3rd Interdisciplinary Winter School 2019

FOOD AND ENERGY

Facts

- February 18 - 22, 2019
- Where: TUM Science & Study Center, Raitenhaslach, Germany
  (see https://www.raitenhaslach.tum.de/en/contact/directions/ for directions)
- Costs: 500,00 € (including excursion, board and lodging)
- Who: up to 30 participants (Ph.D. candidates; post graduates)
- Requirements: Interest in sustainable development and energy questions, agriculture, food processing or distribution, energy accounting methods of complex processes
- Organization: Graduate Center Munich School of Engineering (MSE) at TUM

Timetable

- February 18 (morning): Welcome reception with introductory talk and research presentations
- February 19 -22: Topic lectures, tutorials, creative labs, discussions
- February 20 (afternoon): Excursion
- February 22 (morning): Final presentations and open discussion

Application (deadline: November 16, 2018)

- Please send your application (including CV & supervisor's recommendation letter) to
  Dr. Petra Liedl (liedl@mse.tum.de)
- More information: http://www.mse.tum.de/winterschool2019

Lectures and Topics

(Chronological order)

- Prof. T. Hamacher, TUM, Germany: Food and Energy – An Introduction
  - Energy demand for food production
  - Relation between oil price and food costs
  - Food in a world without oil

- Prof. H. Mempel, HSWT, Germany: Horticultural Production and Resource Economics
  - History and principles of food preservation
  - Sustainability and energy efficiency of production systems and supply chains
  - Targeted influencing and non-destructive measurement of quality parameters
  - Maintaining post-harvest quality
  - Urban horticulture

- Prof. J. Roosen, TUM, Germany: Food Waste and Consumer Behavior
  - Food waste: extent and impact
  - Consumer behavior and the buying cycle
  - Designing intervention measures to reduce food waste

- Prof. J. den Besten, HAS, Netherlands: New Cultivation Systems
  - Daylight-free multi-layer cultivation
  - Horticulture production
  - Plant breeding and plant physiology
  - Ideal growing formula: light, air, temperature, nutrition, water and substrate
  - City farming and vertical farming

Goals

- Understanding the relation between food and energy
- Realizing the connected challenges in times of climate change and population rise
- Exploring sustainability in the food production, processing and supply chain
- Examining the relation between quality of food and sustainability
- Discovering cutting-edge daylight-free cultivation
- Networking and scientific exchange
- Starting discussions for possible future collaborations

Methods

- Topic lectures
- Tutorials
- Creative labs
- White paper meetings
- Interdisciplinary discussions
- Poster presentations by PhD students
- Techniques to describe the implied energy in the food sector
- Experiencing the importance of interdisciplinary approaches

Short CVs of lecturers

(Alphabetical order)

Prof. Jan den Besten, HAS University of applied sciences, The Netherlands

https://has.nl/nl/kenniscentrum/lectoraten/lectoraat-nieuwe-teeltsystemen

Jan den Besten is Professor in New Cultivation Systems at HAS University of applied science, Den Bosch, The Netherlands and co-founder and manager of BrightBox in Venlo, an expertise centre for daylight-free multi-layer cultivation. He studied horticulture, genetics and plant breeding at Wageningen University and Research. Professor den Besten's expertise is in plant breeding, plant physiology and application in innovative cultivation systems including vertical farming for a wide range of crops. Prof. den Besten has vast experience in completely controlled environment cultivation with LED, HPS and LEP and is advisor of the Association for Vertical Farming. He is also coordinator of the HAS on location and online courses in 'growing without daylight' and plays a leading role in the curriculum and module development in the field of horticulture and plant biology. His network within the horticultural education covers Europe and Asia.

Prof. Dr. Thomas Hamacher, Technical University of Munich

http://www.professoren.tum.de/en/hamacher-thomas/

Professor Hamacher conducts research on energy and systems analysis, focusing on urban energy systems, the integration of renewable energy into the power grid, and innovative nuclear systems (including fusion). Other focuses of his work are the methods and fundamentals of energy models. After studying physics in Bonn, Aachen and Columbia University (New York), Professor Hamacher received a doctorate from the University of Hamburg for his work on baryonic beta decay. Professor Hamacher has been with the Max Planck Institute for Plasma Physics since 1996, most recently as head of the Energy and System Studies Group. From 2010 to 2013 he served as acting head of the Chair of Energy Management and Application Technology. In 2013, he was appointed Full Professor for Renewable and Sustainable Energy Systems. Furthermore he is Director of the Munich School of Engineering. Prof. Hamacher is a member of the Environmental Science Centre (WZU) of the University of Augsburg and the Energy Working Group of the European Physical Society (EPS).

Prof. Dr. Heike Mempel, Weihenstephan-Triesdorf University of Applied Sciences

https://www.hswt.de/person/heike-mempel.html

Before joining the University in 2009, Prof. Mempel worked in leadership positions of two of Germany's biggest supermarket chains in the Quality Management Department. Mempel's research group is renowned for its high-quality research in the field of LED lighting strategies for crop production. The optimization of lighting regimes with different spectral output and intensities, their targeted application and timing are areas of special interest. In addition, Prof. Mempel has extensive knowledge in the food retail industry, based on a user-centric, commercial approach. Her main research topics are energy efficiency and sustainability of production processes and value chains, quality assurance of horticultural products as well as urban horticulture. The HSWT is a member of the Association for Vertical Farming.

Prof. Dr. Jutta Roosen, Technical University of Munich

https://www.professoren.tum.de/en/roosen-jutta/

Professor Roosen's research focuses on consumer behavior and demand analysis. Her main interest is on cognitive aspects of perception and cultural influences on behavior. Her work often deals with questions of food quality and safety, nutrition and health behavior as well as sustainable consumption of energy and food. Professor Roosen studied in Bonn, Washington and Iowa and earned her PhD (1999) in economics from Iowa State University, USA. She later served as assistant professor at the Université Catholique de Louvain in Belgium (1999-2002). Prior to her appointment as Chair of Marketing and Consumer Research at TUM in 2008, she was a professor at Kiel University.

Programme / Schedule (tentative)

	Monday, Feb. 18	Tuesday, Feb. 19 **Energy and Food**	Wednesday, Feb 20 **Consumers & Waste**	Thursday, Feb 21 **Cultivation Systems**	Friday, Feb 22 **Into the Future**
07:00 - 08:30		Breakfast	Breakfast	Breakfast	Breakfast
08.30 - 10.00	**Arrival**	Lecture (Mempel)	Lecture (Roosen)	Lecture (den Besten)	Creative Lab (den Besten)
10:00 - 10:30	Welcome & Coffee break	Coffee break	Coffee break	Coffee break	Coffee break
10.30 - 12.00	Introductory lecture (Hamacher)	Lecture (Mempel)	Tutorial (Roosen)	Lecture (den Besten)	Final discussion
12.00 - 13.30	Lunch	Lunch	Lunch	Lunch	Lunch
13.30 - 15.00	Research presentations (I)	Tutorial (Mempel)	Excursion	Tutorial (den Besten)	**Departure**
15:00 - 15:30	Coffee break	Coffee break		Coffee break	
15.30 - 17.00	Research presentations (II)	Tutorial (Mempel)		Tutorial (den Besten)	
17:00 - 17:30	Break	Break			
17:30 - 19:00	Research presentations (III)	Sports Event	Break	Break	
19:00 - 20:30	Dinner at Academy	Dinner in Burghausen	Dinner at Academy	Final Dinner in Burghausen	