

## Aalborg and surroundings

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With its approximately 210,000 inhabitants, Aalborg is the third largest city in Denmark and the capital of the region of northern Jutland. Only 35 kilometres from Aalborg, you will find some of the best and nicest beaches in Europe along the west coast of northern Jutland. In the central section of the city, you find bustling streets and squares, many modern shops, cafés, pavement restaurants and modern coffee bars.



## Aalborg University

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Aalborg University (AAU) was inaugurated in 1974 and is a well-established research and teaching institution in Denmark offering quite an untraditional range of educational programmes and research in the fields of Humanities, Social Sciences, Engineering and Science, and Medicine. The relatively young Aalborg University differentiates itself from the older and more traditional Danish universities with its focus on interdisciplinary, inter-faculty studies. The real life problem based learning structure is internationally recognized as 'The Aalborg Model'. Aalborg University also greatly emphasizes international relations and cooperation. At present, app. 13% out of a total of 21,600 students are from abroad.

## Hotel

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Hotel CabInn / [www.cabinn.com](http://www.cabinn.com)  
Single room: 495 DKK

First Hotel / [www.firsthotels.com](http://www.firsthotels.com)  
Single room: 862,53 DKK

Prinsen Hotel / [www.prinsen-hotel.dk/en](http://www.prinsen-hotel.dk/en)  
Single room: 726,62 DKK

## Conference venue

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Aalborg University  
Fibigerstræde 16  
Auditorium 1.108  
9220 Aalborg



## Summer school website

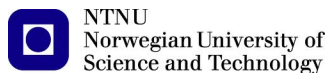
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More information on the summer school and lecture material will be available at the website: [www.ISSSD2.aau.dk](http://www.ISSSD2.aau.dk)

## Organising committee

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**Prof. Søren R. K. Nielsen**, AAU, Denmark  
**Prof. Jianbing Chen**, Tongji University, China  
**Prof. Arvid Næss**, NTNU, Norway  
**Prof. Göran Sandberg**, Lund University, Sweden



## Conference secretariat / Contact

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Aalborg University, Denmark



1st Announcement  
March 2014

## 2nd International Summer School on Stochastic Dynamics of Wind Turbines and Wave Energy Absorbers

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Aalborg, Denmark  
6-8 August 2014



## Introduction

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The development of wind energy during the last four decades has primarily been focused on onshore applications. However, the majority of the wind energy production in the next decade is expected to be harvested offshore, providing new technical challenges with respect to foundation problems, dynamic response, structural vibration control, maintenance and surveillance.

Wave energy is less developed. At present, many principles have been suggested and are being tested, without any generally agreed convergence. The constrained optimal control of the power take-off due to saturation of the actuator system and the necessary limitation of the motion of the absorbers is still not solved in a satisfactory way. Many wave energy prototypes have collapsed due to fatigue and extreme loadings. Hence, optimal control and structural reliability play an important role in the further development of this energy resource.

In the summer school, some review and dissemination of the state-of-the-art of these issues will be addressed with emphasis on the stochastic modelling of wave and wind loads and the resulting structural dynamics analysis.

## Topics

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- Stochastic excitations (wind and wave) on offshore wind turbines and wave energy structures.
- Structural dynamics and vibration control of offshore wind turbine structures and wave energy structures.
- Stochastic dynamics of nonlinear structures.
- Global reliability assessment methods for wind turbines and wave energy structures.

## ECTS and course format

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This course will entitle PhD students to 2.5 ECTS, corresponding to 67.5-75 hours of work load. The course will consist of 3 full days of lecturers, assignment work and discussions.

## Preliminary Schedule

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### AUGUST 6, 2014

8:00-08:45

**Assoc. Prof. Jens Peter Kofoed:** *Wave energy. Principles and status of an emerging technology.*

09:00-09:45

**Prof. Søren R. K. Nielsen:** *Optimal stochastic control of arrays of wave energy point converters.*

10:00-10:45

**Prof. Biswajit Basu:** *Vibration and power control of wind turbines.*

11:00-12:00

*Workshop*

13:00-14:45

**Prof. Jens Nørkjær Sørensen:** *Wake modelling for offshore wind turbine parks.*

15:00-16:45

**Assoc. Profs. Kent Persson and Per Erik Austrell:** *Simulation and system identification of wind turbines.*

### AUGUST 7, 2014

8:00-10:00

**Prof. Jie Li:** *Physically based modelling of engineering dynamic excitations.*

10:15-12:00

**Prof. Jie Li:** *Stochastic dynamics and global reliability analysis of wind turbines.*

13:00-14:45

**Prof. John Dalsgaard Sørensen:** *Reliability of wind turbines and wave energy devices.*

15:00-19:00

Visit to the Danish National Test Center for 6-10 MW wind turbines, Østerild Plantage.

Visit to the Wave Star Wave Energy test facility, Hanstholm Harbour.

20:00-22:00

Dinner at Hanstholm Hotel.

## Preliminary schedule—continued

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### AUGUST 8, 2014

8:00-8:45

**Assoc. Prof. Delphine Bard:** *Measurement of sound emission and vibration of wind turbines.*

9:00-9:45

**? (Lund University):** *Societal impact and influence.*

10:00-11:30

**Prof. Arvid Næss:** *Extreme value distributions for offshore wind turbines.*

13:00-13:45

**Assoc. Prof. Michael Muskulus:** *Design and Optimization of Floating Offshore Wind Turbines.*

14:00-14:45

**Assoc. Prof. Michael Muskulus:** *Hydrodynamics and Control of Floaters.*

15:00-15:45

**Frank Sandner:** *Reduced Order Model of a Floating Wind Turbine.*

## Speakers

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**Prof. Jie Li,** Tongji University, China

**Prof. Arvid Næss,** NTNU, Norway

**Prof. Biswajit Basu,** Trinity College Dublin, Ireland

**Prof. Jens Nørkjær Sørensen,** Technical University of Denmark, Denmark

**Prof. Søren R. K. Nielsen,** AAU, Denmark

**Prof. John Dalsgaard Sørensen,** AAU, Denmark

**Assoc. Prof. Jens Peter Kofoed,** AAU, Denmark

**Assoc. Prof. Michael Muskulus,** NTNU, Norway

**Assoc. Prof. Kent Persson,** Lund University, Sweden

**Assoc. Prof. Per Erik Austrell,** Lund University, Sweden

**Assoc. Prof. Delphine Bard,** Lund University, Sweden

**Frank Sandner,** University of Stuttgart, Germany

## Registration

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**FEE:** Early 800 DKK / Registration 1000 DKK

### IMPORTANT DATES:

Early registration deadline — May 23, 2014

Registration deadline — July 1, 2014

**REGISTER:** <http://billetto.dk/en/2nd-international-summer-school-on-stochastic-dynamics-of-wind-turbines-and-wave-energy-absorbers>