
Studying (physics) in Oldenburg

a small advertisement

by Michael Hölling



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The city of Oldenburg

Where is Oldenburg?



source: www.google.de/maps

The city of Oldenburg

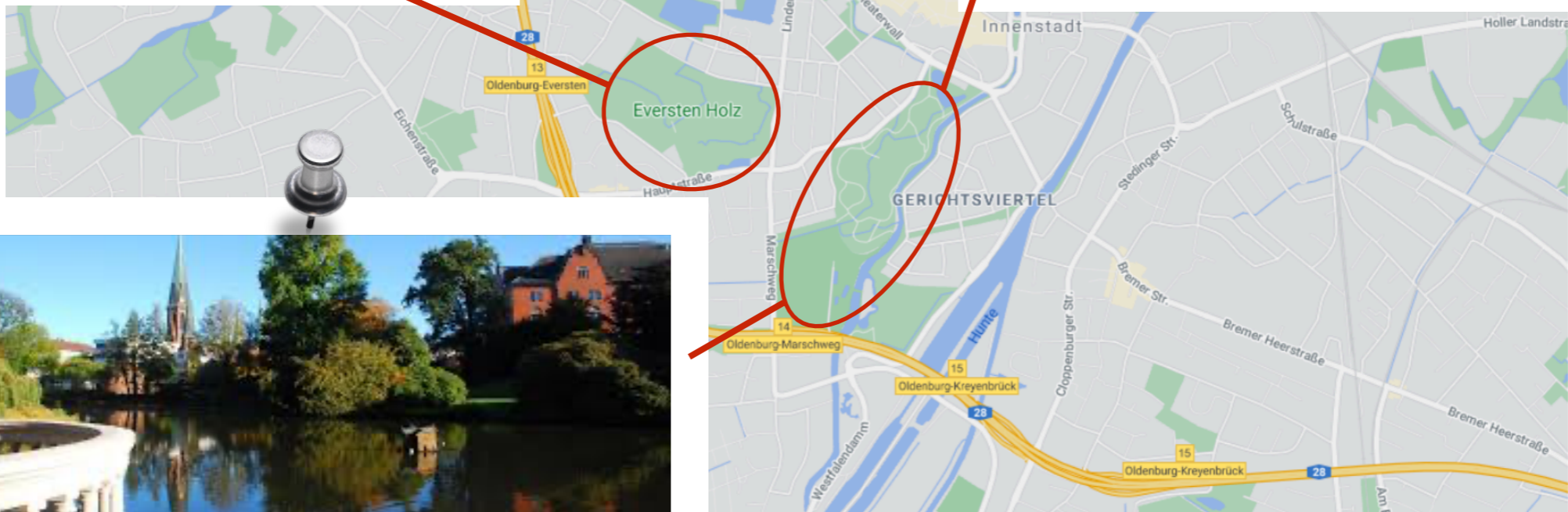
Oldenburg is green !



source: www.oldenburg-tourismus.de



source: www.schlossgarten-ol.de



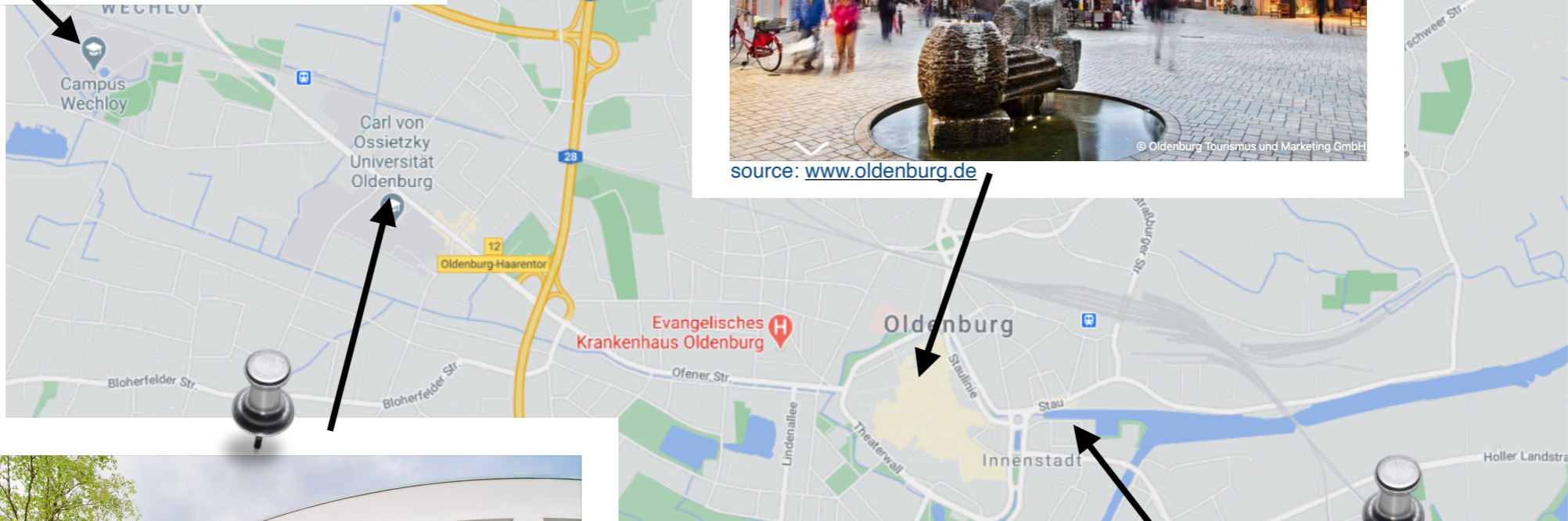
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The city of Oldenburg

What is in Oldenburg?



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Research at the institute of Physics

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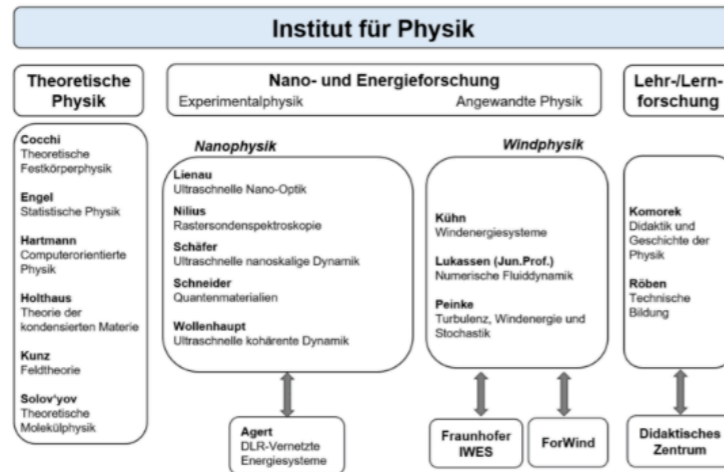
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Site plan with route plan

Imprint

Research



Research topics at the Institute of Physics

Experimental and Applied Physics	Theoretical Physics
Rastersondenspektroskopie (Prof. Dr. Niklas Nilius)	Computerorientierte Physik (Prof. Dr. Alexander Hartmann)
Turbulenz, Windenergie und Stochastik (Prof. Dr. Joachim Peinke)	Feldtheorie (Prof. Dr. Jutta Kunz)
Ultraschnelle kohärente Dynamik (Prof. Dr. Matthias Wollenhaupt)	Statistische Physik (Prof. Dr. Andreas Engel)
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	Physics Didactics
	Didaktik der Physik und Wissenschaftskommunikation (Prof. Dr. Michael Komorek)
	Technical Education
	Technische Bildung (Prof. Dr. Peter Röben)

link: <https://uol.de/en/physics/research>

contact: michael.hoelling@uol.de

Research at the institute of Physics

Computational theoretical Physics

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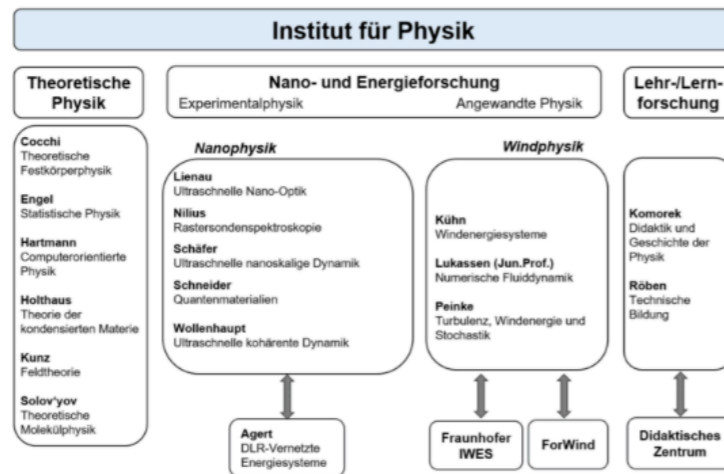
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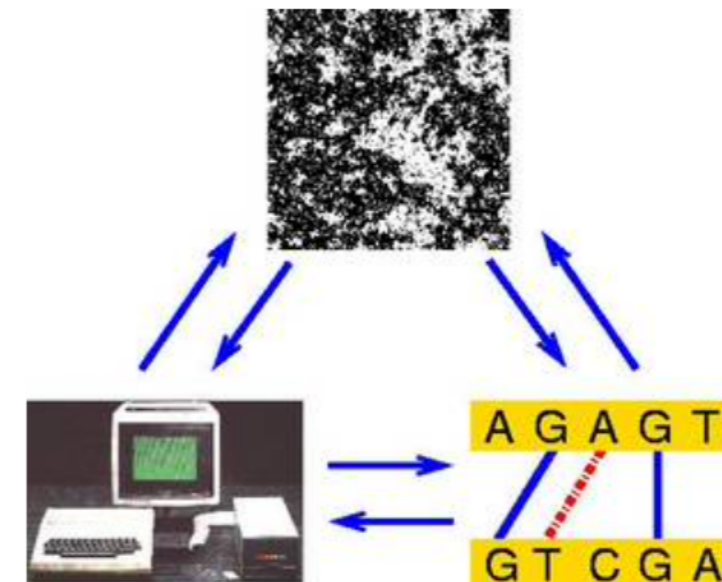


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Research

“We working at the cutting edge of computer simulations and our main area of expertise are sophisticated optimization algorithms applied in statistical physics. We work on spin glasses, random-field systems, the vertex-cover problem, the satisfiability problem, percolation problems, RNA secondary structures, sequence alignment and large-deviation properties.”



source: www.uol.de/en/compphys

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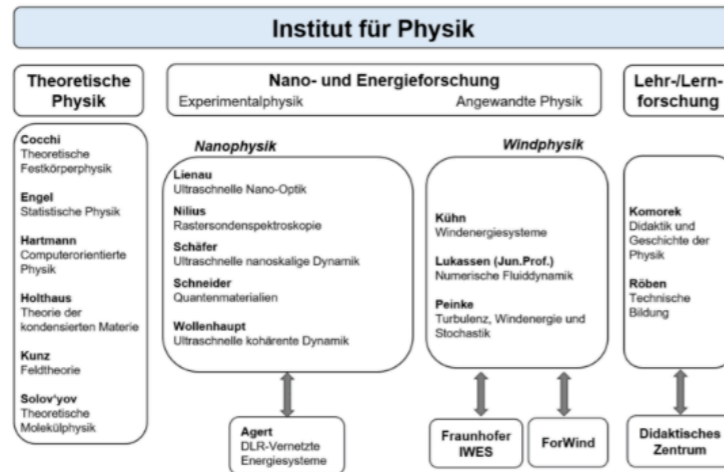
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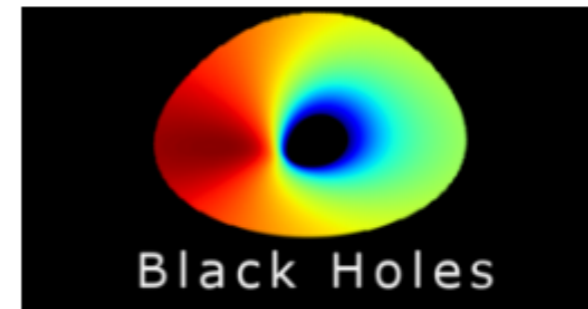
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Field Theory

Research



Black Holes



Neutron Stars



Wormholes

source: www.uol.de/en/fieldtheory

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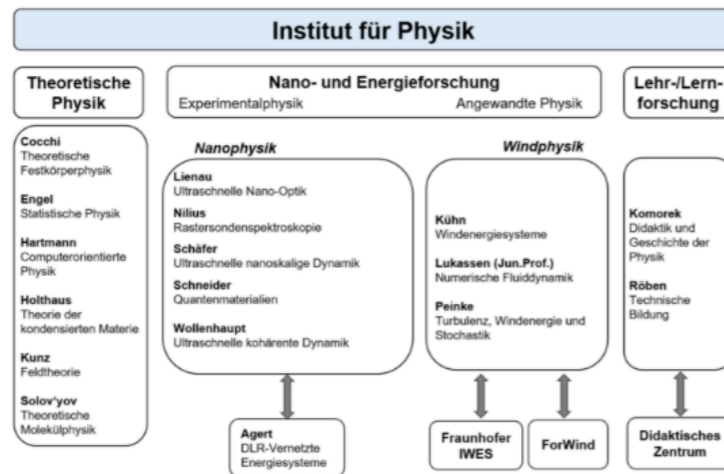
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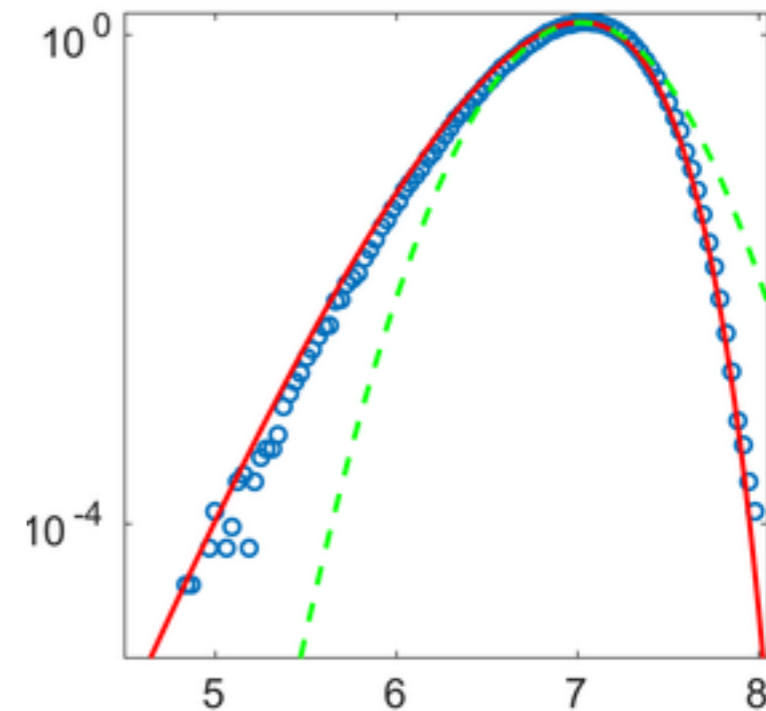
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- Stochastic Thermodynamics
- Collective phases in modes of biodiversity
- The emergence of thermodynamics in isolated quantum systems



source: www.uol.de/en/statphys/research

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Research at the institute of Physics

Condensed Matter Theory

Navigation: [...] > Schools > School V > Physics > Research

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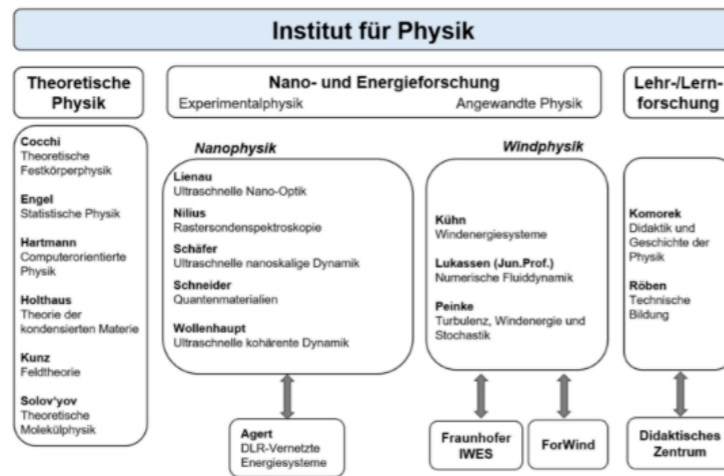
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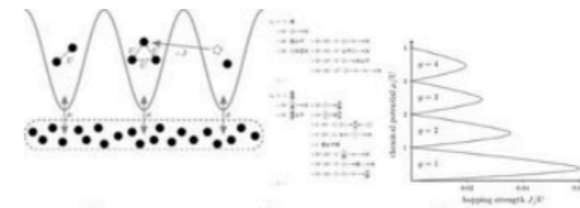
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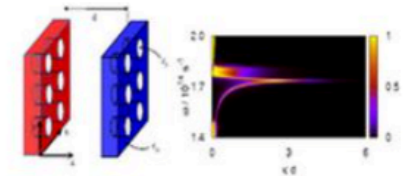
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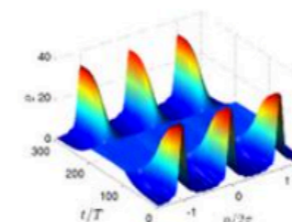
Research topics



Quantum phase transitions



Nanoscale thermal radiation



Periodically driven quantum systems

source: www.uol.de/en/condmat/research

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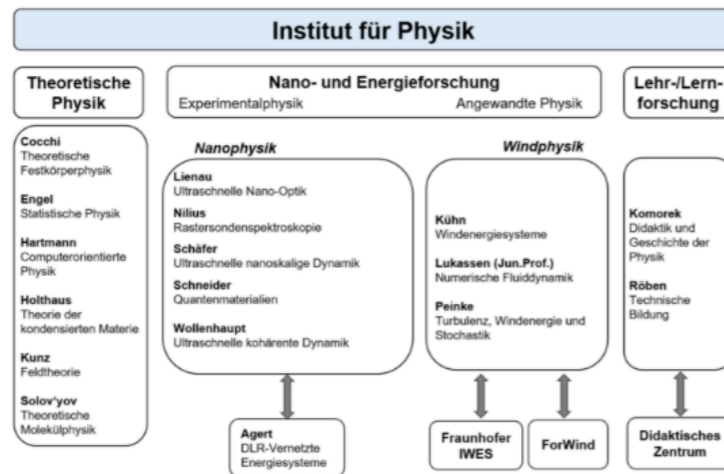
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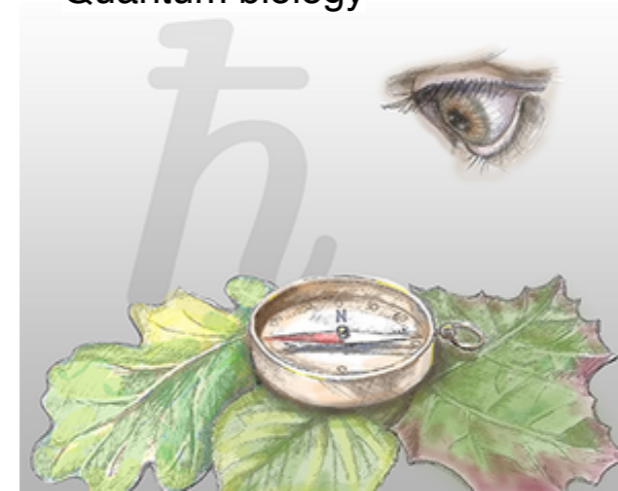
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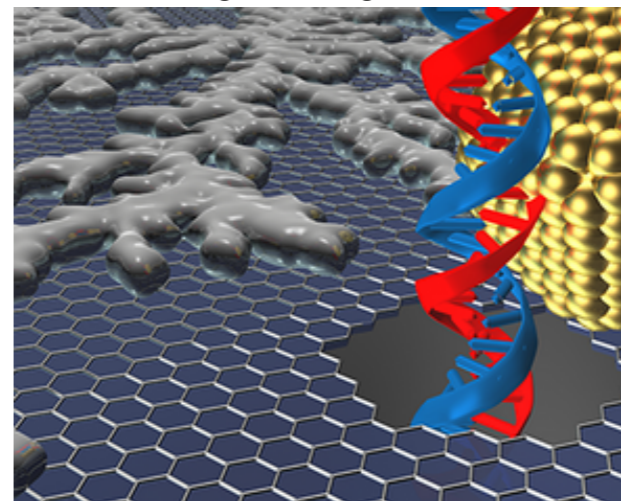
Quantum Biology and Computational Physics

• Quantum biology



source: www.uol.de/quantbio/forschung

• Nano engineering



source: www.uol.de/quantbio/forschung

Research at the institute of Physics

Scanning Probe Spectroscopy

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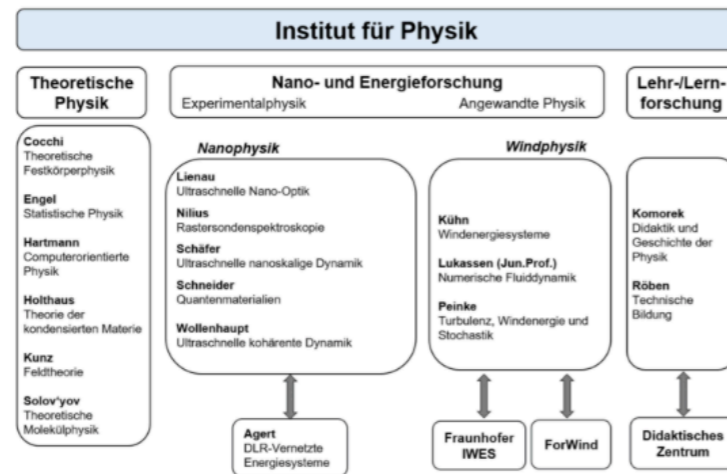
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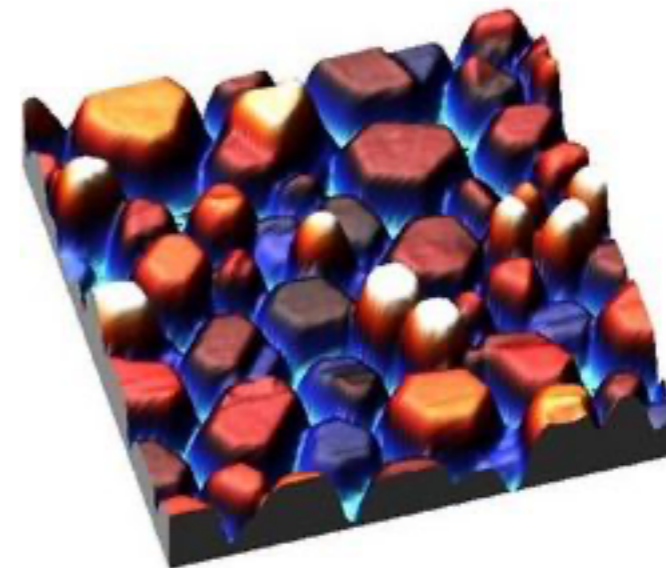
- Didaktik der Physik und Wissenschaftskommunikation (Prof. Dr. Michael Komorek)

Technical Education

- Technische Bildung (Prof. Dr. Peter Röben)

Research

“Our work aims at analyzing the structural, electronic, optical and adsorption properties of solid surfaces with atomic scale precision. We mainly focus on dielectric surfaces, in particular of oxides and more recently of transition metal dichalcogenides. In order to overcome problems with their insulating nature, the materials are prepared in the form of thin films grown on crystalline substrates”



source: www.uol.de/en/raspe

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Research at the institute of Physics

Turbulence Wind Energy and Stochastics

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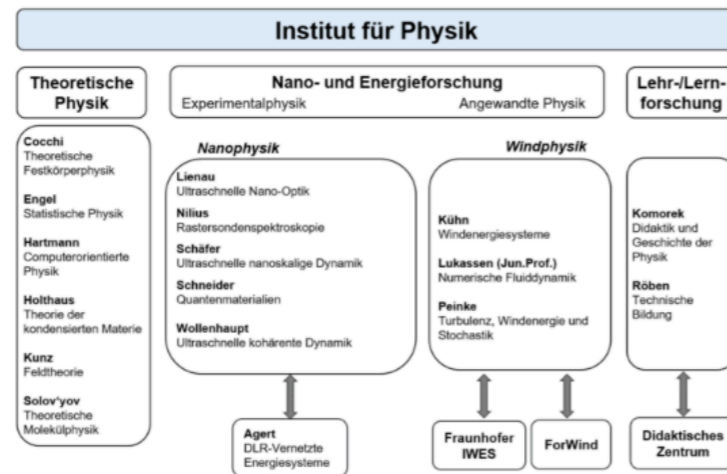
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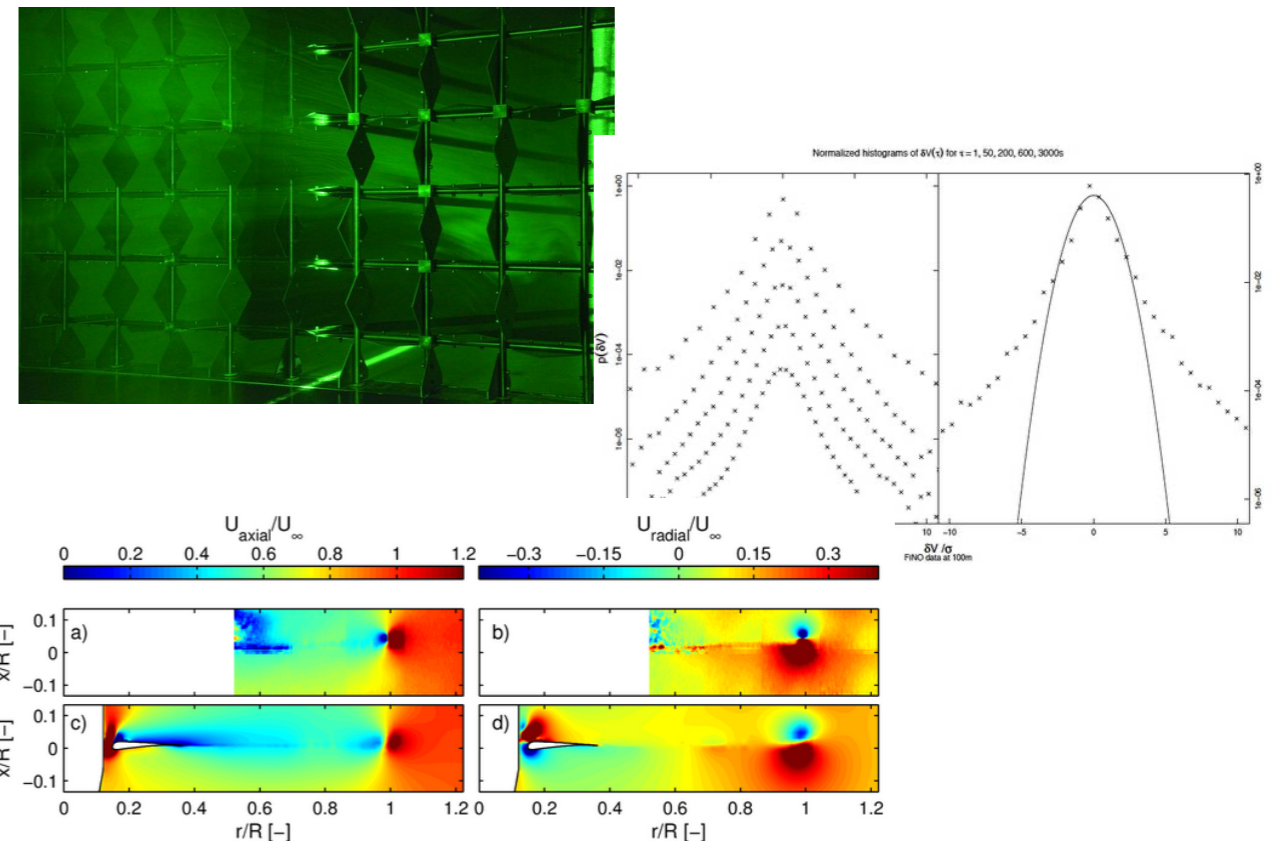
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Technical Education

- Technische Bildung (Prof. Dr. Peter Röben)

Research

- Wind Physics
- Turbulent flows
- Measurements
- Stochastic analysis



source: www.uol.de/en/physics/twist

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Research at the institute of Physics

Ultrafast Coherent Dynamics

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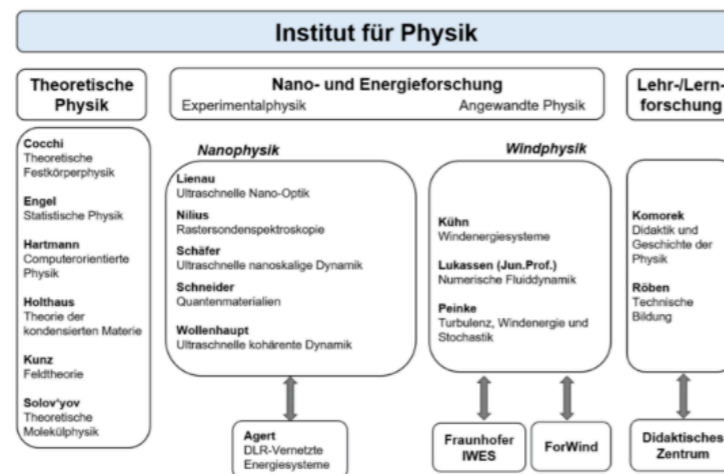
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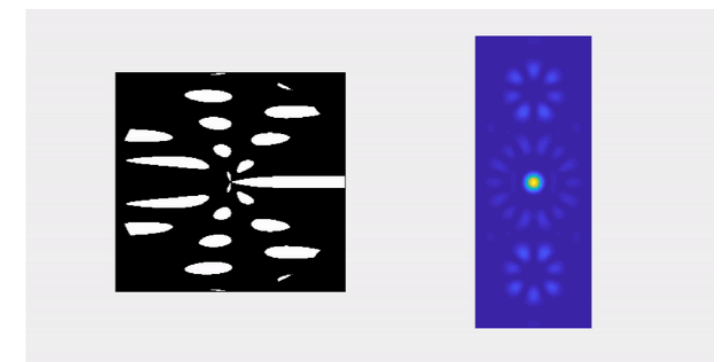
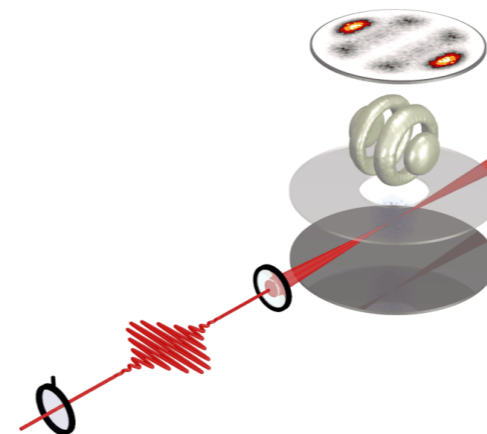
Technical Education

- Technische Bildung (Prof. Dr. Peter Röben)

Research

“The Ultrafast Coherent Dynamics group (ULTRA) deals with the observation and control of coherent dynamics of quantum systems using tailored ultrashort laser pulses.”

- Tomography of Potassium
- Dynamic quantum state holography
- Control of electron vortex beams



source: www.uol.de/ukd/forschung

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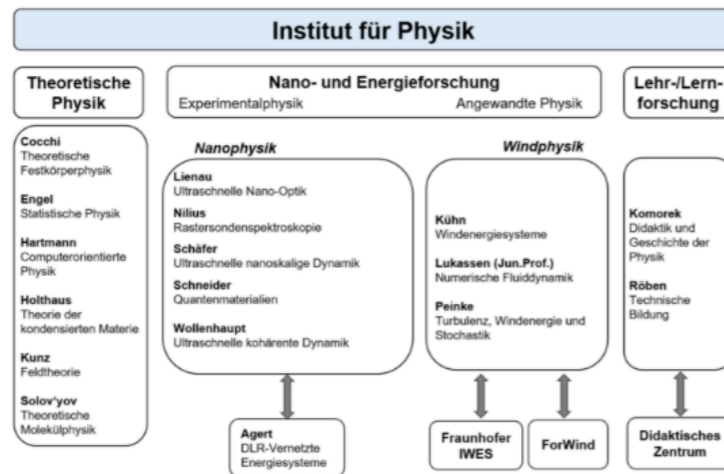
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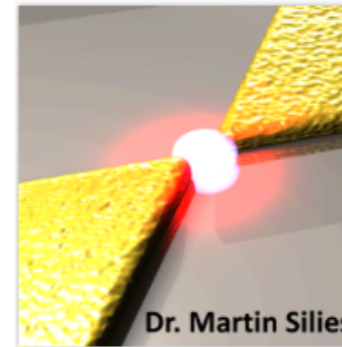
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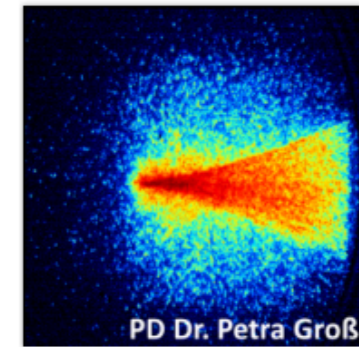
Ultrafast Nano-optics

Research

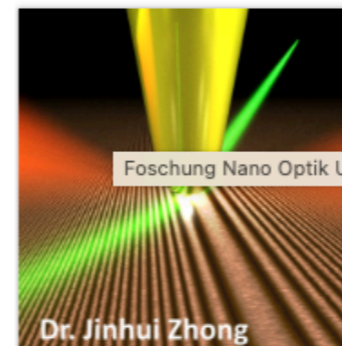
Photonic Transistors
BMBF Junior Research Group



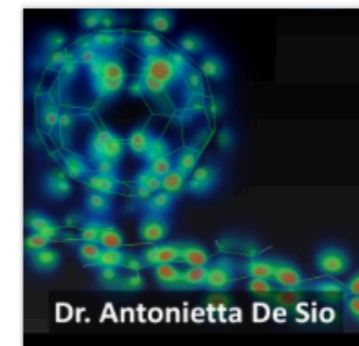
Generation and application of ultrashort electron pulses



Coherent ultrashort NanoOptics



Ultrafast multidimensional spectroscopy



source: www.uol.de/en/uno/research

Research

- Research activities
- Publications
- Theses
- Pictures and Videos

Contact

- +49 (0)441 798-3572
- +49 (0)441 798-3699
- Institute of Physics

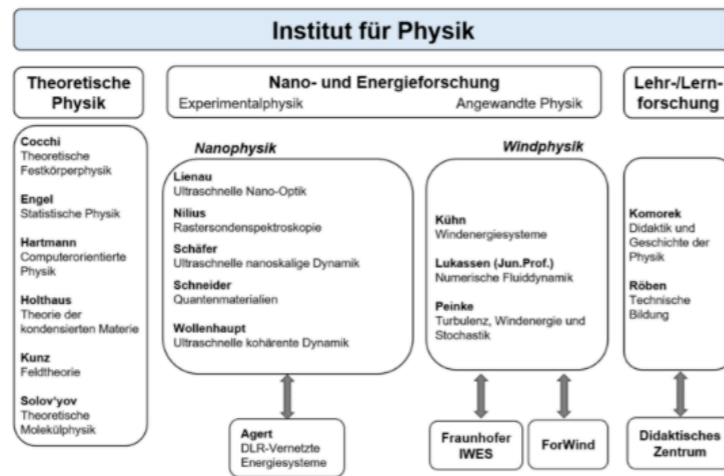
Postal address

Carl von Ossietzky University of Oldenburg
Institute of Physics
D-26111 Oldenburg
Germany

Site plan with route plan

Imprint

Research



Research topics at the Institute of Physics

Experimental and Applied Physics

- Rastersondenspektroskopie (Prof. Dr. Niklas Nilius)
- Turbulenz, Windenergie und Stochastik (Prof. Dr. Joachim Peinke)
- Ultraschnelle kohärente Dynamik (Prof. Dr. Matthias Wollenhaupt)
- Ultraschnelle Nano-Optik (Prof. Dr. Christoph Lienau)
- Ultraschnelle nanoskalige Dynamik (Prof. Dr. Sascha Schäfer)**
- Windenergiesysteme (Prof. Dr. Martin Kühn)
- Experimentelle Physik komplexer Systeme (Apl. Prof. Achim Kittel)
- Numerische Fluidodynamik in der Windphysik (Junior-Prof. Dr. Laura Lukassen)

Theoretical Physics

- Computerorientierte Physik (Prof. Dr. Alexander Hartmann)
- Feldtheorie (Prof. Dr. Jutta Kunz)
- Statistische Physik (Prof. Dr. Andreas Engel)
- Theorie der kondensierten Materie (Prof. Dr. Martin Holthaus)
- Quantum Biology and Computational Physics (Prof. Dr. Iliia Solov'yov)

Physics Didactics

- Didaktik der Physik und Wissenschaftskommunikation (Prof. Dr. Michael Komorek)

Technical Education

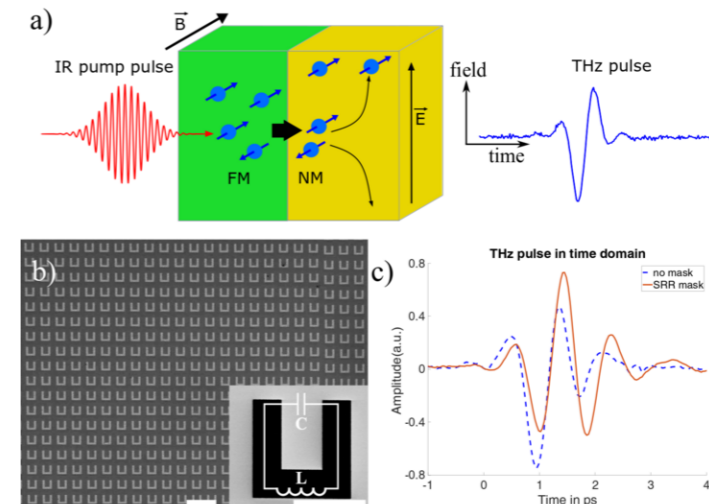
- Technische Bildung (Prof. Dr. Peter Röben)

Research

“Many fundamental processes in solids evolve on nanometer length scales and femto- to picosecond time scales.

In our group, we develop novel experimental techniques to image such processes on their intrinsic time and length scales. A comprehensive understanding of the relevant nanoscopic coupling mechanism may yield new avenues for a detailed control ultrafast nanoscale dynamics.”

- e.g. nanoscale spintronic terahertz emitter



source: www.uol.de/en/und

link: <https://uol.de/en/physics/research>

contact: michael.hoelling@uol.de

Research at the institute of Physics

Wind Energy Systems

Navigation: [...] > Schools & > School V & > Physics & > Research &

- Research
- Research activities
- Publications
- Theses
- Pictures and Videos

Contact

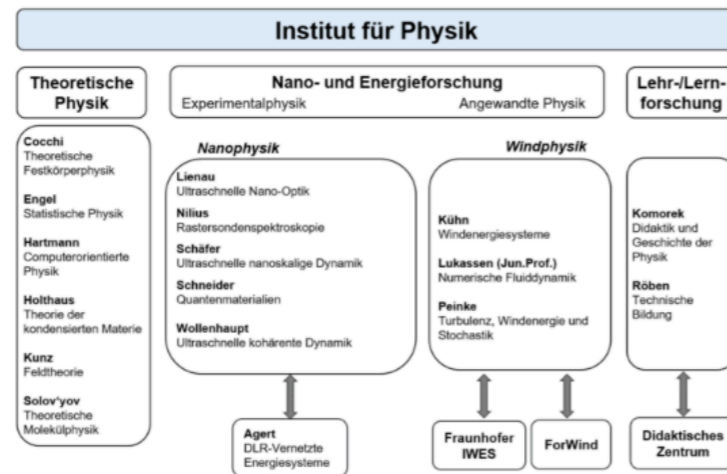
+49 (0)441 798-3572
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Institute of Physics

Postal address

Carl von Ossietzky University of Oldenburg
Institute of Physics
D-26111 Oldenburg
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Site plan with route plan

Imprint

Research



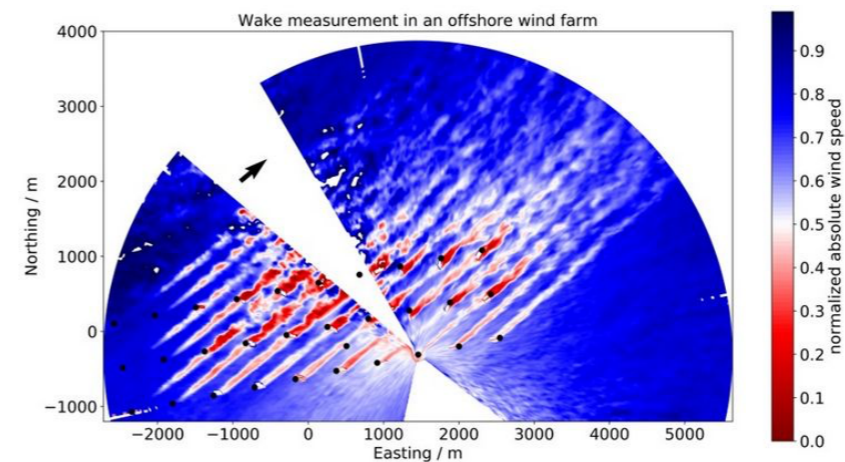
Research

“We focus on the interaction of wind energy systems (i.e. wind farms, wind turbines and their components) with the physical environment and the electrical grid. Our mission is to transfer basic knowledge on wind physics to the design and operation of on- and offshore wind farms to provide more cost-effective, reliable and grid-friendly wind power.”

- Lidar and Wakes
- Turbine and Windfarm Control

Research topics at the Institute of Physics

Experimental and Applied Physics	Theoretical Physics
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Ultraschnelle Nano-Optik (Prof. Dr. Christoph Lienau)	Theorie der kondensierten Materie (Prof. Dr. Martin Holthaus)
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Windenergiesysteme (Prof. Dr. Martin Kühn)	
Experimentelle Physik komplexer Systeme (Apl. Prof. Achim Kittel)	
Numerische Fluidodynamik in der Windphysik (Junior-Prof. Dr. Laura Lukassen)	
	Physics Didactics
	Didaktik der Physik und Wissenschaftskommunikation (Prof. Dr. Michael Komorek)
	Technical Education
	Technische Bildung (Prof. Dr. Peter Röben)



source: www.uol.de/en/we-sys/research

link: <https://uol.de/en/physics/research>

contact: michael.hoelling@uol.de

Research at the institute of Physics

- Research
- Research activities
- Publications
- Theses
- Pictures and Videos

Contact

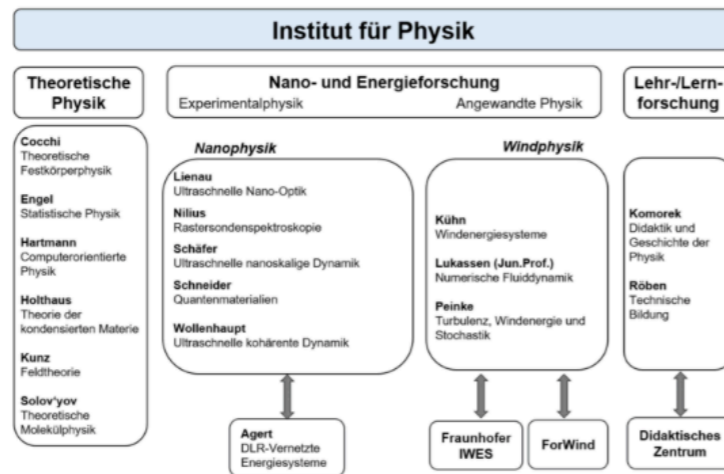
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Research topics at the Institute of Physics

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	Technical Education
	Technische Bildung (Prof. Dr. Peter Röben)

link: <https://uol.de/en/physics/research>

contact: michael.hoelling@uol.de

Computational Fluid Dynamics for Wind Physics

Research

- Meteorological methods
- Analysis of wind velocity fluctuations and power output fluctuations
- Fluid-Structure-Interaction (FSI)
- Experimental and stochastic methods



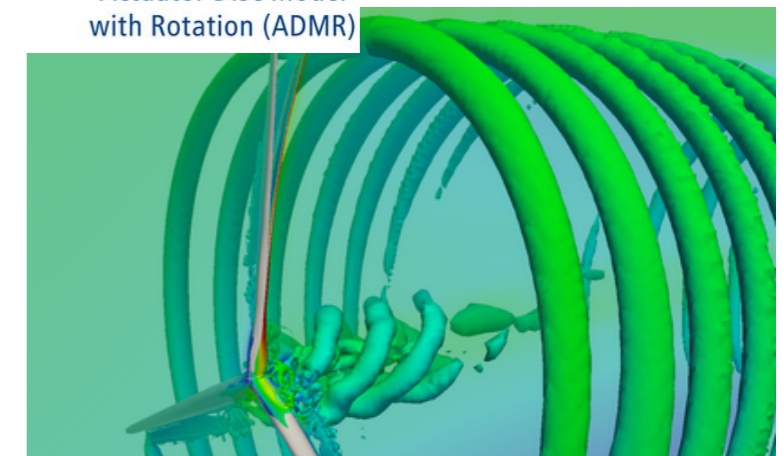
Actuator Line Model (ALM)



Actuator Sector Model (ASM)



Actuator Disc Model with Rotation (ADM-R)



source: www.uol.de/en/computational-fluid-dynamics/research

Study program Master Physics

Contact information

- All questions concerning your studies:
- Study and Career Counselling Service
- All questions concerning the subject/degree:
- Academic counselling for Physics
 - Student representatives of Physics

Facts and Data

- Duration: 4 semesters
- Degree Award: Master of Science
- Language: German
- admission free
- Special admission requirements

Important information

- Studienverlaufsplan Physik (M.Sc.) [pdf]
- Study plan of Physics (M.Sc.) [pdf]
- Zugangsordnung Physik M.Sc. [pdf]

Course of study

Physics - Master's Programme

Study Infos How to apply Exams



Orientation and Goals	+
Study Design and Contents	-
This programme is structured so as to consist of a consolidation phase (60 credit points) and a research phase (60 credit points), including the master's thesis. Consolidation areas are	
<ul style="list-style-type: none">– acoustics and signal processing,– biomedical physics and neurophysics,– field theory and many body theory,– materials science,– photonics,– the physics of renewable energy and– environmental physics– minor subjects include, for example, mathematics, chemistry, computing science, and economics.	
Teaching and Learning	+
Reasons for Studying	+
Foreign Language Skills	+
Careers and Areas of Employment	+
Target Group/Admission Requirements	+
Application/Admission Procedures	+
Further Information	+

Some courses are also offered in english!

For an overview of the courses please check:

https://elearning.uni-oldenburg.de/plugins.php/veranstaltungsverzeichnis_lvsg/englishmodules/index/9181502738f074c9b31307cbd4dd3df2?vz_sem_select=a2eae20475c9dc0f5a0bc24778e4d6a9

Study Design and Content

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- acoustics and signal processing,
- biomedical physics and neurophysics,
- field theory and many body theory,
- materials science,
- photonics,
- the physics of renewable energy and
- environmental physics
- minor subjects include, for example, mathematics, chemistry, computing science, and economics.

link: www.uol.de/en/students/course-of-study?id_studg=213&cHash=18371bc27a0c982f40e53aaf1e08c164

Study program Master Physics

Contact information

All questions concerning your studies:
 - Study and Career Counselling Service

All questions concerning the subject/degree:
 - Academic counselling for Physics
 - Student representatives of Physics

Facts and Data

- Duration: 4 semesters
- Degree Award: Master of Science
- Language: German
- admission free
- Special admission requirements

Important information

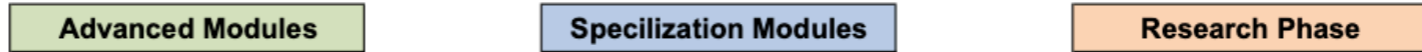
- [Studienvorlaufplan Physik \(M.Sc.\) \[pdf\]](#)
- [Study plan of Physics \(M.Sc.\) \[pdf\]](#)
- [Zugangsordnung Physik M.Sc. \[pdf\]](#)

- Course
- Physics -
- Study Infos
- Orientation
- Study Design
- Teaching ar
- Reasons for
- Foreign Lan
- Careers and
- Target Grou
- Application
- Further Information

Study Program Master Physics

Date: 19.Nov.13

		→ Credit Points									
		3	6	9	12	15	18	21	24	27	30
Semester ↓	1	Theoretical Physics		Applied Physics		Specialization I					
	2	Experimental Physics		Specialization II					Advanced Laboratory Course (research oriented)		
	3	Research-oriented training					Methods + Project Planning				
	4	Master Thesis									



The courses in the specialization modules can be chosen within the research fields present at the Institute of Physics and the Physics research groups of the faculty VI: Acoustics and Signal Processing, Biomedical Physics and Neuro Physics, Computational Physics, Material Sciences, Photonics, Physics of Renewable Energies, Theoretical Physics. Up to 12 CP can be obtained in courses offered by the research area Environmental Physics of the Institute for Biology and Chemistry of the Ocean (ICBM) or in a minor subject.

It is possible to take the advanced modules in a different order and in other semesters. In this case the schedule of the specialization modules I and II may be changed accordingly.

link: www.uol.de/en/students/course-of-study?id_studg=213&cHash=18371bc27a0c982f40e53aaf1e08c164

Study program Engineering Physics

Contact information

- All questions concerning your studies:
- Study and Career Counselling Service
- All questions concerning the subject/degree:
- Academic counselling for Engineering Physics
 - Student representatives of Engineering Physics

Facts and Data

- Duration: 4 semesters
- Degree Award: Master of Science
- Language: German/English
- admission tree
- Special admission requirements

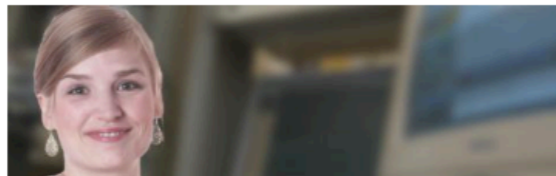
Important information

- Admission regulations Engineering Physics M.Sc. [pdf]
- Studienverlaufsplan Engineering Physics (M.Sc.) [pdf]
- Zugangsordnung Engineering Physics M.Sc. [pdf]

Course of study

Engineering Physics - Master's Programme

Study Infos How to apply Exams



Orientation and Goals

This master's programme is offered jointly by the University of Oldenburg and the University of Applied Sciences (Fachhochschule) Emden/Leer, and is intended to fill the gap between traditional physics and engineering. Students gain a comprehensive understanding in selected areas of physics. Additionally, the application of physics and engineering is elaborated upon in a focal area that can be chosen from the areas of "Laser & Optics", "Biomedical Physics", "Acoustics" and "Renewable Energies". Furthermore, this programme is international in its orientation, and students from many continents work closely together in lectures, practice sessions, and projects.

Study Design and Contents +

Teaching and Learning +

Reasons for Studying +

Foreign Language Skills +

Careers and Areas of Employment +

Target Group/Admission Requirements +

Application/Admission Procedures +

Further Information +

Orientation and Goals

This master's programme is offered jointly by the University of Oldenburg and the University of Applied Sciences (Fachhochschule) Emden/Leer, and is intended to fill the gap between traditional physics and engineering. Students gain a comprehensive understanding in selected areas of physics. Additionally, the application of physics and engineering is elaborated upon in a focal area that can be chosen from the areas of "Laser & Optics", "Biomedical Physics", "Acoustics" and "Renewable Energies". Furthermore, this programme is international in its orientation, and students from many continents work closely together in lectures, practice sessions, and projects.

link: [https://uol.de/en/students/course-of-study?](https://uol.de/en/students/course-of-study?id_studg=2&cHash=97147c810caa214764482d7bf209e699)

[id_studg=2&cHash=97147c810caa214764482d7bf209e699](https://uol.de/en/students/course-of-study?id_studg=2&cHash=97147c810caa214764482d7bf209e699)

Webmaster (Changed: 2021-01-14)

Study program Engineering Physics

Contact information

- All questions concerning your studies:
- Study and Career Counselling Service
- All questions concerning the subject/degree:
- Academic counselling for Engineering Physics
 - Student representatives of Engineering Physics

Facts and Data

- Duration: 4 semesters
- Degree Award: Master of Science
- Language: German/English
- admission free
- Special admission requirements

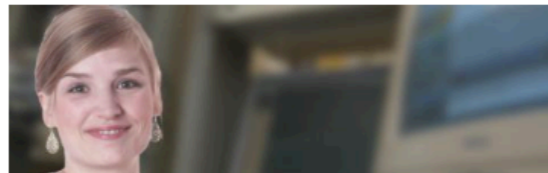
Important information

- Admission regulations Engineering Physics M.Sc. [pdf]
- Studienverlaufsplan Engineering Physics (M.Sc.) [pdf]
- Zugangsordnung Engineering Physics M.Sc. [pdf]

Course of study

Engineering Physics - Master's Programme

Study Infos How to apply Exams



Orientation and Goals	+
Study Design and Contents	+
Teaching and Learning	+
Reasons for Studying	-
Foreign Language Skills	+
Careers and Areas of Employment	+
Target Group/Admission Requirements	+
Application/Admission Procedures	+
Further Information	+

Reasons for Studying

Our profile:

- physics combined with engineering
- mathematics lectures dealing with mathematical methods for physics and engineering
- theoretical physics dealing with application situations
- specialisation area to be freely chosen from biomedical physics, lasers and optics, materials science, renewable energies, acoustics
- excellent future prospects
- international students and international environment.

Reasons for Studying

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link: https://uol.de/en/students/course-of-study?id_studg=2&cHash=97147c810caa214764482d7bf209e699

Study program Engineering Physics

Study plan

Contact information

All questions concerning your studies:

- Study and Career Counselling Service

All questions concerning the subject/degree:

- Academic counselling for Engineering Physics
- Student representatives of Engineering Physics

Facts and Data

- Duration: 4 semesters
- Degree Award: Master of Science
- Language: German/English
- admission free
- Special admission requirements

Important information

- Admission regulations Engineering Physics M.Sc. [pdf]
- Studienverlaufsplan Engineering Physics (M.Sc.) [pdf]
- Zugangsordnung Engineering Physics M.Sc. [pdf]

CP →	3	6	9	12	15	18	21	24	27	30	sum
4.→ Semester	Thesis										
CP	30										30
3.→ Semester	Theoretical Methods	Advanced Topics in EP	Specialization			Advanced Research Project					
CP	6	3	6			15					30
2.→ Semester	Advanced Physics	Engineering Sciences	Specialization		Specialization		Tools and Skills in Engineering Sciences				
CP	6	6		6		6		6			30
1.→ Semester	Advanced Physics	Advanced Metrology	Engineering Sciences	Engineering Sciences		Specialization					
CP	6	6		6		6		6			30

Fields of study: **Physics**, **Engineering**, **Specialization**, **Laboratory**, **Management**, **Thesis** $\Sigma CP = 120$

The field of specialization consists of *Biomedical Physics, Acoustics, Laser & Optics, Renewable Energies.*

Further Information +

link: https://uol.de/en/students/course-of-study?id_studg=2&cHash=97147c810caa214764482d7bf209e699

Postgraduate Programme Renewable Energy - PPRE

Contact information

All questions concerning your studies:
– [Study and Career Counselling Service](#)
All questions concerning the subject/degree:
– [Academic counselling for Postgraduate Programme Renewable Energy](#)

Facts and Data

– Duration: 4 semesters
– Degree Award: Master of Science
– Language: English
– admission limited
– Special admission requirements
– Fee-based

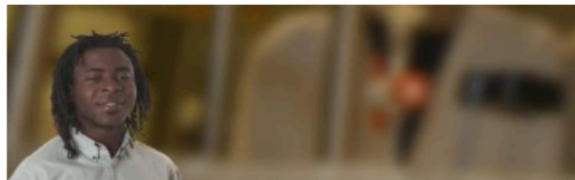
Important information

– [Zugangsordnung Postgraduate Programme Renewable Energy M.Sc. \[pdf\]](#)

Course of study

Postgraduate Programme Renewable Energy - Master's Programme

[Study Infos](#) [How to apply](#) [Exams](#)



Orientation and Goals

The Postgraduate Programme in Renewable Energy (PPRE) has been offered by the Physics Department at the University of Oldenburg since 1987. Over 500 students from over 85 countries (particularly from Africa, Asia, Central and South America, but also from Germany and other industrialised countries) have successfully completed this 24 month degree programme. The overarching objective of PPRE is to teach students the fundamental principles and applications of renewable energy sources; special attention is paid to the possibilities for application in developing countries.

Technical focuses include: teaching the physical foundations of renewable energy systems, technical implementation and economic conditions for the use of renewable energies, practical testing of components, decentralised energy supply systems, analysis and planning, concrete decentralised energy supply projects (case studies), contacts with firms and institutions in the area of utilising renewable energy sources.

Foreign Language Skills	+
Careers and Areas of Employment	+
Target Group/Admission Requirements	+
Application/Admission Procedures	+
Further Information	+

Orientation and Goals

The Postgraduate Programme in Renewable Energy (PPRE) has been offered by the Physics Department at the University of Oldenburg since 1987. Over 500 students from over 85 countries (particularly from Africa, Asia, Central and South America, but also from Germany and other industrialised countries) have successfully completed this 24 month degree programme. The overarching objective of PPRE is to teach students the fundamental principles and applications of renewable energy sources; special attention is paid to the possibilities for application in developing countries.

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- practical testing of components,
- decentralised energy supply systems,
- analysis and planning, concrete decentralised energy supply projects (case studies),
- contacts with firms and institutions in the area of utilising renewable energy sources.

link: https://uol.de/en/students/course-of-study?id_studg=214&cHash=da9ffa44851f2dca66a2e3380f33b276

Webmaster (Changed: 2021-01-14)

Postgraduate Programme Renewable Energy - PPRE

Student InfoPortal

Navigation: Home > Students > Degree programmes > Course of study

Contact information

- All questions concerning your studies:
 - Study and Career Counselling Service
- All questions concerning the subject/degree:
 - Academic counselling for Postgraduate Programme Renewable Energy

Facts and Data

- Duration: 4 semesters
- Degree Award: Master of Science
- Language: English
- admission limited
- Special admission requirements
- Fee-based

Important information

- Zugangsordnung Postgraduate Programme Renewable Energy M.Sc. [pdf]

Course of study

Postgraduate Programme Renewable Energy - Master's Programme

Study Infos How to apply Exams



- Orientation and Goals +
- Foreign Language Skills +
- Careers and Areas of Employment +
- Target Group/Admission Requirements +
- Application/Admission Procedures +
- Further Information -
 - Brief Information Postgraduate Programme Renewable Energy (M. Sc.) [pdf]
 - Kurzbeschreibung Postgraduate Programme Renewable Energy (M.Sc.) [pdf]
 - Current courses for Postgraduate Programme Renewable Energy (Master's Programme)
 - Website Postgraduate Programme Renewable Energy (M.Sc.) (in English)
 - Studienportal Erneuerbare Energien
 - Platform for the Study of Renewable Energy (in English)
 - Fee-based degree programmes
 - Gebührenpflichtige Studiengänge
 - Akkreditierungsurkunde Postgraduate Programme Renewable Energy (M.Sc.) bis 2024 [pdf]

link: https://uol.de/en/students/course-of-study?id_studg=214&cHash=da9ffa44851f2dca66a2e3380f33b276

Webmaster (Changed: 2021-01-14)

V. School of Mathematics and Science
Institute of Physics

Navigation: [...] > Physics > Studies > Course of Studies > PPRE Start

PPRE Start

- Masters on Renewable Energy
- Course Structure
- Application

Contact

On questions about PPRE and its application procedure

Sandra Schwerz
Application and Administration Support
ppre@uol.de
+49 (0)441-798 3544

Programme Coordinator

Edu Knagge
edu@uol.de
+49-441-798-3544
Mon - Thu

PPRE/EMRE (Core Oldenburg)

Dr. Herena Torio
Programme Manager
herena.torio@uni-oldenburg.de
+49 (0)441-798-3546

Director

Prof. Dr. Carsten Agert
c.agert@uni-oldenburg.de
Address
University of Oldenburg
School of Mathematics and Science
Institute of Physics
D-26111 Oldenburg
Germany

Postgraduate Programme Renewable Energy (PPRE)

Information Regarding the COVID-19 Pandemic

Despite the COVID-19 pandemic, the winter semester 2020/21 will be conducted as planned. Due to special hygiene measures the courses are partly offered online.

About PPRE

We offer a MSc programme on the fundamentals of renewable energy, designed for scientists and engineers intending to pursue a professional career in this field.

The next application deadlines are

- 15 October 2020 (1 year before entry) only for DAAD applicants from developing countries
- 15 January 2021 (9 months before entry) regular application deadline for self-sponsored students and those applying for a scholarship other than DAAD (all countries)

Please apply online between August 15, 2020 and January 15, 2021. (Flash, Javascript and https/ssl encryption are needed).

Classes start in early October every year.

Please see our application section for important information on the process, and also the FAQ for questions about applying to PPRE.

Regulations

Plagiarism

Facilities

Photo gallery

News

03/13/2020 PPRE | News from/about Alumni

Obituary - Carlos Armando Girón Rosa

"Carlos Armando Girón Rosa, Guatemala (PPRE 2015-17) passed away on 11.03.2020 in Malawi as the result of a tragic automobile accident. He was only... more

11/12/2019 PPRE

Over 30 years of PPRE...

...ready to be dumped.

more

PPRE accredited by ASIIN

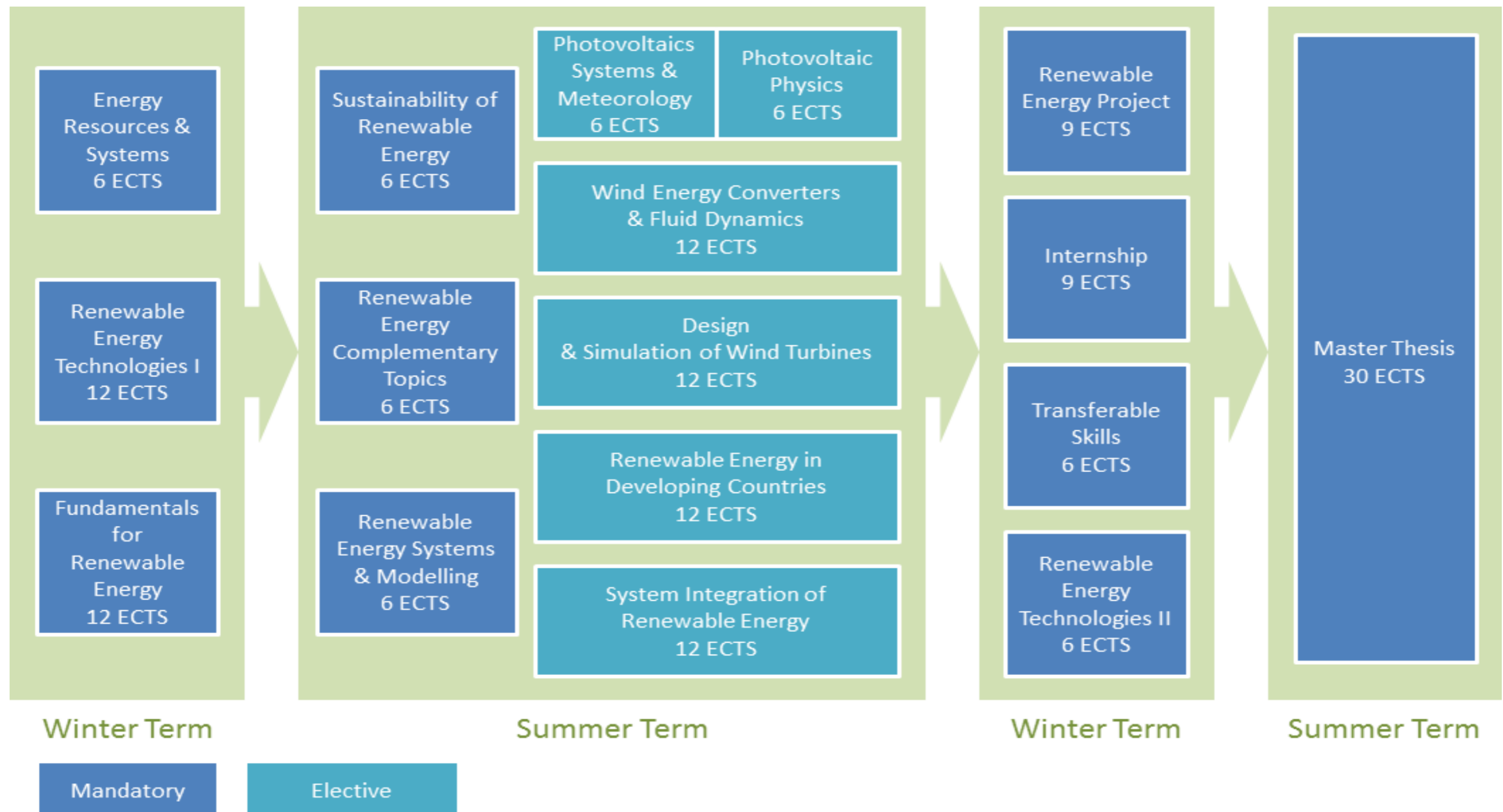
PPRE was accredited by the Accreditation Agency for Degree Programmes in Engineering, Informatics, the Natural Sciences and Mathematics. Read more

PPRE wins Ars Legendi Prize 2016

PPRE wins one of the most prestigious prizes for education in Germany. Read more

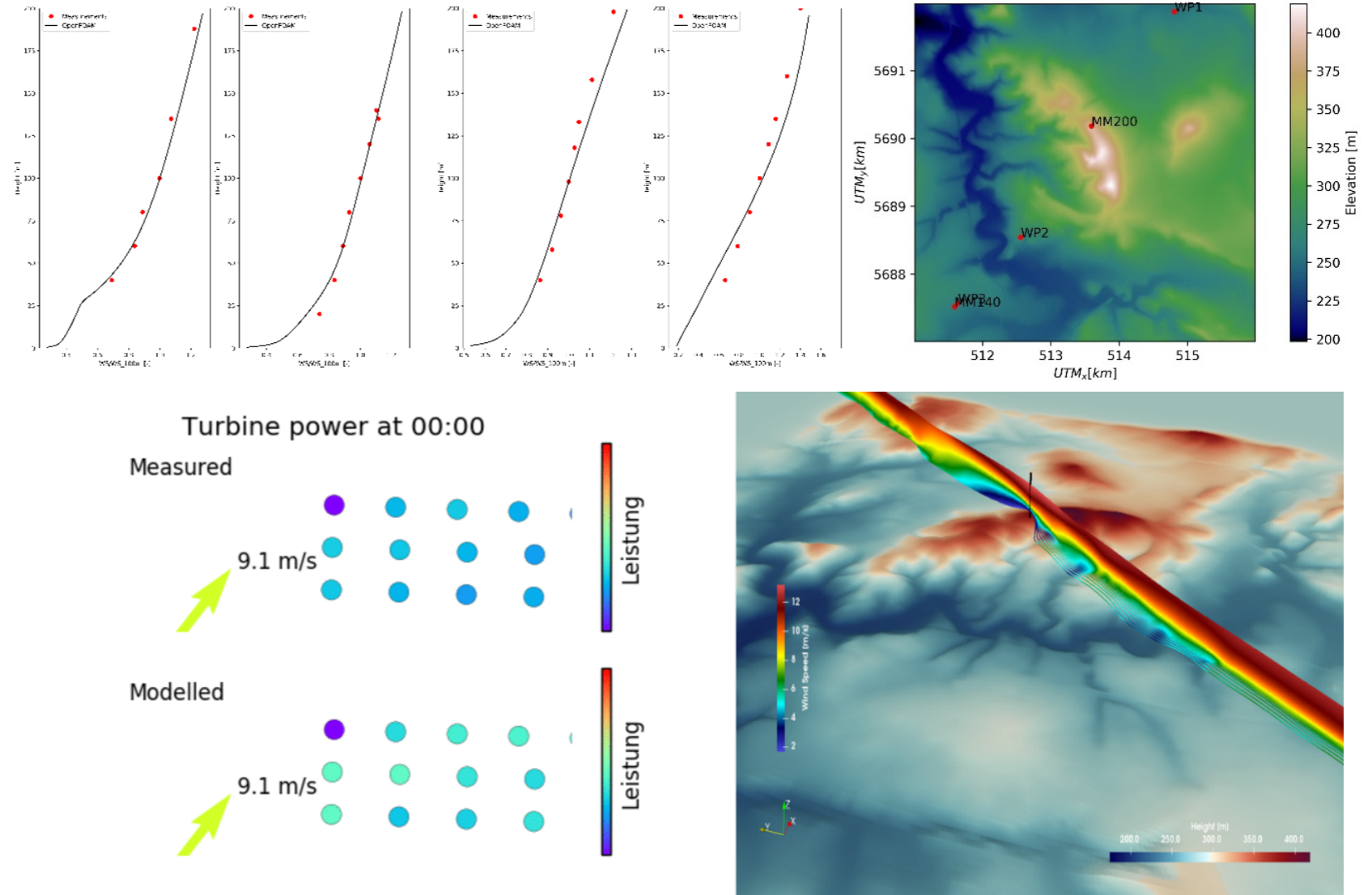
link: <https://uol.de/en/ppre>

PPRE Curriculum



Using computational fluid dynamics in site analysis for wind farms

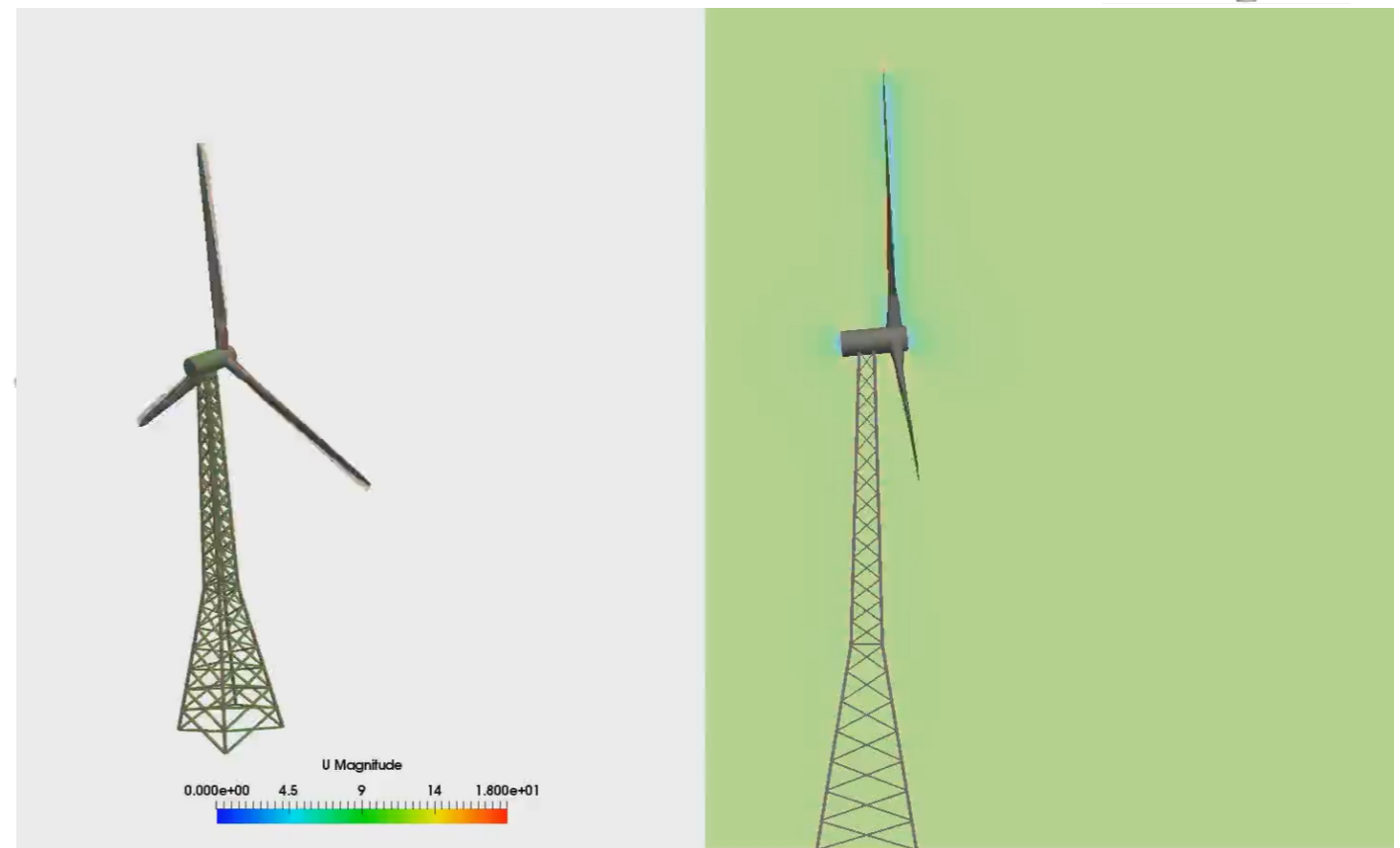
- Simulating wind fields at large scales with obstacles
- Howto include all natural phenomena into simulation?
- Turbulence at scales from 1 km to μm
- Also include wind farm effects
- Compare with real wind farm results



Fluid-Structure coupled Flow Simulations for Aerodynamics

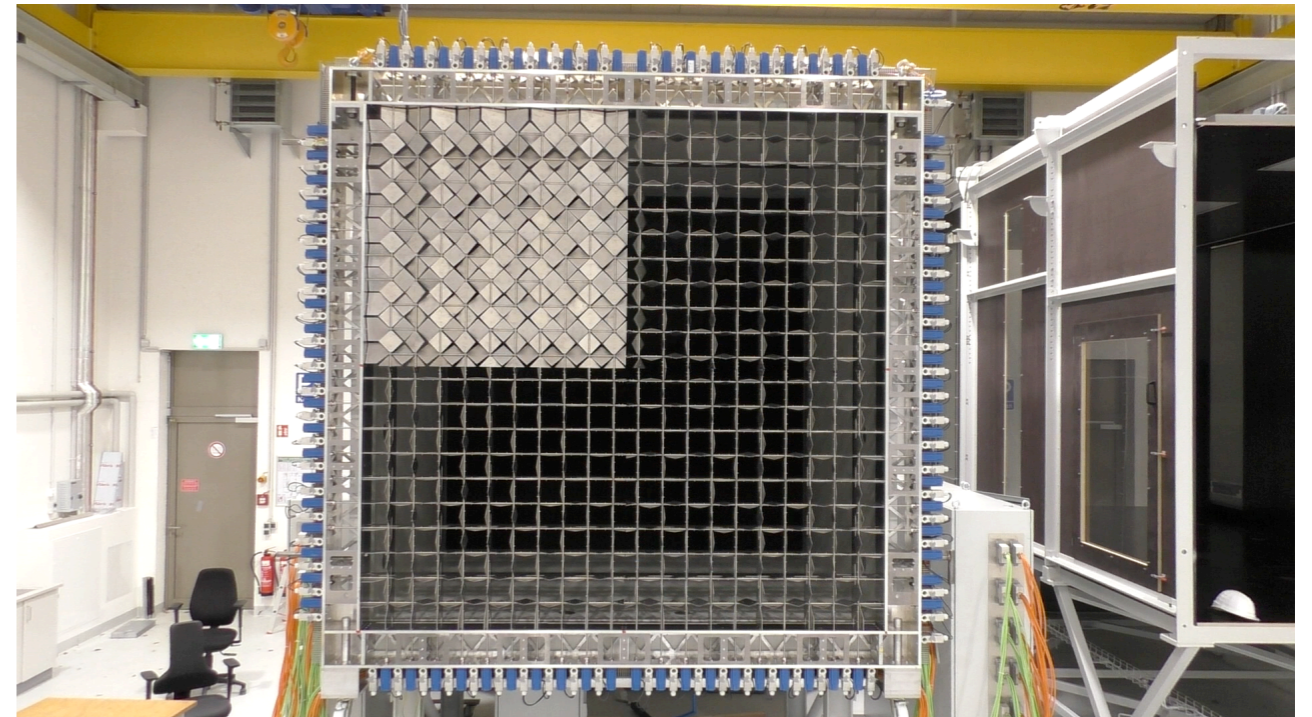
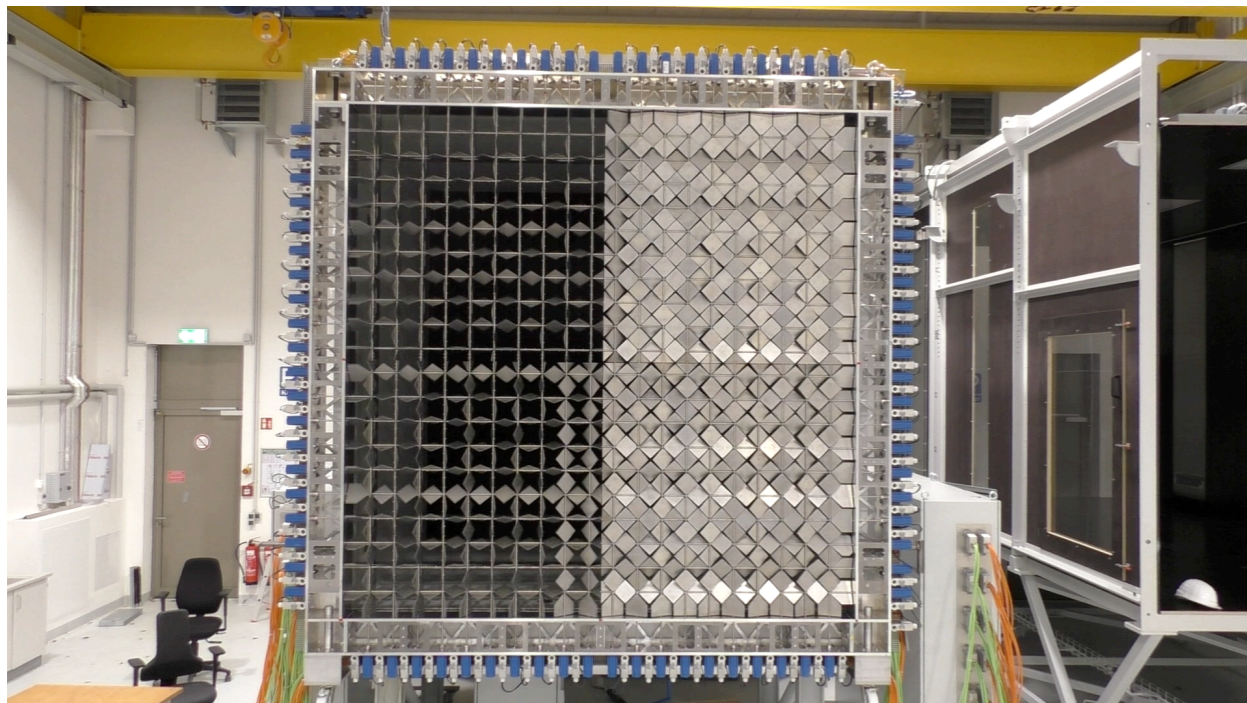
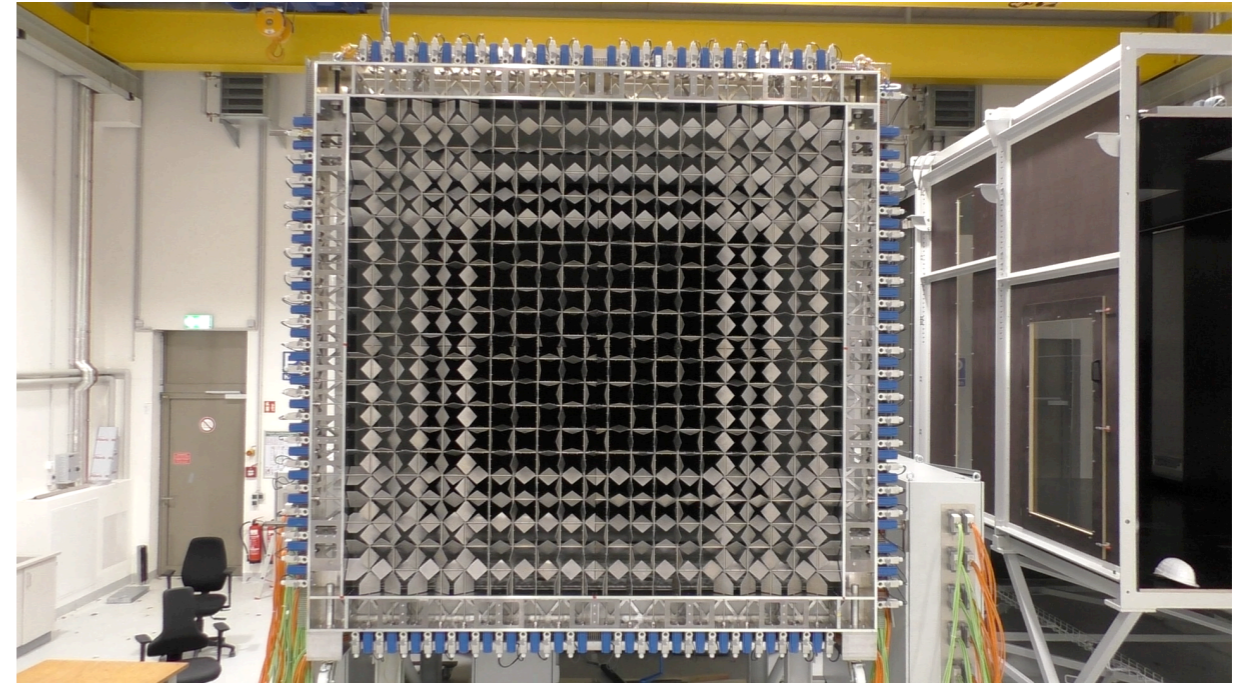
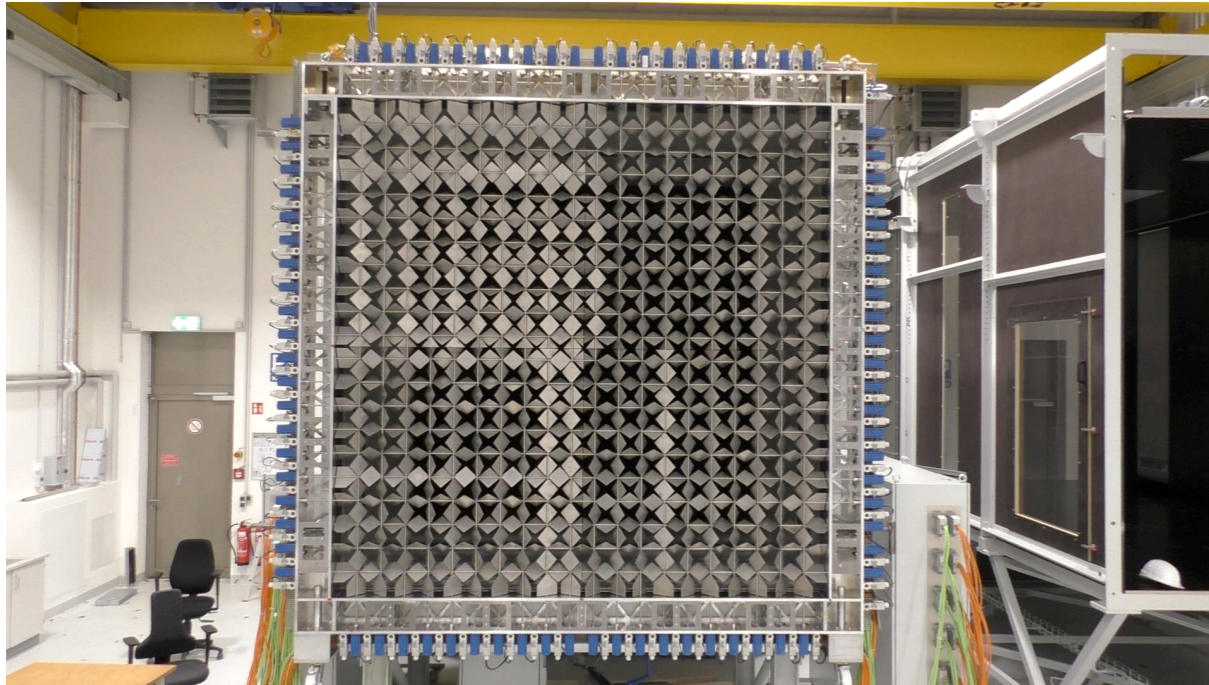
- Wind turbines are aerodynamic machines
- Computational fluid dynamics gives a deep insight into the flow characteristics
- Fluid-structure coupling for blades for higher fidelity turbine simulations
- In the field of non-standard situations many open questions

NREL 5MW

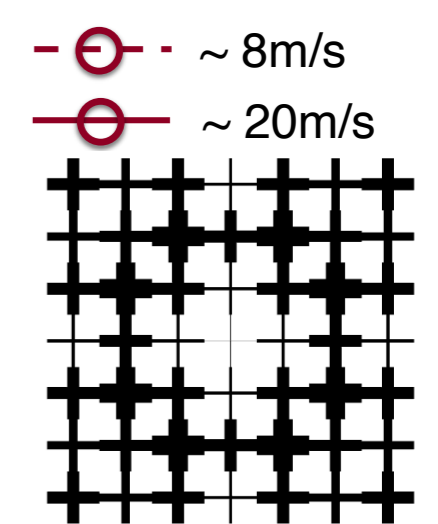
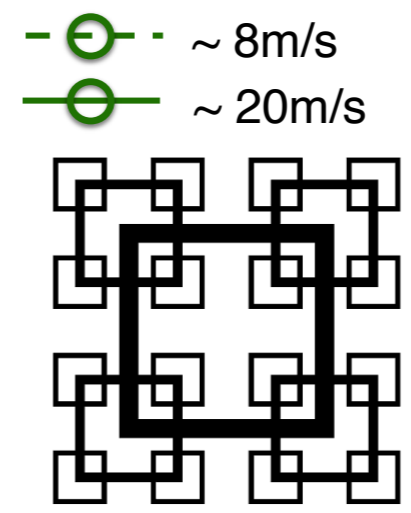
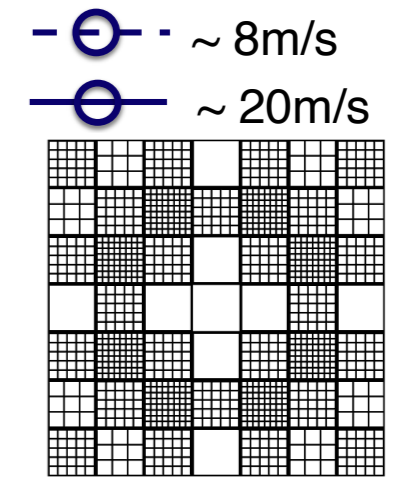
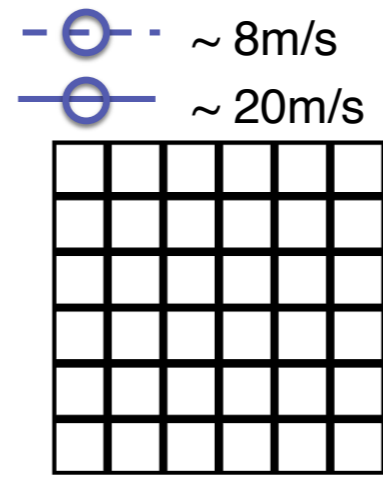
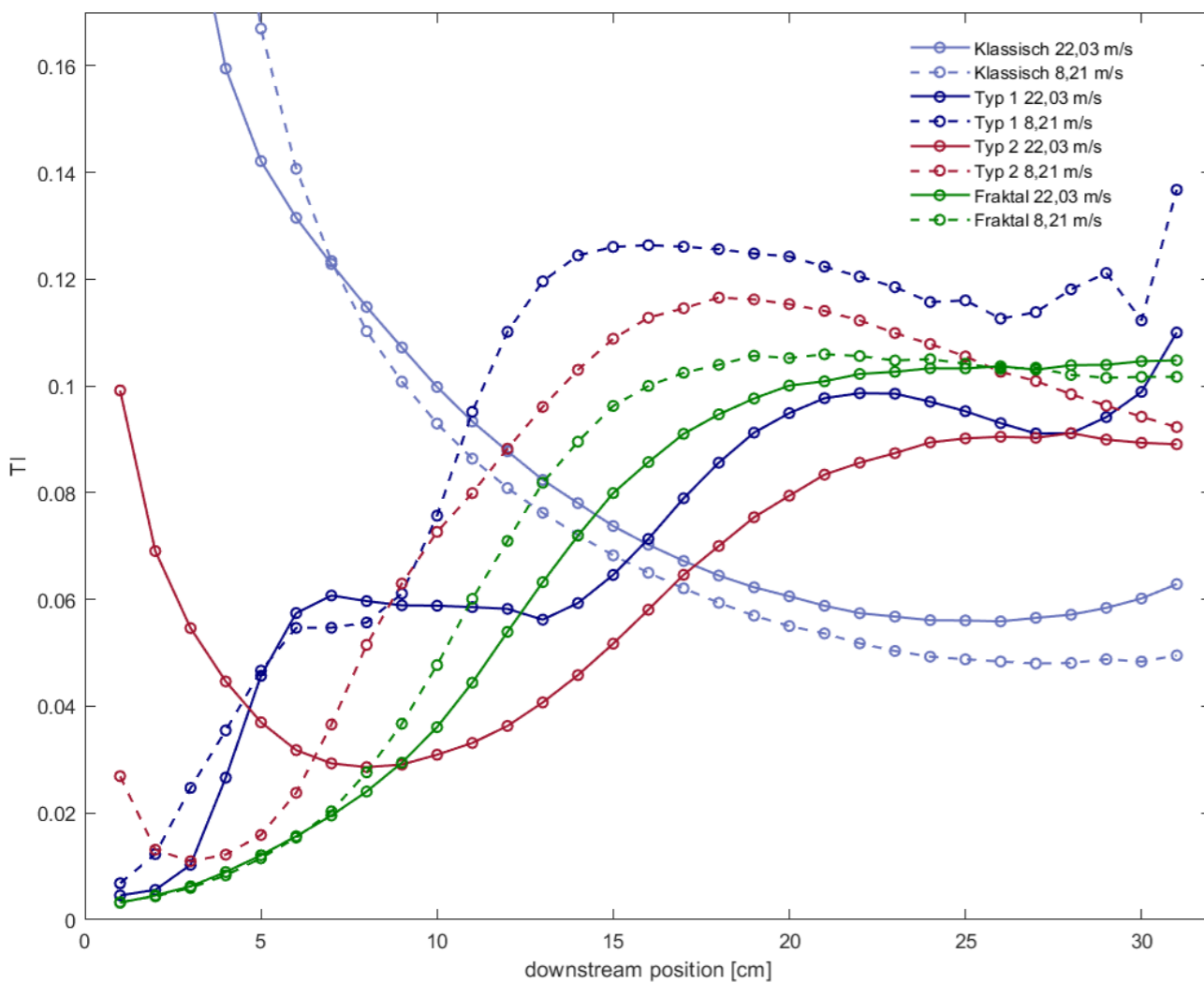


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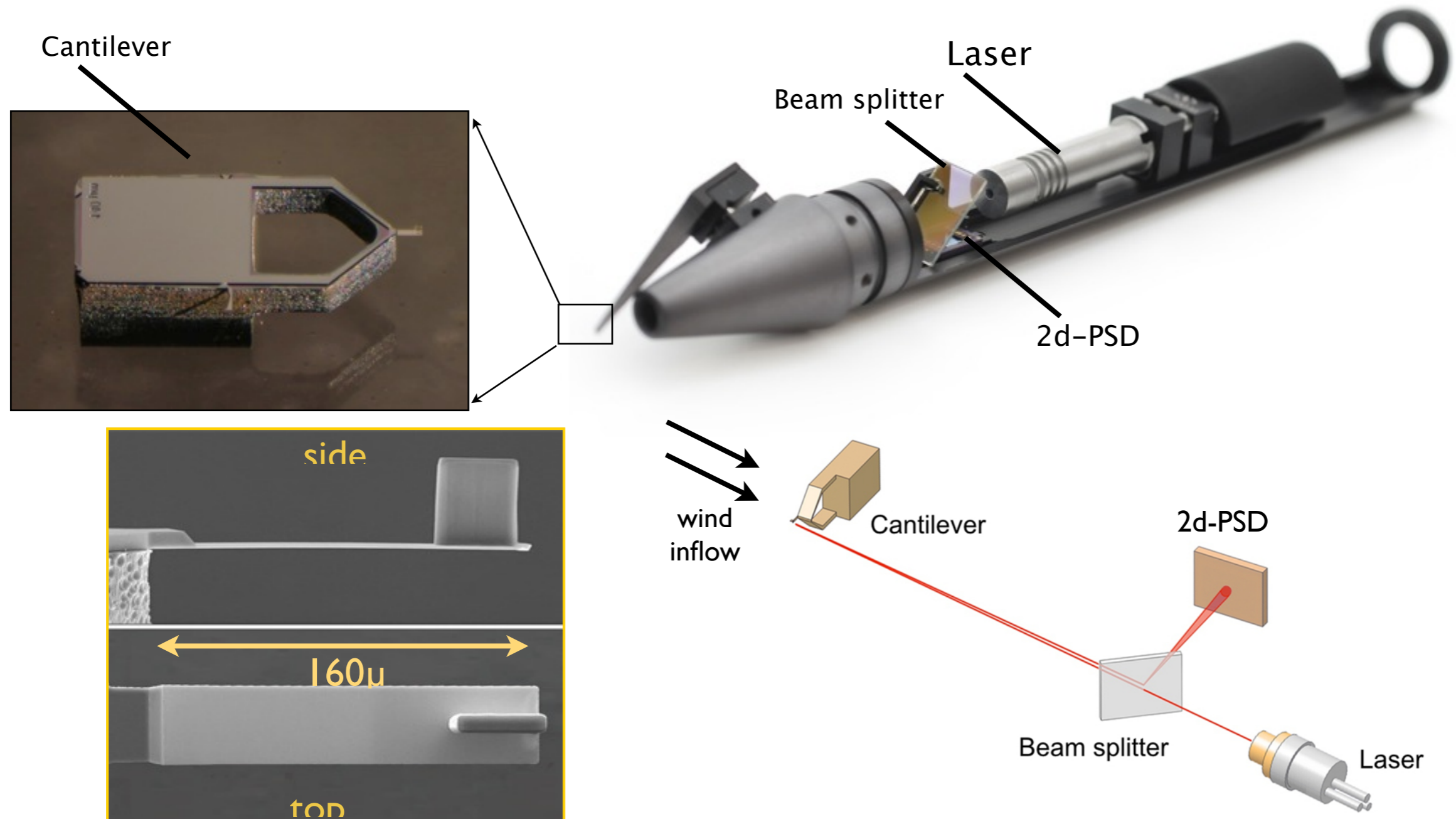
Generation of turbulent flows by active grids



Generation of turbulent flows by passive grids

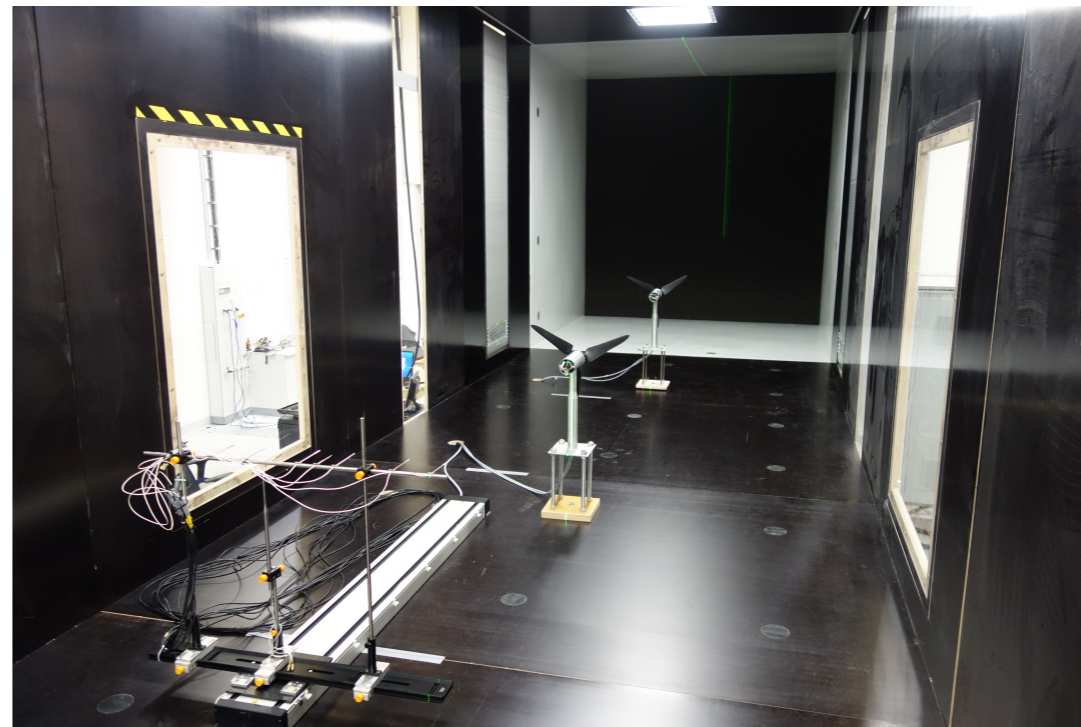


Measurements techniques - 2D Laser Cantilever Anemometer



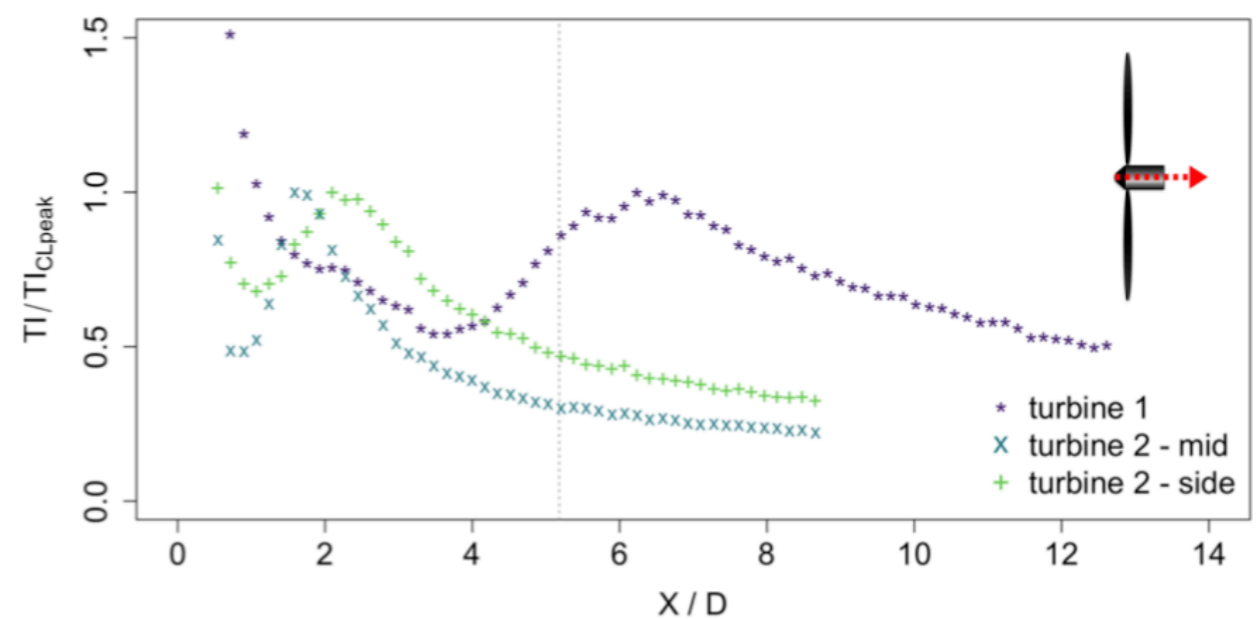
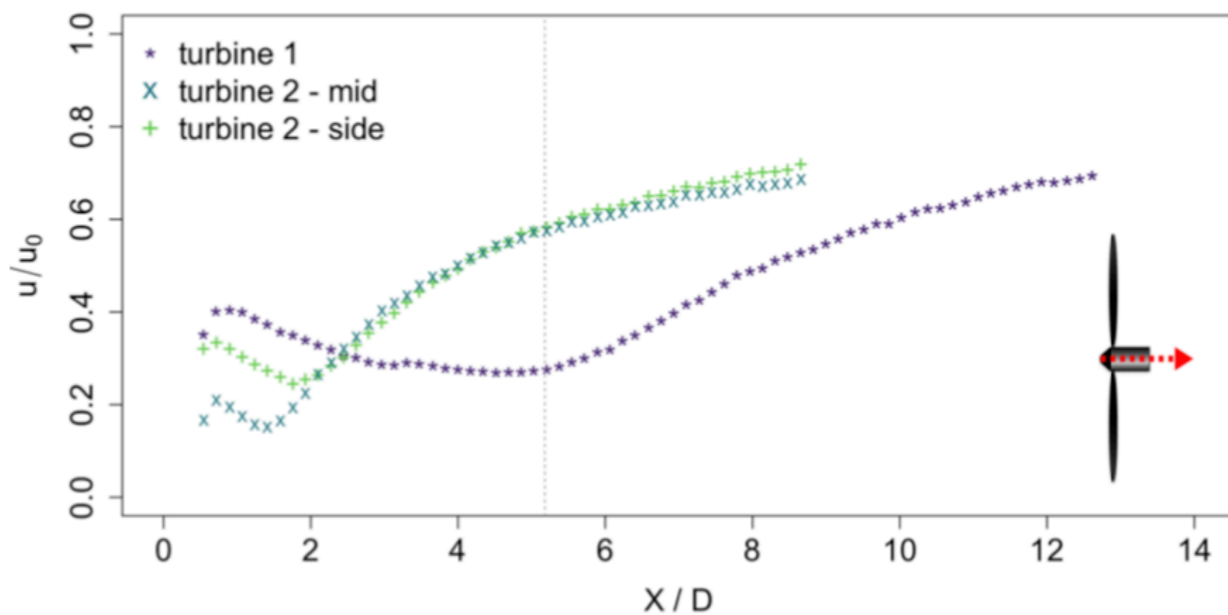
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Model wind turbines e.g. wake measurements



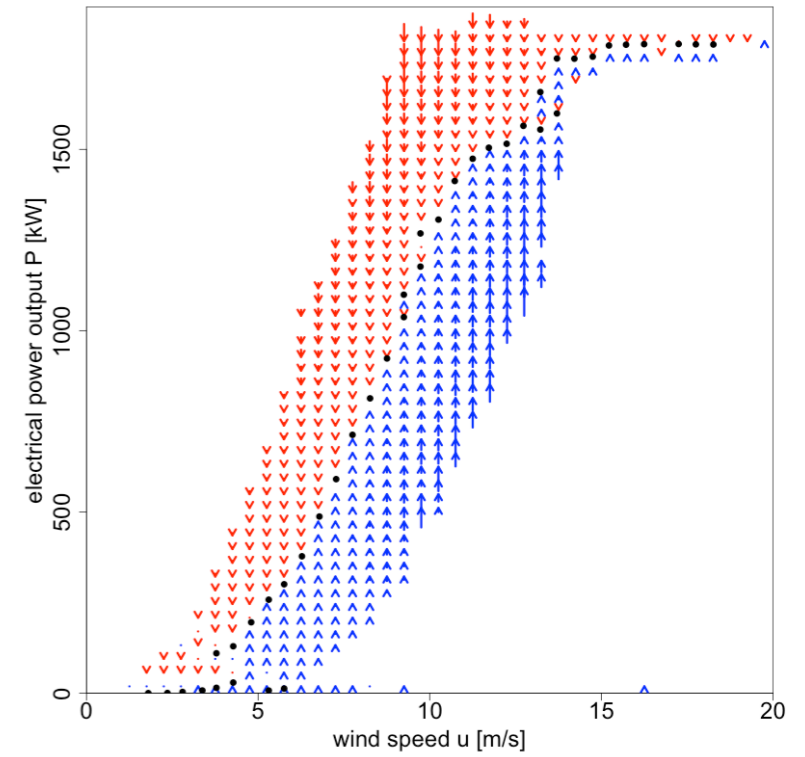
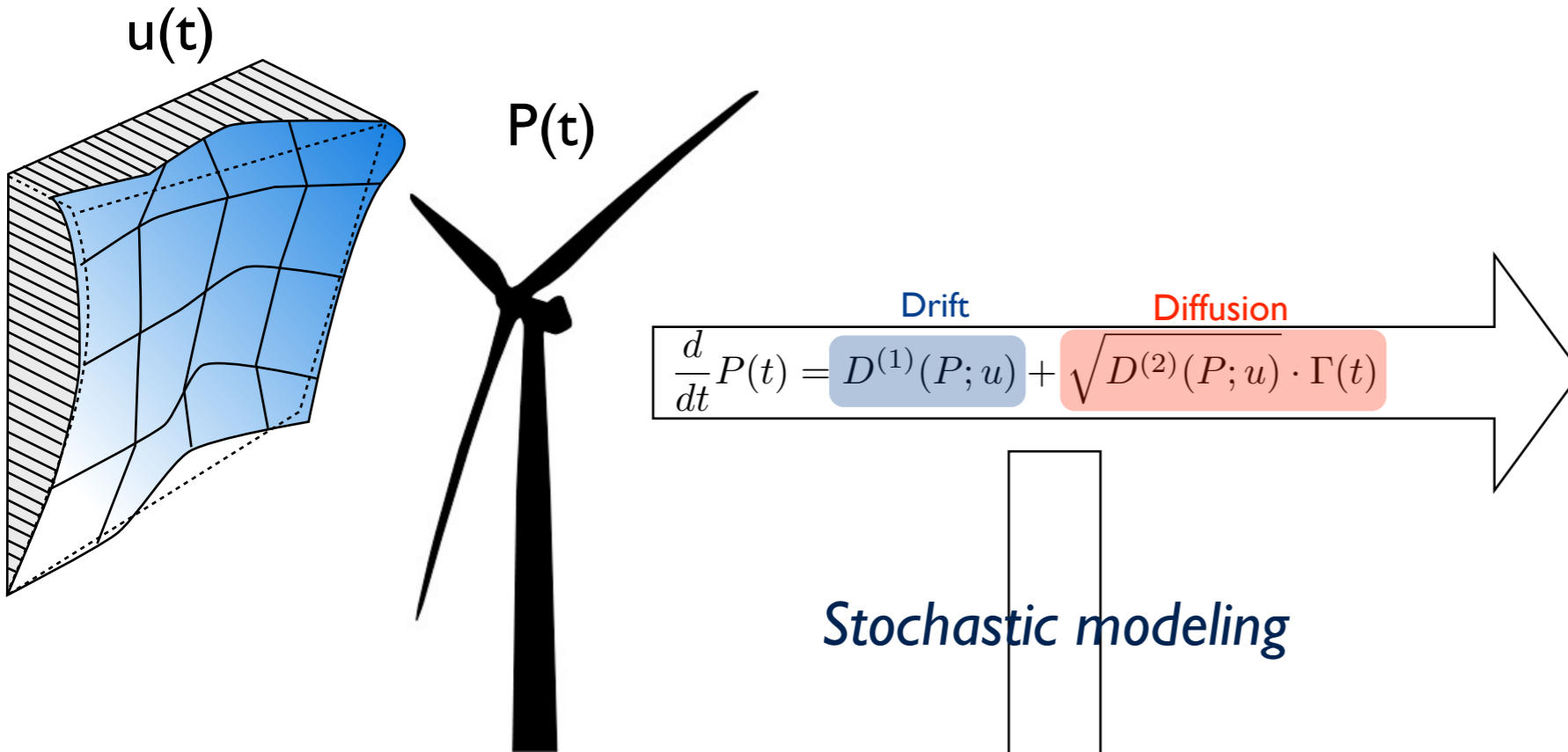
Mean velocity

Turbulence intensity

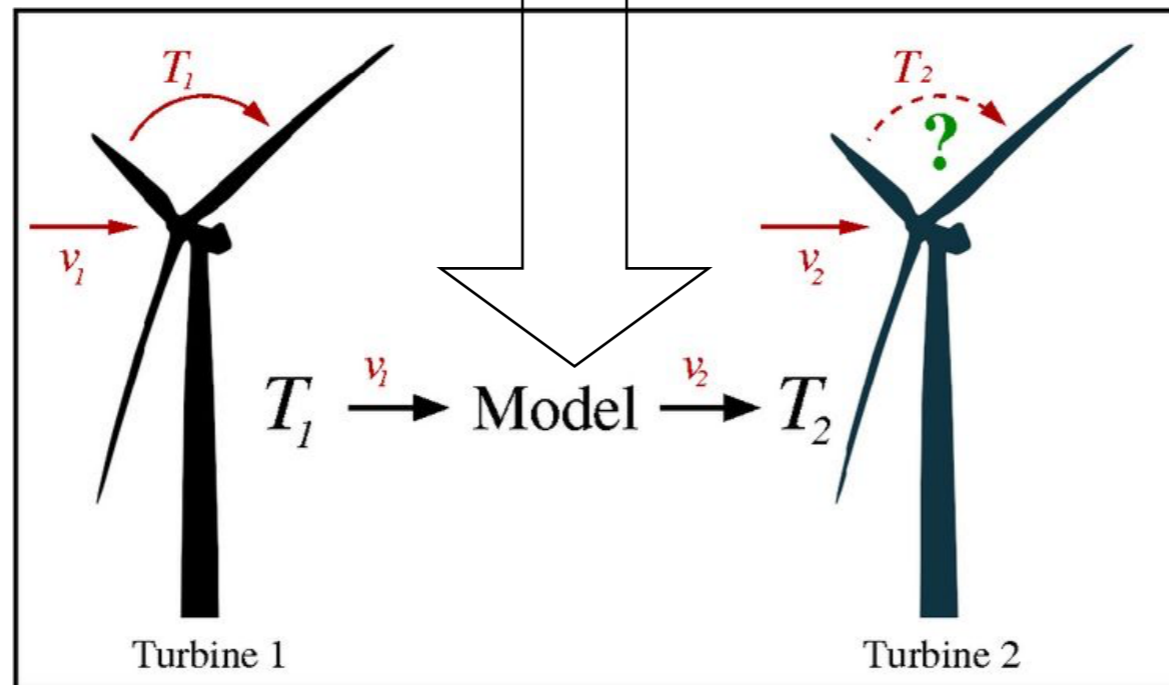


Stochastic analysis

Langevin Power curve

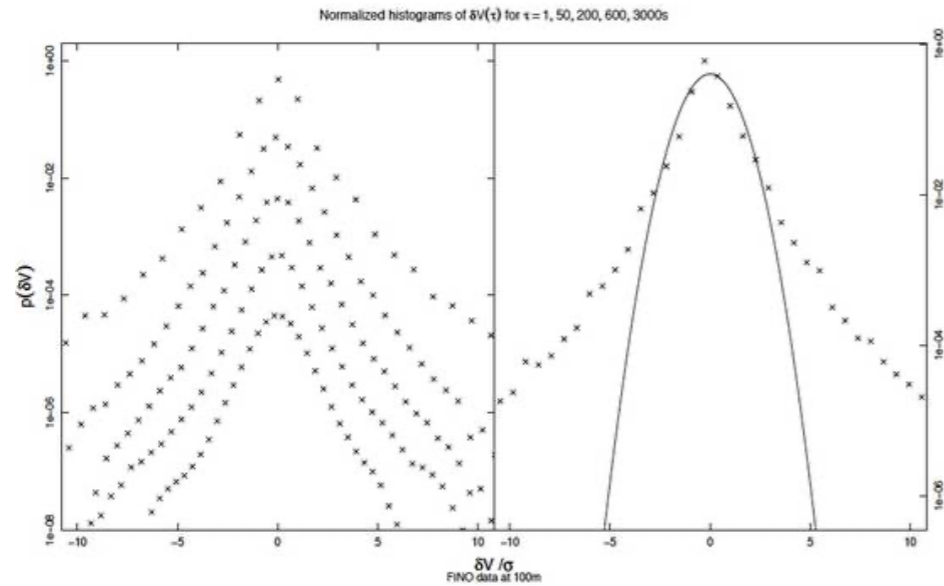


Stochastic modeling

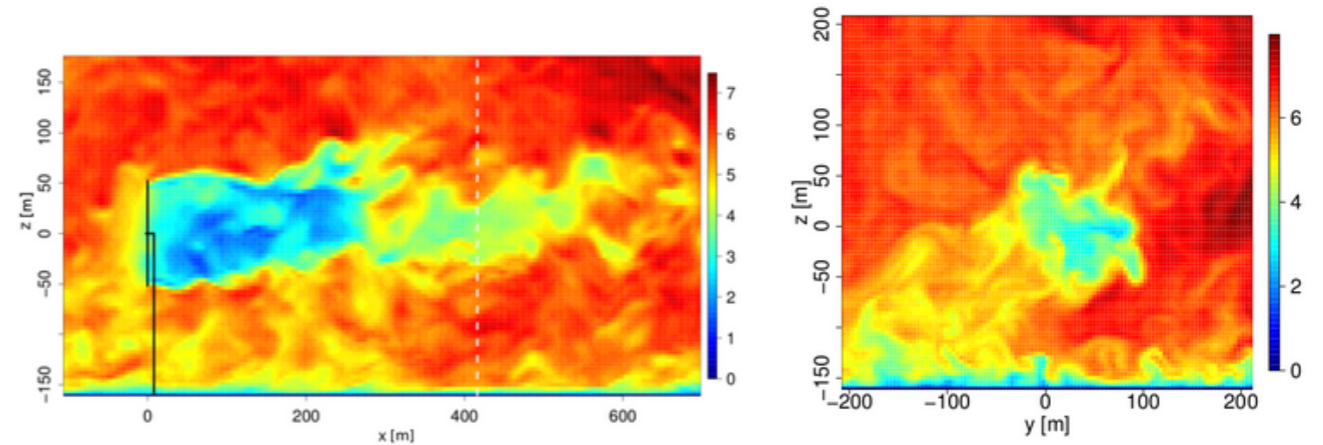


Stochastic analysis and modeling

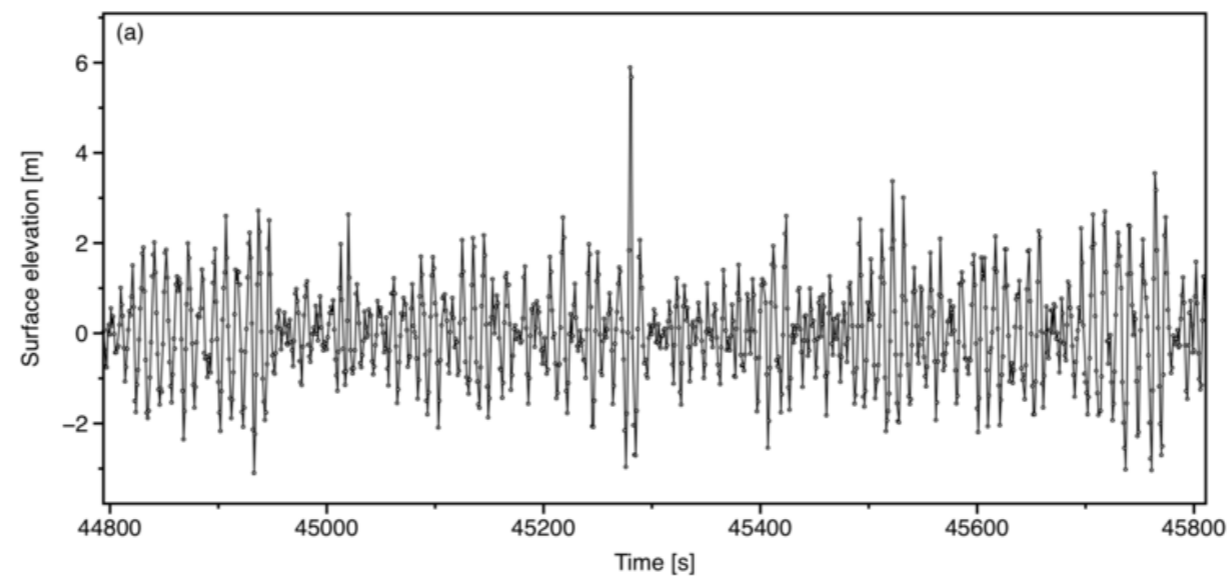
wind field characterisation



reduced order modeling of wind turbine wakes



“roque waves”



Questions?

