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**Gambrinus  
Lectures**

## Process Systems Engineering: Evolution, Accomplishments and Future Research Trends

Ignacio E. Grossmann is the R. R. Dean University Professor of Chemical Engineering at Carnegie Mellon, member of the „Center for Advanced Process Decision-making”, and member of the National Academy of Engineering. His research interests are mixed-integer, disjunctive and stochastic programming, energy systems, and planning and scheduling for enterprise-wide optimization.

He will first give a historical account of the evolution of Process Systems Engineering highlighting key contributions in industry. Research trends in Chemical Engineering are discussed including energy systems, sustainability, process intensification, smart manufacturing, digitization, and healthcare.

**12 February 2019**

Lecture at 16:00 followed by flying buffet  
IBZ, Emil-Figge-Straße 54,  
Dortmund



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## Innovation by Evolution: Expanding the Protein Universe

Frances Arnold is the Linus Pauling Professor of Chemical Engineering, Bioengineering and Biochemistry at the California Institute of Technology, where she pioneered methods of directed protein evolution used to make better proteins for applications in alternative energy, chemicals, and medicine. Her current research focuses on evolution of new enzymes and improved protein engineering methods using machine learning.

Arnold will describe how we use evolution to optimize existing enzymes and invent new ones. She will present different evolutionary strategies that allow us to circumvent our profound ignorance of how sequence encodes function.

**24 May 2019**

Lecture at 16:00 followed by flying buffet  
Rudolf-Chaudoire-Pavillon  
Baroper Straße 297, Dortmund



## Invitation

### Jubilee Lecture Series

**Klavs F. Jensen**

(Massachusetts Institute of Technology)  
15 October 2018

**Philippe A. Tanguy**

(Polytechnique Montreal)  
06 November 2018

**Marc-Olivier Coppens**

(University College London)  
06 February 2019

**Ignacio Grossmann**

(Carnegie Mellon University)  
12 February 2019

**Frances Arnold**

(California Institute of Technology)  
24 May 2019

On the occasion of  
the 50<sup>th</sup> anniversary  
of **bcj**





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### Automation and Process Intensification of Chemical Processes

Klavs F. Jensen is Warren K. Lewis Professor in Chemical Engineering and Materials Science and Engineering at the Massachusetts Institute of Technology. His research interests revolve around reaction and separation techniques for on-demand multistep synthesis, catalysis, chemical kinetics and transport phenomena methods for automated synthesis, as well as microsystems biological discovery. He is a member of the US National Academies of Sciences and Engineering.

Jensen presents examples of Process Intensification i.e. on-demand synthesis of common pharmaceuticals in a plug-and-play, manually reconfigurable, refrigerator-sized manufacturing platform of integrated unit-operations. Microfabrication, precision machining and 3D printing are used to realize the miniaturized process equipment.

**15 October 2018**

Lecture at 16:00 followed by flying buffet  
Rudolf-Chaudoire-Pavillon  
Baroper Straße 297, Dortmund



### The Challenges of the Electrification of the Energy System

Philippe A. Tanguy is Professor and the President of Polytechnique Montreal, the largest technological university in Canada. He worked for the international energy company Total in France and Germany, serving in several top R&D executive positions. His education background includes a doctorate degree in physics, a Ph.D. in chemical engineering, an industrial post-doctoral year experience for GE Canada.

The presentation will highlight some key challenges and the hurdles to overcome that will make the electrification of the energy system a success. The development of technological innovation in power generation -increasingly decentralized-, transmission and distribution, mobility, and manufacturing (including the chemical industry), helped by a massive deployment of digital technologies will be the key enablers.

**06 November 2018**

Lecture at 16:00 followed by flying buffet  
Rudolf-Chaudoire-Pavillon  
Baroper Straße 297, Dortmund



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### Nature-inspired Chemical Engineering, a Transformative Methodology for Innovation

Marc-Olivier Coppens is Ramsay Memorial Chair and Head of Department of Chemical Engineering at UCL. He is most recognised for pioneering work on nature-inspired chemical engineering. He received Rensselaer's School of Engineering Education Innovation Award (2012).

Nature is replete with well-integrated, "intensified" systems, optimized over the eons, to satisfy stringent constraints for survival by scalable processes. Coppens proposes to take nature as a source of inspiration, leveraging fundamental mechanisms underpinning desirable properties (like scalability, resilience or efficiency) and applying these to engineering designs to satisfy the different contexts of technology and nature.

**06 February 2019**

Lecture at 16:00 followed by flying buffet  
IBZ, Emil-Figge-Straße 54,  
Dortmund

