ANNUAL SEMINAR IN
OPTIMIZATION AND SYSTEMS ENGINEERING

# SEMINAR PROGRAM

10.00 **Professor Tapio Westerlund**
**Chairman of the OSE group**
*Opening statement*

10.05 **Professor Leo Liberti**
*Symmetry in mathematical programming*

10.50 **COFFEE**

11.10 **Professor Leo Liberti**
*Distance constraints in Euclidean geometry*

12.00 **LUNCH**
*M/S Bore*

13.30 **Mikael Nyberg, PhD student**
*Weather routing – using dynamic programming to win sailing races*

13.50 **Johan Pensar, PhD student**
*Marginal pseudo-likelihood: a Bayesian approach for learning the graph structure of a Markov network*

14.10 **Anders Skjäl, PhD student**
*Complexity theory for the global optimizer*

14.30 **COFFEE**

15.00 **Amir Shirdel, PhD student**
*Trend and system identification with orthogonal basis function*

15.20 **Axel Nyberg, PhD student**
*Applications of the quadratic assignment problem*

15.40 **Otto Nissfolk, PhD student**
*Reformulation of 0-1 quadratic programs*

16.00 **Henrik Nyman, PhD student**
*Stratified Gaussian graphical models*

OPTIMIZATION AND
SYSTEMS ENGINEERING

# ANNUAL SEMINAR 2013


## Tapio Westerlund

CHAIRMAN OF THE OSE GROUP

CENTER OF EXCELLENCE IN
OPTIMIZATION AND SYSTEMS ENGINEERING
ÅBO AKADEMI UNIVERSITY


ÅBO, FINLAND, NOVEMBER 15 2013

OSE OPTIMIZATION AND SYSTEMS ENGINEERING

Åbo Akademi University

## About the OSE research group

- For the period 2010–14, Åbo Akademi University has appointed four internal Center of Excellences within research:
  - *Cell Stress and Molecular Aging*
  - *Democracy: A citizen perspective*
  - *Optimization and systems engineering*
  - *Post-secular culture and a changing religious landscape*
- The internal CoE in Optimization and Systems Engineering (OSE) is focusing on theory, methods and algorithms in systems engineering, optimization and statistics, as well as their applications in science and engineering. The group bridges the systems engineering, systems theory and mathematical disciplines at ÅAU.

# Key facts about the OSE research group

- Steering group:

**Prof. Tapio Westerlund**
Process design and systems engineering

Optimization

**Prof. Jukka Corander**
Mathematics

Mathematical statistics

**Prof. Göran Högnäs**
Mathematics

Systems theory

**Prof. Paavo Salminen**
Mathematics

Probability theory

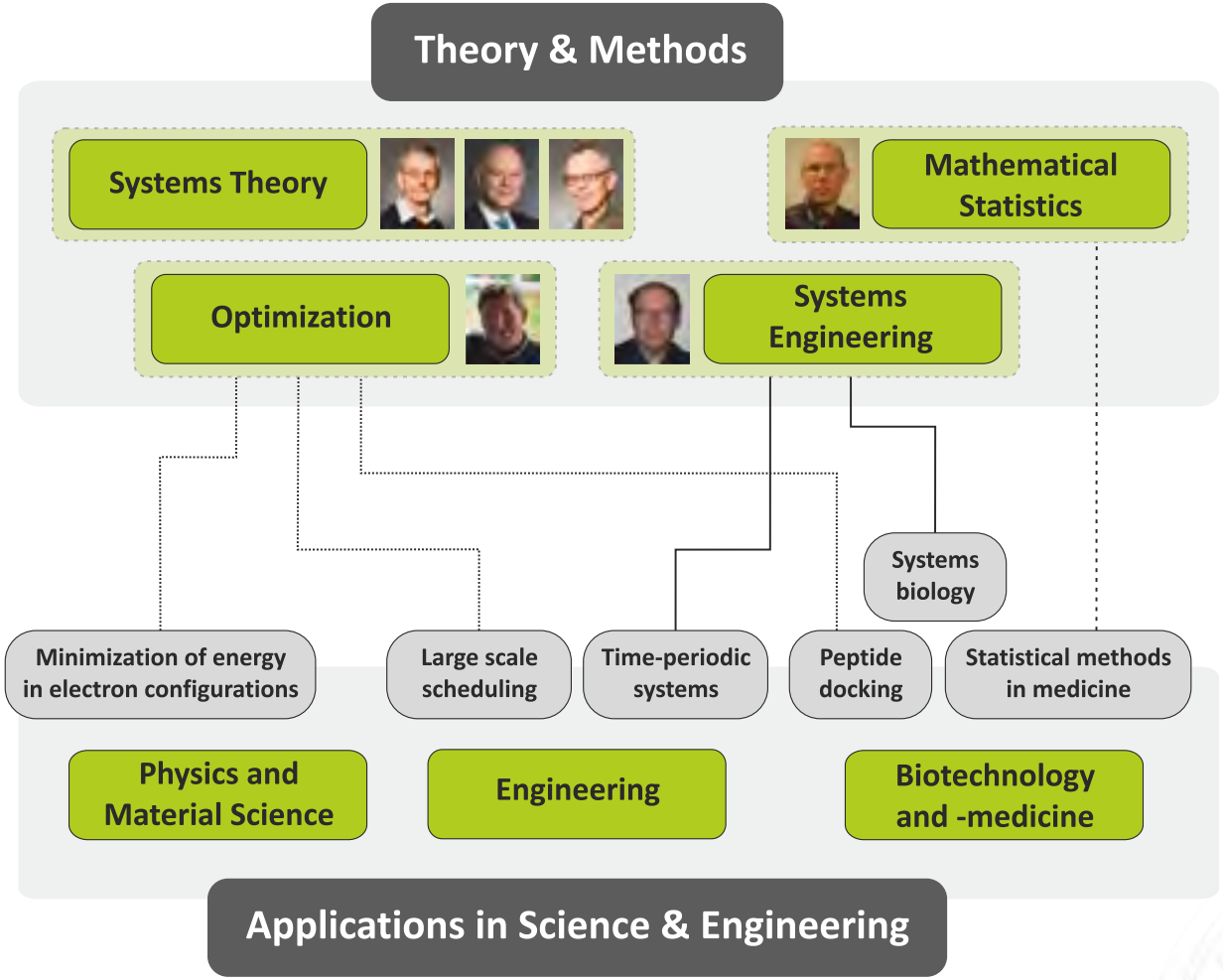
**Prof. Hannu Toivonen**
Industrial systems engineering

Systems engineering

- Funding sources:
  - Foundation of Åbo Akademi University: 1.2 MEUR 2010–14
  - Academy of Finland, EU, Outotec Research: 2.0 MEUR 2008–13
- Currently the group consists of about 25 PhD students and post doc researchers
- Publications 2010–12 include a monograph, four book chapters and over 70 peer-reviewed journal papers

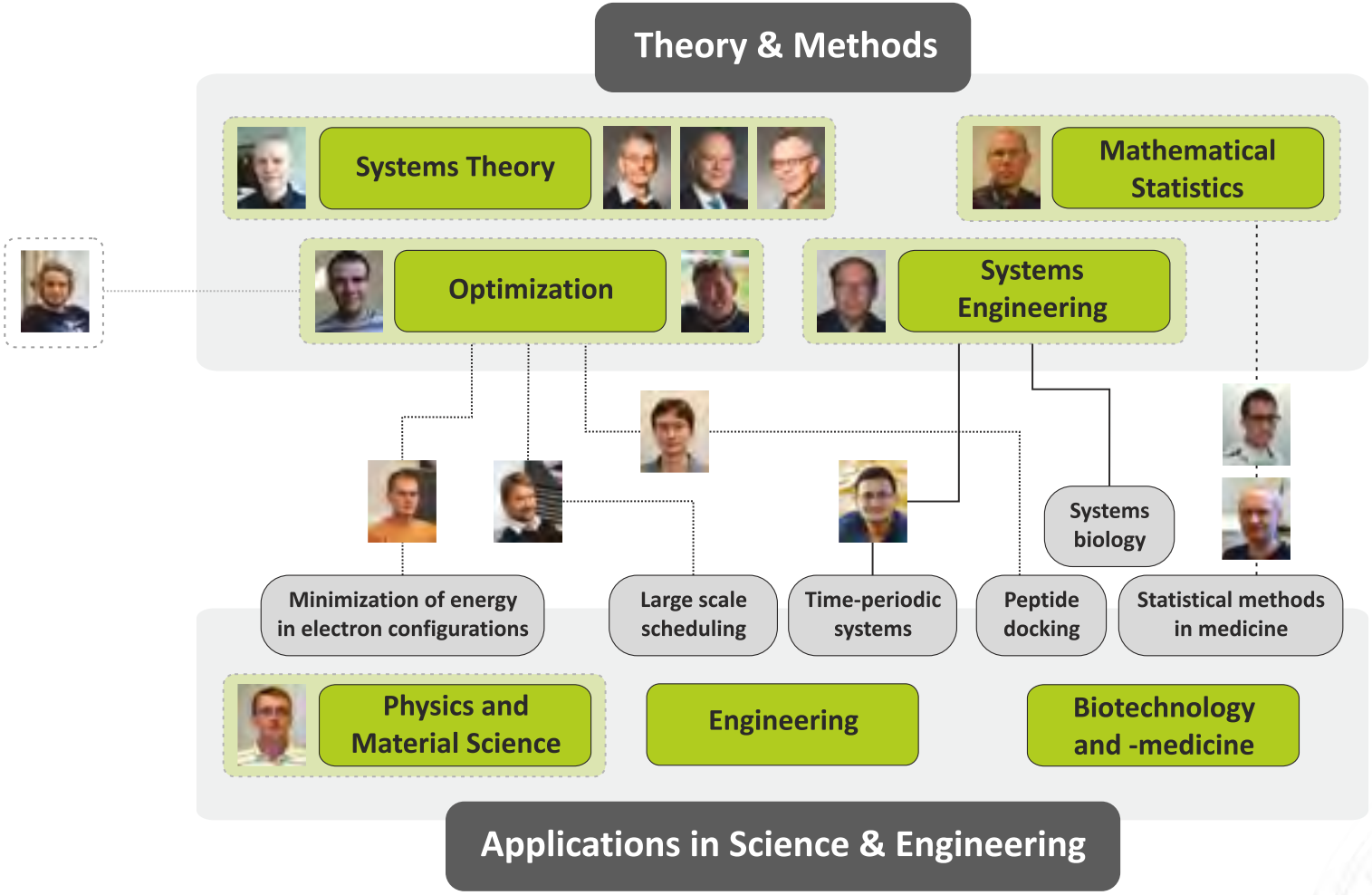
# Structure of the OSE group

*The research areas and group leaders*



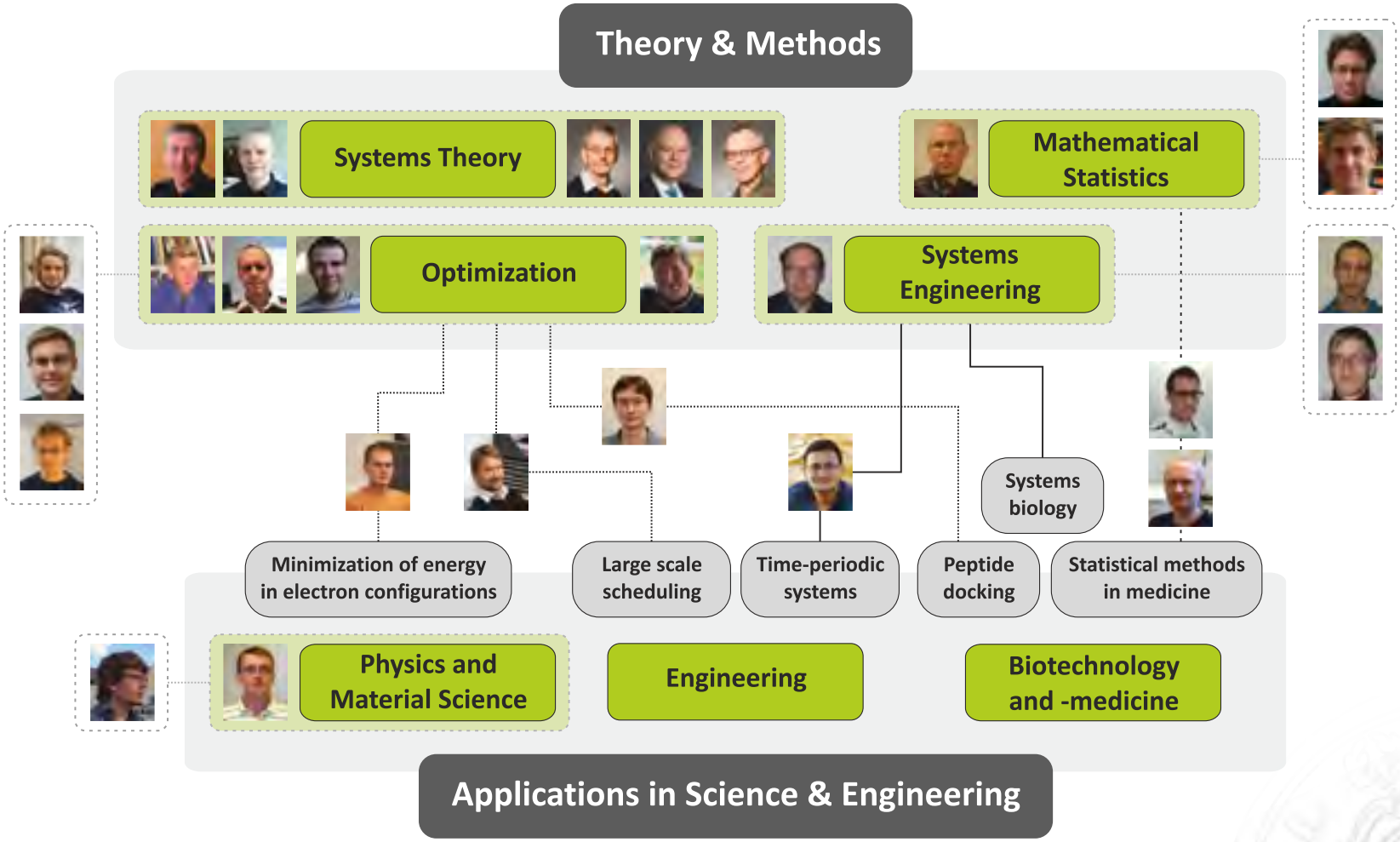
# Structure of the OSE group

*People with direct financing*



# Structure of the OSE group

*People with direct financing and some affiliated researchers*



# About the venue

*"The Forum Marinum Maritime Centre is a lively and versatile center for maritime activities, comprising a national special maritime museum, and the Finnish Navy Museum."*

ANNUAL SEMINAR IN
OPTIMIZATION AND SYSTEMS ENGINEERING

# SEMINAR PROGRAM

10.00 **Professor Tapio Westerlund**
**Chairman of the OSE group**
*Opening statement*

10.05 **Professor Leo Liberti**
*Symmetry in mathematical programming*

10.50 **COFFEE**

11.10 **Professor Leo Liberti**
*Distance constraints in Euclidean geometry*

12.00 **LUNCH**
*M/S Bore*

13.30 **Mikael Nyberg, PhD student**
*Weather routing – using dynamic programming to win sailing races*

13.50 **Johan Pensar, PhD student**
*Marginal pseudo-likelihood: a Bayesian approach for learning the graph structure of a Markov network*

14.10 **Anders Skjäl, PhD student**
*Complexity theory for the global optimizer*

14.30 **COFFEE**

15.00 **Amir Shirdel, PhD student**
*Trend and system identification with orthogonal basis function*

15.20 **Axel Nyberg, PhD student**
*Applications of the quadratic assignment problem*

15.40 **Otto Nissfolk, PhD student**
*Reformulation of 0-1 quadratic programs*

16.00 **Henrik Nyman, PhD student**
*Stratified Gaussian graphical models*

## Invited speaker

*Professor Leo Liberti, École Polytechnique / IBM Research*

- earned his PhD from Imperial College London, UK 2004
- was a professor at École Polytechnique (Paris) until 2012
- currently a researcher at IBM Research, T. J. Watson Research Center, New York, USA
- is an editor of several scientific journals including 4OR (editor-in-chief), EURO Journal of Computational Optimization, Computational Management Science and Journal of Global Optimization
- has been the author of about 160 refereed papers, and the author or editor of several books in optimization including "Distance Geometry: Theory, Methods and Applications" coedited with A. Mucherino, C. Lavor and N. Maculan, Springer New York, 2013, and "Global Optimization: from Theory to Implementation" coedited with N. Maculan, Springer Berlin, 2006

ANNUAL SEMINAR IN
OPTIMIZATION AND SYSTEMS ENGINEERING

# SEMINAR PROGRAM

10.00 **Professor Tapio Westerlund**
**Chairman of the OSE group**
*Opening statement*

10.05 **Professor Leo Liberti**
*Symmetry in mathematical programming*

10.50 **COFFEE**

11.10 **Professor Leo Liberti**
*Distance constraints in Euclidean geometry*

12.00 **LUNCH**
*M/S Bore*

13.30 **Mikael Nyberg, PhD student**
*Weather routing – using dynamic programming to win sailing races*

13.50 **Johan Pensar, PhD student**
*Marginal pseudo-likelihood: a Bayesian approach for learning the graph structure of a Markov network*

14.10 **Anders Skjäl, PhD student**
*Complexity theory for the global optimizer*

14.30 **COFFEE**

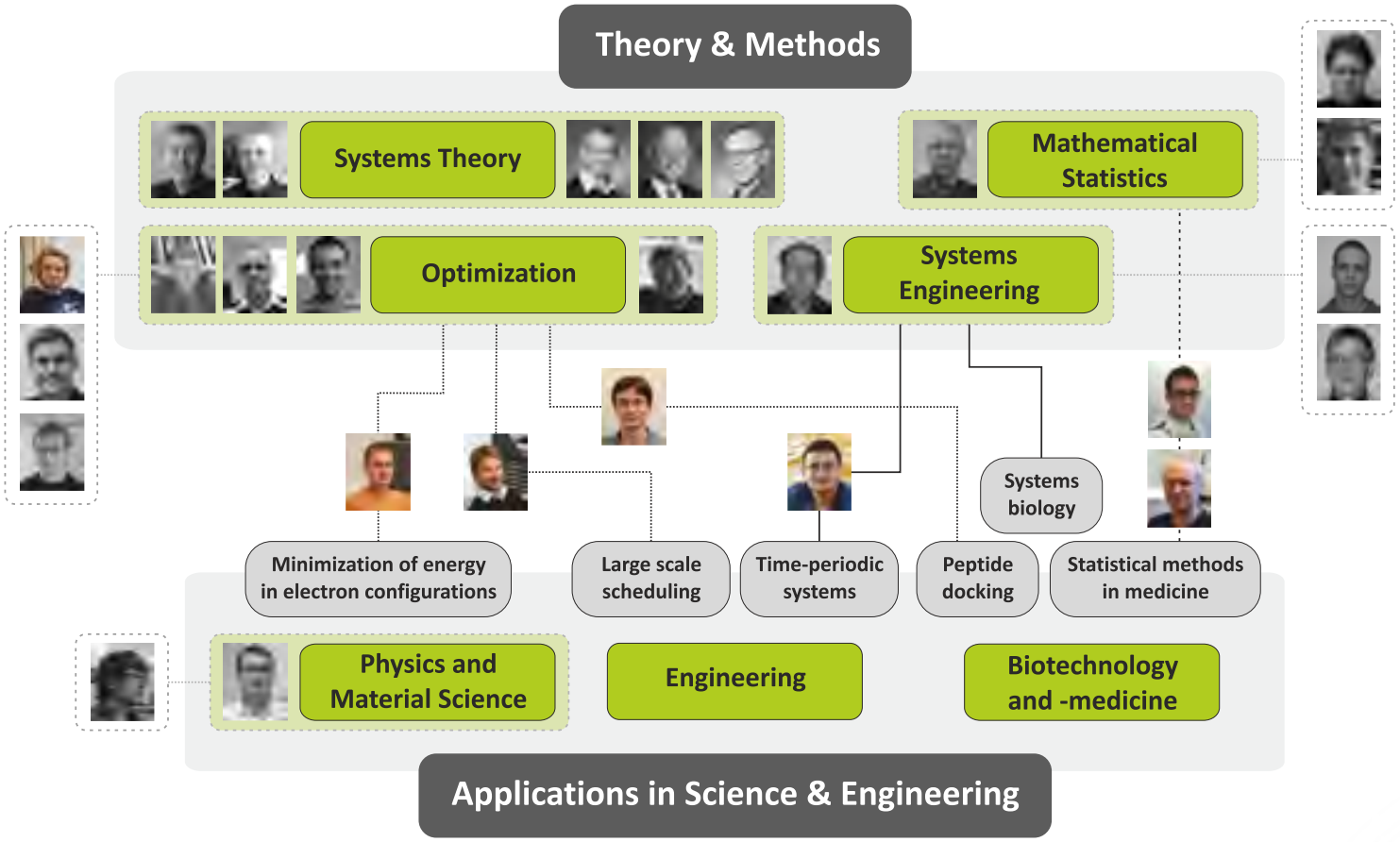
15.00 **Amir Shirdel, PhD student**
*Trend and system identification with orthogonal basis function*

15.20 **Axel Nyberg, PhD student**
*Applications of the quadratic assignment problem*

15.40 **Otto Nissfolk, PhD student**
*Reformulation of 0-1 quadratic programs*

16.00 **Henrik Nyman, PhD student**
*Stratified Gaussian graphical models*

# Presentations by PhD students



# Presentations by PhD students

13.30 **Mikael Nyberg**
*Weather routing – using dynamic programming to win sailing races*

13.50 **Johan Pensar**
*Marginal pseudo-likelihood: a Bayesian approach for learning the graph structure of a Markov network*

14.10 **Anders Skjäl**
*Complexity theory for the global optimizer*

14.30 **COFFEE**

15.00 **Amir Shirdel**
*Trend and system identification with orthogonal basis function*

15.20 **Axel Nyberg**
*Applications of the quadratic assignment problem*

15.40 **Otto Nissfolk**
*Reformulation of 0-1 quadratic programs*

16.00 **Henrik Nyman**
*Stratified Gaussian graphical models*