the workshop (week 5 and 7), when the number of participants is the highest.

# Seminar Week 1 - Program<sup>1</sup>

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## Monday, May 12

- 10:30 - 11:00 Coffee & tea
- 11:00 - 12:30 Welcome & introduction - **room 1D1**
- 12:30 - 14:00 Lunch break
- 14:00 - 15:30 Research overview talks - **room 1D1**

**Peter Grassberger** (FZ Jülich)  
**Jörn Davidsen** (University of Calgary)  
**Jaroslav Hlinka** (Academy of Sciences of the Czech Republic)

- 15:30 - 16:00 Break with coffee & tea
- 16:00 - 17:30 Research overview talks - **room 1D1**

**Elliot Martin** (University of Calgary)  
*Testing the robustness of functional network methods, and novel information theoretic techniques*  
**Sarah Hallerberg** (MPI for Dynamics and Self-Organization, Göttingen)  
**Holger Kantz** (MPI PKS)

## Tuesday, May 13

- 09:00 - 10:30 Research overview talks - **room 1D1**

**Jakob Runge** (Potsdam Institute for Climate Impact Research)  
**Damian Gabriel Hernandez Lahme**  
(Instituto Balseiro and Centro Atomico Bariloche, CNEA and CONICET)  
*Co-occurrence of symbols in a sequence*

- 10:30 - 11:00 Break with coffee & tea
- 11:00 - 12:30 Research overview talks - **room 1D1**

**Luis Tapia** (DRCC, Campinas)  
*A study of the resting state of the brain using fMRI and NIRS*  
**Benjamin Wahl** (University of Oldenburg)  
*Wind farm measurements and ECoG signals*  
**Gautam Sethia** (Institute for Plasma Research, Gandhinagar)  
*Chimera states in coupled oscillator systems*

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<sup>1</sup>Abstracts available at <http://www.pks.mpg.de/~cidnet14/>

# Seminar Week 1 - Program<sup>1</sup>

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12:30 - 14:00 Lunch break

14:00 - 15:30 Research overview talks - **room 1D1**

**Stephan Bialonski** (MPI PKS)

*Harmful algal blooms and the prediction of extreme events in networks*

**Dorota Wejer** (The University of Gdańsk)

15:30 - 16:00 Break with coffee & tea

16:00 - 17:30 Round table discussion - **room 2A1**

## Wednesday, May 14

09:00 - 10:30 Round table discussion - **room 2A1**

10:30 - 11:00 Break with coffee & tea

11:00 - 12:30 Research time and informal discussions

12:30 - 14:00 Lunch break

14:00 - 15:30 Research time and informal discussions

15:30 - 16:00 Break with coffee & tea

16:00 - 17:30 Research time and informal discussions

## Thursday, May 15

09:00 - 10:30 Round table discussion - **room 2A1**

10:30 - 11:00 Break with coffee & tea

11:00 - 12:30 Research time and informal discussions

12:30 - 14:00 Lunch break

14:00 - 15:30 Research time and informal discussions

15:30 - 16:00 Break with coffee & tea

16:00 - 17:30 Research time and informal discussions

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# Seminar Week 1 - Program<sup>1</sup>

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## Friday, May 16

- 09:00 - 10:30 Round table discussion - **room 2A1**
- 10:30 - 11:00 Break with coffee & tea
- 11:00 - 12:30 Research time and informal discussions
- 12:30 - 14:00 Lunch break
- 14:00 - 15:30 Research time and informal discussions
- 15:30 - 16:00 Break with coffee & tea
- 16:00 - 17:30 Research time and informal discussions

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# Seminar Week 2 - Program<sup>1</sup>

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## Monday, May 19

09:00 - 10:00 Round table discussion - **seminar room 3**

10:00 - 10:30 Break

10:30 - 12:00 Mini-lecture - **seminar room 1**

**Jakob Runge** (Potsdam Institute for Climate Impact Research)  
*Causality & information theory*

12:00 - 14:00 Lunch break

14:00 - 15:30 Research overview talk & discussions - **seminar room 3**

**Milan Palus** (Academy of Sciences of the Czech Republic)

15:30 - 16:00 Break

16:00 - 17:30 Research time and informal discussions

## Tuesday, May 20

09:00 - 10:00 Round table discussion - **room 2A1**

10:00 - 10:30 Break

10:30 - 12:00 Seminar talk - **seminar room 1**

**Mason Porter** (Oxford University)  
*Community structure in multilayer networks*

12:00 - 14:00 Lunch break

14:00 - 15:30 Research time and informal discussions

15:30 - 16:00 Break

16:00 - 17:30 Research time and informal discussions

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## Seminar Week 2 - Program<sup>1</sup>

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### Wednesday, May 21

09:00 - 10:00 Round table discussion - **room 1D1**

10:00 - 10:30 Break

10:30 - 12:00 Research overview talk & discussions - **room 1D1**

**Eckehard Olbrich** (MPI for Mathematics in the Sciences, Leipzig)  
*Information theoretic approaches to complex systems*

12:00 - 14:00 Lunch break

14:00 - 15:30 Research time and informal discussions

15:30 - 16:00 Break

16:00 - 17:30 Research time and informal discussions

### Thursday, May 22

09:00 - 10:00 Round table discussion - **room 2A1**

10:00 - 10:30 Break

10:30 - 12:00 Research time and informal discussions

12:00 - 14:00 Lunch break

14:00 - 15:30 Mini-lecture - **seminar room 1**

**Peter Grassberger** (FZ Jülich)  
*Mutual information: Estimation and applications to inference of gene interaction networks and phylogenetic trees*

15:30 - 16:00 Break

16:00 - 17:30 Research time and informal discussions

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## Seminar Week 2 - Program<sup>1</sup>

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### Friday, May 23

- 09:00 - 10:00 Round table discussion - **room 2A1**
- 10:00 - 10:30 Break
- 10:30 - 12:00 Research time and informal discussions OR mini-lecture (tbd)
- 12:00 - 14:00 Lunch break
- 14:00 - 15:30 Research time and informal discussions
- 15:30 - 16:00 Break
- 16:00 - 17:30 Research time and informal discussions

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<sup>1</sup>Abstracts available at <http://www.pks.mpg.de/~cidnet14/>

# Seminar Week 3 - Program<sup>1</sup>

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## Monday, May 26

09:00 - 09:45 Round table discussion - **room 1D1**

09:45 - 10:15 Break

10:15 - 12:15 Research overview talks & round table discussion - **seminar room 3**

**Agostina Palmigiano** (MPI for Dynamics and Self-Organization, Göttingen)

12:15 - 14:00 Lunch break

14:00 - 15:30 Research time and informal discussions

15:30 - 16:00 Break

16:00 - 17:30 Research time and informal discussions

## Tuesday, May 27

09:00 - 09:45 Round table discussion - **room 2A1**

09:45 - 10:15 Break

10:15 - 12:15 Research time and informal discussions

12:15 - 14:00 Lunch break

14:00 - 15:30 Research time and informal discussions

15:30 - 16:00 Break

16:00 - 17:30 Research time and informal discussions

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# Seminar Week 3 - Program<sup>1</sup>

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## Wednesday, May 28

10:00 - 11:30 Seminar talk/mini-lecture - **room 1D1**

**Jörn Davidsen** (University of Calgary)

*Structural and functional networks in nerve cell cultures and the brain*

11:30 - 12:30 Round table discussion - **room 1D1**

12:30 - 14:00 Lunch break

14:00 - 15:30 Research time and informal discussions

15:30 - 16:00 Break

16:00 - 17:30 Research time and informal discussions

## Thursday, May 29

**Ascension Day - public holiday**

## Friday, May 30

09:00 - 09:45 Round table discussion - **room 2A1**

09:45 - 10:15 Break

10:15 - 12:15 Research time and informal discussions

12:15 - 14:00 Lunch break

14:00 - 15:30 Research time and informal discussions

15:30 - 16:00 Break

16:00 - 17:30 Research time and informal discussions

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# Seminar Week 4 - Program<sup>1</sup>

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## Monday, June 02

09:00 - 10:30 Research overview talks & discussions - **room 1D1**

**Sandra Chapman** (University of Warwick)

**Heidelinde Röder** (University of Oldenburg)

*Reconstruction of causality from short, unevenly sampled environmental time series*

10:30 - 11:00 Break

11:00 - 12:30 Round table discussion - **room 2A1**

12:30 - 14:00 Lunch

14:00 - 15:30 Research time and informal discussions

15:30 - 16:00 Break

16:00 - 17:30 Research time and informal discussions

## Tuesday, June 03

09:00 - 10:30 Research overview talk & round table discussion - **room 1D1**

**Björn Schelter** (University of Aberdeen)

**Michael Eichler** (Maastricht University)

10:30 - 11:00 Break

11:00 - 12:30 Round table discussion - **room 2A1**

12:30 - 14:00 Lunch

14:00 - 15:30 Research time and informal discussions

15:30 - 16:00 Break

16:00 - 17:30 Research time and informal discussions

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<sup>1</sup>Abstracts available at <http://www.pks.mpg.de/~cidnet14/>

# Seminar Week 4 - Program<sup>1</sup>

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## Wednesday, June 04

09:00 - 09:45 Round table discussion - **room 2A1**

09:45 - 10:15 Break

10:15 - 12:15 Mini lecture - **room 1D1**

**Björn Schelter** (University of Aberdeen)  
*Granger causal inference of networks I*

12:15 - 14:00 Lunch

14:00 - 15:30 Mini lecture - **room 1D1**

**Björn Schelter** (University of Aberdeen)  
*Granger causal inference of networks II*

15:30 - 16:00 Break

16:00 - 17:30 Research time and informal discussions

## Thursday, June 05

10:00 - 11:30 Seminar talk - **room 1D1**

**Eckehard Olbrich** (MPI for Mathematics in the Sciences)  
*Information transfer across scales and levels*

12:30 - 14:00 Lunch

14:00 - 15:30 Research time and informal discussions

15:30 - 16:00 Break

16:00 - 17:30 Research time and informal discussions

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# Seminar Week 4 - Program<sup>1</sup>

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## Friday, June 06

09:00 - 10:30 Round table discussion - **room 2A1**

10:30 - 11:00 Break

11:00 - 12:30 Seminar talk - **room 1D1**

**Sandra Chapman** (University of Warwick)

*Edge localized modes (large scale energy release events) in magnetically confined plasmas for fusion: Coincidence, causality, predictability or synchronization?*

12:30 - 14:00 Lunch

14:00 - 15:30 Research time and informal discussions

15:30 - 16:00 Break

16:00 - 17:30 Research time and informal discussions

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<sup>1</sup>Abstracts available at <http://www.pks.mpg.de/~cidnet14/>

# Seminar Week 5 - Program<sup>1</sup>

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**Monday, June 09**

**Pentecost Monday - public holiday**

**Tuesday, June 10**

09:00 - 10:30 Research overview talks & discussions - **room 1D1**

**Dante R. Chialvo** (CONICET)  
**Jie Sun** (Clarkson University)  
**Joe Dods** (University of Warwick)

10:30 - 11:00 Break with coffee & tea

11:00 - 12:30 Research overview talks & discussions - **room 1D1**

**Christian Meisel** (NIMH, University Clinic Carl Gustav Carus Dresden)  
**Michael Rosenblum** (Potsdam University)  
**Nicolas Rubido** (University of Aberdeen)  
*Network inference from time-series measurements*

12:30 - 14:00 Lunch

14:00 - 15:30 Research overview talks & discussions - **room 1D1**

**Vimal Kishore** (Indian Institute of Science Education and Research, Pune)  
**Shambhavi Srivastavi** (University of Aberdeen)  
*Understanding the grammar behind genome*  
**Heba Elsegai** (University of Aberdeen)  
*Network inference from irregular time series*

15:30 - 16:00 Break with coffee & tea

16:00 - 17:30 Round table discussion - **room 1D1**

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# Seminar Week 5 - Program<sup>1</sup>

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## Wednesday, June 11

09:30 - 10:30 Mini-lecture - **room 1D1**

**Michal Zochowski** (University of Michigan)

*Interaction of nodal and network connectivity properties in neuronal networks  
- part I*

10:30 - 11:00 Break with coffee & tea

11:00 - 12:00 Mini-lecture - **room 1D1**

**Michal Zochowski** (University of Michigan)

*Interaction of nodal and network connectivity properties in neuronal networks  
- part II*

12:00 - 14:00 Lunch

14:00 - 15:30 Research time and informal discussions

15:30 - 16:00 Break with coffee & tea

16:00 - 17:30 Research time and informal discussions

## Thursday, June 12

09:00 - 10:30 Round table discussion - **room 1D1**

10:30 - 11:00 Break with coffee & tea

11:00 - 12:30 Research time and informal discussions

12:30 - 14:00 Lunch

14:00 - 15:30 Research time and informal discussions

15:30 - 16:00 Break with coffee & tea

16:00 - 17:30 Research time and informal discussions

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# Seminar Week 5 - Program<sup>1</sup>

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## Friday, June 13

09:00 - 10:30 Round table discussion - **seminar room 3**

10:30 - 11:00 Break with coffee & tea

11:00 - 12:30 Seminar talk - **room 1D1**

**Sarah Hallerberg** (MPIDS Göttingen)

*Predicting and triggering long jumps and sticks in molecular diffusion*

12:30 - 14:00 Lunch

14:00 - 15:30 Seminar talk - **room 1D1**

**Kris Vasudevan** (University of Calgary)

*Insight into earthquake sequencing:*

*A graph theoretic approach to modified Markov chain model*

15:30 - 16:00 Break with coffee & tea

16:00 - 17:30 Research time and informal discussions

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# Workshop Week<sup>1</sup>

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## Sunday, June 15

18:00 - 20:00 registration

18:30 - 21:00 welcome reception

## Monday, June 16

07:30 - 09:00 breakfast

08:00 - 16:30 registration

08:45 - 09:00 Jan-Michael Rost (managing director of MPIPKS) and scientific coordinators opening

Chair: Jörn Davidsen

09:00 - 09:50 **John M. Beggs** (Indiana University)  
*The impact of network structure on criticality in cortical circuits*

09:50 - 10:40 **Jan W. Kantelhardt** (Martin-Luther-Universität Halle-Wittenberg)  
*The reconstruction of dynamical physiological networks from time series*

10:40 - 11:10 Break with coffee & tea

11:10 - 12:00 **Michael Eichler** (Maastricht University)  
*Causal inference from multivariate time series: Principles and problems*

12:00 - 12:25 **Sandra Chapman** (University of Warwick)  
*Fast reconfiguration of high-frequency human brain networks in response to surprising changes in auditory input*

12:25 - 14:20 Lunch

Chair: Peter Grassberger

14:20 - 15:10 **Holger Kantz**(MPIPKS)  
*Causality versus predictability*

15:10 - 15:35 **Jie Sun** (Clarkson University)  
*Causal network inference by optimal causation entropy*

15:35 - 16:00 **Sarika Jalan**(IIT Indore)  
*Importance of randomness in networks: A random matrix theory framework*

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# Workshop Week<sup>1</sup>

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16:00 - 16:30 Break with coffee & tea

16:30 - 17:30 **CIDNET14 Colloquium** - Chair: Eduardo Altmann (MPIPKS)

**Klaus Lehnertz** (University of Bonn)  
*Large-scale epileptic networks*

18:00 - 19:30 Dinner

## Tuesday, June 17

07:30 - 09:00 breakfast

08:00 - 16:30 registration

Chair: Michael Eichler

09:00 - 09:50 **Michal Zochowski** (University of Michigan)  
*From network dynamics to network structure and back*

09:50 - 10:40 **Lionel Barnett** (University of Sussex)  
*Information flow and phase transitions in complex systems*

10:40 - 11:10 Break with coffee & tea

11:10 - 12:00 **Celso Grebogi** (University of Aberdeen)  
*Time-series based prediction of dynamical systems and complex networks*

12:00 - 12:25 **Jaume Casademunt** (Universitat de Barcelona)  
*Noise focusing: The emergence of coherent activity in neuronal cultures*

12:25 - 14:00 Lunch

Chair: Holger Kantz

14:00 - 14:50 **Tim Sauer** (George Mason University)  
*Network inference from spike trains and time series*

14:50 - 15:40 **Milan Palus** (Institute of Computer Science - CAS)  
*Cross-scale information transfer: Atmospheric dynamics*

15:40 - 16:10 Break with coffee & tea

16:10 - 16:35 **Linda Sommerlade** (University of Aberdeen)  
*Assessing the strength of directed influences among neural signals:  
An approach to noisy data*

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# Workshop Week<sup>1</sup>

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- 16:35 - 17:00 **Javier Orlandi** (Universitat de Barcelona)  
*Transfer entropy reconstruction of neuronal networks from calcium imaging data*
- 17:00 - 17:25 **Christian Meisel** (NIMH, University Clinic Carl Gustav Carus Dresden)  
*Sleep, criticality and information processing in the brain*
- 18:00 - 19:30 Dinner
- 19:30 - 21:00 **Poster session I**  
(including free drinks)

## Wednesday, June 18

- 07:30 - 09:00 breakfast  
08:00 - 16:30 registration
- Chair: Klaus Lehnertz
- 09:00 - 09:50 **Stefan Kiebel** (TU Dresden & MPI for Human Cognitive and Brain Sciences, Leipzig)  
*Dynamic causal modelling for magneto- and electroencephalography*
- 09:50 - 10:40 **Jakob Runge** (Potsdam Institute for Climate Impact Research)  
*Quantifying causal interactions from time series of complex systems*
- 10:40 - 10:45 **Group photo**  
(to be published on the CIDNET14 website)
- 10:45 - 11:10 Break with coffee & tea
- 11:10 - 12:00 **Markus Müller** (Universidad Autónoma del Estado de Morelos)  
*Are epileptic seizures condensed sleep?*
- 12:00 - 13:00 Lunch

## Social program (excursion & dinner)

- 13:15 tram to the city center (tickets provided)  
14:00 paddle steamer tour  
15:00 bus to Koenigstein Fortress  
16:00 guided tour (English and German)  
18:00 workshop dinner  
20:30 bus to Dresden

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# Workshop Week<sup>1</sup>

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## Thursday, June 19

07:30 - 09:00 breakfast

08:00 - 16:30 registration

Chair: Tim Sauer

09:00 - 09:50 **Dante R. Chialvo** (CONICET)

*The brain at the edge*

09:50 - 10:40 **Michael Rosenblum** (Potsdam University)

*Reconstructing effective phase connectivity of oscillator networks from observations*

10:40 - 11:10 Break with coffee & tea

11:10 - 12:00 **Michael Stumpf** (Imperial College London)

*Cellular inference*

12:00 - 12:25 **Jaroslav Hlinka** (Institute of Computer Science - CAS)

*Using computational models to relate structural and functional brain connectivity*

12:25 - 14:00 Lunch

Chair: Björn Schelter

14:00 - 14:50 **Peter Stadler** (Leipzig University)

*Chromatin-based regulation: A computational interpretation and the role of ncRNAs*

14:50 - 15:40 **Ilya Nemenman** (Emory University)

*Predictive information, adaptation, criticality, and all that*

15:40 - 16:10 Break with coffee & tea

16:10 - 16:35 **Premysl Jiruska** (Institute of Physiology - CAS)

*Unstable neuronal network dynamics precedes transition to seizure and seizure termination*

16:35 - 17:00 **Reik Donner** (Potsdam Institute for Climate Impact Research)

*Geometric approaches to detecting coupling directions and synchronization - A complex network perspective*

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# Workshop Week<sup>1</sup>

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17:00 - 17:25 **Omri Tal** (MPI for Mathematics in the Sciences)  
*Quantifying the complexity of population structure*

18:00 - 19:30 Dinner

19:30 - 21:00 **Poster session II**  
(including free drinks)

## Friday, June 20

07:30 - 09:00 breakfast

08:00 - 16:30 registration

Chair: Michal Zochowski

09:00 - 09:50 **Ljupco Kocarev** (Macedonian Academy of Sciences and Arts)  
*Epidemic spreading on complex networks*

09:50 - 10:40 **Christoph Bandt** (Greifswald University)  
*Order patterns in time series and models of  $1/f$  noise*

10:40 - 11:10 Break with coffee & tea

11:10 - 12:00 **Klaus Lehnertz** (University of Bonn)  
*Data-driven network inference: What's next?*

12:00 - 12:25 Closing remarks

12:25 - 14:00 Lunch

14:00 - 18:30 Research time and informal discussions

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<sup>1</sup>Abstracts available at <http://www.pks.mpg.de/~cidnet14/>

# Seminar Week 7 - Program<sup>1</sup>

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## Monday, June 23

09:00 - 10:00 Round table discussion - **room 1D1**

10:00 - 10:30 Break with coffee & tea

10:30 - 12:00 Seminar talk - **seminar room 1**

**Xiaogeng Wan** (Imperial College London)

*Comparison of modern causality measures: PDC, TE, MIME and PMIME*

12:00 - 14:00 Lunch break

14:00 - 15:30 Research time and informal discussions

15:30 - 16:00 Break with coffee & tea

16:00 - 17:30 Research time and informal discussions

## Tuesday, June 24

09:00 - 10:00 Round table discussion - **room 1D1**

10:00 - 10:30 Break with coffee & tea

10:30 - 12:00 Seminar talk - **room 1D1**

**Markus Müller** (Universidad Autónoma del Estado de Morelos)

*How to orchestrate a football team?*

12:00 - 14:00 Lunch break

14:00 - 15:30 Research time and informal discussions

15:30 - 16:00 Break with coffee & tea

16:00 - 17:30 Research time and informal discussions

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# Seminar Week 7 - Program<sup>1</sup>

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## Wednesday, June 25

09:00 - 10:00 Round table discussion - **room 1D1**

10:00 - 10:30 Break with coffee & tea

10:30 - 12:00 Seminar talk - **room 1D1**

**Viola Priesemann** (MPI for Dynamics and Self-Organization)

*Bridging the gap between self-organized criticality and the dynamics of neural activity in vivo*

12:00 - 14:00 Lunch break

14:00 - 15:30 Research time and informal discussions

15:30 - 16:00 Break with coffee & tea

16:00 - 17:30 Research time and informal discussions

## Thursday, June 26

09:00 - 10:00 Round table discussion - **room 1D1**

10:00 - 10:30 Break with coffee & tea

10:30 - 12:00 Seminar talk - **room 1D1**

**Arlex Marín** (Universidad Autonoma del Estado de Morelos)

*Graph theoretical analysis of EEG on focal onset seizures: Extra- and intracranial recordings*

12:00 - 14:00 Lunch break

14:00 - 15:30 Research time and informal discussions

15:30 - 16:00 Break with coffee & tea

16:00 - 17:30 Research time and informal discussions

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# Seminar Week 7 - Program<sup>1</sup>

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## Friday, June 27

09:00 - 10:00 Round table discussion - **room 1D1**

10:00 - 10:30 Break with coffee & tea

10:30 - 12:00 Seminar talk - **room 1D1**

**Carlo Cafaro** (Clarkson University)  
*Symbolic causation entropy*

12:00 - 14:00 Lunch break

14:00 - 15:30 Research time and informal discussions

15:30 - 16:00 Break with coffee & tea

16:00 - 17:30 Research time and informal discussions

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<sup>1</sup>Abstracts available at <http://www.pks.mpg.de/~cidnet14/>

# Seminar Week 8 - Program<sup>1</sup>

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## Monday, June 30

- 09:00 - 09:45 Round table discussion - **room 1D1**
- 09:45 - 10:15 Break
- 10:15 - 12:15 Research time and informal discussions
- 12:15 - 14:00 Lunch break
- 14:00 - 15:30 Research time and informal discussions
- 15:30 - 16:00 Break
- 16:00 - 17:30 Research time and informal discussions

## Tuesday, July 1

- 09:00 - 09:45 Round table discussion - **room 2A1**
- 09:45 - 10:15 Break
- 10:15 - 12:15 Research time and informal discussions
- 12:15 - 14:00 Lunch break
- 14:00 - 15:30 Research time and informal discussions
- 15:30 - 16:00 Break
- 16:00 - 17:30 Research time and informal discussions

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<sup>1</sup>Abstracts available at <http://www.pks.mpg.de/~cidnet14/>

# Seminar Week 8 - Program<sup>1</sup>

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## Wednesday, July 2

- 09:00 - 09:45 Round table discussion - **room 2A1**
- 09:45 - 10:15 Break
- 10:15 - 12:15 Research time and informal discussions
- 12:15 - 14:00 Lunch break
- 14:00 - 15:30 Research time and informal discussions
- 15:30 - 16:00 Break
- 16:00 - 17:30 Research time and informal discussions

## Thursday, July 3

- 09:00 - 10:30 Summarizing talks - **seminar room 4**

Jörn Davidsen

*Pitfalls in partial mutual Information and beyond*

Elliot Martin

*Synergy, and a novel maximum entropy estimator*

Luis Tapia

*A comparison between the resting state of the brain and the brain in a language task*

- 10:30 - 11:00 Break with coffee & tea

- 11:00 - 12:30 Summarizing talks - **seminar room 4**

Pinaki Pal

*Homoclinic bifurcations in low-Prandtl number Rayleigh-Bénard convection*

Damian Hernandez

*Unveiling latent variables through triplet analysis*

Benjamin Wahl

*Time continuous linear Granger causality*

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<sup>1</sup>Abstracts available at <http://www.pks.mpg.de/~cidnet14/>

## Seminar Week 8 - Program<sup>1</sup>

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12:30 - 14:00 Lunch break

14:00 - 15:30 Summarizing talks - **seminar room 4**

Dorota Wejer

*Transfer of information between cardiac time series*

Michal Zochowski

*tba*

Eckehard Olbrich

*tba*

15:30 - 15:45 Closing remarks

### Friday, July 4

Research time and informal discussions

The Long Night of Sciences

<http://www.wissenschaftsnacht-dresden.de>

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<sup>1</sup>Abstracts available at <http://www.pks.mpg.de/~cidnet14/>

## List of poster presentations<sup>2</sup>

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All posters will be on display during the whole workshop week.

The poster sessions take place on Tuesday (June 17) and Thursday (June 19) 7:30 - 9 pm.

The number in front of the name corresponds to the number on the poster wall!

Posters with odd numbers are presented on Tuesday,

posters with even numbers are presented on Thursday.

- |    |                               |  |
|----|-------------------------------|--|
| 1  | Ansmann, Gerrit               | <i>Generating mechanisms of extreme events in oscillator networks</i>  |
| 2  | Bajic, Djordje                | <i>Instability of genetic networks to internal perturbations</i>   |
| 3  | Bhattacharya, Joydeep         | <i>Signature of genre specific musical creativity on cortical network patterns: A pilot study</i>                      |
| 4  | Bialonski, Stephan            | <i>Data-driven prediction of extreme events in high-dimensional excitable systems</i>                                  |
| 5  | Bianco-Martinez, Ezequiel     | <i>Information based approach for data analysis and network inference</i>  |
| 6  | Casadiago Bastidas, Jose Luis | <i>Network dynamics as an inverse problem: Reconstruction from time series</i>   |
| 7  | Dana, Syamal                  | <i>Amplitude death and lag synchronization in coupled oscillators: A common mechanism</i>                              |
| 8  | Dana, Syamal                  | <i>Amplitude death and oscillation death in coupled dynamical system: Mechanisms of transition</i>                     |
| 9  | Di Bernardi Luft, Caroline    | <i>The effect of graded and categorical feedback on learning related global synchronization</i>                        |
| 10 | Dickten, Henning              | <i>Measuring delay directed interactions with symbolic transfer entropy</i>  |
| 11 | Dods, Joe                     | <i>A dynamic network analysis of space weather activity as observed in multiple ground based magnetometer stations</i> |
| 12 | Elsegai, Heba                 | <i>Network inference in the presence of latent confounders</i>   |
| 13 | Gascoyne, Daniel              | <i>Non-linear dynamics of learning and its application to colour identification</i>                                    |
| 14 | Geier, Christian              | <i>Is the epileptic focus the most important region in epileptic brain networks?</i>                                   |
| 15 | Hallerberg, Sarah             | <i>Predicting and triggering long jumps and sticks in molecular diffusion</i>  |
| 16 | Hens, Chittaranjan            | <i>Chimera state in globally coupled chaotic oscillators</i>   |
| 17 | Hens, Chittaranjan            | <i>Extreme Multistability in network of oscillators</i>  |

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<sup>2</sup>Abstracts available at <http://www.pks.mpg.de/~cidnet14/>

## List of poster presentations<sup>2</sup>

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- 18 Hernandez Lahme, Damian Gabriel *High-order interactions between words in written language*
- 19 Hlinka, Jaroslav *Reliability of inference of directed climate networks using conditional mutual information*
- 20 Jajcay, Nikola *Granger causality estimate of information flow in temperature fields is consistent with wind direction*
- 21 Ji, Peng *Cluster explosive synchronization in complex networks*
- 22 Kishore, Vimal *Extreme events and network failures*
- 23 Korbel, Jan *Rnyi transfer entropy and its application for intraday financial data*
- 24 Liang, X. San *Information flow/transfer: A rigorous formalism with respect to dynamical systems*
- 25 Lünsmann, Benedict *From effective to physical networks from time series*
- 26 *canceled*
- 27 Martin, Elliot *Creating and interpreting climate networks: Insights and caveats*
- 28 Marín, Arlex *Genuine cross-correlations: Which surrogate based measure reproduces analytical results best?*
- 29 Nitzan, Mor *Revealing cross talk between distant RNAs in regulatory networks*
- 30 Olguín, Paola *Stationary pattern and dynamical aspects of the functional network extracted from sleep EEGs of healthy subjects*
- 31 Pal, Pinaki *Gluing bifurcation in Rayleigh-Benard convection*
- 32 Palmigiano, Agostina *Routing information in networks at the edge of synchrony*
- 33 Pascual-García, Alberto *Inference of ecological networks from high-throughput experiments*
- 34 Pereda, Ernesto *Maximal information coefficient reveals network correlates to the perception of binaural beats*
- 35 Pidde, Aleksandra *canceled*
- 36 Porz, Stephan *Pros and cons of reducing the influence of common sources on phase-based estimates of interaction-strengths*
- 37 Priesemann, Viola *Organization principles of neural activity in vivo - beyond self-organized criticality*

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<sup>2</sup>Abstracts available at <http://www.pks.mpg.de/~cidnet14/>

## List of poster presentations<sup>2</sup>

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- 38  *canceled*
- 39 Rubido, Nicolas  *Exact detection of direct links in networks of interacting dynamical systems*
- 40 Rubido, Nicolas  *Resiliently evolving supply-demand networks*
- 41 Ríos Herrera, Wady Alexander  *The influence of EEG references on the analysis of spatio-temporal interrelation pattern*
- 42 Röder, Heidelinde  *Reconstructing correlation and causality between compounds of dissolved organic matter*
- 43 Rüdiger, Sten  *Degree correlations in complex networks: effects on percolation and information transfer in neural populations*
- 44 Soriano Fradera, Jordi  *Multi-neuron calcium imaging: Exploring neuronal dynamics in cortical cultures*
- 45 Srivastava, Shambhavi  *Functional representation of DNA*
- 46 Tapia, Luis  *Resting state of the brain and networks metrics*
- 47 Teller Amado, Sara  *Dynamics in clustered neuronal networks*
- 48 Valencia, Miguel  *Subthalamic activity during motor state levodopa-induced transitions in Parkinson's disease*
- 49 Vasudevan, Kris  *Insight into earthquake sequencing: A graph theoretic approach to modified Markov chain model*
- 50 Vasudevan, Kris  *Synchronization studies: Kuramoto model on directed graphs*
- 51 Wahl, Benjamin  *Definition of a nonlinear Granger causality index within the framework of stationary Fokker-Planck equations*
- 52 Wan, Xiaogeng  *The causal inference of cortical neural networks during music improvisations*
- 53 Wejer, Dorota  *Entropic measures of fluctuations of heart period intervals and systolic blood pressure for recordings obtained from the head-up tilt table test*
- 54 Wilting, Jens  *Time-resolved inference of interaction properties of coupled dynamical systems*

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<sup>2</sup>Abstracts available at <http://www.pks.mpg.de/~cidnet14/>

# Notes

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## Frequently asked questions

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- **SECRETARIAT:**  
guest house no. 4, library (ground floor, tel. 1932) Monday - Thursday 08:00 - 16:30, Friday 08:00 - 15:30.
- **SCIENTIFIC COORDINATORS' OFFICE:** 2 D 1 (second floor, tel. 2401).
- **COMPUTER ROOMS:**  
The computers in the offices 2 D 3, 2 D 5 and 2 D 6 (second floor) are reserved for the participants. On the last page of the booklet is a map for your convenience.
- **COMPUTER ACCOUNT:**  
Please check the details on the information sheet included in your welcome folder.
- **COMPUTER SUPPORT & PRINTING A POSTER:**  
If you have any computer-related questions or if you wish to print a poster (providing us with an appropriate PDF file) please contact the staff in offices 2 A 4, 2 A 12 or 2 A 14. Help with hardware (terminals, printers) can be obtained in office 2 A 10.
- **PRINTERS:**  
For printing documents, papers, etc., please use the terminals in the computer rooms mentioned above or the PCs in the offices 1 C 17, 2 D 9 or 2 C 9.
- **LIBRARY:**  
Our library is located in guest house no. 4. It is a reference library which means that books must remain in the institute. You are allowed to check out books and use them in your office. Please ask Ms. Poetschke, our librarian, for details. Journals should not be taken out of the library. Articles which are not available in our library may be requested from other libraries in Germany. Information concerning the library is available at [http://www.pks.mpg.de/pages/institut/bibliothek/bibl\\_en.html](http://www.pks.mpg.de/pages/institut/bibliothek/bibl_en.html), including an online catalogue.
- **COPY MACHINES:**  
You can use the copy machines in 1 C 17 and 2 C 9.
- **OFFICE SUPPLIES:**  
Please contact Mrs. Dohrmann at the institute's reception desk.
- **PER DIEM:**  
You receive a per diem to cover the cost for your meals (except for the workshop). Please hand in the invitation form/questionnaire included in your welcome folder to arrange your payment.
- **HEALTH INSURANCE:**  
If you do not have a health insurance valid for Germany please come to the secretariat in order to arrange one.
- **TELEPHONE CALLS:**  
For private calls you can buy a telephone card at the institute's reception desk. It costs 10 Euro. Together with your telephone card you receive an information sheet how to use it. For business calls please come to office 4.01.

## Frequently asked questions

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- **INFORMATION DESK:** For sending faxes and getting any information concerning train schedules, public transportation in Dresden, tourist information about Dresden, ordering taxis please contact the institute's reception desk.
- **MAIL:**  
Internal and external outgoing mail can be left at the institute's reception desk. There are also stamps available upon request.
- **PRIVATE CAR:**  
You need a special permit to park your car at the institute's parking lots as well as the guest houses' parking lots, the permit is available upon request at the institute's reception desk.
- **SHOPPING:** The shops in the city center are open Monday - Saturday from 09:00 - 20:00. **Please note that Thursday, May 29 and Monday, June 9 are public holidays! All shops are closed.**
  - The main shopping area "Prager Strasse" is close to the Main Railway Station. Take tram no. 3 (direction Wilder Mann) to the stop "Walpurgisstrasse" and keep to the left. You will find a shopping mall, a large department store as well as many other shops on "Prager Strasse". If you walk in direction of the "Altmarkt" you will find another shopping mall.
  - Food and beverages: after 5 minutes walk along the tram tracks towards the city centre you will find a small supermarket (Konsum) open Monday - Saturday from 08:00 - 22:00. Every Wednesday morning there is a small farmer's market at Münchner Platz.
- **FOR THOSE ACCOMMODATED IN THE GUEST HOUSES:**
  - Breakfast: is served **Monday - Friday** from 07:30 to 09:00 in our institute's cafeteria. For the workshop week from 16 - 20 June you receive a ticket. During the seminar it costs 4 Euro per person per day. For the **weekend** the following places can be recommended:
    - \* the bakery Bäckerei Möbius on Münchner Platz
    - \* Marché in the Dresden main station
  - Guest house keys: you can open each entrance of the institute as well as the library with your guest house key or with the attached white chip. Move it along the little grey box at each entrance, after a beep you can open the door.  
When leaving please drop the guest house keys into the box in the entrance hall of your guest house. Please vacate your guest house room on your departure day **before** 9 a.m.
- **FOR THOSE ACCOMMODATED IN THE FFF CITY HOTEL LEONARDO:**
  - Breakfast: is served in the hotel.
  - Keys for entering the institute: You receive the key card for entering the institute upon your registration. Please do not forget to return it either to the reception desk or to the visitors program when leaving.
- **LAUNDRY:**  
There is the possibility to wash your clothes in the basement of guest house no. 2, please dry your clothes there and not in your room.

## Frequently asked questions

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- **SOCIAL PROGRAM:**

You will find more information on the cidnet14 announcement board on the ground floor close to the seminar rooms and on the workshop's web page <http://www.pks.mpg.de/~cidnet14>.

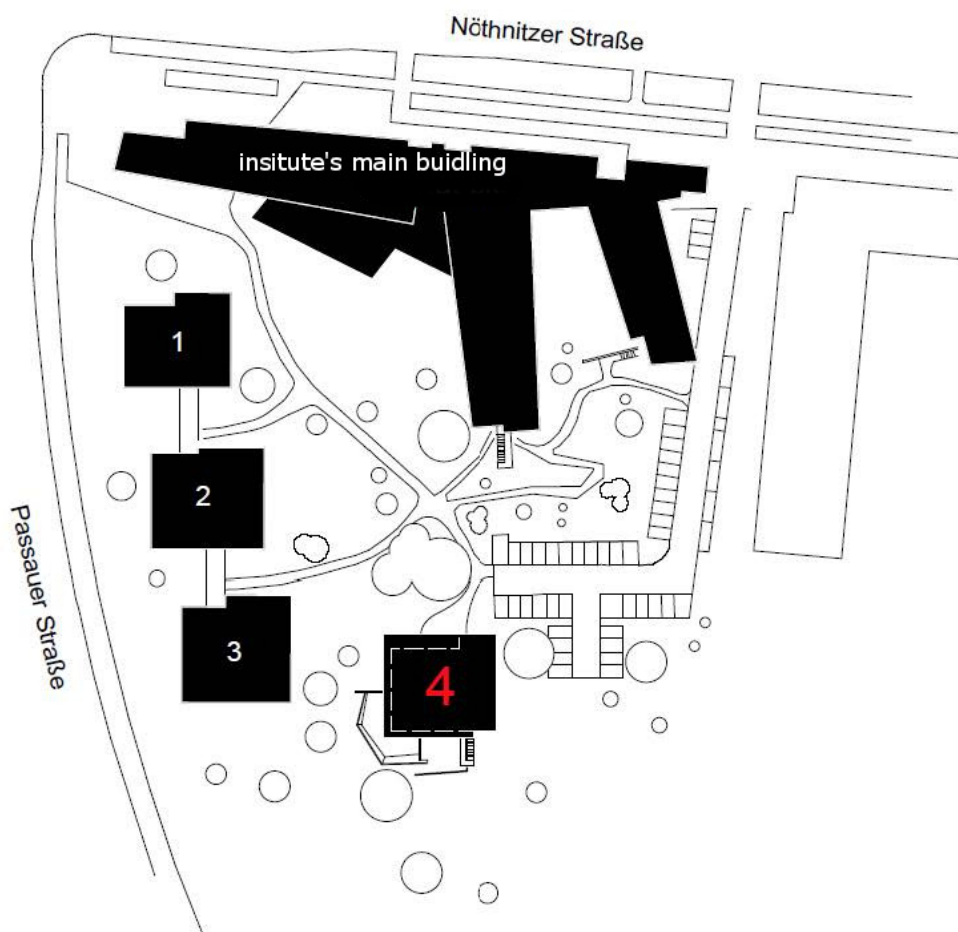
- **LUGGAGE:** If you would like to store your luggage in a secure place on your departure day, please use room 2 C 25 on the second floor. You have to dial the following code to open the door **7240**.

- **SECURITY:**

After 7 p.m. the entrances of the institute should be locked. Please check after entering or leaving the institute that the door is correctly shut. Please leave your window shut or tilted, but not open.

- **IF YOU HAVE ANY QUESTIONS OR SUGGESTIONS PLEASE CONTACT US.**

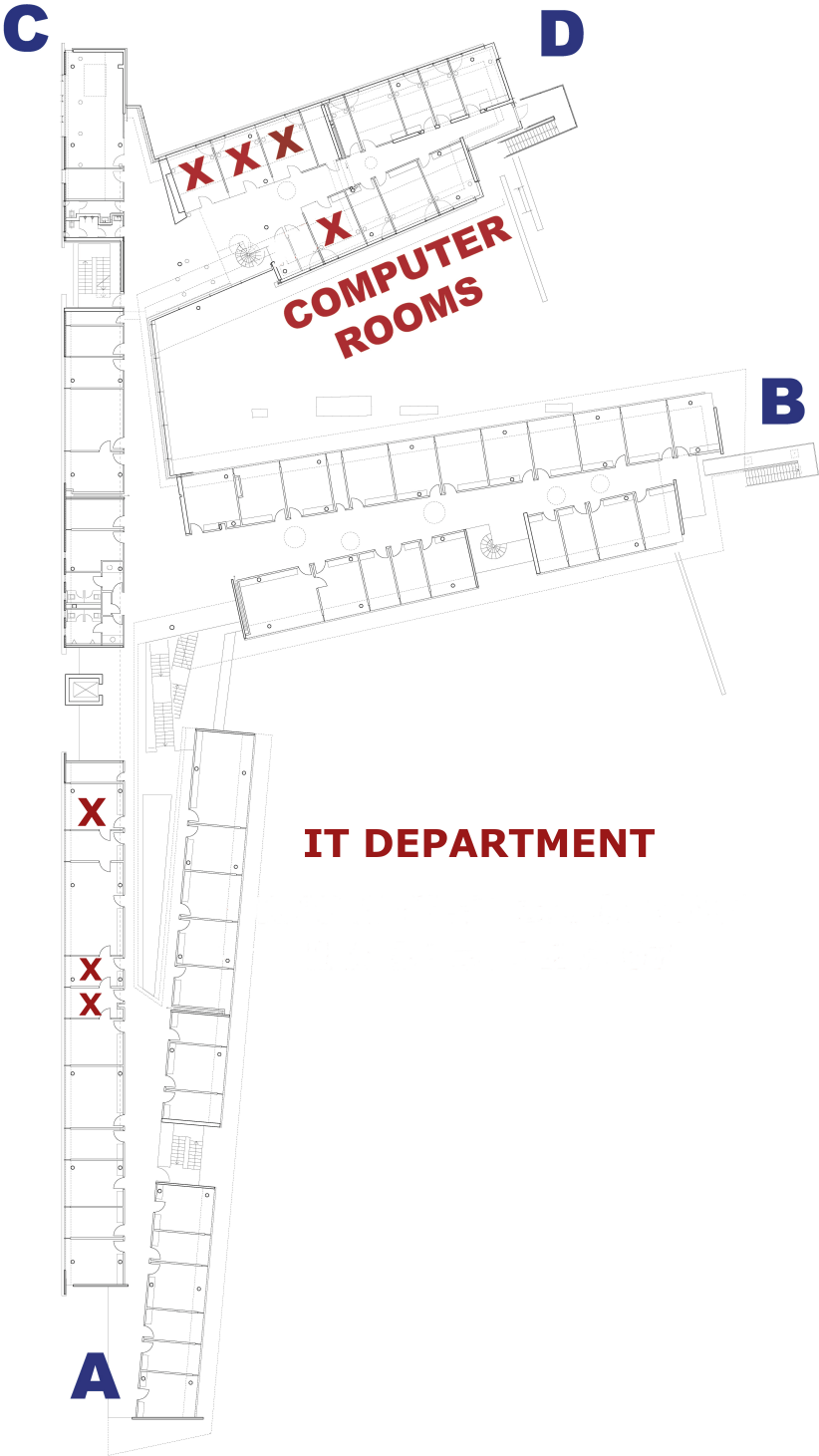
## MPIPKS campus map



- 1 - guest house 1
- 2 - guest house 2
- 3 - guest house 3
- 4 - guest house 4

VISITORS PROGRAM &  
library

# 2nd Floor



# Notes

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