



PROGRAMME

7 – 10 May 2023 · Scandic Hotel Copenhagen · Denmark

EuroPACT 2023

6th European Conference on Process Analytics and Control Technology

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GENERAL INFORMATION

2060
The NIR
ANALYZER



**High-throughput,
state-of-the-art spectrometer**



**Automatic system
performance validation**



**24/7 in plants
operation**



**Smart
programming**

COMMITTEE

Scientific Committee

Tobias Eifert	Covestro, Uerdingen/D (Conference Chair)
Franciscus Winfried J van der Berg	University of Copenhagen/DK
Ana Cameirao	SPIN Center Mines Saint-Etienne/FR
Noémie Caillol	Axel'One, Lyon/FR
Katharina Dahlmann	Aquila Biolabs/CH
Martin Gerlach	Bayer, Leverkusen/DE
Massimiliano Grosso	University of Cagliari/IT
Christoph Herwig	TU Wien/AT
Jeroen Jansen	Radboud University Nijmegen/NL
Anna de Juan Capdevila	University of Barcelona/ES
Riadh Lakhmi	SPIN Center Mines Saint-Etienne/FR
David Littlejohn	University of Strathclyde, CFACT, Glasgow/UK
Ingrid Måge	Nofima, Oslo/NO
Michael Maiwald	Bundesanstalt für Materialforschung und -prüfung (BAM), Berlin/DE
Geir Rune Flåten	aspentech, Oslo/NO
Dan Wood	Keit Spectrometers, Didcot/UK

Local Organising Committee

Franciscus Winfried J van der Berg	University of Copenhagen/DK
Natalie Kerr	University of Strathclyde, CFACT, Glasgow/GB
Nina Weingärtner	DECHEMA e.V., Frankfurt am Main/DE

VENUE

Scandic Hotel Copenhagen
Vester Søgade 6
Copenhagen
Denmark

WIFI

Just connect to Scandic_Easy and go to your browser and press "click to connect"

OFFICE HOURS CONFERENCE DESK

Sunday, 7 May 2023	14:00 h – 20:00 h
Monday, 8 May 2023	08:00 h – 20:00 h
Tuesday, 9 May 2023	08:30 h – 18:00 h
Wednesday, 10 May 2023	08:30 h – 13:30 h

ORGANISER/CONTACT

DECHEMA e.V.	Nina Weingärtner
Theodor-Heuss-Allee 25	Tel.: +49 69 - 7564 125
60486 Frankfurt am Main	Fax: +49 69 - 7564 176
www.dechema.de	Email: nina.weingaertner@dechema.de



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EXHIBITION

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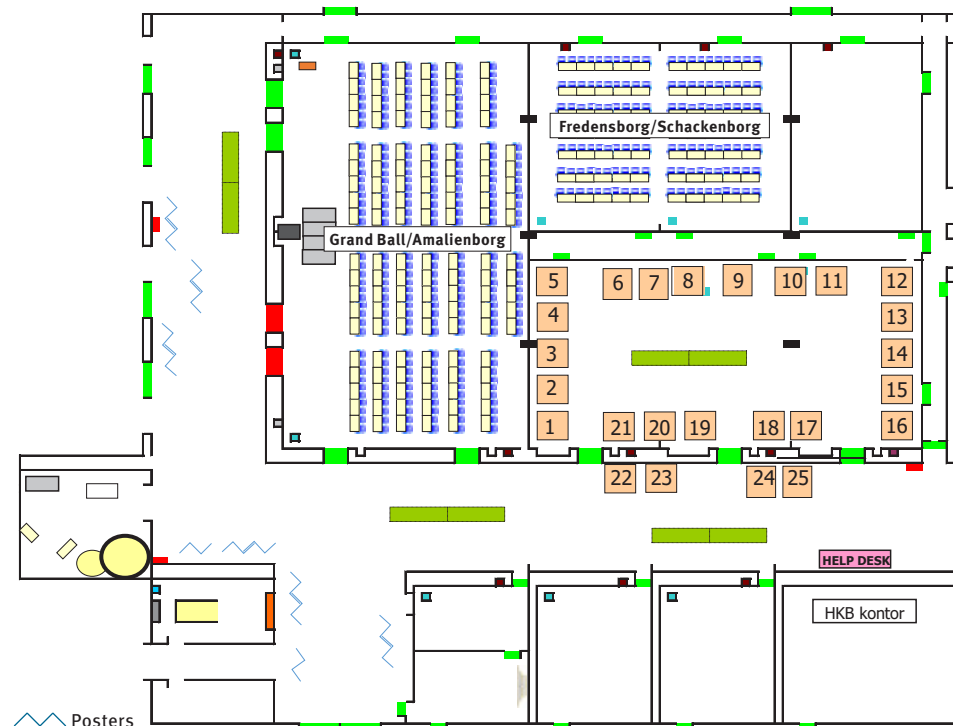
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EXHIBITORS



FLOORPLAN EUROPACT 2023 - SCANDIC HOTEL COPENHAGEN



EXHIBITORS & SPONSORS OF EUROPACT 2023

1. Metrohm Process Analytics, Schiedam/NL
2. Timegate Instruments Oy, Oulu/FIN
3. Bruker Optics GmbH & Co. KG, Ettlingen/D
4. Axel`one, Solaize/FR
5. VIAVI Solutions, Santa Rosa/US
6. Keit Spectrometers, Oxford/UK
7. usePAT GmbH, Wien/AT
8. Endress + Hauser Liquid Analysis, Gerlingen/D
9. Optics 11, Amsterdam/NL
10. Sentronic GmbH, Dresden/D
11. CultiXcell A/S, Vordingborg/DK
12. Hamilton Bonaduz AG, Bondaduz/CH
13. Renishaw, Wotton-under-Edge/UK
14. Robert Bosch GmbH, Stuttgart/D
15. art photonics GmbH, Berlin/D
16. iSud Solutions GmbH, Eschach/D
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18. Bruker BioSpin, Ettlingen/D
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20. Process Insights AG, Frankfurt/D
21. InProcess Instruments GmbH, Bremen/D
22. tec5 AG, Steinbach/D
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PROGRAMME

Sunday, 7 May 2023

15:00 REGISTRATION

PRE-CONFERENCE COURSES

Room: Fredensborg

Room: Schackenborg

Lecturer: M. Gerlach, Bayer, Leverkusen/D;
T. Eifert, COVESTRO/D

Lecturer: Geir Rune Flaten, aspentech, Oslo/NO

15:00

Course 1
Fundamentals on PAT in industrial applications

Course 2
Model life cycling in the field

Room: Grand Ball/Amalienborg

OPENING LECTURE

Chair: T. Eifert, COVESTRO/DE

18:00 **Modern process data analytics: What's the fuzz with all the buzz (words)?**
K. Eisen¹; ¹ Daiichi Sankyo Europe GmbH, Pfaffenhofen /D

19:00 **WELCOME RECEPTION with snacks and drinks** (19:00 – 21:00)

Speed Dating

Chair: Dan Wood, Keit Spectrometers, Didcot/UK

PROGRAMME

Monday, 8 May 2023

Room: Grand Ball/Amalienborg

09:15 **WELCOME**
T. Eifert, COVESTRO/DE, F. van den Berg, University of Copenhagen/DK

Chair: T. Eifert, COVESTRO/DE

09:30 **KEYNOTE LECTURE**
Current and future PAT challenges from a Lanxess and a NAMUR perspective
F. Grümbe¹; ¹ Lanxess Deutschland GmbH, Köln/D & NAMUR/D

10:10 **KEYNOTE LECTURE**
Batch Performance - An Ethanol Process Optimization Journey
S. Dickerson¹; ¹ Novozymes, Raleigh/USA

10:50 **Exhibitor's Pitch 1 (Booth 1-9)**
M. Maiwald, BAM, Berlin/D

Room: Grand Ball/Amalienborg

PROCESS ANALYTICS IN REAL-WORLD APPLICATION I

Chair: N. Caillol, Axel' One, Solaize/FR

11:20 **Application of chemometric techniques to facilitate on-line monitoring of advanced nuclear fuel reprocessing**
C. McFarlan¹; A. Nordon¹; M. Sarsfield²; R. Taylor²; ¹ University of Strathclyde, Glasgow/UK; ² National Nuclear Laboratory, Sellafield/UK

11:45 **A process intensification approach for circular economy in the pulp and paper industry**
K. Wieland¹; B. Weiß¹; A. Schwaiger²; B. Lendl³; M. Harasek³; M. Kraft¹; ¹ Competence Center CHASE GmbH, Vienna/A; ² Sappi Europe, Gratkorn/A; ³ TU Wien, Vienna/A

12:10 **In-line FTIR spectroscopy to monitor the lignocellulosic waste stream feed of a continuous C.glutamicum bioprocess**
B. Kozma¹; D. Waldschitz²; Y. Bus¹; E. Karner¹; C. Herwig³; ¹ TU Wien, Wien/A; ² Technische Universität Wien, Vienna/A; ³ Technische Universität Wien, Wien/A

12:35 **Lunch at exhibition space**

PROGRAMME

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Room: Fredensborg/Schackenborg

ML SUPPORTED PROCESS MONITORING

Chair: I. Mage, Nofima, Oslo/NO

11:20 **Machine-learned digital phase switch for sustainable chemical production**
S. Teng¹; J. Jansen²; ¹ Radboud University, IMM, Nijmegen/NL; ² Radboud University, Nijmegen/NL

11:45 **Exploring the Impact of Experimental Conditions on the Accuracy of PINN-Based Soft Sensing Applications**
A. Tappe¹; C. Heiduk²; S. Scholl²; R. Schenkendorf¹; ¹ Harz University of Applied Sciences, Wernigerode/D; ² TU Braunschweig, Braunschweig/D

12:10 **Soft Sensor to Forecast Mooney Viscosity in an Industrial Rubber Production Process**
A. Botton¹; A. Ferrando²; F. Bonacini²; E. Mantovani²; G. Marchetti²; P. Facco¹; ¹ University of Padova, Padova/I; ² Versalis s.p.a., San Donato Milanese (MI)/I

12:35 **Lunch at exhibition space**

PROGRAMME

Monday, 8 May 2023

Room: Grand Ball/Amalienborg

Chair: C. Herwig, TU Wien/AT

13:40 **KEYNOTE LECTURE**
NIR hyperspectral in process lines. When is it needed?
 J. Amigo Rubio¹; ¹ IKERBASQUE/ES & University of the Basque Country UPV, Leioa/E

14:20 **KEYNOTE LECTURE**
Digital sensor technologies for Process Optimization
 M. Heisterkamp¹; ¹ Endress+Hauser Conducta GmbH+Co.KG, Gerlingen/D

Room: Grand Ball/Amalienborg

NOVEL PROCESS ANALYSIS TECHNOLOGIES I

Chair: I. Mage, Nofirma, Oslo/NO

15:00 **2D wavelets and multivariate statistical process control for endpoint detection of blending processes monitored by hyperspectral imaging**
 R. Rocha de Oliveira¹; M. Cocchi²; A. de Juan¹; ¹ Universitat de Barcelona, Barcelona/E;
² University of Modena and Reggio Emilia, Modena/I

15:25 **Hyperspectral incubator: A novel tool for high-throughput bioprocesses monitoring and screening based on spectral imaging**
 P. Mishra¹; M. Bekker¹; G. Otten¹; P. De Boer¹; D. van Seijst¹; ¹ Wageningen University & Research, Wageningen/NL

15:50 **Tracking of Resonant Frequencies in Microwave-Assisted Drying – Opportunities for Process Monitoring and Optimization**
 T. Sickert¹; N. Rudisile¹; V. Gaukel¹; ¹ Karlsruhe Institute of Technology (KIT), Karlsruhe/D

16:15 Coffee Break – walk-in to the vendors

16:45 **Poster Slam Group A** Room: Grand Ball/Amalienborg
 Chair: K. Dahlmann, aquila biolabs GmbH, Baesweiler/DE

Room: Grand Ball/Amalienborg

Room: Poster Exhibition

18:00 – 20:00 **EuroPACT Discussion Rounds**
 Chair: M. Gerlach, Bayer, Leverkusen/D & T. Eifert, COVESTRO/D

POSTER SESSION
 including snacks & drinks

PROGRAMME

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Room: Fredensborg/Schackenberg

PROCESS CONTROL & OPTIMIZATION

Chair: C. Herwig, TU Wien/AT

15:00 **On the Control and Economic Optimization of the Crystallization of Melt Emulsions**
 G. Kaysan¹; L. Elmlinger¹; H. Klyszcz-Nasko²; M. Kind¹; ¹ Karlsruher Institut für Technologie, Karlsruhe/D; ² Acmos Chemie KG, Bremen/D

15:25 **Real-time estimation of changing metabolic capacities of microbial cultures: The cases of adaption and degradation**
 J. Kager¹; F. Mueller²; P. Sinner²; C. Herwig²; C. Herwig²; ¹ Technical University of Denmark, Kemitec, 2800 Kongens Lyngby/DK; ² Vienna University of Technology, Vienna/A

15:50 **On/in-line monitoring of cleaning in place (CIP) operation using a passive acoustic emission (PAE) sensor technology**
 F. Alberini¹; A. Paglianti¹; ¹ University of Bologna, Bologna/I

16:15 Coffee Break – walk-in to the vendors

16:45 **Poster Slam Group B** Room: Fredensborg/Schackenberg
 Chair: D. Wood, Keit Spectrometers, Didcot/UK

Room: Grand Ball/Amalienborg

Room: Poster Exhibition

18:00 – 20:00 **EuroPACT Discussion Rounds**
 Chair: M. Gerlach, Bayer, Leverkusen/D & T. Eifert, COVESTRO/D

POSTER SESSION
 including snacks & drinks

PROGRAMME

Tuesday, 9 May 2023

Room: Grand Ball/Amalienborg

08:30 Registration & Exhibition Opening

08:55 **WELCOME**

T. Eifert, COVESTRO/D

*Chair: T. Eifert, COVESTRO/D*09:00 **KEYNOTE LECTURE****Implementation of automated learning for novel bioprocesses by combining well controlled high throughput experiments with analytical technologies**P. Neubauer¹; ¹ Technische Universität Berlin, Berlin/D09:40 **KEYNOTE LECTURE****eNose networks monitor ambient air industrial sites 24/7 to detect anomalous gas emissions that pose a risk of safety in the surrounding area**S. Bootsma¹; ¹ Comon Invent, Delft/NL10:20 **Exhibitor's Pitch 2 (Booth 10-18)**

M. Maiwald, BAM, Berlin/D

11:00 Coffee Break – walk-in to the vendors

Room: Grand Ball/Amalienborg

NOVEL PROCESS ANALYSIS TECHNOLOGIES II

*Chair: D. Littlejohn, University of Strathclyde, CPACT/UK*11:30 **Micro-Simulated Moving Bed Chromatography – Mass Spectrometry (μSMB-MS): Continuous On-line Sample Preparation for Process Analytical Technology**J. Diehm¹; L. Witting¹; F. Kirschhöfer¹; G. Brenner-Weiß¹; M. Franzreb¹; ¹ Karlsruhe Institute of Technology (KIT), Eggenstein-Leopoldshafen/D11:55 **Anomaly detection in fermentation processes by online GC-IMS exhaust gas monitoring and chemometrics**J. Christmann¹; S. Rohn²; P. Weller¹; ¹ Hochschule Mannheim, Mannheim/D; ² Technische Universität Berlin, Berlin/D12:20 **In-line Determination of Diastereomeric α-Amino Acids by Benchtop NMR**L. Schmidt¹; L. Jolly²; H. Gröger²; L. Hennecke¹; A. Liese¹; ¹ Hamburg University of Technology (TUHH), Hamburg/D; ² University of Bielefeld, Bielefeld/D

12:45 Lunch at exhibition space

PROGRAMME

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08:30 Registration & Exhibition Opening

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M. Maiwald, BAM, Berlin/D

11:00 Coffee Break – walk-in to the vendors

Room: Fredensborg/Schackenberg

PROCESS MODEL LIFECYCLING

*Chair: M. Grosso, University of Cagliari/IT*11:30 **Accelerating machine learning-based soft-sensor construction via transfer learning**S. Kay¹; M. Mowbray¹; H. Kay¹; A. Lane²; C. Mendoza²; P. Martin¹; D. Zhang¹; ¹ University of Manchester, Manchester/UK; ² Unilever Research Port Sunlight, Bebington/UK11:55 **Bioprocessing in the Digital Age: from Process Models, through the Integration of Machine Learning, to Digital Twins**M. von Stosch¹; ¹ DataHow AG, Zurich/CH12:20 **Optimization-based modeling for efficient data utilization in Process Analytical Technology applications**C. Kappatou¹; J. Odgers¹; S. García-Muñoz²; R. Misener¹; ¹ Imperial College London, London/UK; ² Eli Lilly & Company, Indianapolis/USA

12:45 Lunch at exhibition space

PROGRAMME

Tuesday, 9 May 2023

Room: Grand Ball/Amalienborg

13:30 **PAT Award for Young Scientists sponsored by Knick** **Knick** *Chair: M. Grosso, University of Cagliari/IT*13:40 **KEYNOTE LECTURE**
Smart spectroscopic sensors contribute to an efficient and sustainable food industry
J. Wold¹; ¹ Nofima, Ås/D14:20 **KEYNOTE LECTURE**
Ready? Or not ready? Old and new modelling approaches in dairy process monitoring and control
E. Szymanska¹; ¹ FrieslandCampina, /NL15:00 **Exhibitor's Pitch 3 (Booth 18-25)**
M. Maiwald, BAM, Berlin/D

15:40 Coffee Break – walk-in to the vendors

Room: Grand Ball/Amalienborg

PROCESS ANALYTICS IN REAL-WORLD APPLICATION II*Chair: N. Caillol, Axel' One, Solaize/FR*16:20 **PAT as backbone for a small-scale Continuous Manufacturing line**
S. Busche¹; ¹ Merck Healthcare KGaA, Darmstadt/D16:45 **Determination of stem cell pluripotency in spent cultivation media by Raman spectroscopy**
J. Hagedorn¹; C. Halloin¹; E. Skibsted¹; L. Poulsen¹; M. Hedegaard²; ¹ Novo Nordisk A/S, Måløv/DK; ² University of Southern Denmark, Odense/DK17:10 **Implementation of Process Analytical Technologies in Continuous Direct Compression (CDC)**
S. Matrali¹; P. Deamer¹; R. Walker¹; E. Lavialle¹; M. Cannon¹; A. Benedetti¹; ¹ GSK, Ware/UK17:35-
18:00 **PAT and integrated analytics for continuous API manufacturing**
B. Hogan¹; ¹ Pfizer, Sandwich/UK19:00 **Conference Dinner at the Scandic Hotel** (19:00 – 23:00)

PROGRAMME

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M. Maiwald, BAM, Berlin/D

15:40 Coffee Break – walk-in to the vendors

Room: Fredensborg/Schackenborg

ADVANCES IN PROCESS CHEMOMETRICS*Chair: J. Jansen, Radboud University Nijmegen/NL*16:20 **Why is Chemometrics so important in Pharmaceutical applications?**
A. Massei¹; N. Cavallini²; D. Fissore²; F. Savorani²; N. Falco³; ¹ Merck S.p.A. / Politecnico di Torino, Torino/I; ² Politecnico di Torino, Torino/I; ³ Merck Serono S.p.A., Guidonia Montecelio/I16:45 **A structured approach to implementation of loading space standardisation for temperature correction of spectra**
M. Chong¹; A. Parrott¹; F. Montes²; G. Sin²; A. Nordon¹; ¹ University of Strathclyde, Glasgow/UK; ² DTU, Kongens Lyngby/DK17:10 **Overcoming the cage of co-variance in PAT applications – examples from whey ingredient production**
P. Skou¹; E. Hosseini²; J. Ghasemi²; A. Smilde³; C. Eskildsen⁴; ¹ Arla Foods Ingredients, Videbæk/DK; ² University of Tehran, Tehran/IR; ³ University of Amsterdam, Amsterdam/NL; ⁴ Imperial College London, London/UK17:35-
18:00 **Calibration free kinetic modeling of a Sonogashira coupling reaction in a continuous-flow microreactor**
L. Schulz¹; T. Röder¹; N. Kockmann²; ¹ Mannheim University of Applied Sciences - Institute of Chemical Process Engineering, Mannheim/D; ² TU Dortmund University, Dortmund/D19:00 **Conference Dinner at the Scandic Hotel** (19:00 – 23:00)

PROGRAMME

Wednesday, 10 May 2023

Room: Grand Ball/Amalienborg

08:55 **WELCOME***Chair: T. Eifert, COVESTRO/D*

09:00 **KEYNOTE LECTURE**
Variable selection of spectroscopy data in multivariate statistical process monitoring for fault detection and diagnosis
 I. Jul-Jørgensen¹; C. Hundahl²; K. Gernaey³; P. Facco⁴; M. Barolo⁴; ¹ DTU/Novo Nordisk, Kgs. Lyngby/DK; ² Novo Nordisk A/S, Bagsværd/DK; ³ DTU, Kgs. Lyngby/DK; ⁴ University of Padova, Padova/I

09:40 **KEYNOTE LECTURE**
Scalable Continuous Photochemical and Electrochemical Reactions: Reactors and PAT challenges and Current Gaps and Future Opportunities - from Picoseconds to Tonnes
 M. George¹; ¹ University of Nottingham, Nottingham/UK

10:20 **Coffee Break – walk-in to the vendors**

Room: Grand Ball/Amalienborg

NOVEL PROCESS ANALYSIS TECHNOLOGIES III

Chair: J. Jansen, Radboud University Nijmegen/NL

11:00 **Optofluidic Force Induction as Process Analytical Technology**
 M. Šimić¹; C. Neuper²; D. Auer³; C. Hill³; U. Hohenester⁴; ¹ University of Graz/Brave Analytics GmbH, Graz/A; ² Graz University of Technology/Brave Analytics GmbH, Graz/A; ³ Medical University of Graz/Brave Analytics GmbH, Graz/A; ⁴ University of Graz, Graz/A

11:25 **Direct Inline Characterization of Microalgae and Contaminant Species for Biomanufacturing**
 J. Scouten¹; M. Münzberg¹; R. Störandt²; S. Schönfelder²; J. Emmerich³; R. Panckow³; ¹ University of Potsdam, Potsdam/D; ² Institute for Food and Environmental Research e.V., Bad Belzig/D; ³ SOPAT GmbH, Berlin/D

11:50 **In situ monitoring of crystallizations through Spatially Resolved Spectroscopy : Difficulties of predicting physical descriptors**
 R. Kersaudy¹; E. Gagnière¹; D. Colson¹; N. Caillol²; D. Mangin¹; ¹ University Claude Bernard Lyon 1, Villeurbanne/F; ² Axel'One, Solaize/F

12:15 **Online monitoring of Polymorphic transitions in suspensions using Raman and NIR spectroscopic techniques**
 N. Caillol¹; ¹ Axel'one, Solaize/F

12:40 **Poster Prize, Closing** (12:40 – 13:15)
 Lunch Packages will be served

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10:20 **Coffee Break – walk-in to the vendors**

Room: Fredensborg/Schackenberg

ADVANCES IN PROCESS MONITORING

Chair: D. Littlejohn, University of Strathclyde, CPACT/UK

11:00 **Deep learning-based non-intrusive detection of instabilities in formulated liquids**
 M. De Micco¹; F. Zonfrilli²; V. Guida²; M. Villone¹; G. Poggi¹; L. Verdoliva¹; ¹ University of Naples Federico II, Naples/I; ² The Procter and Gamble Company, Brussels/B

11:25 **Comparison of methods for variable time-delay estimation in industrial data**
 M. Cattaldo¹; A. Ferrer Riquelme²; I. Måge¹; ¹ Nofima, Ås/N; ² Universitat Politècnica de València, València/E

11:50 **Data-Driven Optimization of operation and maintenance of Process Analyzer Technology (PAT)**
 L. Bimmerle¹; ¹ Siemens AG, Karlsruhe/D

12:15 **Use of NOA for monitoring and optimization**
 R. Roßmann¹; D. Marszallek²; ¹ Bayer AG, Dormagen/D; ² Bayer AG, Leverkusen/D

Room: Grand Ball/Amalienborg

12:40 **Poster Prize, Closing** (12:40 – 13:15)
 Lunch Packages will be served

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POSTER

PROCESS ANALYTICS IN REAL-WORLD APPLICATION

- P 1.01. **Development of in-line Spectroscopy in a Continuous Chemical Production to Analyze Samples with Unstable Intermediates.**
M. Balsam¹; ¹ Bayer AG, Dormagen/D
- P 1.03. **Simultaneously In-Line Monitoring of Tablet Hardness, Density and Porosity: Application of CIELAB Color Space**
R. Brands¹; N. Tebart¹; J. Bartsch¹; M. Thommes¹; ¹ TU Dortmund University, Dortmund/D
- P 1.04. **Process Intensification in Lab Enriches Process Understanding at Scale**
S. Kasakov¹; ¹ Lonza, Bern/CH
- P 1.05. **Determination of Pollutants in Untreated Smoke Gases**
C. Buck¹; J. Mannhardt²; J. Mannhardt²; ¹ Dr. Buck Prozess- und Onlineanalytik, Darmstadt/D; ² iSud Solutions GmbH, Eschach/D
- P 1.06. **From biomass to levulinic acid: Inline reaction monitoring by mid-IR spectroscopy in harsh conditions of a thermochemical lignocellulosic biorefinery**
A. Echtermeyer¹; J. Viell¹; ¹ RWTH Aachen University, Aachen/D
- P 1.07. **Case studies in choosing the right chemometric technique for the customer's needs: a hierarchy of complexity**
J. Speed¹; A. Wilson¹; ¹ Keit Spectrometers, Oxford/UK
- P 1.09. **Online Near Infrared and FTIR analyser solutions for petrochemical processing**
H. Buytaert¹; ¹ Process Insights, Frankfurt/D
- P 1.11. **Application of Novel BlazePAT for Drug Substance and Drug Product Manufacturing. Multiple Best-in-Class PAT in a Single Probe.**
C. Callahan¹; P. Cholewa²; R. Becker³; ¹ BlazeMetrics, Edinburgh/UK; ² BlazeMetrics, Wrocław/PL; ³ BlazeMetrics, Seattle/USA
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