

EFCE Awards Jacques Villiermaux medal to Rafiqul Gani



The European Federation of Chemical Engineering (EFCE) has awarded its most prestigious medal - the Jacques Villiermaux Medal, to Professor Rafiqul Gani in recognition of scientific achievement within the Federation. The Jacques Villiermaux Medal is awarded every four years

and recognises a scientist's achievements and contributions to the EFCE science policy, working parties, conference programmes and related activities.

Professor Gani, who in 2017 retired from the Technical University of Denmark to set up a consultancy, received the medal in recognition of his internationally acclaimed research in Process Systems Engineering over several decades. His work spans computer-aided modeling, molecular-mixture design, process engineering and process tools integration, as well as his methodology development and industrial impact.

The award also acknowledges Professor Gani's role as a member and Chair of the EFCE Working Party on Computer Aided Process Engineering (CAPE) and his contribution to the profession of chemical engineering, education and scholarship worldwide. Through his role in the Working Party, he was instrumental in founding the renowned ESCAPE symposium series and led the organisation of several events in the series.

The medal was presented by the EFCE President, Dr Hermann J Feise, at the 12th European Congress

of Chemical Engineering (ECCE), which took place from the 15 to 19 September in Florence, Italy.

On receiving the medal, Professor Gani said: "It is gratifying to see that the vision, achievements and leadership of Professor Jacques Villiermaux are alive and well. I am humbled to have been named as the recipient of this prestigious award, and would like to thank the EFCE for making this occasion possible."



Hello and welcome to the latest EFCE newsletter!

It is a packed issue, sent to you fresh from the 12th European Congress of Chemical Engineering, which took place in Florence on 15-19 September. I hope you find it an interesting and informative read.

If you have any comments on the newsletter please get in touch.

Hermann Feise
EFCE President

Highlights in this issue:

- Rafiqul Gani receiving the Jacques Villiermaux Medal
- A report from the Escape 29
- A raft of winners for EFCE Excellence Awards, the 2019 Student Mobility Award, and this year's Industrial Innovation Award
- A call for nominations for the EFCE Excellence Award for an outstanding PhD thesis on CAPE



Thank you for your participation in ECCE12 & ECAB5

EFCE presents its 2019 EFCE Student Mobility Award Winners

Three outstanding young chemical engineers have been selected by an international jury to receive the **2019 Student Mobility Award** of the Federation which recognises mobility during their academic studies. The award was presented in Florence, Italy, on 19 September 2019 during the Closing Session of the 12th European Congress of Chemical Engineering & 5th European Congress of Applied Biotechnology - ECCE12 & ECAB5.

Filippo Licordari – 1st prize

This year's first prize of €2,000 was awarded to Filippo Licordari who is currently working for Boston Consulting Group AG, in Zürich, Switzerland. Filippo Licordari obtained a Foundation Degree in chemical engineering from Imperial College London, United Kingdom his Bachelor's degree in chemical engineering from Politecnico di Milano, Italy, and a Master's degree in process engineering from ETH Zürich, Switzerland. During his studies he completed internships at Eni SpA in Italy and Lonza AG in Switzerland. Furthermore, he conducted the Master's research project at the Massachusetts Institute of Technology, Cambridge, USA.

In his essay Mr. Licordari stated: "I deeply believe that Politecnico di Milano (which I attended for my bachelor's degree) and ETH offered me a first-class working method as I was constantly stimulated to understand and to analyze new phenomena and processes."

He wrote: "I would like to thank all the people in the community, the Professors of Politecnico di Milano and ETH Zurich, and all my colleagues attending the conference. I have met great people during my studies, and they all have been very inspiring during my path: The chemical engineering community is really great!"

Roman Weh – 2nd prize

The second prize (€1,500) was awarded to Roman Weh who is currently a PhD student in Chemical & Process Engineering at The University of Western Australia, Perth, Australia. His research is looking at "Gas Separation by Dual Reflux-Pressure Swing Adsorption". He completed his Bachelor's degree in process engineering and his Master's degree in chemical engineering at Mannheim University of Applied Sciences, Germany. Weh completed his final degree project at the École Nationale Supérieure des Industries Chimiques - ENSIC, in Nancy, France. During his studies he completed a research internship at the University of Alberta, Edmonton, Canada.

In his essay he stated: "Not only did I learn how



(L-R): Professor Eric Schaer (Chair of EFCE Working Party on Education); 3rd prize winner, Jeanne Le Loeuff; Dr. Hermann J. Feise, BASF SE; 2nd prize winner, Roman Weh; Professor David Bogle, EFCE Scientific Vice-President (missing: 1st Prize winner, Filippo Licordari).

to work independently in a scientific environment, but I also had the valuable opportunity to work with people from all over the world. It was remarkable to witness how research brings together people from very different cultures and countries, all sharing the same interests and striving for the same goals. This experience significantly contributed to my personal development. I became more open-minded towards people from foreign cultures and overcame prejudice. I also improved my English language skills and learned to work in an international team setting."

Jeanne Le Loeuff – 3rd prize

The third prize (€1,000) was awarded to Jeanne Le Loeuff who is currently finalizing her German-French Binational double degree programme in process engineering (Bachelor's degree) and chemical engineering (Master's degree) at the Ecole Nationale Supérieure des Industries Chimiques - ENSIC, Nancy, France, in collaboration with the Mannheim University of Applied Sciences, Germany. During her studies she completed two training periods in Germany, at Raschig Ludwigshafen and Grosskraftwerk Mannheim.

Commenting on her experiences studying abroad, she said: "This advantage of having seen different methods of learning is both a great chance for my professional life and my personal one." She added that studying in a foreign country has given her a bigger vision of the world and helped her

understand it better.

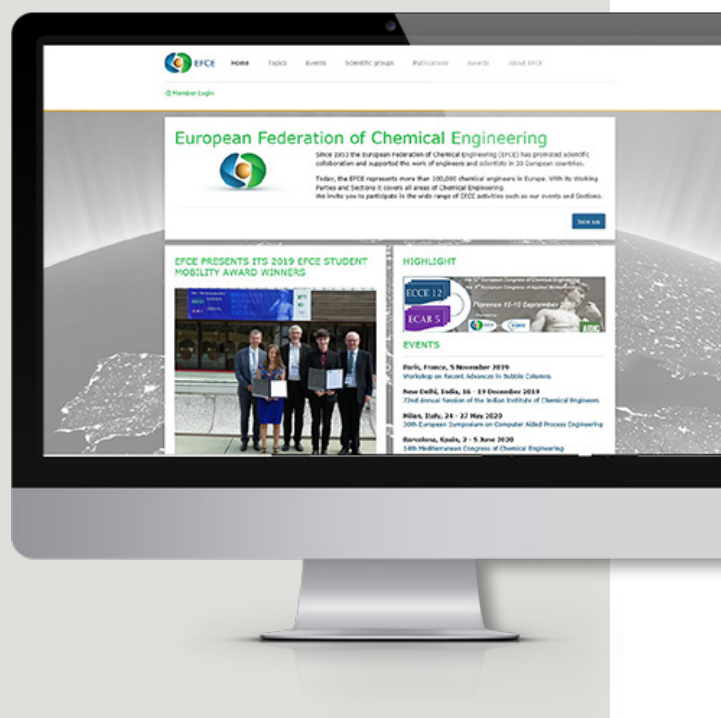
Presented twice a year by the European Federation of Chemical Engineering (EFCE), these awards honour the best European chemical engineering students who have sought professional development and gained cross-cultural experiences by studying outside their home country for one semester or more.



The 2019 Student Mobility Award is generously sponsored by BASF SE.

About the sponsor: At BASF, we create chemistry for a sustainable future. We combine economic success with environmental protection and social responsibility. More than 115,000 employees in the BASF Group work on contributing to the success of our customers in nearly all sectors and almost every country in the world. Our portfolio is organized into five segments: Chemicals, Performance Products, Functional Materials & Solutions, Agricultural Solutions and Oil & Gas. BASF generated sales of €64.5 billion in 2017. BASF shares are traded on the stock exchanges in Frankfurt (BAS), London (BFA) and Zurich (BAS). Further information at: www.basf.com.

Visit the new EFCE website!



Safer photoinitiator synthesis wins 2019 Industrial Innovation Award

An innovative new flow process to produce a photoinitiator for Agfa-Gevaert has



been awarded the **2019 Process Intensification Award for Industrial Innovation** by the European Federation of Chemical Engineering (EFCE). The new process prevents the production of liquid bromine, which is both toxic and volatile, making the process both safer and cheaper than the established process.

The process is the final step in Agfa's production of photoinitiators for printing plates and involves a bromination reaction using sodium hypobromite as the brominating agent. In the original process, this hypobromite was generated in a batch reactor by the addition of liquid bromine to a cold caustic solution. Handling liquid bromine safely requires dedicated installations, which are expensive and inflexible.

The team at Agfa, consisting of Wim Dermaut, Bart Cappuyns, Gert Engelen and Peter Kempnaers, developed an alternative flow process in which hypobromite is generated in a flow reactor



Presentation of the Process Intensification Award for Industrial Innovation (from left to right): Tom Van Gerven (Chair WP PI), Bora Aydin (Chair of the jury and representative of TechnipFMC, the sponsor), Wim Dermaut and Bart Cappuyns (both Agfa-Gevaert NV)

by reacting an aqueous sodium bromide solution with concentrated hypochlorite (bleach). As the process does not require any liquid bromine, it is much safer and more environmentally friendly. Since it does not require elaborate safety precautions or dedicated reactors, the team estimates the final product will be up to 35% cheaper.

To date, the company has proved the concept using a 400 litre pilot plant. Work on a full-scale plant with a capacity of 1000 litres is underway.

The judges, from EFCE's Working Party on Process Intensification, were particularly impressed that the team applied out of the box thinking to develop the process with very limited investment and no off the shelf flow reactors or suitable pump skids. The result has been a huge improvement in safety and flexibility.

"Even though there is still a need for progress for industrial scale-up, the objectives for the lower OPEX and CAPEX is promising," the judges noted.

The award, which is sponsored by Technip Benelux B.V., was presented on 27 May 2019 during the 2nd International Process Intensification Conference (IPIC2) in Leuven, Belgium.



About the sponsor:

TechnipFMC is a global leader in subsea, onshore/offshore, and surface projects. With our proprietary technologies and production systems, integrated expertise, and comprehensive solutions, we are transforming our clients' project economics. To learn more about how we are enhancing the performance of the world's energy industry, go to www.TechnipFMC.com. TechnipFMC Process Technology is a global network of centers which looks after the company's expanding portfolio of onshore process technologies in petrochemicals, refining, hydrogen and syngas polymers and gas monetization.

Excellence Award Winners

Avalanche work sweeps up EFCE particulates award



Work to better understand the behaviour of sand pile avalanches has been awarded the **2019 EFCE Excellence Award in Mechanics of Particulate Solids**.

Dr. Matthew Arran won the award for his thesis on the

'Intermittency between avalanche regimes on grain piles', which he completed as part of his PhD in the Department of Applied Maths and Theoretical Physics at the University of Cambridge in the UK, under the supervision of Dr. Nathalie M. Vriend.

Praising Arran's work for its extremely high technical quality, the judges said that the thesis had led to a completely new understanding of avalanche behaviour. "From our understanding, he was able to detect two different avalanche scenarios, and provide an understanding of new behaviour. He was able to hypothesize why these scenarios could occur and then provide a careful experimental and theoretical explanation to support his hypothesis."

The jury praised the beautiful presentation and innovative scope of work, which has true scientific impact. "Arran has a unique ability to tell a remarkable story while incorporating high level theoretical and experimental work."

The prize consists of a €1500 cash prize and travel stipend kindly sponsored by Jenike and Johanson Inc.



Matthew Arran (right) received the award from the Chair of the EFCE Working Party on Mechanics of Particulate Solids, Professor Álvaro Ramírez-Gomez (left), during the 2019 PARTEC conference, which took place in Nuremburg, Germany, on 9-11 April 2019.



About the sponsor:

Jenike & Johanson is the world's leading company in powder and bulk solids handling, processing, and storage technology. Over the past 55 years, we've tested over 13,000 unique powders and bulk solids and worked on more than 7,500 projects, giving our team the broadest real-world and in-depth experience in the industry to address a wide variety of bulk material handling and engineering needs.

Process Intensification Award recognises outstanding research on high-purity hydrogen production



Dr. Andy N. Antzara has been awarded the **2018 EFCE Excellence Award in Process Intensification**. The Award was conferred upon him for his excellent PhD thesis "Intensification of sorption enhanced steam methane reforming for high-purity hydrogen production"

The judges praised the thesis for being both innovative and useful for the production of high-purity hydrogen (up to 99%), as well as being of great importance for future energy demand and energy storage as energy carrier. Dr. Antzara developed a new path for hydrogen production via a novel intensified process concept combining two loops, namely that of calcium and chemical to produce pure hydrogen in a single step with a lower carbon footprint and reduced energy demand. It confirmed the high potential and significant advantages of the combined concept as an intensified route for the conversion of natural gas.

The jury also noted that Dr. Antzara had published seven publications in highly prestigious scientific journals with a cumulative impact factor of 38.5, which have received more than 200 citations. In a short period of time, he also managed to accomplish multiple experimental techniques and computational methods.



Presentation of the Excellence Award, with (from left to right): Tom Van Gerven (Chairman WP PI), Dirk Kirschneck (Microinnova, Sponsor), Nikola Nikacevic (Chairman of the jury) and Andy N. Antzara (winner of the award).

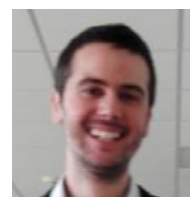
Dr. Antzara obtained his Diploma and PhD degree in Chemical Engineering from Aristotle University of Thessaloniki, Greece. Currently, he holds the position of post doctoral researcher at the Department of Chemical Engineering, Aristotle University of Thessaloniki.

Nominating Dr. Antzara for the award, Professor Angeliki A. Lemonidou, stated: "Dr. Andy Antzara is an ambitious young researcher with drive and ability to make a significant impact in the field of reaction engineering and especially in process intensification of energy related processes via combining reaction and separation in a single step ..."

The prize consists of a certificate and €1500 cash prize, a travel grant and an invitation to attend the 2nd International Process Intensification Conference – IPIC2, where the prize was awarded on Monday, 27 May 2019. Dr. Antzara was also invited to give a scientific presentation of 15 minutes on Wednesday, 29 May 2019.

EFCE presents Process Safety Award for work on safety aspects of CO₂ handling in the frame of the Carbon Sequestration Chain

Dr. Paolo Mocellin has been named the winner of the **2019 EFCE Excellence Award in Process Safety** of the European Federation of Chemical Engineering (EFCE).



The Award recognises his excellent PhD thesis "Carbon Capture and Storage (CCS) and Enhanced Oil Recovery (EOR) hazard analysis. Experimental investigation and modelling of multiphase CO₂ pressurized releases" completed at the University of Padova, Italy, under the supervision of Professor Giuseppe Maschio.

His research covered key aspects of Safety Science and Technology applied to CO₂ pipeline networks in the framework of the Carbon Sequestration Chain. A synergistic experimental and modelling activity was performed in order to make a modelling tool available for hazard analysis purposes. The combination of two approaches has led to the development of a global model for use in QRA studies applied to CO₂ treatment infrastructure, both in land use planning and in emergency situations. Dr. Mocellin's work has resulted in eleven scientific publications, six of which have seen him as lead author with a majority of these in the Chemical Engineering Transactions journal.

He said: "I am very grateful and thrilled for the nomination of this prestigious award."



Paolo Mocellin (left) receiving the certificate from Remko Harbers, representative of the sponsor Aspen Oss)

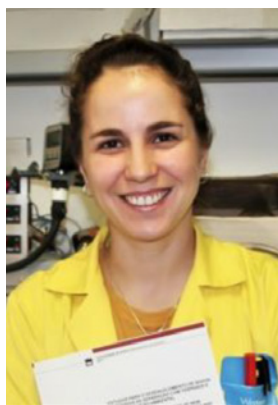
fluid dynamic simulations of atypical accidental scenarios.

In his nomination, Prof. Maschio stated: "He represents an inspired young researcher engaged in studying and disseminating Safety Science applied to engineering and sustainable industrial development."

The Award was presented to Paolo Mocellin on 18 June 2019 at the end of the morning plenary session of the 16th Loss Prevention Symposium, held in Delft, The Netherlands, from 16 to 19 June 2019.

The 2019 Excellence Award in Process Safety is generously sponsored by Aspen Oss B.V. and supported by TU Delft.

Monia Martins takes 2019 EFCE Thermodynamics Award for her studies of terpenes, ionic liquids and deep eutectic solvents



Dr. Mónica Martins has been awarded the **2019 EFCE Excellence Award in Thermodynamics** for her excellent PhD thesis "*Studies for the Development of New Separation Processes with Terpenes and their Environmental Distribution*" completed at the Department of Chemistry, University of

Aveiro, Portugal under the supervision of Prof. João A. P. Coutinho and Prof. Simão P. Pinho.

The award jury was impressed by her studies of terpenes, ionic liquids and deep eutectic solvents, helping to develop different experimental methods for the measurement of their physicochemical properties.

This included the implementation of a new methodology to gather extensive high quality experimental solubility data of terpenes and benzimido derivatives in water at different temperatures. She also worked on the development of different experimental methods for the measurement of the solid-liquid phase diagrams of deep eutectic solvents containing mixtures and the development of experimental gas-liquid chromatography measurements to obtain the activity coefficients at infinite dilution of various solutes in ionic liquids. Furthermore, she successfully used different theoretical approaches to estimate the distribution of terpenes in different environmental compartments and COSMO-RS for solvent screening and selection of ionic liquids.

The judges noted that her thesis formed the basis of 12 peer reviewed research papers, which were published in prestigious international scientific journals.

Nominating her for the Excellence Award, Professor Simão P. Pinho said: "Mónia Martins developed an excellent body of work on a challenging and innovative subject, showing maturity, creativity, and involvement of unique and high quality standards."

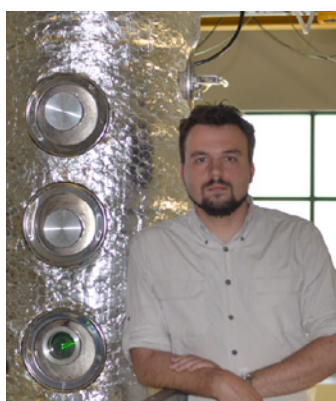
The Excellence Award recognizes an outstanding PhD thesis and is judged on dissemination of knowledge including quality of the publications and presentations, duration of the thesis, originality of the topic studied and of the methodology followed, innovation and industrial relevance, and scientific impact of the work.

The award, which is supported by Bayer AG, consists of a €1500 cash prize and a travel grant to attend the 26th Thermodynamics Conference 2019, in Huelva, Spain, on 26-28 June 2019, where the award was presented.

In addition, the Award jury gave special recognition to the runner-up, **Dr. Duncan Paterson**, Denmark, for his excellent PhD thesis "*Flash Computation and EoS Modelling for Compositional Thermal Simulation of Flow in Porous Media*" for which he achieved the second-best evaluation results. The research originates from the need to describe the complex process of recovering heavy oil with steam and solvents to reduce the energy and water consumption and the associated CO₂ emissions. In his thesis,

Dr. Paterson has given unique contributions in generic algorithms for multiphase flash, and in particular the RAND-based flash framework which allows simultaneous computation of chemical equilibrium. It is expected that the formulations developed in his thesis will have a lasting impact on how we perform multiphase flash calculations under various specifications, with or without chemical equilibrium.

Jaskulski wins Drying Excellence Award for the modelling of particle agglomeration in dryers



Dr. Eng. Maciej Jaskulski has been named the winner of the 2019 Excellence Award in Drying and Freeze-Drying of the European Federation of Chemical Engineering (EFCE).

The Award recognises his excellent PhD thesis "CFD Modeling of

Particle Agglomeration in Counter – Current Spray Drying Process" completed at the Lodz University of Technology, Poland, under the supervision of Prof. Dr Hab. Eng Ireneusz Zbiciński, which achieved the best evaluation results in terms of breadth and depth of the thesis, scientific impact, innovation and industrial relevance and dissemination of results.

Maciej Jaskulski obtained his M.Sc.Eng and PhD degrees in Chemical Engineering from the Lodz University of Technology, Poland. Since 2017, Dr. Jaskulski has been an Assistant Professor at Lodz University of Technology in the Faculty of Process and Environmental Engineering, Department of Heat and Mass Transfer.

In his PhD thesis Dr. Jaskulski presents a new methodology for predicting morphological properties of powders obtained by the spray drying method. The particle agglomeration model developed as part of his work is the first comprehensive model combining the growth of agglomerates with the kinetic model of drying. In addition, the model was verified based on the experimental data obtained during pilot plant and industrial spray drying tower experiments.

In his nomination, Prof. Zbiciński stated: "His knowledge, competence and professionalism consolidated his position in the scientific market, Dr. Jaskulski is recognisable and frequently

invited for lectures in research labs and industry."

The Award jury commented: "Dr. Jaskulski prevails in consideration of the quality of the thesis, and for the innovative approach he adopted in his PhD thesis. ... His research is likely to be applied to various industrial problems, including operating conditions, optimisation and design. The candidate also has an excellent publication list, and good work experience."

The award was presented in Torino, Italy, in July 2019 in conjunction with the 7th European Drying Conference – EuroDrying'2019.

The 2019 Excellence Award in Drying and Freeze-Drying is generously sponsored by Crioforma S.a.S.



About the sponsor:

CRIOFARMA is an Italian company with over 58 years

of experience specialising in the production of pharmaceutical machinery, in particular freeze-drying equipment and sterile production machines. CRIOFARMA is also rich in funds, experiences and comprehensive technology including vacuum technology, low temperature devices, electrical equipment and instrumentation. CRIOFARMA started the production of freeze-dryers in 1962, in their Turin plant, and over the years have developed their own advanced technology to obtain the best performances as possible in this field.

Knowledge as a fixed asset around which all the work at the company revolves. Knowledge as added value, to be able to stand out on the industrial panorama. These are the cardinal points at Crioforma.

EFCE presents Product Design Excellence Award for the development of molecule-selective breath sensors for medical diagnostics



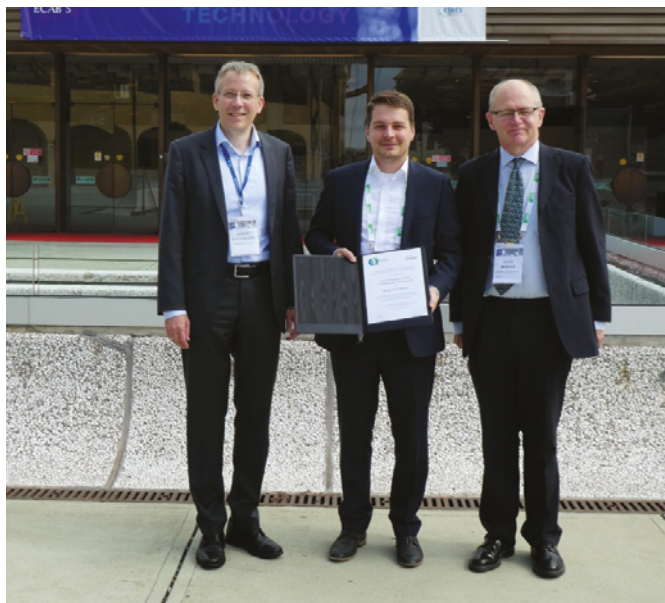
Dr. Andreas Güntner has been named as the winner of the **2019 EFCE Excellence Award in Product Design and Engineering** of the European Federation of Chemical Engineering (EFCE) for his outstanding PhD thesis on

"Selective gas sensors from flames for breath analysis", completed at ETH Zürich, Switzerland, under the supervision of Professor Sotiris E. Pratsinis.

In his thesis, Dr. Güntner's research focused on advancing chemical and process engineering towards the creation of molecule-selective breath sensors for the next generation of non-invasive and inexpensive medical diagnostics monitoring and treatment in personalized medicine. He designed novel sensor concepts and systems, including new sensing materials to systematically address the required selectivity and sensitivity in breath analysis. His work targets key breath markers for which no reliable chemical sensors exist to date, such as ammonia, isoprene, formaldehyde and acetone. Ammonia, isoprene and acetone are markers for early kidney dysfunction, cholesterol and fat metabolism respectively. He also pioneered the development of a so-called electronic nose to detect formaldehyde, a marker for lung cancer and indoor air pollution emitted from furniture varnishes. The resulting gas sensor systems were tested on humans in clinical environments.

The Award jury stated: "The thesis is an excellent example of design from problem to product. Dr. Güntner's work is industrially relevant, shows depth and breadth – with a remarkable publication output – and the ability to disseminate and innovate."

Dr. Güntner obtained his Master's degree



(L-R): Dr. Stefan Kaufmann (Beiersdorf AG, Chair of EFCE Section on Product Design and Engineering); Dr. Andreas Güntner (Award winner); Prof. David Bogle (EFCE Scientific Vice-President)

in Mechanical Engineering and his PhD in Mechanical and Process Engineering from ETH Zürich, Switzerland. Since 2017, he is a Postdoctoral Fellow, Research Group Leader and (since 2018) Lecturer at the Department of Mechanical and Process Engineering, ETH Zürich, Switzerland. He is also a Research Associate at the Department of Endocrinology, Diabetes and Clinical Nutrition, University Hospital Zürich, and co-founder of Sentiras GmbH, Zürich, Switzerland.

He said: "I feel deeply honored and humbled to receive this prestigious award."

Nominating him for the Award, Professor Pratsinis wrote: "Andreas is distinguished for his exceptional talent, motivation and leadership that truly shine now as a Research Team Leader and Lecturer in my department."

The award, which comprised of a €1,500 cash prize and a travel grant, was presented to Dr. Güntner during the Closing Session of the 12th European Congress of Chemical Engineering and 6th European Congress of Applied Biotechnology – ECCE12 & ECAB5, held in Florence, Italy, from 15 to 19 September 2019.

The 2019 EFCE Excellence Award in Product Design and Engineering is generously sponsored by Beiersdorf AG.

Beiersdorf **About Beiersdorf AG**

Beiersdorf AG is a leading provider of innovative, high-quality skin care products and has over 135 years of experience in this market segment. The Hamburg-based company has about 20,000 employees worldwide and is listed on the DAX, the German benchmark equities index. Beiersdorf generated sales of €7.2 billion for the financial year in 2018. Its product portfolio comprises of strong, international leading skin and body care brands including NIVEA – the world's largest skin care brand – Eucerin, Hansaplast/Elastoplast, and La Prairie. Millions of people around the world choose Beiersdorf brands every day for their innovative, high-quality products. Further renowned brands such Labello, Aquaphor, Florena, 8x4, Hidrofugal, arix, SLEK, and Maestro round off their extensive portfolio. Beiersdorf's wholly owned affiliate Tesa SE, another globally leading manufacturer in its field, supplies self-adhesive products and system solutions to industry, craft businesses and consumers.*

* Source: Euromonitor International Limited; NIVEA by umbrella brand name in the categories Body Care, Face Care, and Hand Care; in retail value terms, 2017.

Call for Nominations – EFCE Excellence Award in Recognition of an Outstanding PhD Thesis on CAPE 2020

The European Federation of Chemical Engineering (EFCE) is pleased to announce the call for nominations for its prestigious Excellence Award in Recognition of an Outstanding PhD Thesis on CAPE. Launched in 2006, this biennial award recognises a PhD thesis which demonstrates an outstanding contribution to research and/or practice in computer-aided process engineering (CAPE) or process systems engineering (PSE).

The award consists of a cash prize of €1,500 and a certificate and will be presented to the winner at a plenary session during the ESCAPE-30 conference to be held in Milan, Italy, from 24 to 27 May 2020. The award also comprises of a travel grant of up to €500 and the ESCAPE registration cost. Furthermore, the successful candidate will be invited to make a plenary presentation at the ESCAPE conference and to prepare a paper for publication as a “guest paper” in Computers & Chemical Engineering.

Any PhD thesis supervised at a university or PhD-awarding institution of an EFCE member country in computer-aided process engineering (CAPE) or process systems engineering (PSE) is eligible for nomination. The candidate's thesis must have been defended after 1 January 2017.

The closing date for nominations is **31 December 2019**.

Further information about the nomination procedure, eligibility, supporting documentation, etc., can be obtained from the EFCE website at www.efce.info/ExcellenceAwardCAPE.html

The Award is generously sponsored by Process Systems Enterprise Inc.



About Process Systems Enterprise Inc. The Advanced Process Modeling Company: PSE is the world's leading provider of advanced process modelling software and services to the process industries. The company's gPROMS tools are used to explore the process decision space and optimise design and operation using high-fidelity mechanistic models and advanced global system analysis and optimisation techniques. The result is accelerated process development, better process design and operation, reduced technology risk and improved R&D efficiency. Key application areas are chemicals & petrochemicals production, formulated products manufacture, and oil & gas safety and production optimisation. PSE supports academic research and teaching in universities around the world via a dedicated PSE Academic operation. www.psenderprise.com/

Working Party News

Working Party on Multiphase Fluid Flow - WP MFF

During the 12th European Congress of Chemical Engineering in Florence, long serving member of the Multiphase Fluid Flow Working Party, **Philipp Rudolf von Rohr**, has been honored with a lecture given by Prof. Klavs Jensen from MIT Department of Chemical Engineering.

Philipp Rudolf von Rohr has been the head of the Institute of Process Engineering at ETH Zurich since 1992 and chaired the Department of Mechanical and Process Engineering from 1999 until 2002. He studied mechanical engineering at the ETH Zurich, specialising in process engineering. The Swiss National Science Foundation granted him a scholarship to study small low-temperature systems at MIT in Cambridge, USA. In 1985, he started working for a company in the field of process



(L-R): Prof. Klavs Jensen, Prof. Philipp Rudolf von Rohr, Prof. Michael Schlüter

engineering apparatus and plant engineering with a focus on environmental technology. In 1990 he had taken over the technical management of the company. In 1998 he founded the Laboratory for Transport Processes and Reactions. His research activities focused on three main areas: Transport processes, Plasma-assisted surface treatment processes and high-pressure processes on a micro- and macro-scale.

Philipp Rudolf von Rohr headed the EFCE Working Party on Multiphase Fluid Flow for several years and significantly contributed to its successful development. On behalf of the Working Party, Chair, Prof. Michael Schlüter, thanks Philipp for his work and outstanding engagement for the scientific community and wishes him all the best for his future after retiring.

The EFCE Working Party on Multiphase Fluid Flow has named **Viktoria Wiedmeyer**, M.Sc., Max Planck Institute for Dynamics of Complex Technical Systems, Magdeburg, Germany, as the winner of the **Poster Award 2019**. The winning poster, "Crystal growth simulation in a continuously operated helically coiled tube" (by V. Wiedmeyer, A. Voigt and K. Sundmacher), was presented at the poster competition on fluid flow and multiphase systems at ECCE12&ECAB5, 2019 in Florence.

The award jury commented that Wiedmeyer's group had presented outstanding work that shows the successful modeling of crystal growth populations of large mean crystal size and narrow crystal size distribution. "The jury was especially impressed by Viktoria's deep understanding of the physical fundamentals



The winner of the 2019 Multiphase Flow Best Poster Award Viktoria Wiedmeyer (second from left) and members of the jury (from left Prof. Michael Schlüter, M.Sc. Viktoria Wiedmeyer, Dr. Mária Zedníková, Prof. Alain Line)

of crystal growth and the group's consideration in modelling", said Prof. Michael Schlüter, Chair of the Working Party on Multiphase Fluid Flow. EFCE congratulates Viktoria Wiedmeyer and co-authors for their great success. The Poster Award carries prize money of €300.

Working Party on Loss Prevention and Safety Promotion

During the 16th Loss Prevention Symposium, held in Delft, The Netherlands, from 16 to 19 June 2019, the Loss Prevention Working Party of the European Federation of Chemical Engineering together with the sponsor TU Delft presented the **EFCE Loss Prevention Symposium Award 2019** to Professor Hans J. Pasman.

The award recognises his outstanding lifelong research excellency and contribution to the advancement of process safety, and recognises the importance of loss prevention in the chemical engineering community .

The Award was presented to Prof. Pasman on 18 June 2019 at the end of the morning plenary session.



(L-R): Prof. Bruno Fabiano (Chair of the EFCE Loss Prevention Working Party), Prof. Hans Pasman, Prof. Genserik Reniers (Symposium Chair)

Recent EFCE events

ESCAPE-29 Report

The 29th European Symposium on Computer-Aided Process Engineering (ESCAPE-29) took place in Eindhoven (The Netherlands) between 16-19 June 2019. The event was organised under the auspices of EFCE (Event No. 758), CAPE-WP, Nederland Procestechologie (NPT), and Process Systems Engineering NL (PSE-NL). The event received generous financial support from several sponsors: Shell, BASF, Process Systems Enterprise, DotX Control Solutions, Corbion, MDPI Processes, and Mobatec.

ESCAPE-29 (www.escape29.nl) was a successful event that attracted approximately 400 participants from 44 countries, with a balance of contributions from academia and industry. The program included 5 plenary lectures, 24 keynote lectures, 96 oral presentations, and 189 posters, covering seven overarching scientific themes. The proceedings were published by Elsevier in Computer Aided Process Engineering (vol. 46, ISBN 978-0-1281-8634-3). The main vision was to collaborate in organising an unforgettable event and coordinating an attractive scientific program, covering a wide range of topics: from molecule to enterprise level. Besides traditional themes, ESCAPE-29 also offered a platform for emerging topics related to sustainable development, the food industry, energy transition, biorefineries, as well as micro/nano-scale processes and devices.

The event also included special sessions illustrating the cross-fertilization between the Computer Aided Process Engineering Working Party (CAPE-WP) and other EFCE Working Parties, such as Quality by Design and Process Intensification. Alongside the scientific aspects, the programme also included some social events, such as a concert (by Collegium Vocale Eindhoven) at the Saint Catherine church, a nice excursion to Brainport and a fantastic gala dinner at Evoluon, with swing music for lindy hop dancers by The Kalishnikovs band.

The event was a great success and was well received by the scientific community (we are thankful for all the positive feedback). It proved to serve as an excellent platform for chemical engineers, scientists, researchers and students to present and discuss the progress being made in the CAPE and PSE areas. It also constituted a major CAPE event with great worldwide participation, allowing excellent networking opportunities with academics as well as industrial peers and pre/post-conference meetings. The conference highlighted the key contributions of the CAPE / PSE community to the sustainability of the modern society, and proving once more that the most important product delivered by the CAPE community to the world are highly skilled engineers.



Group photo of all participants to ESCAPE-29

News from the European Process Safety Centre

European Conference on Plant & Process Safety *Processes with Hazardous Chemicals - Practical Learnings*

Cologne, Germany, 11-12 December 2019

The European Process Safety Centre-EPSC invites you to its first European Conference on Plant & Process Safety in Cologne on 11-12 December 2019.

The conference will bring together the technical safety specialists and managers from Seveso like companies to learn and network. The event is broadly supported by the European industrial chemical associations and sponsored by BASF, Bayer and Total.

Topics: Learning from incidents; Risk reduction tools; Plant monitoring & Integrity; Human Performance.

The tentative **programme** is available at: <https://safetycongress.eu/Program.html>

Furthermore, suppliers to the hazardous processing industry with specific knowledge on Process Safety are invited to participate with a stand at the **Network Forum. Register now!**

Website: <https://safetycongress.eu/>

Events organised by or on behalf of EFCE in 2019/21

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

Recent Advances in Bubble Columns *Paris, France, 5 November 2019* *(EFCE Event No. 770)*

Bubble columns are frequently used in the chemical, biotechnology and water treatment industries, as well as many others. Despite decades of research, the design and scale-up of bubble column reactors is still a challenging task. What are the challenges and opportunities? What are the latest experimental and numerical techniques and tools that will help design and operation?

The group 'Reactors & Intensification' of the French society of chemical engineering (SFGP) and the 'Multiphase Flows' Working Party of the European Federation of Chemical Engineering (EFCE) invite you to participate in a 1-day workshop on the recent scientific developments in the field of bubble columns and bubbly flows involved in chemical reactors. This event will bring together some of the principal experts in the field today and provide the opportunity to discuss current challenges.

Speakers: Alain Cartellier, University of Grenoble Alpes; Michael Schlüter, Hamburg University of Technology; Frédéric Risso, Institut de Mécanique des Fluides de Toulouse; Daniele Marchisio, Politechnico of Turino;

Holger Marchall, University of Darmstadt; Arne Hofmann, BASF SE; Niels Deen, University of Eindhoven; Guillaume Bois, CEA Saclay; David Fletcher, The University of Sydney.

Programme and on-line registration:
<https://www.weezevent.com/recent-advances-in-bubble-columns>

CHEMCON-2019

72nd Annual Session of the Indian Institute of Chemical Engineers *New Delhi, India, 16-19 December 2019 (EFCE Event)*

The 72nd Annual Session of the Indian Institute of Chemical Engineers (IICChE) will be organised at Indian Institute of Technology Delhi (IITD), New Delhi from 16th to 19th December 2019 by Indian Institute of Chemical Engineers (Northern Regional Centre) in association with Chemical Engineering Department, IIT Delhi, Indian Oil Corporation Limited (IOC) and EFCE.

CHEMCON 2019 includes a half-day Indo-European symposium. Leading personalities from India, Europe and other countries in the field of Chemical Engineering from academia

and industry, will make plenary technical presentations on their subject of expertise, relevant to the theme of various technical sessions.

Topics: Advanced Techniques in Bio-production, Bio-Separation & Bio-Detection (Biosensors); Biomass and Renewables; Catalysis and Reaction Engineering; Computational Fluid Dynamics; Electrochemical Processes; Fertilisers; Fluid Mechanics; Food Engineering; Green Technologies; Hydrocarbons; Hydrogen Energy and Fuel Cells; Instrumentation and Process Control; Materials of Construction; Modelling and Simulation of Processes; Nanotechnology; Novel Separation Processes; Particle Technology; Polymer Engineering and Technologies; Process Intensification; Process Scheduling; Production of Chemicals; Safety, Health and Environment; Solid Waste Management; Thermodynamics; Transport and Interfacial Phenomena; Upstream and Downstream Petroleum Processes; Wastewater Treatment.

Website: <http://www.chemcon-2019.com>

European Symposium on Computer Aided Process Engineering - ESCAPE30

**Milan, Italy, 24-27 May 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.

ESCAPE-30 will be held in Milano, a pleasant town, especially in the springtime, with a variety of attractions including great museums, the wonderful Duomo, the Sforza Castle, many medieval historical churches, a fascinating shopping area and beautiful surroundings.

The venue will be four star Hotel Michelangelo, located close to the Central Station.

The symposium contributions will be: Plenary Lectures, Keynotes, Oral and Poster contributions. After peer review, the contributions will be published by Elsevier in the series Computer Aided Chemical Engineering.

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, USA; Ana Paula Barbosa-Póvoa, Portugal

Registration will open on **15 November 2019**.

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

14th Mediterranean Congress of Chemical Engineering Barcelona, Spain, 2-5 June 2020 (EFCE Event No. 768)

The 14th Mediterranean Congress of Chemical Engineering - MECCE 2020 is organised by SEQUI (Sociedad Española de Química Industrial e Ingeniería Química) 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

Do not miss this opportunity to improve the visibility and disseminate the potential applications of your work, find new opportunities and application fields and promote Scientific/ industrial symbiosis.

Selected papers will be published in special issues of different specialized journals.

The call for papers is open. Deadline for submission of abstracts: **15 January 2020**.

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

12th European Symposium on Electrochemical Engineering - ESEE 2020 Leeuwarden, The Netherlands, 14-18 June 2020 (EFCE Event No. 766)

The 12th European Symposium on Electrochemical Engineering - ESEE 2020 is organised by the EFCE Working Party on Electrochemical Engineering in cooperation with Wetsus.

The scope of ESEE 2020 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 CO₂; 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.

The call for papers will open on 1 November 2019 with a deadline for submission of abstracts on **15 January 2020**.

Website: <http://www.electrochemical-engineering.eu/2020/>

2nd International Conference on Sustainable Production and Consumption – SPC20 **Edinburgh, United Kingdom, 24-25 June 2020 (EFCE Event No. 771)**

The conference is organised by IChemE in collaboration with the EFCE Sustainability Section and the journal Sustainable Production and Consumption published by Elsevier on behalf of IChemE.

The conference will provide a platform for high-quality papers on sustainable production and consumption, aiming to explore multidimensional interactions between technology, the environment, economy, society and policy. To promote the multidisciplinary efforts needed in addressing the challenges of sustainable production and consumption, papers are invited from engineers, natural and social scientists, as well as the humanities. Contributions at the interface of these disciplines are particularly encouraged. As in 2018, attendees will have a unique opportunity to share and develop their knowledge of sustainable production and consumption methods, make useful contacts, meet other professionals in the field and foster new collaborations.

Topics: Circular economy; Ecosystem

services; Energy, food, water and waste nexus; Life cycle sustainability assessment and management; Sustainable lifestyles and consumer engagement; Sustainable technologies, products and services; Sustainability indicators, multi-criteria decision analysis and systems optimisation; Sustainable development policy.

The call for papers is open. Deadline for submission of abstracts: **10 January 2020**.

Website: <http://www.icheme.org/spc20>

XXIV International Conference on Chemical Reactors – CHEMREACTOR-24 **Milan, Italy, 30 August – 4 September 2020** **EFCE Event No. 769)**

The XXIV International Conference on Chemical Reactors – CHEMREACTOR-24 is organised by the Boreskov Institute of Catalysis, Russia jointly with the world famous Politecnico di Milano, Italy. What started as a small domestic event in the 1960-s, has turned into a significant international conference, bringing together hundreds of researchers and engineers from countries all over the world.

Traditionally, the CHEMREACTOR conference programme focuses on the fundamental aspects and practical application of catalytic processes and chemical reactors, as well as on the development of novel highly-efficient technologies. The conference is held in different countries and cities where there are major research centers, whose activities are related to the development of innovative chemical engineering.

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.

The call for papers is open. Deadline for submission of abstracts: **5 December 2019**.

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

1st International Symposium on Industrial Crystallization-ISIC 21 Potsdam, Germany, 8-11 September 2020 (EFCE Event No. 751)

Crystallization occurs in many natural physical, biological, and chemical systems, and is exploited in numerous applications, ranging from novel environmental and purification technologies to the production of bulk and fine chemicals, as agrochemicals, pharmaceuticals, food ingredients and pigments. Active research is done on a broad range of subjects from fundamentals to industrial applications resulting in new findings, innovative processes and products. The ISIC meetings, taking place every three years, aim to provide a broad overview of the current science and technology of crystallization and, to bring together scientists and engineers of various disciplines, both academic and industrial, from all over the world to meet and exchange ideas. The symposium, initiated by Jaroslav Nývlt in 1960, is organised under the auspices of the EFCE's Working Party on Crystallization since 1978 and, has become the premier international conference in the field of industrial crystallization.

The 21st ISIC 2020 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 programme 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.

The call for papers is open. Deadline for abstract submission: **31 January 2020.**

Website: https://dechema.de/ISIC_21.html

ECCE13 & ECAB6 - 13th European Congress of Chemical Engineering & 6th European Congress on Applied Biotechnology

Berlin, Germany, 19-23 September
2021 (EFCE Event No. 767)

Theme: Engineering the Future

Chemical engineering, biotechnology and bioprocessing are key to providing innovative solutions for food supply, mobility, energy, health and well-being while striving for a sustainable economy.

At ECCE13 & ECAB6, 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.

Subscribe to the ECCE13 & ECAB6 Newsletter now!

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

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Ines Honndorf, e-mail:
ines.honndorf@dechema.de

Claudia Flavell-While, e-mail:
claudia@icheme.org

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