

ESCAPE-29



29th European Symposium on Computer-Aided Process Engineering

16-19 June 2019

Eindhoven, The Netherlands

Technical Program

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Edited by: John Posada (TU Delft) and Tony Kiss (The University of Manchester)

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Contact

E-mail: info@escape29.nl (general contact)
secretary@escape29.nl (contact secretary)
treasurer@escape29.nl (registration & payments)
support@escape29.nl (IT related support)

Website: www.escape29.nl

Secretary: John Posada Duque, Tel: +31 15 278 8707

Address: Delft University of Technology, Room: C0.360, Maasweg 9, 2629 HZ Delft

Web Resources

The technical program is available online at:

https://escape29.nl/?page_id=60

The technical program is available as a PDF via:

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The START conference manager is available at:

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Words of welcome

Welcome to 29th European Symposium on Computer-Aided Process Engineering (ESCAPE), held in Eindhoven, The Netherlands, from June 16th to 19th, 2019. This 29th event of the ESCAPE series is a continuation of the conferences under the auspices of the CAPE Working Party of the European Federation of Chemical Engineering (EFCE), Nederland Procestechnologie (NPT), and Process Systems Engineering NL (PSE-NL).

ESCAPE-29 is jointly organized by a team of skilled professionals from Eindhoven University of Technology, Delft University of Technology, University of Twente, and Upfield (The Netherlands), University of Bremen (Germany), The University of Manchester (UK), and The Hong Kong University of Science and Technology (Hong Kong). The main vision was to collaborate in organizing the event and coordinating the scientific program, such that besides traditional themes it offers a platform for additional topics covering a wide range of topics: from molecule to enterprise.

The themes of ESCAPE-29 have been selected after a comprehensive discussion with the CAPE Working Party (CAPE-WP) members and the scientific community. The particular topics within these overarching themes have been formulated to allow researchers from CAPE-related sciences to present their results and exchange valuable knowledge and experience.

ESCAPE-29 attracted over 300 contributions from five continents (Europe, Americas, Africa, Asia and Australia), and the International Scientific Committee (ISC) selected 120 oral presentations out of these contributions, the rest of them being presented as posters. The scientific program is rounded up by five plenary lectures given by renowned experts from academia and industry, as well as 20 keynotes given by academic and industrial leaders in their field. Putting together all this would have been impossible without the help of 8 topic coordinators, as well as the many members of the ISC. We are deeply thankful for timely and careful reviews by these committees, as well as their invaluable help in suggesting plenary and keynote speakers. We hope that the contributions to this edition of ESCAPE are excellent illustrations of the current state of the art in their respective field.

We wish you an exciting and enjoyable time at ESCAPE-29, and hope that you will also enjoy Eindhoven – the high-tech capital of Europe and a beautiful city.

Prof. Anton Kiss and Prof. Edwin Zondervan
On behalf of the Local Organization Committee

Organizing & Scientific committees

National Organizing Committee

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Leyla Özkan (Treasurer) – Eindhoven University of Technology

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Richard Lakerveld – The Hong Kong University of Science and Technology

Leyla Özkan – Eindhoven University of Technology

Topic coordinators

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Alexander Mitsos – RWTH Aachen

Paul van den Hof – Eindhoven University of Technology

Albert van der Padt – Wageningen University / FrieslandCampina

Antonis Kokossis – National Technical University of Athens

Stratos Pistikopoulos – Texas A&M Energy Institute

Ruud van Ommen – Delft University of Technology

Antonio Espuña – Universitat Politècnica de Catalunya

ISC members & reviewers

Jens Abildskov, Technical University of Denmark

Elvis Ahmetovic, University of Tuzla

Cristhian Almeida-Rivera, Organization for the Prohibition of Chemical Weapons

Norbert Asprion, BASF

Ana Paula Barbosa-Povoa, University of Lisbon

Andre Bardow, RWTH Aachen

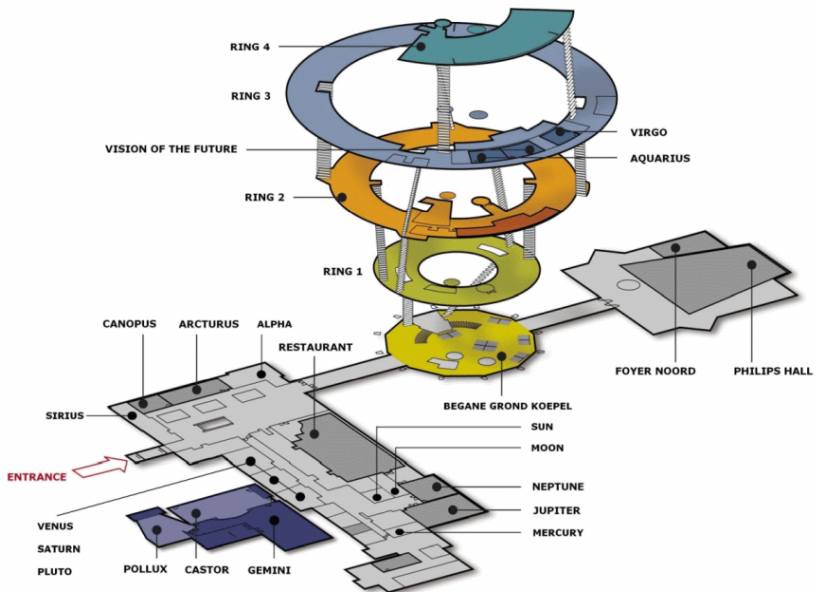
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David Bogle, University College London
Heiko Briesen, Technical University of Munich
Jose Antonio Caballero, University of Alicante
Kyle Camarda, The University of Kansas
Ana Carvalho, Technical University of Lisbon
Benoit Chachuat, Imperial College London
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Mircea Cristea, Babes-Bolyai University of Cluj-Napoca
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Michael Fairweather, University of Leeds
Ferenc Friedler, Pazmany Peter Catholic University
Rafiqul Gani, PSE for Speed
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Krist V. Gernaey Technical University of Denmark
Moises Graells, Universitat Politecnica de Catalunya
Gonzalo Guillen-Gosalbez, Imperial College London
Iiro Harjunkoski, ABB Corporate Research
Christoph Herwig, Vienna University of Technology
Rene Hofmann, Vienna University of Technology
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Zdravko Kravanja, University of Maribor
Gregoire Leonard, University of Liege
Filip Logist, BASF
Sandro Macchietto, Imperial College London
Davide Manca, Politecnico Milano
Christos Maravelias, University of Wisconsin-Madison
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Fengqi You, Cornell University
Zhihong Yuan, Tsinghua University
Victor Zavala-Tejeda, University of Wisconsin-Madison
Lei Zhang, Dalian University of Technology
Jinsong Zhao, Tsinghua University

Conference venue

The conference venue is Evoluon – a conference centre and former science museum built by the electronics and electrical company Philips in 1966. Ever since its construction, Evoluon has become a landmark and a symbol for the city. Evoluon is located on Noord Brabantlaan 1A, 5652 LA, Eindhoven – which is a 15-20 minute-walk from Eindhoven central station.



Tourist information about Eindhoven

Eindhoven is a vibrant modern city bursting with energy and with many things to offer. Eindhoven is the design capital of the Netherlands and a world-renowned high tech hotspot. A city where young and old comes together in a mix of over 170 nationalities: Eindhoven is a city with many faces. The largest town in the southern Netherlands, Eindhoven offers a number of attractions and rewarding things to do. Because of its connections with electronics giant Philips, Eindhoven is known as "Lichtstad" (the City of Light) and it is one of the country's industrial powerhouses. There is plenty more for tourists to do here, from art museums to historic churches and lovely parks. The top rated tourist attractions in Eindhoven include for example: Van Abbemuseum, DAF Museum, PSV Eindhoven Museum, St. Catherine's Church, Philips Museum, Van Gogh Village (Nuenen), PreHistorisch Dorp (Prehistoric Village), GLOW and other Festivals, Genneper Parken and Stadswandelpark, Dierenrijk Zoo, Inrijkmuseum and Ton Smits Huis.

Travel information

Eindhoven international airport connects to more than 70 European cities. A bus rapid transit line (401) connects the airport to the city center of Eindhoven and its main railway station. Alternatively, Eindhoven can also be easily reached by a direct train (about 1:20 hrs trip) from Amsterdam Schiphol airport, a major European hub with direct connections to over 270 destinations. Just in case you travel by car, the venue is easily reachable via A2 motorway and there is plenty of parking space available nearby (over 500 places):

URL: www.google.com/maps/search/parking+near+evoluon+eindhoven

Accommodation

The cost of accommodation in Eindhoven is in the range of 150-200 €/day for 5* hotels, 100-150 € for 4* hotels, and 80-100 € for 3* hotels. For your convenience, we have made a block reservation for rooms at the following hotels:

[Inntel Art Hotel Eindhoven](#) – €179.00 per night (incl. breakfast, excl. tax)

[Pullman Eindhoven Cocagne](#) – €169.00 per night (incl. breakfast, excl. tax)

[Van der Valk Eindhoven](#) – €95.00 per night (excl. breakfast €16.50, excl. tax) – code: GF107834 (booking e-mail: reservations@eindhoven.valk.com)

Themes and topics

Theme 1: Process-product synthesis, design and integration

Structured products, 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, Synthesis of different supply-chains.

Theme 2: Methods, models and computational tools for PSE

Generation and development of concepts for CAPE/PSE, Advances in multi-scale modelling, modelling in different CAPE/PSE applications, Numerical methods and tools, Numerical analysis, Process simulation, Large-scale and multi-level optimization, Process plant data analysis, Agent based modelling.

Theme 3: Process control and operations

Scheduling, operability, flexibility and optimization under uncertainty, Supply-chains optimization and logistics, Cyber-physical structures, 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.

Theme 4: CAPE/PSE in sustainable development and food industry

Food & water issues, Biorefineries, Solar refineries, Life cycle analysis, Industrial infrastructures, Infrastructures for sustainable production, Sustainability indicators and footprints, Risk assessment, Safety, Waste reduction & management, Waste-water treatment, Conversions of fossil-free energy & materials.

Theme 5: CAPE/PSE in energy transition

Heat and power integration, Waste-to-energy applications, Renewable resources in total-site integration, Novel approaches to address the complex system integration challenges, Electrification of chemical industry, Integration of energy sources & sinks, Reliable dynamic supply & demand.

Theme 6: CAPE/PSE in hi-tech micro/nano-devices and processes

Frontiers at the tiny scales: micro-, nano scale products & systems, Micro- and nano-scale engineering, Solid state, Semi-conductors, Advanced materials, Self-assembly, Energy storage.

Theme 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.

Sessions overview

Sunday, 16th June 2019

CAPE WP Business meeting (by invitation only)

from 9:00- 17.00h. Room: Jupiter

Registration

from 14:00h. Room: Alpha – Crew

Welcome and Plenary Lecture I

from 18:00 to 19:00 hrs. Room: Philips hal

Welcome reception

from 19:00 to 20:00 hrs. Room: Koepel

Monday, 17th June 2019

Time	Room					
	Philips hal	Jupiter	Castor	Neptune	Pollux	Spare
08:00 – 09:00	Registration (Alpha Crew room)					
09:00 – 10:00	Announcements + Plenary Lecture II (Philips hal) Tribute to Prof. Roger Sargent					
10:00 – 10:30	Coffee break (Koepel)					
10:30 – 12:20	Parallel 1.1 (T1, 5x)	Parallel 1.2 (T2, 5x)	Parallel 1.3 (T3, 5x)	Parallel 1.4 (T4, 5x)	Special session PRONTO (5x)	ObD Business meeting
12:20 – 13:30	Lunch (Koepel)					
13:30 – 15:00	Poster Session I Coffee break (Foyer/Koepel) (95x)					
15:00 – 16:50	Parallel 2.1 (T1, (5x)	Parallel 2.2 (T2, 5x)	Parallel 2.3 (T3, 5x)	Parallel 2.4 (T4, 5x)	Special session ObD (5x)	n/a
19:00 – 20:00	Social activity t.b.c. (e.g. Concert Sint Catharina kerk)					

Tuesday, 18th June 2019

Time	Room					
	Philips hal	Jupiter	Castor	Neptune	Pollux	Spare
08:00 – 09:00	Registration (Alpha Crew room)					
09:00 – 10:00	Announcements + Plenary Lecture III (Philips hal)					
10:00 – 10:30	Coffee break (Koepel)					
10:30 – 12:20	Parallel 3.1 (T1, 5x)	Parallel 3.2 (T2, 5x)	Parallel 3.3 (T3, 5x)	Parallel 3.4 (T5, 5x)	Special Session PI (5x)	ISPT workshop
12:20 – 13:30	Lunch (Koepel)					
13:30 – 15:00	Poster Session II Coffee break (Foyer/Koepel) (92x)					
15:00 – 16:50	Parallel 4.1 (T1, 5x)	Parallel 4.2 (T2, 5x)	Parallel 4.3 (T3, 5x)	Parallel 4.4 (T5, 5x)	Special session Prof. Sargent (5x)	Board meeting C&CE
19:00 – 20:00	Conference dinner (Evoluoen, Ring 2/3)					

Wednesday, 19th June 2019

Time	Room					
	Philips hal	Jupiter	Castor	Neptune	Pollux	Spare
08:00 – 09:00	Registration (Alpha Crew room)					
09:00 – 10:00	Announcements + Plenary Lecture IV (Philips hal)					
10:00 – 10:30	Coffee break (Koepel)					
10:30 – 12:20	Parallel 5.1 (T6, 5x)	Parallel 5.2 (T2, 5x)	Parallel 5.3 (T7, 5x)	Parallel 5.4 (T5, 5x)	Special session ISPT	PSE-NL assembly & Prof. Ton Backx retirement
12:20 – 13:30	Lunch (Koepel)					
13:30 – 14:30	Plenary Lecture V (Philips hall)					
14:30 – 15:30	Awards and closing ceremony (Philips hall)					

Detailed technical program

Sunday, 16th June 2019

CAPE-WP Business meeting

from 9:00 to 17.00. Room: Jupiter

Registration ESCAPE-29

from 14:00 to 20:00. Room: Alpha – Crew

Welcome and Plenary Lecture I: Joseph Powell (Shell)

from 18:00 to 19:00. Room: Philips hal

Addressing Energy and Sustainability Challenges in the Digital Age

Dr. Joseph Powell (Shell)

Welcome reception (Koepel)

from 19:00 to 20:00. Room: Koepel

Monday, 17th June 2019

Registration

from 8:00 to 9:00. Alpha Crew room

Opening ceremony

from 8:30 to 9:00. Room: Philips hal

Opening by the organizing & scientific committee chairs
Welcome by the mayor of Eindhoven

Plenary Lecture II: Sandro Macchietto (ICL) - Tribute to Prof. Sargent

from 9:00 to 10:00. Room: Philips hal

Engineering Success: What Does It Take To Get PSE Technologies Used?
Prof. Sandro Macchietto (Imperial College London, UK)

Coffee Break

from 10:00 to 10:30. Room: Koepel

Parallel Session 1.1. Process-product synthesis, design and integration

from 10:30 to 12:20. Room: Philips hal

Chaired by: t.b.c.

- 10:30 Title (182): Keynote Lecture. Automatic Synthesis Of Distillation Processes For Azeotropic Multi-Component Systems
Authors: [Thulasi Sasi](#), Jonas Wesselmann, Hanns Kuhlmann and Mirko Skiborowski
- 11:00 Title (17): Innovative Application Of Statistical Analysis For The Optimization Of CO₂ Absorption From Flue Gas With Ionic Liquid
Authors: [Grazia Leonzio](#) and Edwin Zondervan
- 11:20 Title (95): Technoeconomic MINLP Optimisation Of Liquid-Liquid Extraction (LLE) Cascades For Continuous Pharmaceutical Manufacturing Of Atropine

- Authors: Samir Diab, Nikolaos Mytis, Andreas Boudouvis and Dimitrios Gerogiorgis
- 11:40 Title (243): Risk-Conscious Optimization Approach To Assessing Bioenergy Investments In The Brazilian Sugarcane Industry
Authors: Victoria Morgado Mutran, Celma de Oliveira Ribeiro, Claudio Oller do Nascimento and Benoit Chachuat
- 12:00 Title (256): An MILP Model For Safe Multi-Floor Process Plant Layout
Authors: Jude Eje, Songsong Liu and Lazaros Papageorgiou

Parallel Session 1.2. Methods, models and computational tools for PSE

from 10:30 to 12:20. Room: Jupiter

Chaired by: t.b.c.

- 10:30 Title (KL-EJS): Keynote Lecture. Digital Twinning – A Transformation In Our Industry: Its Acceleration And The Consequences
Authors: Egbert-Jan Sol
- 11:00 Title (6): Optimal Dose Administration Of Renally Excreted Drugs
Authors: Giuseppe Pesenti, Adriana Savoca and Davide Manca
- 11:20 Title (92): Flexibility Assessment Of A Distillation Train: Nominal Vs. Perturbated Conditions Optimal Design
Authors: Alessandro Di Pretoro, Ludovic Montastruc, Flavio Manenti and Xavier Joulia
- 11:40 Title (347): Reduced Model-Based Global Optimisation Of Large-Scale Steady State Nonlinear Systems
Authors: Min Tao, Jie Li and Constantinos Theodoropoulos
- 12:00 Title (242): A Model Identification Approach For The Evaluation Of Plant Efficiency
Authors: Keivan Rahimi-Adli, Benedikt Beisheim, Patrick Schiermoch, Simon Wenzel and Sebastian Engell

Parallel Session 1.3. Process control and operations

from 10:30 to 12:20. Room: Castor

Chaired by: t.b.c.

- 10:30 Title (KL-AH): Keynote Lecture. Process System Engineering And Control Aspects Of Solar Fuel Plants
Authors: [Adrie Huesman](#)
- 11:00 Title (32): The Impact Of Sustainable Supply Chain On Waste-To-Energy Operations
Authors: [Maryam Mohammadi](#) and Iiro Harjunoski
- 11:20 Title (104): An Advanced Data-Centric Multi-Granularity Platform for Industrial Data Analysis
Authors: [Marco Seabra dos Reis](#) and Tiago Rato
- 11:40 Title (171): Nonlinear Model Predictive Control of Haemodialysis
Authors: Tianhao Yu and [Vivek Dua](#)
- 12:00 Title (229): Dynamics And Control Of A Heat Pump Assisted Azeotropic Dividing-Wall Column For Biobutanol Purification
Authors: [Iulian Patrascu](#), Costin Sorin Bildea and Tony Kiss

Parallel Session 1.4. CAPE in sustainable development and food industry

from 10:30 to 12:20. Room: Neptune

Chaired by: t.b.c.

- 10:30 Title (KL445): Keynote Lecture. Process Design Meets Sustainability: Overview On The Use Of Modelling Tools For Process Development At Corbion And Their Role For Reaching Sustainability Targets
Authors: [Carlos Rugeiro](#), Gerard Bochove, Ana Morao and Luisa Cruz
- 11:00 Title (60): A neural Network-Based Framework To Predict Process-Specific Environmental Impacts
Authors: [Johanna Kleinekorte](#), Leif Kröger, Kai Leonhard and André Bardow
- 11:20 Title (275): A Stochastic Environmental Model To Deal With Uncertainty In Life Cycle Impact Assessment
Authors: [Andreia Santos](#), Ana Póvoa and Ana Carvalho
- 11:40 Title (346): Optimization Of Biofuel Supply Chain Design Via A Water-Energy-Food Nexus Framework

Authors: Dulce Lopez, Fernando Lira-Barragán, Jose Maria Ponce-Ortega and Mahmoud M. El-Halwagi

- 12:00 Title (362): Life Cycle Design Of Indoor Hydroponic Horticulture Considering Energy-Water-Food Nexus
Authors: Yasunori Kikuchi, Yuichiro Kanematsu and Tatsuya Okubo

Parallel Session 1.5. Special Session: PRONTO

from 10:30 to 12:20. Room: Pollux

Chaired by: t.b.c.

- 10:30 Title (KL232): Keynote Lecture. An Explicit Online Resource-Task Network Scheduling Formulation to Avoid Plant Nervousness
Authors: Giancarlo Dalle Ave, Mert Alici, Iiro Harjunoski and Sebastian Engell
- 11:00 Title (83): Short-term Scheduling of a Multipurpose Batch Plant Considering Degradation Effects
Authors: Ouyang Wu, Giancarlo Dalle Ave, Iiro Harjunoski, Lars Imsland, Stefan Marco Schneider, Ala E.F. Bouaswaig and Matthias Roth
- 11:20 Title (112): Stochastic Nonlinear Model Predictive Control Of A Batch Fermentation Process
Authors: Eric Bradford and Lars Imsland
- 11:40 Title (210): Optimal Maintenance Scheduling for Washing of Compressors to Increase Efficiency
Authors: Frederik Schulze Spüntrup, Giancarlo Dalle Ave, Lars Imsland and Iiro Harjunoski
- 12:00 Title (292): Optimal Distributed Load Allocation And Resource Utilisation In Evaporation Plants
Authors: Maria Marcos Nunez, Jose Luis Pitarch, Christian Jasch, Cesar de Prada

Quality-by-Design Business meeting

from 10:30 to 12:20. Room: Spare

Lunch

from 12:20 to 13:30. Room: Koepel

Poster Session I & Coffee break

from 13:30 to 15:00. Room: Foyer/Koepel

Parallel Session 2.1. Process-product synthesis, design and integration

from 15:00 to 16:50. Room: Philips hal

Chaired by: t.b.c.

- 15:00 Title (KL157): Keynote Lecture. Comparison Of The Performance Of Multi-Objective Optimization Methodologies For Solvent Design
Authors: Ye Seol Lee, Edward Graham, George Jackson, Amparo Galindo and Claire Adjiman
- 15:30 Title (31): ORC On Tour: Integrated Design Of Dynamic Orc Processes And Working Fluids For Waste-Heat Recovery From Heavy-Duty Vehicles
Authors: Dominik Tillmanns, Jonas Petzschmann, Johannes Schilling, Christoph Gertig and André Bardow
- 15:50 Title (324): An MPCC Reactive Distillation Optimization Model for Multi-Objective Fischer–Tropsch Synthesis
Authors: Yizu Zhang, Cornelius Mduduzi Masuku and Lorenz T. Biegler
- 16:10 Title (202): Towards Development Of A Decision Support Tool For Conceptual Design Of Wastewater Treatment Plants Using Stochastic Simulation Optimization
Authors: Resul Al, Chitta Ranjan Behera, Krist V. Gernaey and Gürkan Sin
- 16:30 Title (144): Optimal Design Of A Multi-Product Pineapple-Based Biorefinery: A Superstructure Approach
Authors: Juan Murcia-Palacios, Rolando Barrera-Zapata, Edwin Zondervan

Parallel Session 2.2. Methods, models and computational tools for PSE

from 15:00 to 16:50. Room: Jupiter

Chaired by: t.b.c.

- 15:00 Title (KL443): Keynote Lecture. Systematic Steady-State Detection Using Econometrics
Authors: [Levente Simon](#)
- 15:30 Title (20): Parameter Estimation for Thermodynamic Models Using an Identifiability Analysis and Subset Selection
Authors: [Christian Hoffmann](#), Joris Weigert, Erik Esche and Jens-Uwe Repke
- 15:50 Title (298): Molecular Modelling Of Co-processing Biomass Pyrolysis Oil With Vacuum Gasoil In An Oil Refinery Fluid Catalytic Cracking Unit
Authors: [Mohamed Al Jamri](#), Robin Smith and Jie Li
- 16:10 Title (161): Multi-level Life Cycle Analysis Tool for Sustainable Energy Systems Modeling
Authors: [Emre Gençer](#) and Francis O'Sullivan
- 16:30 Title (250): Reinforcement Learning For Batch To Batch Bioprocess Optimization
Authors: [Panos Petsagkourakis](#), Ilya Orson Sandoval, Eric Bradford, Dongda Zhang and Antonio del Rio Chanona

Parallel Session 2.3. Process control and operations

from 15:00 to 16:50. Room: Castor

Chaired by: t.b.c.

- 15:00 Title (KL153): Keynote Lecture. Review Of Cascade And Override Control Methods For Process Control
Authors: [Jan Schuurmans](#)
- 15:30 Title (40): Combining The Advantages Of Discrete- And Continuous-Time Scheduling Models
Authors: Hojae Lee and [Christos Maravelias](#)
- 15:50 Title (105): Optimal Operation And Control Of Fluidized Bed Membrane Reactors For Steam Methane Reforming
Authors: Alejandro Marquez Ruiz, Jiaen Wu, [Leyla Ozkan](#), Fausto Gallucci and Martin Van Sint Annaland

- 16:10 Title (186): On The Optimization Of Production Scheduling In Industrial Food Processing Facilities
Authors: Georgios Georgiadis, Chrysovalantou Ziogou, Georgios Kopanos, Borja Mariño Pampín, Daniel Cabo, Miguel Lopez and Michail Georgiadis
- 16:30 Title (416): Extension Of A Particle Filter For Bioprocess State Estimation Using Invasive And Non-Invasive NIR Measurements
Authors: Julian Kager, Vladimir Berezinskiy, Robert Zimmerleiter, Markus Brandstetter and Christoph Herwig

Parallel Session 2.4. CAPE in sustainable development and food industry

from 15:00 to 16:50. Room: Neptune

Chaired by: t.b.c.

- 15:00 Title (KL218): Keynote Lecture. Design And Planning Of Agri-Food Supply Chains
Authors: Lourenço Cruz, João Pires-Ribeiro and Ana Paula F. D. Barbósa-Póvoa
- 15:30 Title (244): Dynamic Modeling Of Syngas Fermentation: Multi-Response Parameter Estimation And Multi-Objective Operational Optimization Of Bubble Column Bioreactor
Authors: Elisa de Medeiros, John Posada, Henk Noorman and Rubens Maciel Filho
- 15:50 Title (291): Sustainable Supply Chain: Integrating Risk Measures while Monetizing Environmental Impacts
Authors: Cátia Silva, Ana Paula Barbosa-Póvoa and Ana Carvalho
- 16:10 Title (349): A Multi-Scale Model Approach For Lipids And Pigments Production By Haematococcus Pluvialis Under Different Environmental Conditions
Authors: Alessandro Usai, Constantinos Theodoropoulos and Jon Pittman
- 16:30 Title (384): Giving Added Value To Products From Biomass: The Role Of Mathematical Programming In The Product-Driven Process Synthesis Framework
Authors: Aleksandra Zderic, Alexandra Kiskini, Elias Tsakas, Crishtian Almeida-Rivera and Edwin Zondervan

Parallel Session 2.5. Special session: Quality-by-Design

from 15:00 to 16:50. Room: Pollux

Chaired by: t.b.c.

- 15:00 Title (KL147): Keynote Lecture. Towards Model-Based Optimization for Quality by Design in Biotherapeutics Production
Authors: [Alireza Ehsani](#), Chrysoula Dimitra Kappatou, Adel Mhamdi, Alexander Mitsos, Andreas Schuppert and Sebastian Niedenfuehr
- 15:30 Title (96): Dynamic Modelling And Simulation Of Chinese Hamster Ovary (Cho) Cell Fermentation For Advanced Biopharmaceutical Manufacturing
Authors: [Haruku Shirahata](#), Samir Diab, Hirokazu Sugiyama and Dimitrios Gerogiorgis
- 15:50 Title (143): An in-Silico Tool For Design And Synthesis Of Downstream Separation Network For Biopharmaceuticals
Authors: [Soonho Hwangbo](#), Merve Öner and Gürkan Sin
- 16:10 Title (178): Implementation Of Model Based And Model Free Quality-By-Control (QBC) Frameworks For A Pharmaceutical Crystallization Process
Authors: [Ayse Eren](#), Botond Szilagy, Justin Quon, Charles Papageorgiou and Zoltan Nagy
- 16:30 Title (216): A Quality-By-Control Approach In Pharmaceutical Continuous Manufacturing Of Oral Solid Dosage Via Direct Compaction
Authors: [Qinglin Su](#), Sudarshan Ganesh, Yasasvi Bommireddy, Marcial Gonzalez, Gintaras Reklaitis and Zoltan Nagy

Social activity (Concert Sint Catharina kerk)

from 19:00 to 20:00. Eindhoven city centre

Tuesday, 18th June 2019

Registration

from 8:00 to 9:00. Alpha Crew room

Plenary Lecture III: Megan Jobson (UoM)

from 9:00 to 10:00. Room: Philips hal

Effective Use Of CAPE Tools For Design, Optimisation And Retrofit Of Integrated Separation Processes

Prof. Megan Jobson (The University of Manchester, UK).

Coffee Break

from 10:00 to 10:30. Room: Koepel

Parallel Session 3.1. Process-product synthesis, design and integration

from 10:30 to 12:20. Room: Philips hal

Chaired by: t.b.c.

- 10:30 Title (KL90): Keynote Lecture. A Framework For The Integration Of Holistic Sustainability Assessment In Computer-Aided Molecular Design
Authors: [Athanasios Papadopoulos](#), Gulnara Shavaliyeva, Panos Seferlis and Stavros Papadokonstantakis
- 11:00 Title (142): An Optimization Model For A Biorefinery System Based On Process Design And Logistics
Authors: Christos Galanopoulos, Aristide Giuliano, [Diego Barletta](#) and Edwin Zondervan
- 11:20 Title (48): Optimisation Of Multi Effect Distillation Based Desalination System For Minimum Production Cost Of Freshwater
Authors: [Omer Al-hotmani](#), Mudhar Al-Obaidi, Giacomo Filippini, Flavio Manenti, Raj Patel and Iqbal Mujtaba

- 11:40 Title (330): Optimal Design Of Post Combustion CO₂ Capture Processes Based On Phase-Change Solvents
 Authors: Panagiotis Kazepidis, Athanasios I. Papadopoulos, [Panos Seferlis](#), Felipe Antonio Perdomo Hurtado, Amparo Galindo, George Jackson and Claire S. J. Adjiman
- 12:00 Title (258): A Generalized, Non-smooth Operator For Process Integration
 Authors: [Caroline Nielsen](#) and Paul Barton

Parallel Session 3.2. Methods, models and computational tools for PSE

from 10:30 to 12:20. Room: Jupiter

Chaired by: t.b.c.

- 10:30 Title (KL59): Keynote Lecture. From Single Process Simulation And Optimization To Decision Making Based On A Multitude Of Solutions
 Authors: [Norbert Asprion](#), Roger Böttcher, Johannes Höller, Patrick Schwartz, Jan Schwientek and Michael Bortz
- 11:00 Title (65): Increasing The Reliability Of Parameter Estimates By Iterative Model-Based Design Of Experiments Using A Flowsheet-Simulator
 Authors: [Maria Yliruka](#), Norbert Asprion, Roger Boettcher, Johannes Hoeller, Patrick Schwartz, Jan Schwientek and Michael Bortz
- 11:20 Title (118): From Peak Power Prices To Seasonal Storage: Long-Term Operational Optimization Of Energy Systems By Time-Series Decomposition
 Authors: [Nils Baumgärtner](#), David Shu, Björn Bahl, Maike Hennen and André Bardow
- 11:40 Title (198): Global Uncertainty And Sensitivity Analysis Of Operational Parameters In A Rotary Kiln Design Model
 Authors: [Thomas Berg Iversen](#) and Gürkan Sin
- 12:00 Title (253): Rigorous Bayesian Inference Vs New Approximate Strategies For Estimation Of The Probability Distribution Of The Parameters Of DAE Models
 Authors: [Francesco Rossi](#), Linas Mockus and Gintaras Reklaitis

Parallel Session 3.3. Process control and operations

from 10:30 to 12:20. Room: Castor

Chaired by: t.b.c.

- 10:30 Title (KL45): Keynote Lecture. Towards Economic Nonlinear Model Predictive Control for Large-Scale Air Separation Processes
Authors: [Adrian Caspari](#), Yannic Martin Perez, Christoph Offermanns, Pascal Schäfer, Anna-Maria Ecker, Andreas Peschel, Florian Schliebitz, Gerhard Zapp, Adel Mhamdi and Alexander Mitsos
- 11:00 Title (51): Intelligent Decision-Making In Online Scheduling Using Neuroevolution Of Augmenting Topologies
Authors: [Teemu Ikonen](#) and Iiro Harjunkoski
- 11:20 Title (138): Efficient Robust Nonlinear Model Predictive Control Via Approximate Multi-Stage Programming: A Neural Networks Based Approach
Authors: [Wachira Daosud](#), Paisan Kittisupakorn, Miroslav Fikar, Sergio Lucia and Radoslav Paulen
- 11:40 Title (197): Multi-Objective Optimization Approach To Design And Planning A Hydrogen Supply Chain Under Uncertainty: A Portugal Study Case
Authors: Diego Camara, Tânia Varela and Ana Povoá
- 12:00 Title (280): Data-Based Robust Model Predictive Control Under Conditional Uncertainty
Authors: Chao Shang, [Wei-Han Chen](#) and Fengqi You

Parallel Session 3.4. CAPE/PSE in energy transition

from 10:30 to 12:20. Room: Neptune

Chaired by: t.b.c.

- 10:30 Title (KL387): Keynote Lecture. Energy System Modelling in support of the Energy Transition
Authors: [Jan van Schijndel](#), Karin Griffioen, Levi Ikele and Andreas ten Cate

- 11:00 Title (2): On The Role Of H₂ Storage And Conversion In An Energy System With High Wind And Solar Penetration: A Dutch Case-Study
Authors: [Lukas Weimann](#), Paolo Gabrielli, Alessandro Poluzzi, Gert Jan Kramer and Matteo Gazzani
- 11:20 Title (55): Optimal Integration Of A CSP Plant And A Waste Based Power Facility For Constant Power Production
Authors: Ester de la Fuente and [Mariano Martin](#)
- 11:40 Title (341): Novel Methodology for Cogeneration Targeting with Optimum Steam Level Placement
Authors: [Julia Jimenez](#), Adisa Azapagic and Robin Smith
- 12:00 Title (411): Optimal Oversizing and Operation of the Switchable Chlor-Alkali Electrolyzer for Demand Side Management
Authors: [Kosan Roh](#), Luisa Bree, Karen Perrey, Andreas Bulan and Alexander Mitsos

Parallel Session 3.5. Special session: Process Intensification

from 10:30 to 12:20. Room: Pollux

Chaired by: t.b.c.

- 10:30 Title (KL272): Keynote Lecture. Towards A Systematic Framework For The Synthesis Of Operable Process Intensification Systems – Application To Reactive Distillation Systems
Authors: Yuhe Tian, Iosif S. Pappas, [Baris Burnak](#), Justin Katz, Styliani Avraamidou, Nikolaos A. Dangelakis and Efstratios N. Pistikopoulos
- 11:00 Title (111): Multi-Product Reactive Distillation Process For Higher Acrylates
Authors: [Mihai Daniel Moraru](#), Tony Kiss and Costin Sorin Bildea
- 11:20 Title (368): Process Intensification and Miniaturisation of Chemical and Biochemical Processes
Authors: Filip Strniša, Tomaz Urbič, Polona Žnidaršič-Plazl and [Igor Plazl](#)
- 11:40 Title (140): Innovative Method For Screening Reactive Distillation Designs
Authors: [Rahma Muthia](#), Megan Jobson and Tony Kiss
- 12:00 Title (130): Modelling Of Extractive Heterogeneous-Azeotropic Distillation

Method In Dividing-Wall Column

Authors: Andras Jozsef Toth, Daniel Fozer, Tibor Nagy, Eniko Haaz and Peter Mizsey

ISPT workshop

from 10:30 to 12:20. Room: Spare

Lunch

from 12:20 to 13:30. Room: Koepel

Poster Session II & Coffee break

from 13:30 to 15:00. Room: Foyer/Koepel

Parallel Session 4.1. Process-product synthesis, design and integration

from 15:00 to 16:50. Room: Philips hal

Chaired by: t.b.c.

- 15:00 Title (KL379): Keynote Lecture. Predictive LCA - A Systems Approach To Integrate Lca Decisions Ahead Of Design
Authors: Paraskevi Karka, Stavros Papadokonstantakis and Antonis Kokossis
- 15:30 Title (80): Optimising European Supply Chains For Carbon Capture, Transport And Sequestration, Including Uncertainty On Geological Storage Availability
Authors: Federico d'Amore, Nixon Sunny, Diana Iruretagoyena, Fabrizio Bezzo and Nilay Shah
- 15:50 Title (296): Novel Refrigeration Cycle Configurations For Performance Improvements In LNG Processes At Small Scale
Authors: Fernando Almeida-Trasvina and Robin Smith
- 16:10 Title (303): Integration of Consumer Preferences and Heuristic Knowledge in the Design of Formulated Products: Application to a Cosmetic Emulsion
Authors: Javier Arrieta-Escobar, Fernando Bernardo, Alvaro Orjuela, Mauricio Camargo, Laure Morel and Laurent Wendling

- 16:30 Title (259): A Comparison of Process Alternatives for Energy-Efficient Bioethanol Downstream Processing
Authors: Dinis Nunes, José Granjo, Belmiro Pereira Duarte and Nuno Oliveira

Parallel Session 4.2. Methods, models and computational tools for PSE

from 15:00 to 16:50. Room: Jupiter

Chaired by: t.b.c.

- 15:00 Title (KL447): Keynote Lecture. New MINLP Formulations for Flexibility Analysis for Measured and Unmeasured Uncertain Parameters
Authors: Maria Paz Ochoa and Ignacio Grossmann
- 15:30 Title (74): Estimating Mixture Properties From Batch Distillation: Supporting Lab Experiments By Semi-Rigorous And Rigorous Models
Authors: Michael Bortz, Raoul Heese, Alexander Scherrer, Thomas Gerlach, Thomas Schilling and Thomas Runowski
- 15:50 Title (123): Scale-up Modeling of a Pharmaceutical Antisolvent Crystallization via a Hybrid Method of Computational Fluid Dynamics and Compartmental Modeling
Authors: Merve Öner, Stuart Michael Stocks, Jens Abildskov and Gürkan Sin
- 16:10 Title (200): Comprehensive Analysis Of Scenario Reduction Methods Applied To The Operation Of Bio-Based Energy Generation Networks
Authors: Sergio Medina-González, Ioannis Gkioulekas, Vivek Dua and Lazaros Papageorgiou
- 16:30 Title (267): Computer-Aided Design Of Solvent Blends For The Cooling And Anti-Solvent Crystallisation Of Ibuprofen
Authors: Oliver Luke Watson, Amparo Galindo, George Jackson and Claire Adjiman

Parallel Session 4.3. Process control and operations

from 15:00 to 16:50. Room: Castor

Chaired by: t.b.c.

- 15:00 Title (KL107): Keynote Lecture. Iterative Mid-Term Production Scheduling Of An Industrial Formulation Plant
Authors: Vassilios Yfantis, Thomas Siwczyk, Matthias Lampe, Nicolai Kloye, Manuel Remelhe and Sebastian Engell
- 15:30 Title (70): One-Point Temperature Control Of Heterogeneous Reactive Distillation
Authors: Mihai Daniel Moraru and Costin Sorin Bildea
- 15:50 Title (158): Real-Time Feasible Model-Based Crystal Size And Shape Control Of Crystallization Processes
Authors: Botond Szilagyi and Zoltan K. Nagy
- 16:10 Title (371): Synthesis Technology For Failure Analysis And Corrective Actions In Process Systems Engineering
Authors: Ákos Orosz and Ferenc Friedler
- 16:30 Title (415): Perspectives And Challenges For Decision-Making In The Pharmaceutical Industry
Authors: Catarina Marques, Samuel Moniz and Jorge Pinho de Sousa

Parallel Session 4.4. CAPE/PSE in energy transition

from 15:00 to 16:50. Room: Neptune

Chaired by: t.b.c.

- 15:00 Title (KL235): Keynote Lecture. Optimizing Return on Investment in Biomass Conversion Networks under Uncertainty using Data-Driven Adaptive Robust Optimization
Authors: Jack Nicoletti, Chao Ning and Fengqi You
- 15:30 Title (50): An MPEC model for Strategic Offers in a Jointly Cleared Energy and Reserve Market under Stochastic Production
Authors: Evangelos Tsimopoulos, Michail Georgiadis
- 15:50 Title (204): Optimization Of Semi-Permeable Membrane Systems For Biogas Upgrading
Authors: Diego Filippetto, Federico Capra, Francesco Magli, Manuele Gatti and Emanuele Martelli
- 16:10 Title (389): Are Renewables Really That Expensive? The Impact Of

Uncertainty On The Cost Of The Energy Transition

Authors: Xiang Li, Stefano Moret, Francesco Baldi and François Maréchal

16:30 Title (449): The Use Of Optimization Tools For The Hydrogen Circular Economy

Authors: María Yáñez, Alfredo Ortiz, Braulio Brunaud, Ignacio Grossmann and Inmaculada Ortiz

Parallel Session 4.5. Special session: Prof. Roger Sargent

from 15:00 to 16:50. Room: Pollux

Chaired by: t.b.c.

15:00 Title (KL336): Keynote Lecture. Component based Development of Computer-Aided Tools for Different Applications

Authors: Anjan Tula, Mario Eden and Rafiqul Gani

15:30 Title (217): Targeting Of Sustainable Chemical Processes Using Data Envelopment Analysis: Application To Liquid Fuels For Transportation

Authors: Daniel Rodriguez Vallejo, Ángel Galán-Martín, Gonzalo Guillén-Gosálbez and Benoît Chachuat

15:50 Title (444): A Comparison of Data Reconciliation Tools for Modelling Heat Recovery

Authors: Petar Varbanov, Jun Yow Yong, Jiří Klemeš and Zdravko Kravanja

16:10 Title (343): A Multi-Objective Multi-Period Optimization Approach Of Integrated Carbon Integration Networks In Industrial Parks

Authors: Dhabia Al-Mohannadi, Patrick Linke and Nilay Shah

16:30 Title (121): A Financial Accounting based Model of Carbon Footprinting: Built Environment Example

Authors: Sandro Macchietto, Alex Veys and Virginia Acha

Advisory board meeting: Computer & Chemical Engineering

from 15:00 to 16:40. Room: Spare

Conference dinner (Evoluon Ring 2/3)

from 19:00 to 20:00. Room: Ring 2/3

Wednesday, 19th June 2019

Registration

from 8:00 to 9:00. Alpha Crew room

Plenary Lecture IV - Zoltan K. Nagy (Purdue)

from 18:00 to 19:00 hrs. Room: Philips hal

Quality-by-Control Approaches For Process Intensification In Advanced
Pharmaceutical Manufacturing

Prof. Zoltan K. Nagy (Purdue University, US | Loughborough University, UK)

Coffee Break

from 10:00 to 10:30. Room: Koepel

Parallel Session 5.1. CAPE in hi-tech micro/nano-devices and processes

from 10:30 to 12:20. Room: Philips hal

Chaired by: t.b.c.

- 10:30 Title (KL159): Keynote Lecture. Automated Open-Loop Control Of Directed Self-Assembly With Multiple Electrokinetic Actuators In Microfluidic Devices
Authors: Yu Gao and [Richard Lakerveld](#)
- 11:00 Title (145): A Dynamic Model For Automated Control Of Directed Self-Assembly Of Colloidal Particles
Authors: [Baggie W. Nyande](#), Yu Gao and Richard Lakerveld
- 11:20 Title (193): Structured Millichannel Multiphase Reactors
Authors: [J. Ruud van Ommen](#), John Nijenhuis and Johan T. Padding
- 11:40 Title (335): ProCAFD: Computer-Aided Tool for Sustainable Process Synthesis, Intensification and Hybrid solutions
Authors: Anjan Tula, [Mario Eden](#) and Rafiqul Gani

- 12:00 Title (399): Modelling of Microfluidic Devices for Liquid-Liquid Extraction of Radionuclides
 Authors: Miguel Pineda, Panagiota Angeli, Takehiko Tsukahara, Eric Fraga

Parallel Session 5.2. Methods, models and computational tools for PSE

from 10:30 to 12:20. Room: Jupiter

Chaired by: t.b.c.

- 10:30 Title (KL448): Keynote Lecture. Mathematical Process Modelling Past, Present And Future – A Personal Perspective
 Authors: Pieter Schmal
- 11:00 Title (76): An MILP Approach For Short-Term Scheduling Of Batch Operations
 Authors: Hossein Mostafaei and Iiro Harjunkoski
- 11:20 Title (139): Optimal Design Of Multi-Stage Depressurization Systems Using Dynamic Modeling
 Authors: Juan Quattordio, Sander Groenendijk, Robert Kedzierski and Hans Goebel
- 11:40 Title (241): The Robust Pooling Problem
 Authors: Johannes Wiebe, Inês Cecílio and Ruth Misener
- 12:00 Title (281): Development of the Texas A&M Superfund Research Program Computational Platform for Data Integration, Visualization, and Analysis
 Authors: Rajib Mukherjee, Melis Onel, Burcu Beykal, Adam Szafran, Fabio Stossi, Michael Mancini, Lan Zhou, Fred Wright and Efstathios Pistikopoulos

Parallel Session 5.3. Education in CAPE/PSE & knowledge transfer

from 10:30 to 12:20. Room: Castor

Chaired by: t.b.c.

- 10:30 Title (KL432): Keynote Lecture. Process Systems Engineering From An Industrial And Academic Perspective
 Authors: Tony Kiss and Johan Grievink

- 11:00 Title (278): FermProc: A Pedagogical Simulation Tool For Teaching Fermentation Processes
Authors: Björn Gutschmann, [Simoneta Caño de las Heras](#), Krist V. Gernaey, Ulrich Krühne and Seyed Soheil Mansouri
- 11:20 Title (302): Engineering Success: What Does It Take To Get PSE Technologies Used?
Authors: [Sandro Macchietto](#)
- 11:40 Title (370): Recent Advances in Graph-Based Abstractions for Modeling and Simulating Complex Systems
Authors: Jordan Jalving and [Victor Zavala](#)
- 12:00 Title (270): Flexible And Efficient Solution For Control Problems Of Chemical Laboratories
Authors: [Tibor Nagy](#), Gergely Csorja, Eniko Haaz, Daniel Fozer, Andras Jozsef Toth and Peter Mizsey

Parallel Session 5.4. CAPE/PSE in energy transition

from 10:30 to 12:20. Room: Neptune

Chaired by: t.b.c.

- 10:30 Title (KL294): Keynote Lecture. Optimisation And Control Of A Distributed Energy Resource Network Using Internet Of Things Technologies
Authors: [Evgenia Mechleri](#), Tim Sidnell, Bogdan Dorneanu and Harvey Arellano-Garcia
- 11:00 Title (53): Model-Based Bidding Strategies for Simultaneous Optimal Participation in Different Balancing Markets
Authors: [Pascal Schäfer](#), Nils Hansmann, Svetlina Ilieva and Alexander Mitsos
- 11:20 Title (326): Optimisation Of The Integrated Water – Energy Systems In Small Group Of Islands Communities
Authors: Christiana Papapostolou, George Tzanes and [Emilia Kondili](#)
- 11:40 Title (409): Model-Based Decision-Support For Waste-To-Energy Pathways In New South Wales, Australia

Authors: Koen van Dam, Bowen Feng, Xiaonan Wang, Miao Guo, Nilay Shah and Stephen Passmore

12:00 Title (429): Optimal Operation and Control of Heat to Power Cycles: A New Perspective using a Systematic Plantwide Control Approach
 Authors: Cristina Zotica, Sigurd Skogestad, Lars O. Nord and Jenö Kovacs

Parallel Session 5.5. Special session ISPT

from 10:30 to 12:20. Room: Pollux

Chaired by: t.b.c.

Workshop organized by the Institute for Sustainable Process Technology (ISPT).

PSE-NL assembly meeting

from 10:30 to 12:20. Room: Spare

Includes a reception for the retirement of:
 Prof. Ton Backx (Eindhoven University of Technology)

Lunch

from 12:20 to 13:30. Room: Koepel

Plenary Lecture V: Paulien Herder (TUD)

from 13:30 to 14:30. Room: Philips hal

The Comprehensive Systems Challenge For Decarbonizing The Industry
 Prof. Paulien Herder (Delft University of Technology, NL)

Awards and Closing Ceremony

from 14:30 to 15:30. Room: Philips hal

Poster Session I (Monday, 17th June 2019)

from 13:30 to 15:00. Room: Foyer/Koepel

Poster No.	Theme & Paper-ID	Title	Authors
P001	T2-001	On The Implementation Of Polynomial Chaos In Dynamic Optimization Under Stochastic Uncertainty: A User Perspective	Satyajeet Bhonsale, Philippe Nimmegeers, Dries Telen, Joel Paulson, Ali Mesbah and Jan Van Impe
P002	T3-003	Fuzzy Control Applied to Combustion in Sugarcane Bagasse Boilers	Fernando Martins de Mello, Antonio José Gonçalves da Cruz and Ruy de Sousa Jr.
P003	T3-005	Dynamics and Control of a Fully Heat-Integrated Complex Distillation Configuration	Manuel Rodríguez and Ignacio Fernández
P004	T2-008	A Functional Model Based Tool To Assist In HAZOP Studies	Borja Martinez, Manuel Rodríguez and Ismael Diaz
P005	T2-010	A Novel Optimizable Inherent Safety Index Based on Fuzzy Logic	Daniel Vázquez, Rubén Ruiz-Femenia and José A. Caballero
P006	T2-011	Individualized Optimization Of Melatonin Pharmacotherapy For Critically Ill Patients	Adriana Savoca, Giuseppe Pesenti and Davide Manca
P007	T1-012	Simultaneous Design And Controllability Optimization For The Reaction Zone For Furfural Bioproduction	Ana-Gabriela Romero-garcía, Juan-Gabriel Segovia-Hernandez, Oscar-Andrés Prado-Rubio, Gabriel Contreras-Zarazua, Cesar Ramírez-Márquez and Jorge-Humberto Ramirez-Prado
P008	T1-013	Design and Optimization of Azeotropic and Extractive Distillation to Purify Furfural Considering Safety, Environmental and Economic Issues	Gabriel Contreras-zarazúa, Miriam-Esmeralda Jasso-Villegas, Eduardo Sánchez-Ramírez, José-Antonio Vázquez-Castillo, José-María Ponce-Ortega and Juan-Gabriel Segovia-Hernandez
P009	T1-014	Reducing Global Warming Potential in Acetic Acid Production by CO ₂ Utilization and Optimal Hydrogen Consumption	Juan D. Medrano-García, Rubén Ruiz-Femenia and José A. Caballero
P010	T2-018	Optimization Of A Shell-And-Tube	Oscar Daniel Lara-Montaña and

		Heat Exchanger Using The Grey Wolf Algorithm.	Fernando Israel Gómez-Castro
P011	T2-019	Optimization Under Uncertainty Based on a Data-driven Model for a Chloralkali Electrolyzer Cell	Erik Esche, Joris Weigert, Thomas Budiarto, Christian Hoffmann and Jens-Uwe Repke
P012	T2-021	Evaluation of Discretization Methods for Modeling the Chloralkali Membrane Process	Thomas Budiarto, Joris Weigert, Christian Hoffmann, Erik Esche and Jens-Uwe Repke
P013	T1-024	Synthesis, Design and Optimization of Schemes to Produce 2, 3-Butanediol Considering Economic, Environmental and Safety Issues	Eduardo Sánchez-Ramírez, Juan José Quiroz-Ramírez and Juan-Gabriel Segovia-Hernandez
P014	T3-033	Automating A Shuttle-Conveyer For Multi-Stockpile Level Control	Jeffrey Kelly and Brenno Menezes
P015	T7-034	High-Quality Automated Blend Scheduling Solution For Sizing, Selecting, Sequencing, Slotting And Spotting In Fuel Production Industries	Brenno Menezes and Jeffrey Kelly
P016	T3-035	A Simple Modeling Approach To Control Emulsion Layers In Gravity Separators	Christoph Josef Backi, Samuel Emebu, Sigurd Skogestad and Brian Arthur Grimes
P017	T3-039	Improving Waste Water Treatment Plant Operation by Ammonia Based Aeration and Return Activated Sludge Control	Vasile Mircea Cristea, Melinda Várhelyi and Marius Brehar
P018	T2-041	A Steady-State And Dynamic Simulation Tool For Solid Oxide Fuel Cell Operation Applications	Amirpiran Amiri, Khaliq Ahmed and Moses O. Tadó
P019	T2-042	Thermal Conductivity Prediction Of Molten Salt-Based Nanofluids For Energy Storage Applications	Bashar Mahmoud, Lee Mortimer, Michael Fairweather, Hugh Rice, Jeffrey Peakall and David Harbottle
P020	T2-043	Nanoparticle Behaviour In Multiphase Turbulent Channel Flow	Bashar Mahmoud, Lee Mortimer, Michael Fairweather, Hugh Rice, Jeffrey Peakall and David Harbottle
P021	T2-044	Multi-Objective optimisation Of Chemical Processes Using Improved Genetic Algorithms. A Novel Trade-Off And Termination Criterion	Viviane De Buck, Carlos André Munoz López, Philippe Nimmegeers, Ihab Hashem and Jan Van Impe
P022	T2-047	DyOS - A Framework for Optimization of Large-Scale	Adrian Caspari, Andreas M. Bremen, Johannes M. M. Faust,

		Differential Algebraic Equation Systems	Falco Jung, Chrysoula D. Kappatou, Susanne Sass, Yannic Vaupel, Ralf Hannemann-Tamas, Adel Mhamdi and Alexander Mitsos
P023	T2-049	Rate-Based Modelling And Simulation Of Pilot Scale Distillation Column.	Mayra Margarita May-Vázquez, Fernando Israel Gómez-Castro and Mario Alberto Rodríguez-Ángeles
P024	T1-056	Optimization of Petroleum Refinery Configuration for Heavy Crude Oil Processing Using a Model-Based Approach	Cheng Seong Khor, Tareq Albahri and Ali Elkamel
P025	T3-057	Optimal Short-Term Scheduling of Industrial Packing Facilities	Apostolos Elekidis, Francesc Corominas and Michail Georgiadis
P026	T2-058	Computer-Aided Identification of the Two-Phase Viscosity of Fluids	Xenia Gabrisch and Jens-Uwe Repke
P027	T1-061	Performance Evaluation of Reverse Osmosis Brackish Water Desalination Plant with Different Recycled Ratios of Retentate	Alanood Alsarayreh, Mudhar Al-Obaidi, Amro Al Hroub, Raj Patel and Iqbal Mujtaba
P028	T3-064	Deciphering Latent Uncertainty Sources with Principal Component Analysis for Adaptive Robust Optimization: Modeling Framework, Theoretical Bound, And Application	Chao Ning and Fengqi You
P029	T1-066	Globally Optimal Design of Double Pipe Heat Exchangers using Local Properties and Discretized Models	Alice Peccini, André Costa and Miguel Bagajewicz
P030	T3-067	Incipient Fault Detection, Diagnosis, and Prognosis using Canonical Variate Dissimilarity Analysis	Karl Ezra Pilario, Yi Cao and Mahmood Shafiee
P031	T1-072	Optimization Of Biogas To Syngas Via Combined Super-Dry And Tri-Reforming. Analysis Of Fischer-Tropsch Fuels Production.	Borja Hernandez and Mariano Martin
P032	T4-073	Multi-Objective Spatio-Temporal Optimisation For Simultaneous Planning, Design And Operation Of Sustainable And Efficient Rice Value Chains For Rice Crop	Stephen S. Doliente and Sheila Samsatli
P033	T3-075	The Effect Of Indirect GHG Emissions Costs On The Optimal Water And Energy Supply Systems	Negar Vakilifard, Parisa Bahri, Martin Anda and Goen Ho

P034	T2-079	Surrogate-Assisted Modelling And Optimization For Design Of Refinery Hydrogen Network	Shihui Wang, Li Zhou, Xu Ji and Yagu Dang
P035	T2-081	Real-time Design Space Determination In Pharmaceutical Manufacturing	Gabriele Bano, Pierantonio Facco, Marianthi Ierapetritou, Fabrizio Bezzo and Massimiliano Barolo
P036	T3-085	Real-Time Determination Of Optimal Switching Times For A H2 Production Process With CO2 Capture Using Gaussian Process Regression Models	Luca Zanella, Marcella Porru, Giulio Bottegal, Fausto Gallucci, Martin van Sint Annaland and Leyla Ozkan
P037	T1-086	Applying Sustainability Metric in Energy, Water and Food Nexus Applications; A Biomass Utilization Case Study to Extend Investment Decisions	Ahmed AlNouss, Sarah Namany, Gordon Mckay and Tareq Al-Ansari
P038	T4-093	Dynamic Optimisation and Visualisation Of Industrial Beer Fermentation With Explicit Heat Transfer Dynamics	Alistair Rodman, Megan Weaser, Lee Griffiths and Dimitrios Gerogiorgis
P039	T4-094	Statistical Modelling And Optimisation Of Mash Separation Efficiency For Industrial Beer Production	Qifan (Frank) Shen, Megan Weaser, Lee Griffiths and Dimitrios Gerogiorgis
P040	T5-097	A Multiperiod Optimisation Approach To Enhance Oil Field Productivity During Secondary Petroleum Production	Emmanuel Epelle and Dimitrios Gerogiorgis
P041	T2-100	Statistical DIAGNOSIS OF PROCESS MODEL MISMATCH BY MEANS OF THE LAGRANGE MULTIPLIER TEST	Marco Quaglio, Eric S. Fraga and Federico Galvanin
P042	T5-101	Fast Fourier Transforms for Microgrid Climate Computing	Paolo Fracas and Edwin Zondervan
P043	T4-103	Optimization-based approach of Zero Liquid Discharge Systems based on brine water quality	Fatima Mansour and Sabla Alnouri
P044	T2-106	Optimal Design Of Experiments For The Identification Of Kinetic Models of HMF Hydrogenation	Andrea Bortoli, Fabrizio Bezzo and Federico Galvanin
P045	T2-110	On the Solution of the Smoluchowski Coagulation Equation Using a Conservative Discretization Approach (CDA)	Menwer Attarakih and Hans-Jörg Bart

P046	T3-113	Optimal Operation of a CO ₂ Refrigeration System With Heat Recovery	Adriana Reyes-Lua, Glenn Andreasen, Jakob Stoustrup, Lars Finn Sloth Larsen and Sigurd Skogestad
P047	T4-114	A PLSR Model for Consumer Preference Prediction of Dairy Products from Sensory Attribution Profiles	Kexin Bi, Dong Zhang, Zifeng Song, Yizhen Huang and Tong Qiu
P048	T2-115	Coordination of Multiple Production and Utility Systems in a Multi-Leader Multi-Follower Stackelberg Game	Ludger Leenders, Kirstin Ganz, Björn Bahl, Maike Hennen and André Bardow
P049	T1-117	A Point Estimate Method-Based Back-Off Approach To Robust Optimization: Application To Pharmaceutical Processes	Victor Emenike, Xiangzhong Xie, René Schenkendorf and Ulrike Krewer
P050	T3-119	Real-Time Optimisation of Closed-Loop Plants using Open-Loop Models and Transient Measurements	Jack Speakman and Gregory Francois
P051	T4-122	Fouling and Cleaning of Plate Heat Exchangers for Milk Pasteurisation: A Moving Boundary Model	Abhishek Sharma and Sandro Macchietto
P052	T1-124	Design and Operation Optimization for Water and Power Cogeneration System by Reverse Osmosis and Renewable Energy Technologies	Yousef Saif, Muhammad Rizwan, Ali Almansoori and Ali Elkamel
P053	T2-125	Modelling Of Bubble Column Hydrodynamics Using CFD And SQMOM As A Population Balance Solver	Jan Schäfer, Mark W. Hlawitschka, Menwer Attarakih and Hans-Jörg Bart
P054	T2-126	Single-Shooting Optimization Of An Industrial Process Through Co-Simulation Of A Modularized Aspen Plus Dynamics model	Mikael Yamanee-Nolin, Anton Löfgren, Niklas Andersson, Bernt Nilsson, Oleg Pajalic and Mark Max Hansen
P055	T3-128	A Process Integration And Dynamic Control Approach For The Recovery And Utilization Of Otherwise Flared Streams During Process Upsets	Kazi Khoda, Fadwa Eljack, Vasiliki Kazantzi and Nikolaos Kazantzis
P056	T4-129	Potential of Using Satellite Based Biophysical And Vegetation Indices Variables for Crop Water Footprint Assessment: A case study for Qatar	Haile Woldesellasse, Tareq Al-Ansari and Rajesh Govindan

P057	T2-132	A discrete-time MILP Formulation For The Optimal Scheduling Of Maintenance Tasks On Oil And Gas Well's Surface Facilities	Victoria Achkar, Vanina Cafaro, Carlos Méndez and Diego Cafaro
P058	T1-133	Optimization of an Integrated First- and Second-Generation Ethanol Production Plant with Focus on Hydrolysis Parameters	Roymel Carpio, Roberto Giordano and Argimiro Secchi
P059	T1-134	Optimization Of Seaweed-Based Biorefinery With Zero Carbon Emissions Potential	Rofice Dickson and Jay Liu
P060	T1-135	Optimal Design For Integrated Macroalgae-Based Biorefinery Via Mixed Alcohol Synthesis	Rofice Dickson, Jay Liu and Peyman Fasahati
P061	T1-136	Global Optimization of Countercurrent Gasketed Plate Heat Exchanger	Natália Martins, Peam Cheali, André Costa and Miguel Bagajewicz
P062	T3-141	Filter-Based Additional Constraints to Easier Plant Feasibility in Modifier Adaptation Schemes	Aris Papisavvas and Gregory Francois
P063	T5-148	Population Balance Equation Applied to Microalgae Filtration	Pui Ying Lee, Keat Ping Yeoh and Chi Wai Hui
P064	T1-149	Optimisation of Multistage Aqueous Two-Phase Extraction	Emma Chandler, Robert Falconer and Solomon Brown
P065	T2-150	Integrated Process and Controller Design Software Tool – ProCADC	Jialiang Wang, Peng Ji, Xi Chen, Anjan Tula and Rafiqul Gani
P066	T2-151	Computational Fluid Dynamics of Rectangular Monolith Reactor vs. Packed-Bed Column For Sorption-Enhanced Water-Gas Shift	Vlad Sandu, Ionela Dumbrava, Ana-Maria Cormos, Arpad Imre-Lucaci, Calin-Cristian Cormos, Paul Cobden and Robert de Boer
P067	T1-154	Development Of A Biorefinery Scheme To Produce Biofuels From Waste Cooking Oil	Araceli Guadalupe Romero-Izquierdo, Fernando Israel Gómez-Castro, Claudia Gutiérrez-Antonio, Rogelio Cruz Barajas and Salvador Hernández
P068	T2-156	A Novel Process Monitoring Approach Based On Feature Points Distance Dynamic Autoencoder	Feifan Cheng and Jinsong Zhao
P069	T1-160	A network Model-Based Optimization Analysis For The Utilization Of CO ₂ in Qatar's Chemical Industries	Ali Al-Yaeshi, Tareq Al-Ansari and Rajesh Govindan
P070	T5-162	Contract Settlements For	Dan Kröhling and Ernesto

		Exchanging Utilities Through Automated Negotiations Between Prosumers In Eco-Industrial Parks Using Reinforcement Learning	Martinez
P071	T3-163	Integration Of Max-Plus-Linear Scheduling And Control	Risvan Dirza, Alejandro Marquez Ruiz and Leyla Ozkan
P072	T2-164	Nonlinear Dynamic Analysis of Chemical Engineering Processes Described by Differential-Algebraic Equations Systems	Ataide Andrade Neto, Argimiro Secchi and Prıamo Melo
P073	T4-165	Life Cycle Assessment of Petroleum Coke Gasification to Fischer-Tropsch Diesel	Ikenna J. Okeke and Thomas A. Adams II
P074	T1-166	Superstructure Optimization for the Production of Fuels, Fertilizers and Power using Biomass Gasification	Ahmed AlNouss, Tareq Al-Ansari and Gordon Mckay
P075	T2-167	Parameter Estimation for Thermal Runaway of Li-ion cells: a Gaussian Process approach	Robert Milton, Peter Bugryniec and Solomon Brown
P076	T1-168	Techno-Economic-Environmental Study for Recovery of Novel Water Source within a Power Plant - Desalination Complex	Ahmed AlNouss and Fadwa ElJack
P077	T1-169	Molecular Tracking: A novel Approach For Multicomponent High Purity Distillation Column Design	Nima Nazemzadeh, Isuru A. Udugama, Jens Abildskov and Seyed Soheil Mansouri
P078	T2-170	Improved Design of Experiments for Identification of MIMO Systems	Kurt-Erik Haggblom
P079	T2-172	Machine Learning of Molecular Classification and Quantum Mechanical Calculations	David Wong, Jia-Lin Kang, Jie-Jiun Chang, Cheng-Hung Chou, Hsuan-Hao Hsu, Chen-Hsuan Huang and Shang-Tai Lin
P080	T2-173	CFD Comparative Analysis Of A Photovoltaic Thermal (PVT) System Using Desert Sand And Phase Change Materials (PCM)	Aya Al-Hmoud, Daniel Sebastia-Saez and Harvey Arellano-Garcia
P081	T2-181	DEM Study of a Mixer for Core Manufacturing System	Jiwon Roh, Man Sig Lee, Junghwan Kim and Il Moon
P082	T3-185	Development Of Guidelines For Optimal Operation Of A Cogeneration System	Jia-Lin Kang, Hsu-Hung Chang, Shyan-Shu Shieh, Shi-Shang Jang and David, Shan-Hill Wong
P083	T4-188	A Systematic Parameter Study On Film Freeze Concentration	Jan-Eise Vuist, Maarten Schutyser and Remko Boom

P084	T3-190	A Stacked Auto-encoder Based Fault Diagnosis Model for Chemical Process	Yi Qiu and Yiyang Dai
P085	T4-191	Simulation-Based Reinforcement Learning in CO ₂ Fertilisation Networks To Enhance Food Production Systems	Rajesh Govindan and Tareq Al-Ansari
P086	T5-192	Exergoeconomic Analysis For A Flexible Dry Reforming Power Plant With Carbon Capture For Improved Energy Efficiency	Szabolcs Szima and Calin-Cristian Cormos
P087	T4-195	A Systematic Decision Support Methodology For Identifying Promising Platform Technologies Towards Circular Economy	Isuru A. Udugama, Dominic A. Silk, Krist V. Gernaey, Manuel Pinelo and Seyed Soheil Mansouri
P088	T5-196	Kinetics Modeling Of The Gas Hydrate-Based CO ₂ Capture To Identify The Dominant Controlling Mechanisms	Hossein Dashti, Daniel Thomas, Amirpiran Amiri and Xia Lou
P089	T2-205	A Fuzzy Analytic Hierarchy Process (FAHP) Approach To Multi-Objective Optimisation Of Palm Oil Value Chains	John Frederick Tapia and Sheila Samsatli
P090	T6-206	Numerical Simulation Of Forced Convection In A Microchannel With Realistic Roughness Of 3D Printed Surface	Seyed Alborz Manavi and Eugeny Y Kenig
P091	T3-207	Morris Screening for FMECA of Valve Failure Modes On Offshore Gas Reinjection	Emil Krabbe Nielsen, Jérôme Frutiger and Gürkan Sin
P092	T2-208	A Decomposition Based Approach To Solve Large-Scale Biorefinery Optimization Problems	Varun Punnathanam and Yogendra Shastri
P093	T2-209	Strategic Planning of Supply Chains Considering Extreme Events: Novel Heuristic and Application to the Petrochemical Industry	Michael Ehrenstein, Chi-Hsiang Wang and Gonzalo Guillén Gosálbez
P094	T2-211	CFD Modeling Of Continuous Oscillatory Flow Baffled Reactor Using STAR CCM+	Nikola Kljajic, Branislav Todic, Danijela Slavnic and Nikola Nikacevic
P095	T2-212	Overpotentials in Water Electrolysis: In-Silico Comparison of PEM-cell and GAP-cell performance	Luisa Bree, Tobias Schiekel and Alexander Mitsos

Poster Session II (Tuesday, 18th June)

from 13:30 to 15:00. Room: Foyer/Koepel

Poster No.	Theme & Paper-ID	Title	Authors
P096	T2-213	Study On The Formation Of The Chemical-Wave Patterns By The Idea Of Cooperative Information Consensus	Jiali Ai, wei sun and chi zhai
P097	T1-214	Efficient Design Of Intensified Extractive Distillation Processes Based On A Hybrid Optimization Approach	Kai Fabian Kruber, Tamara Grüters and Mirko Skiborowski
P098	T2-215	Flux Balance Analysis Incorporating a Coarse-grained Proteome Constraint for Predicting Overflow Metabolism in Escherichia Coli	Hong Zeng and Aidong Yang
P099	T1-220	Production Scheduling and Lot Sizing of Multi-product Semi-continuous Plant	Utkarsh Konge and Sivakumar Subramanian
P100	T1-221	Fast Bypass Selection Method during the Heat Exchanger Network Synthesis	Rupu Yang, Tran Cong-Toan and Assaad Zoughaib
P101	T1-223	Integrating Oil Refineries and Bio-refineries: Upgrading of Acetone, Butanol and Ethanol to High-Value Products	Elham Ketabchi, Laura Pastor-Perez, Tomas Ramirez Reina and Harvey Arellano-Garcia
P102	T3-224	Dynamic Transitions In A Reactive Distillation Column For The Production Of Silicon Precursors	Salvador Tututi-Avila, Nancy Medina-Herrera, Luis Ricardez-Sandoval and Arturo Jimenez-Gutierrez
P103	T2-227	Adjoint System Method In Shape Optimization Of Some Typical Fluid Flow Patterns	Alexis Courtais, François Lesage, Yannick Privat, Pascal Frey and Abderrazak Latifi
P104	T2-230	Freeze-Thaw Process Design Of Induced Pluripotent Stem Cells Using White-Box Models	Yusuke Hayashi, Ikki Horiguchi, Masahiro Kino-oka, Masahiko Hirao and Hirokazu Sugiyama
P105	T1-231	Heat-Integrated Reactive Distillation Processes To Produce Ethyl	Gabriel Contreras Zarazúa, Jose Antonio Vazquez CastiLLO and

		Levulinic: Design and Optimization including Environmental, Safety and Economics Aspects	Juan Gabriel Segovia Hernández
P106	T4-233	A systemic Approach For Agile Biorefineries	Michelle Houngré, Anne-Marie Barthe-Delanoé and Stéphane Negny
P107	T3-234	Closed-Loop Dynamic Real-Time Optimization Of A Batch Graft Polymerization Reactor	Ryad Bousbia-Salah, François Lesage, Miroslav Fikar and Abderrazak Latifi
P108	T2-236	Optimising Multi-Component Tablet Composition From Pure Component Parameters	Hikaru Jolliffe, Foteini Papathanasiou, Elke Prasad, Gavin Halbert, John Robertson, Cameron J Brown and Alastair J Florence
P109	T4-237	Targeting Material Exchanges In Industrial Symbiosis Networks	Ana Somoza-Tornos, Valeria Giraldo-Carvajal, Antonio Espuña and Moisés Graells
P110	T2-238	Total Organic Carbon Prediction with Artificial Intelligence Techniques	Eda Goz, Mehmet Yüceer and Erdal Karadurmus
P111	T2-239	On the Design and Implementation of a Process Modelling Language for Uncertainty	Pedro I. O. Filho and Eric S. Fraga
P112	T2-240	Simulation of Food Waste Pyrolysis For The Production Of Biochar: A Qatar Case Study	Samar Elkhailifa, Ahmed AlNouss, Tareq Al-Ansari, Hamish Mackey, Prakash Parthasarathy and Gordon Mckay
P113	T1-245	Production Of Chemicals From Syngas: An Enviro-Economic Model-Based Investigation	Andrea Bernardi, Jose Eduardo Alves Graciano and Benoit Chachuat
P114	T3-246	Application Of Cyclic Operation To Acetic Acid / Water Separation	Catalin Patrut, Elena Catalina Udrea and Costin Sorin Bildea
P115	T3-247	Control Analysis Of A Batch Reactive Distillation Column With Intermittent Feed	Christian Felipe Rodriguez-Robles, Salvador Hernandez-Castro, Hector Hernandez-Escoto, Julian Cabrera-Ruiz, Fabricio Omar Barroso-Muñoz and Jose Eduardo Terrazas-Rodriguez
P116	T3-248	Bias Identification And Estimation Based On Data Reconciliation And First-Principle Model – Application To Nuclear Fuel Recycling Process.	Amandine Duterme, Marc Montuir, Binh Dinh, Julia Bisson, Nicolas Vigier, Pascal Floquet and Xavier Joulia
P117	T1-251	A New Index For Chemical Process Design Considering Risk Analysis And Controllability	Nancy Medina-Herrera, Salvador Tututi-Avila and Arturo Jiménez-Gutierrez

P118	T2-252	A Primal Bounding Approach for Multistage Stochastic Programs of Resource Constrained Planning and Scheduling With Stochastic Task Success	Selen Cremaschi and Zuo Zeng
P119	T2-254	Deterministic Global Process Optimization: Flash Calculations via Artificial Neural Networks	Artur M. Schweidtmann, Dominik Bongartz, Wolfgang R. Huster and Alexander Mitsos
P120	T2-261	An Efficient MILP-Based Decomposition Strategy for Solving Large-Scale Scheduling Problems in the Offshore Oil and Gas Industry	Natalia Basan, Mariana E. Cóccola, Alejandro García del Valle and Carlos A. Méndez
P121	T3-264	A Blockchain Framework for Containerized Food Supply Chains	Dimitrios Bechtsis, Naoum Tsolakis, Apostolos Bizakis and Dimitrios Vlachos
P122	T5-266	System-Level Synthesis And Optimization Of Combined Power And Desalting Plants For The State of Qatar	Houd Al-Obaidli, Tareq Al-Ansari, Rajesh Govindan and Sarah Namany
P123	T2-268	Modeling Of Multi-Effect Desalination Process Operated With Thermosolar Energy Applied To The Northeastern Brazil	Diego Cunha, Karen Pontes and Vanessa Gomes
P124	T2-271	Process Model Validation, Analysis And Intensification Of An Industrial Scale Process	Renata C. Chinda, Rotjana Ponsatorn, Amata Anantpinijwatna, Fernando P. Pessoa, John M. Woodley and Seyed Soheil Mansouri
P125	T1-273	A Model Based Analysis In Applying Anderson–Schulz–Flory (ASF) Equation With CO ₂ Utilization Fischer Tropsch Gas-to-liquid	Ali Al-Yaeeshi, Ahmed AlNouss, Gordon Mckay and Tareq Al-Ansari
P126	T5-274	Integration of Consequential Life Cycle Optimization with Spatial Analysis for Food-Water-Energy-Waste Nexus	Yanqiu Tao and Fengqi You
P127	T2-276	BIOPRO-Sim: A Benchmark Simulation Model For Bio-Manufacturing Processes	Giorgio Colombo, Isuru A. Udugama, Krist V. Gernaey and Seyed Soheil Mansouri
P128	T1-283	Scalable Manufacturing Of Nanostructured Materials By Atomic Layer Deposition In Fluidized Bed Reactors	J. Ruud van Ommen, Fabio Grillo and Johan Grievink

P129	T5-284	The Optimization of Heliostat Canting in a Solar Power Tower Plant	Nao Hu, Yuhong Zhao and Jieqing Feng
P130	T1-285	Selectivity Engineering with Hybrid Reactive Distillation Columns: Series Reaction Schemes with Non-Ideal Kinetics	Deepshikha Singh, Antanim Dutta, Ankur Gaur and Shabih Hasan
P131	T2-289	Modelling Paraffin Wax Deposition Using Aspen HYSYS and MATLAB	Ana Sousa, Henrique A. Matos and Maria Pereira
P132	T1-290	Integrated Design of Solvents and Processes based on Reaction Kinetics from Quantum Chemical Prediction Methods	Christoph Gertig, Kai Leonhard and André Bardow
P133	T3-295	Centralise Versus Localised Supply Chain Management Using Flow Configuration Models	Bogdan Dorneanu, Elliot Masham, Evgenia Mechleri and Harvey Arellano-Garcia
P134	T2-297	Modelling And Optimal Operation Of A Natural Gas Fired Natural-Draught Heater	Richard Yentumi, Bogdan Dorneanu and Harvey Arellano-Garcia
P135	T2-299	A Chance-Constrained Nonlinear Programming Approach for Equipment Design under uncertainty	Javier Tovar-Facio, Yankai Cao, José María Ponce-Ortega and Victor Zavala
P136	T1-300	Involving the Water-Energy-Food Nexus in for Satisfying Needs in Low-Income and Isolated Communities	Brenda Cansino-Loeza, J. Betzabe González-Campos and José María Ponce-Ortega
P137	T2-301	Sustainable Strategic Planning for a National Natural Gas Energy System Accounting for Unconventional Sources	Esbeydi Villicaña-García, J. Betzabe González-Campos and José María Ponce-Ortega
P138	T3-304	An Improved approach to scheduling Multipurpose Batch Processes With Conditional Sequencing	Nikolaos Rakovitis, Jie Li and Nan Zhang
P139	T5-307	On-grid Hybrid Power System and Utility Network Planning to Supply an Eco-Industrial Park with Dynamic Data	Florent Mousqué, Marianne Boix, Stéphane Négny, Ludovic Montastruc and Serge Domenech
P140	T1-309	Economic Study Of The Urea Alcoholysis Process For Dimethyl Carbonate Production	Juan Javaloyes-Antón, Daniel Vázquez, José A. Caballero and Juan D. Medrano-García
P141	T5-310	Evaluating the Benefits of LNG Procurement through Spot Market Purchase	Mohd Shahrukh, Ifthekar Karimi and Rajagopalan Srinivasan
P142	T1-311	Effect of Ambient Conditions on Boil Off gas generation in LNG	Phillips Prince Pokkatt and Rajagopalan Srinivasan

		Regasification Terminals	
P143	T3-313	Tracking Operator's Cognitive Workload during Abnormal Operations using Biomarkers in Electroencephalogram (EEG)	Md. Umair Iqbal, Babji Srinivasan and Rajagopalan Srinivasan
P144	T5-315	Optimal Design Of Biomass Supply Chains With Integrated Process Design	Theodoros Damartzis and Francois Marechal
P145	T2-317	Modeling Full Cycles of Carbonation-Calcination for Calcium Looping Process Simulation in gPROMS®	Miguel Abreu Torres, Paula Teixeira, Rui M. Filipe, Luis Domingues, Carla I.C. Pinheiro and Henrique A. Matos
P146	T2-318	Determination of the Optimal Distribution of Active Centers in a Multifunctional Catalyst Pellet using Global Searching Combined with the Reduced-Order Modeling Approach	Katarzyna Bizon and Gaetano Continillo
P147	T2-323	Sequential and Simultaneous Optimization Strategies for Increased Production of Monoclonal Antibodies	Chrysoula Dimitra Kappatou, Oktay Altunok, Adel Mhamdi, Athanasios Mantalaris and Alexander Mitsos
P148	T2-325	Sensor Placement For Dynamic Data Reconciliation Based On Structural Analysis Of Operating Regime Based Models	Gyula Dörgő, Máté Haragovics and János Abonyi
P149	T1-327	Techno-economic analysis of the lactic acid production process using different reactive separation alternatives	Roberto Gasca-González, Oscar A. Prado-Rubio, Fernando I. Gómez-Castro, Javier Fontalvo, Eduardo S. Pérez-Cisneros and Ricardo Morales-Rodriguez
P150	T4-328	Life cycle Analysis Of Biomass-Based Jet Fuels in China	Haoyu Liu and Tong Qiu
P151	T1-331	Optimization Of A Hydroformulation Process In A Thermomorphic Solvent System Using A Commercial Steady-State Process Simulator And A Memetic Algorithm	Tim Janus, Maximilian Cegla, Sabine Barkmann and Sebastian Engell
P152	T1-333	Exergy Analysis For Energy Integration In A Bioethanol Production Process To Determine Heat Exchanger Networks Feasibility	J. Cristóbal García-García, Jaime D. Ponce-Rocha, Danahe Marmolejo-Correa and Ricardo Morales-Rodriguez
P153	T2-337	Determination of Fouling Threshold Models in Crude Oil Heat Exchanger	Jose Loyola-Fuentes, Megan Jobson and Robin Smith

		Networks using Data Reconciliation and Considering The Effect Of Unmeasured Process Variables	
P154	T4-345	Alternate Reverse Osmosis Subsurface Intake Designs For Reduced Environmental Impacts	Abdulrahman H. Al-Kaabi and Hamish Mackey
P155	T2-351	Advanced Model Design Based On Intelligent System Characterization And Problem Definition	Edrisi Munoz, Elisabet Capon-Garcia and Luis Puigjaner
P156	T1-353	Improving Problem's Constraints Modeling Based On Machine Learning Approach	Elisabet Capon-Garcia, Edrisi Munoz and Luis Puigjaner
P157	T1-355	Bioethanol Production with Cyanobacteria by a Two-stage Fermentation Strategy	Maria Diaz
P158	T1-357	Application of Plate Heat Exchangers Into Heat Exchanger Networks Retrofit	Kexin Xu and Robin Smith
P159	T4-358	Ecosystem Services Valuation And Ecohydrological Management In Salt Lakes With Advanced Dynamic Optimisation Strategies	Amira Siniscalchi, Carla Garcia Prieto, Ariel Raniolo, Eduardo Gomez, Ruben Lara and Maria Diaz
P160	T3-365	A Data-Driven Robust Optimization Approach to Operational Optimization of Industrial Steam Systems under Uncertainty	Liang Zhao, Chao Ning and Fengqi You
P161	T2-366	Probabilistic Process Design Space	Linus Mockus, Gintaras Reklaitis, Kenneth Morris and David LeBlond
P162	T2-367	Parametric Modeling Of Life Cycle Greenhouse Gas Emissions From Photovoltaic And Wind Power	Ian Miller, Emre Gençer and Francis O'Sullivan
P163	T1-369	Clustering Alternative Product Formulations Using Graphs	Fernando Bernardo and Javier Arrieta-Escobar
P164	T2-372	Spatio-Temporal Control of Nutrient Flows to Water Bodies from Agricultural Lands	Yicheng Hu, Gerardo Ruiz-Mercado and Victor Zavala
P165	T2-375	Optimal Design And Planning Multi Resource-Based Energy Integration In Process Industries	Shabnam Morakabatchiankar, Fernando Daniel Mele, Moises Graells Sobre and Antonio Espuña Camarasa
P166	T5-380	From Renewable Energy To Ship Fuel: Ammonia As An Energy Vector	Francesco Baldi, Alain Azzi and François Maréchal

		And Mean For Energy Storage	
P167	T2-381	Heat-Integrated Water Allocation Network Design: A Novel Hyperstructure And Sequential Solution Strategy For Industrial Applications	Maziar Kermani, Ivan Kantor, Adriano Ensinas and François Maréchal
P168	T4-391	Environomic Potential Of Energy Efficiency Measures	Anna S. Wallerand, Ivan Kantor and François Maréchal
P169	T1-393	Analysis Of The Tri-Reforming Of Methane In A Membrane Reactor	Samuel Sanchez Queiroz Jardim, José Eduardo Alves Graciano and Rita Maria de Brito Alves
P170	T1-397	Techno-Economic Evaluation and Design Development of Sour Water Stripping System in the Refineries	Umer Zahid, Ali Al-Qadri, Baqer Al-Mousa, Ali Al-Nasser and Usama Ahmed
P171	T1-398	Techno-economic Assessment of Future Generation IGCC Processes with Control on Greenhouse Gas Emissions	Usama Ahmed and Umer Zahid
P172	T5-402	Comparative analysis of IGCC and DMR technologies for the syngas production	Hussain Al-Ibrahim, Usama Ahmed and Umer Zahid
P173	T4-405	Generating Efficient Wastewater Treatment Networks: An integrated Approach Comprising Of Contaminant Properties, Technology Suitability, Plant Design, And Process Optimization	Kirti Yenkie, Ferenc Friedler, Heriberto Cabezas, Sean Burnham and James Dailey
P174	T4-412	A Process Systems Engineering Approach To Designing A Hybrid System Of Solar And Biomass Energy For Dairy Farms In Argentina	Carolina Alvarez C. Blanchet, Antonio M. Pantaleo and Koen van Dam
P175	T2-413	Describing CO ₂ -Absorbent Properties In AspenPlus [©]	Jasper Alexander Ros, Wim Brilman, Ida Bernhardsen and Hanna Knuutila
P176	T3-420	Design of Multi Model Fractional Controllers for Nonlinear Systems: An Experimental Investigation	G. Maruthi Prasad, A Adithya and Seshagiri Rao Ambati
P177	T4-421	Modelling And Simulation Of Supercritical CO ₂ oil Extraction From Biomass	Rui Filipe, José Coelho, David Villanueva-Bermejo and Roumiana Stateva
P178	T2-422	Immune System Modelling In Case Of A Saptic Shock	Jean Tallon, Françoise Couenne, Claire Bordes, Melaz Tayakout, Fabienne Venet, Guillaume

P179	T2-427	More Power To The Individual Modeller Using Ontologies	Monneret, Patrice Nony and François Gueyffier
P180	T2-430	Relative Optimality Index for Evaluation of the Approximate Methods for Synthesis of Flexible Processes Under Uncertainty	Heinz Preisig, Arne Tobias Elve and Sigve Karolius Klavdija Zirngast, Zdravko Kravanja and Zorka Novak Pintaric
P181	T4-433	Optimisation Of The Integrated Water – Energy Systems: A Review With A Focus In Process Systems Engineering	Christiana Papapostolou, Emilia Kondili and Georgios Tzanes
P182	T2-434	Time Resolved Sensitivity & Identifiability Analysis for Directed Parametrization of Highly Dynamic Models	Sven Daume, Julian Kager and Christoph Herwig
P183	T1-435	Synthesis of Solar Heat Network for Preheating of Industrial Process Streams	Ben Abikoye, Lidija Čuček, Niyi Isafiade and Zdravko Kravanja
P184	T3-437	Novel Strategies For Particle Monitoring In Bioprocesses Using Advanced Image Analysis	Rasmus Fjordbak Nielsen, Nasrin Arjomand Kermani, Krist V. Gernaey and Seyed Soheil Mansouri
P185	T3-438	Integrating Simulation and Optimization for Process Planning and Scheduling Problems	Miguel Vieira, Samuel Moniz, Bruno Gonçalves, Tânia Pinto-Varela and Ana Barbosa-Póvoa
P186	T2-440	On Robustness and Tightness of Mixed-Integer reformulations of Generalized Disjunctive Programs	Miloš Bogataj and Zdravko Kravanja
P187	T2-446	Assessment Of The Dominant Factors During Hydroprocessing Stabilization	Ngoc Yen Phuong Cao, Benoit Celse, Denis Guillaume, Isabelle Guibard and Joris Thybaut

