



## 3rd EUROPEAN FORUM ON NEW TECHNOLOGIES

*An event series of the European Federation of Chemical Engineering*CHEMICAL ENGINEERING in the  
PLANT OF THE FUTURE

## 3rd European Forum on New Technologies: Chemical Engineering in the plant of the future

*4 and 11 September 2020 (online)*

### Industry 4.0, Plant of the Future, Factory of the Future, Smart Factory...

It is common to encounter an abundance of terms in the press, media, and calls for projects relative to the industry of tomorrow.

However, how is the industry being transformed? Are the process industries taking ownership of this change and looking to the future? How is this evolution of the process industries im-pacting chemical engineering as a discipline?

These two half-days event will provide you with both a broad and precise vision of the future of the process industries. It will address the place of the industry in today's society, new ways for process design and shifts in the operation of processes, as well as how training of students, technicians and engineers may need to be rethought to meet these new needs.

The Plant of the Future is being built as of now. Whether you are a professional working in chemical and process industries or in academia, if you are interested and curious to discover the future of chemical engineering, come join us at this event to discuss and deepen your knowledge!

**Topics:** Plant of the Future in the society; New

ways of process conception; Profound shifts in operating processes; Training and learning

### Programme:

**Friday, 4 September, 9:00-12:15 CEST**

- SFGP vision on the Plant of the Future (François Nicol, SFGP President, Veolia, France)

Welcome to the summer 2020 issue of the EFCE News. If you have any comments on the newsletter please get in touch.

*Hermann Feise*  
EFCE President

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- Web-Seminar Series in Quality by Design (QbD)
- Future trends in teaching, research and practices: Chemical Product Design
- Who's Who
- News about the official EFCE Journals
- EFCE Events in 2020-22

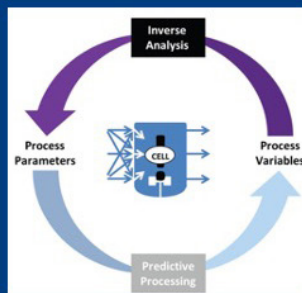
- Hubs for circularity (Angels Orduna, SPIRE, Brussels, Belgium)
- Carbon neutrality: dream or reality? (Sophie Wilmet, CEFIC, Brussels, Belgium)
- New trends in process simulation: paving the way to digital twin (Benoit Celse, IFPEN, Lyon, France)
- Modular plants technology for chemical plants – status update & perspectives (Franck Stenger, ProcessNet, Germany)
- From machine learning to Artificial Intelligence for industrial applications (Maurizio Rovaglio, Siemens, Milano, Italy)
- Process Intensification and electrification (Tom van Gerven, KU Leuven, Belgium)
- Utilizing big data analytics in the chemical industry: experiences and challenges at the Dow Company (Ivan Castillo, Leo Chiang and Ricardo Rendall, Dow Chemical, USA)
- Ground robotics enabler for the plant of the future Jean-Michel Munoz – Total, France
- Smart sensors (Kristina Eisen, Daiichi Sankyo Europe GmbH, Germany)
- Revisiting chemical engineering education (Eric Schaer, Univ. Lorraine, Nancy, France)
- Industrial vision of the process engineer in a digital plant (Thierry Cartage, Solvay, Belgium)

**Friday, 11 September, 14:00-16:45 CEST**

- Data is not a number (Marcin Ignac, Variable, London, UK)

**For programme details and free access to the web-seminars, visit the event website at**

**<https://efce.info/3rd+European+Forum+on+New+Technologies.html>**



## Web-seminar series in Quality by Design (QbD)

*Organised by the EFCE working party on QbD*

### Programme

**Thursday, 24 September 2020, 16:00 CET**

**Title:** Accelerating clone and strain selection using shake flasks, online monitoring and advanced data science - novel QbD approaches in early bioprocess development

**Speakers:** Barbara Pretzner, Werum IT Solutions, Vienna, Austria; Rüdiger Maschke, ZHAW, Wädenswil, Switzerland; Gernot John, Presens, Regensburg, Germany

**Tuesday, 6 October 2020, 16:00 CET**

**Title:** Accelerating vaccines process development and industrialization: can digitalization and in silico modeling help?

**Speaker:** Emanuele Tomba, GSK, Siena, Italy

**Thursday, 29 October 2020, 16:00 CET**

**Title:** An integrated QbD solution for deploying Digital Twins and PAT for Control of Inclusion Body Refolding Processes

**Speakers:** Krisztina Koczka, Bilfinger Industrietechnik, Salzburg, Austria; Lukas Veiter, Chase, Linz, Austria

**Further details will be announced on the EFCE website at: [https://efce.info/WP\\_QbD.html](https://efce.info/WP_QbD.html)**

# Future trends in Teaching, Research and Practices: Chemical Product Design



The EFCE Section Group Product Design and Engineering (PDE) has developed a survey-based discussion paper on future trends in teaching, research and practices of product design, which was published in "Current Opinion

in Chemical Engineering". For the EFCE Newsletter, Jens Uhlemann, one of the authors, explains the motivation and the findings of the study.

**Q: For the last two decades, product design and engineering has been one of the primary topics in the discussion about the future of chemical engineering complementing the continuous processing technology for petrochemical commodities as the lead technology. Where do you see gaps which still need to be discussed?**

**A:** The chemical (non-commodity) PDE industries comprise diverse sectors such as the life sciences, the material, the food and the fast-moving consumer goods (FMCG) industries. Four distinct drivers can be identified fueling the development of PDE in the dimensions: people/activity and industry/academia. Industry needs tools for managing complex supply chains, market differentiation, life cycle management, branding as well as enabling technologies. This, in turn, means that collaborators need to cope with complex roles in globalized and cross-functional teams which means for them life-long learning. Academia teaches students for new chemical engineering job profiles that are more and more multidisciplinary with a sound understanding of soft skills and performance materials. Academic research is driven by new opportunities resulting from multiscale modelling and an increasing integration with material science as well as new needs related to structured products and new manufacturing paradigms. Today's pressing challenges require further development and implementation of

rational methodologies for the transfer of subatomic, molecular, and nanoscale research and discoveries to production scales and commercial practice. This need is further emphasized with the opportunity due to the dawn of the Big Data movement, i.e., involvement of big data obtained by artificial intelligence and machine learning.

**Q: Opinion need knowledge, which information did you have available? Where did you encounter the largest difficulty in information gathering?**

**A:** The chemical engineering body of knowledge is usually applied to the optimal transformation of raw materials and energy into targeted products, with no polluting waste. Chemical engineering practitioners are often involved in process design and development departments. PDE, however, is the chemical engineering contribution to the New Product Development (NPD) workflow in the process industries with a huge diversity of other professional profiles ranging from business and administration to marketing, chemistry and so on. Although PDE is the topic of several dedicated book publications and certain sectors of the process industries (e.g. pharmaceutical, oil industries or food industries) have their own dedicated body of PDE knowledge, it is quite challenging to identify the PDE stakeholders in industrial and academic settings and to define common terminology. PDE might be called NPD, formulation technology, product research, galenic and so on depending on the organization's specifics.

**Q: The EFCE Section Group Product Design and Engineering brings together experts from academia and industry across Europe. Where did you find specific difference between academia and industry?**

**A:** Based on the EFCE-PDE survey, we have developed a positioning map comparing academic and industry views on the relevance of selected PDE curriculum items. A positive point to be emphasized is the common great interest of both industry requirement and academic training on topics such as physical chemistry, rheology, particle processing, formulation technologies and project



management. Interestingly, core chemical engineering curriculum items such as unit operations, process design, information technology (IT), modelling skills are highly relevant to the traditional chemical process industry and commodity products but also to chemical PDE industries. Industrialists responding to the EFCE-PDE survey stressed that, although the chemical engineers working with them might have fewer opportunities to directly apply traditional unit operations and process design, the thinking framework they acquired when studying these topics is an advantage when they are involved in new product development. Naturally, marketing research topics are essential for the development of new products and they should be covered in PDE teaching. However, in the industry practice, chemical engineers working on the NPD workflow must have understand the whole NPD process and must have multilingualism skills to be able to interact with other functions in the company, including marketing. When hiring chemical engineers, employers value such multilingualism more than strong marketing training and PDE teaching should focus on developing these skills.

**Q: You title your Paper "Product design and engineering – past, present, future trends in teaching, research and practices: academic and industry points of view". Where did you find as the main need for development and how does it relate to tertiary education?**

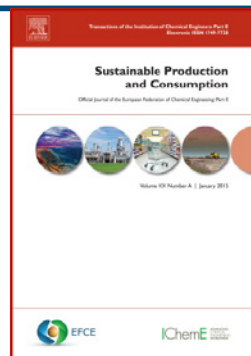
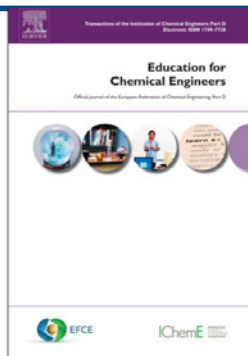
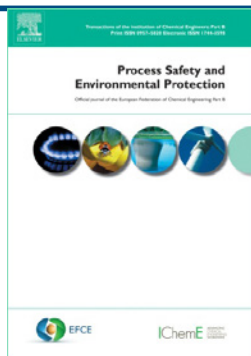
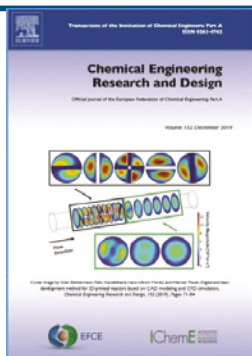
**A:** The systematic design and engineering of new products is more advanced and established in discrete manufacturing industries (e.g., mechanical and electrical), which create identical items built in assembly lines (e.g., cars, trains, toys, furniture), in comparison to process industries. A comprehensive discussion of PDE as one of the building blocks of chemical engineering education, research, and practice is still lacking, which prevents the discipline from having broader impact on academia and the reality of process industries. The lack of a PDE framework, equivalent to that available for process design teaching, to organize thinking, communicate ideas and teach concepts may be less of a concern today than 15–10 years ago when the efforts to systematize PDE became more evident. However, this is still considered to be one of the challenges by those who are involved in PDE teaching. Finding real, or at least realistic, product design problems is another common difficulty in PDE teaching.

This is both because the details of industrial innovations are usually undisclosed, and teaching examples in chemical engineering have traditionally been built around process design over decades whereas PDE is a much more recent educational concern. Developing case studies for PDE courses to illustrate concepts and tools as well as getting students involved in design calculations is often challenging, and one of the top difficulties. Generating appropriate statements for open-ended product design projects was also described as a demanding job.

**Q: From your survey you identified needs for change and development. Which is - in your opinion - the most pressing need and how can chemical engineering communities help?**

**A:** The paper discusses status and challenges of PDE and maps academic and industry requirements, unmet needs and perspectives for the product manufacturing in the framework of Industry 4.0. (or USA Industrial Internet Consortium, Made in China 2025 and Japan Society 5.0 programs) the aim of which is to reduce raw material and energy usage and to improve production efficiencies, thus leading to the design of sustainable technologies. This involves for the chemical engineering communities the development and use of Digital Twin and Big Data towards smart manufacturing and industry 4.0. technologies and tools, such as artificial intelligence, machine learning and big data concepts and processing, data analytics, system integration simulation and flexible manufacturing systems, with the objectives of reducing resource usage, zero-polluting waste and minimum energy consumption (i.e. circular economy). This also involves the development of novel sensors and non-invasive measurements technologies (e.g. signal and image analysis) to better control process system engineering operations leading to safer productions.

**"Product design and engineering - past, present, future trends in teaching, research and practices: academic and industry points of view" by Uhlemann, Costa and Charpentier was published in Current Opinion in Chemical Engineering, Volume 27, March 2020, Pages 10-21 as part of the special issue "Frontier of Chemical Engineering: Chemical Product Design" and is available online at <https://doi.org/10.1016/j.coche.2019.10.003>**



## News about the official EFCE journals

### Read journal papers for free

The following articles / issues are set for free access periods. In addition to these, articles that are published via the open access route in the journal are also freely available to all. These are identified in ScienceDirect by a green dot. It is possible sign up to an RSS alert specifically to inform when a new open access article is published in the journal – see individual journal pages to set this up.

#### **Chemical Engineering Research and Design**

<https://www.sciencedirect.com/journal/chemical-engineering-research-and-design>

Freely available content:

- January 2020 issue (Volume 153) (Available for free until the end of 2020) <https://www.sciencedirect.com/journal/chemical-engineering-research-and-design/vol/153/suppl/C>
- Best cover winner - 'Digital and lean development method for 3D-printed reactors based on CAD modeling and CFD simulation, Sven Bettermann, Felix Kandelhard, Hans-Ulrich Moritz and Werner Pauer' (Available free until 6 September 2020) <https://www.sciencedirect.com/science/article/pii/S0263876219304411>
- Climate Change special issue (content from all IChemE journals brought together in this special collection) (Available for free until the end of 2020) <https://www.sciencedirect.com/journal/chemical-engineering-research-and-design/special-issue/10PKDRV23KV>

#### **Process Safety and Environmental Protection**

<https://www.sciencedirect.com/journal/process-safety-and-environmental-protection>

Freely available content:

- January 2020 issue (Volume 133) (Available for free until the end of 2020)

<https://www.sciencedirect.com/journal/process-safety-and-environmental-protection/vol/133/suppl/C>

#### **Food and Bioprocess Processing**

<https://www.sciencedirect.com/journal/food-and-bioprocess-processing>

Freely available content:

- January 2020 issue (Volume 119) (Available for free until the end of 2020) <https://www.sciencedirect.com/journal/food-and-bioprocess-processing/vol/119/suppl/C>

#### **Education for Chemical Engineers**

<https://www.sciencedirect.com/journal/education-for-chemical-engineers>

Freely available content:

- January 2020 issue (Volume 30) (Available for free until the end of 2020) <https://www.sciencedirect.com/journal/education-for-chemical-engineers/vol/30/suppl/C>

#### **Sustainable Production and Consumption**

<https://www.sciencedirect.com/journal/sustainable-production-and-consumption>

Freely available content:

- January 2020 issue (Volume 21) (Available for free until the end of 2020) <https://www.sciencedirect.com/journal/sustainable-production-and-consumption/vol/21/suppl/C>

#### **Invitation to submit papers**

We have a number of special issues planned that are currently open for submission. Submissions from all welcome! If you require any further information then please contact Managing Editor Catherine Cliffe [ccliffe@icheme.org](mailto:ccliffe@icheme.org)

Details as follows:

## **Chemical Engineering Research and Design**

Special Issue: 60 Years of the Loeb-Sourirajan Membrane (Manuscript submission deadline **31 August 2020**) – <https://www.journals.elsevier.com/chemical-engineering-research-and-design/call-for-papers/special-issue-60-years-of-the-loeb-sourirajan-membrane>

## **Process Safety and Environmental Protection**

Special Issue: Data-Driven Risk Analysis (Manuscript submission deadline **31 August 2020**) – <https://www.journals.elsevier.com/process-safety-and-environmental-protection/call-for-papers/special-issue-on-data-driven-risk-analysis>

Special Issue: Novel Technologies and Methods for Plastics Recycling (Manuscript submission deadline **31 August 2020**) – <https://www.journals.elsevier.com/process-safety-and-environmental-protection/call-for-papers/novel-technologies-and-methods-for-plastics-recycling>

## **Food and Bioproducts Processing**

Special Issue: Digitalisation of Food and Beverage Manufacturing (Manuscript submission deadline **31 October 2020**) – <https://www.journals.elsevier.com/food-and-bioproducts-processing/call-for-papers/special-issue-digitalisation-of-food-and-beverage-manufacturing>

## **Education for Chemical Engineers**

Special Issue: Process Safety in Chemical Engineering Education and Training (Manuscript submission deadline **31 August 2020**) – <https://www.journals.elsevier.com/education-for-chemical-engineers/call-for-papers/process-safety-in-chemical-engineering-education-and-training>

## **Sustainable Production and Consumption**

Special Issue: Circular economy and sustainability (Manuscript submission deadline **31 August 2020**) – <https://www.journals.elsevier.com/sustainable-production-and-consumption/call-for-papers/special-issue-on-circular-economy-and-sustainability>

Special Issue: International Trade and Climate Change (Manuscript submission deadline **30 November 2020**) – <https://www.journals.elsevier.com/sustainable-production-and-consumption/call-for-papers/special-issue-on-international-trade-and-climate-change>

Special Issue: Future of Sustainable Production and Consumption: Lessons from the COVID-19 pandemic (Manuscript submission deadline **30 November 2020**) – <https://www.journals.elsevier.com/sustainable-production-and-consumption/call-for-papers/future-of-sustainable-production-and-consumption>

## **Who's Who**

### **Co-opted charity trustees appointed**

The Federation welcomes two young chemical engineers as co-opted EFCE charity trustees who were appointed by the Executive Board for the current term of office until the end of 2021:

- **Dr.-Ing. Hilke-Marie Lorenz**, Lonza AG, 3930 Visp, Switzerland. She joined the Executive Board as co-opted charity trustee in March 2020.
- **Mr. Thaddeus Anim-Somuah**, Croda Nederland BV, The Netherlands. He joined the Executive Board as co-opted charity trustee in July 2020.

### **The Working Party on Mixing welcomes its new Chair and Secretary**

At their recent online meeting on 7 July 2020, the EFCE Working Party on Mixing elected **Dr. Joëlle Aubin**, Laboratoire de Génie Chimique, Toulouse, France, as its new Chair. She succeeded Prof. Jerzy Baldyga who passed away in November 2019.

At the same time, **Dr. Cláudio Fonte**, The University of Manchester, Manchester, United Kingdom, was elected as the new Working Party Secretary.

## Events organised by or on behalf of EFCE in 2020/22

An extended list of events is available at <http://www.efce.info/events.html>

### European Symposium on Computer Aided Process Engineering - ESCAPE30 Online, 30 August – 2 September 2020 (EFCE Event No. 764)

ESCAPE-30 is organised by the Italian EFCE Member Society AIDIC in collaboration with the EFCE Working Party on Computer Aided Process Engineering. The Symposium attracts scientists from many different countries providing a platform for discussing the latest progress in the field of Computer Aided Process Engineering, following both a scientific and technological interdisciplinary approach.

**Topics:** Modelling and Simulation; Synthesis and Design; Process control and operations; CAPE in Sustainable Energy Applications; Bioresources, Bioprocesses and Biomedical Systems; Internet of Things; Concepts, Methods and Tools; Education in CAPE and Knowledge Transfer.

**Plenary speakers:** Dr. Francesco Rossi; Ana Paula Barbosa-Póvoa.

**Register NOW!**

**Website:** <http://www.escape30.it>

### 14th Mediterranean Congress of Chemical Engineering Barcelona, Spain, New date: 1-4 December 2020 (EFCE Event No. 768)

The event is organised by SEQUI (Sociedad Espanola de Quimica Industrial e Ingenieria Quimica) in the frame of EXPOQUIMIA. The Congress will focus on the dissemination of the most recent advances and results related to Chemical Engineering Science.

**Topics:** Separation Technologies; Chemical Reactors; Processes Systems Engineering; Sustainable Development and Environmental Engineering; Food and Biochemical Engineering; Process and Product Engineering.

**Plenary speakers:** Renato Rota, Politecnico di Milano; Jorge Ruiz Royo, CEO Arandipur SL; Wayne Sim, 3esi and Aucerna.

**Register NOW!**

**Website:** <https://www.mecce.org/>

### CHISA 2020 - 24th International Congress of Chemical and Process Engineering

*Prague, Czech Republic, planned to be postponed to January 2021 – dates to be confirmed (EFCE Event No. 772)*

The Czech Society of Chemical Engineering (CSCHE) invites you to the upcoming CHISA in the very beautiful city of Prague.

The modified CHISA structure and logistics of the program should enable the interested people to listen also to the presentations, which are close to their fields of research, however outside their everyday horizons. A special care will be paid to selection of both the plenary lectures and plenary keynote lectures (as a newly introduced form of presentation), which will be granted by special Congress awards.

**Topics:** I. We Think Global; II. Energy First; III. Continuous Processing and Miniaturisation, Mixing; IV. Industry 4.0; V. Advanced Functional Materials, Structures and Components; VI. The Green Square; VII. The Essentials; VIII. Hand in Hand; VIII. The Wiley-VCH Poster Session. For details see: <https://2020.chisa.cz/scientific-program/#main-topics>

**Plenary and Keynote Plenary speakers:** Enrico Drioli, Univ. Calabria, IT; Timothy Noël, Eindhoven University of Technology, NL; David Bogle, University College London, UK; Edwin Zondervan, Bremen Univ., DE; Julian Thiele, Leibniz Institute of Polymer Research, Dresden, DE.

CHISA will take place at the end of January 2021. Consequently, the deadlines are postponed as follows:

**30 September 2020** – registration and payment;

**15 November 2020** – submission of additional presentations (both oral and posters).

**Website:** <https://2020.chisa.cz/>

### EEM21 - 7th International Congress Engineering, Environment and Materials in Processing Industry Jahorina Mountain, East Sarajevo, Bosnia and Herzegovina, 17-19 March



## **2021 (EFCE Event No. 777)**

For the 7th time, the International Congress on Engineering, Environment and Materials in Processing Industry is organised by the Faculty of Technology, University of East Sarajevo.

EEM21 will continue to bring together leaders from industry and academia to exchange and share their experiences, present research results, explore collaborations and to spark new ideas, with the aim of developing new projects and exploiting new technology for sustainable applications. The purpose of the event is to discuss the current topical issues, in a comprehensive and multidisciplinary manner, concerning sustainable development and protection of the environment and their application in science, technology and processing industry.

**Topics:** Chemical and Electrochemical Engineering; Food Engineering and Biotechnology; Environmental Engineering; Materials and Material Characterization; Nanotechnology; Inorganic Chemistry and Technology; Organic Chemistry and Technology, Polymers; Plasma Technology; Energy Efficiency and Renewable Energy Sources; Textile Engineering; Corrosion and Protection of Materials and Thermal Power Plants; Metallurgy; Management in the Processing Industry; General Sections.

**The call for papers is open!**

**Website:** <https://eem.tfzv.ues.rs.ba/>

## **ESCAPE-31 – 31st European Symposium on Computer Aided Process Engineering Istanbul, Turkey, 6-9 June 2021 (EFCE Event No. 776)**

ESCAPE-31 event is organized under the auspices of the EFCE Working Party on Computer Aided Process Engineering (CAPE-WP), the Chamber of Chemical Engineers of Turkey (KMO), and Koc University, Istanbul. ESCAPE-31 aims to bring together researchers and practitioners of computer-aided process engineering (CAPE) community and provide a forum to present and evaluate emerging research methods and concepts, and to learn from industrial case studies.

### **Themes:**

1. Process-product synthesis, design and integration: product design principles and applications, process integration, single- and multi-objective synthesis and design of processes, modular plants, integration of intensified process units, product-process design: property-prediction-

based synthesis and design;

2. Methods, models and computational tools for PSE: methodical approaches and frameworks for modeling and solving problems in PSE, optimization models and solution algorithms, data analytics, numerical methods and tools, numerical analysis, process simulation, large-scale and multi-level optimization, agent-based modelling;

3. Process control and operations: scheduling, operability, flexibility and optimization under uncertainty, Interaction & information infrastructure, off- and on-line control, smart sensors, analysis of dynamic plant data, plant-wide control, operational excellence, real-time optimization, operator training, safety

4. CAPE/PSE in energy/water/food nexus and sustainability: energy, food and water issues, carbon capture and sequestering, solar refineries, life cycle analysis, industrial infrastructures, infrastructures for sustainable production, sustainability indicators and footprints, risk assessment, waste reduction and management, waste-water treatment, energy storage and conversion systems

5. Process operations and supply chains: process supply chains, synthesis and design of production/distribution systems, models and application of chemicals supply chains, process operations, preventive maintenance, risk assessment in process supply chains, flexibility analysis

6. PSE in biological systems and processes: Biological systems, protein structure-function analysis, design of biological agents, synthetic biology, systems biology, fermentation, biorefineries

7. Education in CAPE/PSE & knowledge transfer: best practices in academia, continued training in a changing professional practice, effective selling of high-quality PSE solutions to industry, knowledge transfer hurdles, effective exploitation of CAPE/PSE tools

**Plenary speakers:** Marc-Olivier Coppens, University College London; Stratos Pistikopoulos, Texas A&M University; Gintaras V. (Rex) Reklaitis, Purdue University.

**The call for papers is open.** Deadline for abstract submission: **7 September 2020**

**Website:** <https://www.escape31.org/>

## **12th European Symposium on Electrochemical Engineering – ESEE 2021 Leeuwarden, The Netherlands, New date: 13-17 June 2021 (EFCE Event No. 766)**



The 12th European Symposium on Electrochemical Engineering - ESEE 2021 is organised by the EFCE Working Party on Electrochemical Engineering in cooperation with Wetsus.

The scope of ESEE is "*Electrochemistry for electrification and energy transition toward a sustainable future*", which captures the aim of the organisers to showcase scientific advances in physical, chemical and biochemical routes towards a future where electrochemical engineering is part of a sustainable society, closing resource cycles and contributing to zero-pollution mobility and manufacturing.

**Topics:** Electrocatalysis and electrochemical technologies; Safe water and air; Corrosion science for durable materials; Water electrolysis and fuel cells; Novel energy storage devices, batteries, and electrochemical capacitors; Bioelectrochemistry for energy conversion and resource recovery; Green capture and conversion of CO<sub>2</sub>; Electrochemical recovery of raw materials; Advanced membranes and electrodes for selective ion removal; General session.

**Invited speakers:** Matthias Wessling; Menachem Elimelech; Martin Z Bazant; Elif Karatay; Geoff Kelsall; Matthew Suss; Manuel Andres Rodrigo; Xiao Su.

On the occasion of the ESEE2021 the EFCE Working Party will present its prestigious **Carl Wagner Medal of Excellence in Electrochemical Engineering**.

**Website:** <http://www.electrochemical-engineering.eu/2021/>

## ACHEMA 2021

**Frankfurt am Main, Germany, 14–18 June 2021 (EFCE Event No. 775)**

Feel the heartbeat of our industry! The process industry is the innovation driver of the world economy and the pacemaker for numerous industrial sectors

Practically all global value chains profit in one way or another from the achievements of chemistry, biotechnology and process engineering. ACHEMA is the central arena of the process industry. Nowhere is the heartbeat of our industry faster, more intense, up-to-date, innovative and international than here.

Take this opportunity to forge new contacts, to build up business relations and find solutions for your current projects!

At the ACHEMA Congress, researchers, developers and users get together to discuss what's needed,

## Save the date!

**17th European Conference on Mixing**  
**Porto, Portugal, 27-30 June 2021**  
**(EFCE Event No. 773)**

The Mixing Conference is organised by the University of Porto on behalf of the EFCE Working Party on Mixing.

**Website:** <http://mixing17.eu/>

what's possible and what will be the next big thing in the process industries. Submission of presentations is now open until 16 October 2020.

**Website:** <https://www.achema.de/en/>

**Electrostatics 2021**  
**Wroclaw, Poland, 21-24 June 2021**  
**(EFCE Event No. 774)**

Electrostatics 2021 is organised by the Wroclaw University of Science and Technology in co-operation with the EFCE Working Party on Static Electricity in Industry.

The Conference provides a unique interdisciplinary forum for discussion about the electrostatic phenomena and its industrial applications. Fundamentals, hazards, applications, measuring techniques, standards and other related topics are within the scope of the conference.

This conference is an excellent opportunity for researchers and users working in many scientific and technical areas where electrostatics is a real concern or challenge to review progress and discuss future trends. Besides, the interdisciplinary composition of the conference gives the best opportunity to get inspired by solutions in other fields and promote relationships for innovation and breakthroughs.

### Topics:

**1. Applications and Industry:** Electrostatic precipitation, Separation and Sorting, Powder Coating, Displays and Printing Technology, Biological Applications, Electrostatic manipulation of particles, droplets and biological cells, electrophoresis, dielectrophoresis and electrorotation, MEMS, Electrofluidisation, Aeronautics, Space & Automobile, Electrostatic handling in Industry, High Voltage electrostatic related measurements, problems and applications, HVDC;

**2. ESD:** Static Electricity control in electronics industry, Factory level ESD considerations, EMI due to ESD, Corona and Gas Discharge, Dielectric breakdown, Cleanroom electrostatics, ESD

waveforms;

**3. Fundamentals:** Modelling, Contact, frictional, induction, conduction and corona charging, Atmospheric electricity, Adhesion, Charged particle physics;

**4. Hazards:** Static elimination, Ignition tests, Risk assessment, Electrostatics hazards and problems in industry, Lightning protection;

**5. Liquids:** Double layer charging, Electrostatic atomization, Electrohydrodynamics, Corona generated secondary electrohydrodynamic flow. Boundary layer control. Electrohydrodynamic pumping, Electro-rheology, Electrospinning and electrospraying, DC and AC Electroosmosis. Electrowetting, Applications including materials processing, thermal management, and flow control;

**6. Solid and Powders:** Electrostatic dissipative materials, Textiles, Electrets, Charging of powders and solids, Charge injection and space charge in dielectrics, Nanomaterials, Nanofibers, Aerosols, Packaging;

**7. Gases:** Corona and dielectric barrier discharges. Electrical breakdown. Applications of plasma technologies, including environmental remediation of gas and liquid streams. Electrostatic discharges from charged surfaces - fundamentals, prevention, safety issues. Electrostatic phenomena in atmospheres, including lightning;

**8. Measuring Techniques:** Electrostatic instrumentation, Electrostatic sensors, Novel measurement methods;

**9. Standards:** New standards, Research for new standards methods and procedures, Round-Robin tests;

**10. History of Electrostatics**

**Website:** <http://www.electrostatics2021.pwr.edu.pl/wp/>

### **1st International Symposium on Industrial Crystallization-ISIC 21 Potsdam, Germany. New date: 30 August – 2 September 2021 (EFCE Event No. 751)**

The symposium is organised under the auspices of the EFCE's Working Party on Crystallization and, has become the premier international conference in the field of industrial crystallization.

The 21st ISIC provides a meeting and a discussion forum for scientists and engineers from academia and industry as well as suppliers of crystallization and related analytical equipment. The conference program will include lectures and poster sessions. A concomitant exhibition and introductory tutorials

will complete the event.

**Main Topics:** Fundamentals of crystallization; Crystallization and precipitation in fine chemical, specialty & life-science industries; Developments in large scale industrial crystallization; Contributions of crystallization to sustainability; Integrated process design: Crystallization in the industrial process chain.

**Plenary and Evening speakers:** Prof. Beatrice Biscans, France; Prof. Richard Braatz, USA; Prof. Helmut Cölfen, Germany; Prof. Juanma Garcia-Ruiz, Spain; Dr. Daniel Green, USA; Dipl.-Ing. Christian Melches, Germany.

**Website:** [https://dechema.de/en/ISIC\\_2021](https://dechema.de/en/ISIC_2021)

### **XXIV International Conference on Chemical Reactors – CHEMREACTOR-24 Milan, Italy, New date: 12-17 September 2021 (EFCE Event No. 769)**

The XXIV International Conference on Chemical Reactors – CHEMREACTOR-24 is organised by the Borskov Institute of Catalysis, Russia jointly with the world famous Politecnico di Milano, Italy.

**Main topics:** Advances in Chemical Reactor Fundamentals; Chemical Reaction Engineering and Reactor Design – Novel Experimental Approaches, Modeling, Scale-Up and Optimisation; Chemical Reactors and Technologies for Targeted Applications; Advanced Processing of Conventional and Unconventional Hydrocarbon Feedstocks.

**Plenary speakers:** Prof. Guy Marin; Prof. Annemie Bogaerts; Prof. Ib Chorkendorff; Prof. Fausto Gallucci; Prof. Freek Kapteijn; Dr. Carlo Perego.

**Register NOW.**

**Website:** <http://conf.nsc.ru/CR-24/en/>

### **ECCE13 & ECAB6 - 13th European Congress of Chemical Engineering & 6th European Congress on Applied Biotechnology Berlin, Germany, 19-23 September 2021 (EFCE Event No. 767)**

**Motto: Engineering the Future**

At ECCE 13 & ECAB 6, scientists from industry, university and research institutions from Europe and beyond will meet in Berlin to discuss the latest research and industrial applications in all fields of chemistry, process engineering, biotechnology and related fields.

Features of ECCE 13 & ECAB 6:

- The highlight event for the European chemical engineering and biotechnology community
- Cross-linking disciplines and organisations to span the bridge from R&D to the industrial practice
- High-profile international keynote and plenary speakers
- Special offerings for students and young scientists
- Industry exhibition and plenty of networking opportunities

ECCE 13 & ECAB 6 is organised by DECHEMA under the auspices of EFCE and ESBES.

#### Topics:

**Controlling complexity:** Modelling, Measurement & Process Control (digitalisation, AI, process modelling, molecular modelling, automation, smart (bio)sensors, process control, CAPE/PSE, plant safety, containments, ...);

**Engineering processes, products, ...:** Chemical & Bioprocesses (bioreactors, integrated continuous bio-manufacturing, single-use reactors, scale-up, process intensification, particle technology, fluid process engineering, multiphase systems, process and plant design, modular production, materials for 3D printing, product design, new materials, ...); Separation technologies/ downstream processing (membranes, fluid separations, adsorption, crystallization, chromatography...); Chemical and Biocatalysis (catalyst characterization, heterogenous catalysis, enzyme technology, protein

engineering, cell-free systems, chemo-enzymatic syntheses, microbial fuel cells & electrosyntheses, ...);

**... And life:** Biological Production Systems (systems biology, metabolic engineering, synthetic biology, cell culture technology, biofilms, ...);

**Finding new routes:** Sustainable production, low carbon & circular (bio)economy, clean water and energy (H<sub>2</sub> Economy, H<sub>2</sub> technologies, C1 feedstocks, plant/algae biotechnology, food production, biorefineries, recycling/waste utilisation, bio-leaching, electrochemical processes, process electrification, power-to-x, (waste)water technologies, bio-based products (fuels, polymers, chemicals), ...);

**Preparing for the future:** Novel ways of education and training (Curriculum Development & Transformation, e-Learning & e-Assessment, Teaching Engineering, Design, Safety & Sustainability, CHARMING

**Sponsorship:** Be part and support ECCE 13 & ECAB 6. Further information:

<http://ecce-ecab2021.eu/sponsoring.html>

The call for papers will open in August 2020.

**Website:** <http://ecce-ecab2021.eu/>

**Twitter:** #ecceecab21

## Save the date!

**17th International Symposium on Loss Prevention and Safety Promotion in the Process Industries – Loss Prevention 2022 Prague, Czech Republic, 5-8 June 2022 (EFCE Event No. 765)**

The 17th International Symposium on Loss Prevention and Safety Promotion in the Process Industries and accompanying exhibition is organised by the Faculty of Safety Engineering - VSB Technical University of Ostrava and the EFCE Working Party on Loss Prevention.

**Website:** <http://www.lossprevention2022.org>

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