

# PROGRAMME



## 2<sup>nd</sup> European Conference on Process Analytics and Control Technology

April 26- 29, 2011, Glasgow/UK

[www.euro-pact.org](http://www.euro-pact.org)



(Programme as of December 16, 2010, subject to change)

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## Invitation

EuroPACT 2011 is the second European Conference on Process Analytics and Control Technology. The conference will cover new technologies in process analytics, the implementation of these technologies in various fields and the transformation of data into knowledge. The conference will be supported by an exhibition of instrumentation, applications and data evaluation tools.

EuroPACT 2011 provides a meeting and a discussion forum for scientists and users of process analytics from academia and industry. The conference programme will include plenary and keynote lectures and discussion during poster sessions. One day of Pre-Conference Courses will provide a good introduction to the field for newcomers and advance the knowledge of existing practitioners.

The conference will be held at the Thistle Hotel in Glasgow, UK. An attractive social programme will accompany the scientific programme. Altogether the environment offers a warm atmosphere for stimulating discussions and exchange of experiences.

## Organising Groups

**CPACT** Centre for Process Analytics and Control Technology

**ARBEITSKREIS PROZESSANALYTIK** Working Group Process Analytics

**DECHEMA** Society for Chemical Engineering and Biotechnology e.V.

**GDCh** German Chemical Society e.V.

**KNCV** Koninklijke Nederlandse Chemische Vereniging

**APACT** Advances in Process Analytics and Control Technology

**NAMUR** User Association for Automation in Process Industries

**EUFEPS** European Federation for Pharmaceutical Sciences

**ISPE** International Society for Pharmaceutical Engineering









**EuPAT** Conference Series

## Scientific Committee

Dr. Pieter K. de Bokx	Philips Research MiPlaza, Eindhoven/NL
Dr. Staffan Folestad	AstraZeneca, Mölndal/S
Dr. Wolf-Dieter Hergeth	Wacker Chemie AG, Burghausen/D
Prof. Dr. Anna de Juan Capdevila	University of Barcelona/ES
Prof. Dr. Rudolf W. Kessler	Reutlingen University/D
Hans H. Lindén	EUFEPS European Federation for Pharmaceutical Sciences, Stockholm/S
Prof. Dr. David Littlejohn	University of Strathclyde, Glasgow/UK
Dr. Leo Nick	DECHEMA e.V., Frankfurt am Main/D
Dr. Dirk Steinmüller	Knick Elektronische Messgeräte GmbH & Co. KG, Berlin/D
Prof. Dr. Romà Tauler	Spanish National Research Council (CSIC), Barcelona/ES

## Exhibitors

The following companies will participate in the exhibition (as of December 16, 2010). Further companies which are interested in the exhibition please contact the conference office.

<p><b>Clairet Scientific Ltd.</b></p> 	<p><b>Fibre Photonics Ltd.</b></p> 
<p><b>J &amp; M Analytik AG</b></p> 	<p><b>Mettler Toledo Ltd.</b></p> 
<p><b>Polytec GmbH</b></p> 	<p><b>Sartorius AG</b></p> 
<p><b>Scottish Enterprise</b></p> 	<p><b>Umetrics</b></p> 

## Sponsors

We thank the following companies for their support.

<p><b>Clairet Scientific Ltd.</b></p> 	<p><b>J &amp; M Analytik AG</b></p> 
<p><b>Polytec GmbH</b></p> 	<p><b>Sartorius AG</b></p> 
<p><b>Scottish Enterprise</b></p> 	

## Programme at a Glance

<b>Tuesday, April 26</b>	
09:00	Registration for Course Participants
09:30-13:00	Pre-Conference Course 1: R. Tauler, CSIC, Barcelona/ES Multivariate Resolution
09:30-13:00	Pre-Conference Course 2: J. von Frese, Data Analysis Solutions DA-SOL GmbH, Greifenberg/D Support Vector Machines: Non-linear Modelling Made Easy
09:30-13:00	Pre-Conference Course 3: EUFEPS organised course Control based Quality by Design (QbD)
13:00-14:00	Lunch for Course Participants
14:00-17:30	Pre-Conference Course 4: R. Bro, University of Copenhagen, Frederiksberg/DK Introduction to PCA and PLS
14:00-17:30	Pre-Conference Course 5: M. Stintz, TU Dresden/D; B. Looser, Malvern Instruments Ltd./UK; I. Haley, Mettler-Toledo Ltd./UK Particle Measuring Techniques for Reaction Monitoring
14:00-17:30	Pre-Conference Course 6: W. Kessler, Steinbeis Transferzentrum, Reutlingen/D Design of Experiments (DoE) for Product and Process Optimization
14:00-17:30	Pre-Conference Course 7: R.W. Kessler, Reutlingen University/D Hyperspectral Chemical Imaging for Process Analytics
Chair:	D. Littlejohn, University of Strathclyde, Glasgow/UK
19:30-21:00	Welcome Reception at Thistle Hotel (with refreshments) & Evening Lecture 20:00 Evening Lecture J. Brückner, Max Planck Institute for Chemistry, Mainz/D Two robotic rovers on the red planet: application of in-situ analytical methods for the exploration of the martian surface
18:00-20:00	Set-up exhibition/posters

## Programme at a Glance

Wednesday, April 27		
08:00	Registration	
08:45	Opening	
Chair:	S. Folestad, AstraZeneca R&D, Mölndal/S	
09:00	Plenary Lecture W. Oostr, A. Gerich, MSD, Oss/NL PAT, from feasibility to real control, a bumpy road	
09:45	Plenary Lecture R. Bro, University of Copenhagen, Frederiksberg/DK Chemometrics - enabling technology and a driver for process analysis	
10:30	Coffee Break	
Session	Process Chemometrics	PAT in Pharmaceutical Industries
Chairs:	R. Tauler, CSIC, Barcelona/ES	S. Folestad, AstraZeneca R&D, Mölndal/S
11:00-11:30	A. Mason	J.C. Menezes
11:30-12:00	P. Van den Kerkhof	P. Hamilton
12:00-12:30	A. McIntyre	S. Pieters
12:30-13:00	O. Preisner	I. Clegg
13:00-14:00	Lunch	
14:00-15:15	Poster Session 1 (including tea/coffee)	
Chair:	H.H. Lindén, EUFEPS European Federation for Pharmaceutical Sciences, Stockholm/S	
15:15	Plenary Lecture T. Page, GEA Pharma Systems Ltd. Advances in monitoring and control of continuous tablet manufacturing systems	
Session	Advances in Control of Continuous Manufacturing	Innovations in Process Analysers and Sensor Technology
Chairs:	H.H. Lindén, EUFEPS European Federation for Pharmaceutical Sciences, Stockholm/S	D. Steinmüller, Knick Elektronische Meßgeräte GmbH & Co.KG, Berlin/D
16:00-16:30	J. Paaso	J. Davies
16:30-17:00	G. Oppong	V. Artyushenko
17:00-17:30	G. Yi	J. Herbst
19:00-21:00	Civic Reception in Glasgow City Chambers (including food)	

## Programme at a Glance

Thursday, April 28		
Chair:	W.-D. Hergeth, Wacker Chemie AG, Burghausen/D	
08:30	Plenary Lecture R. Luttmann, Hamburg University of Applied Sciences/D Novel process design in production of cell recombinant proteins	
09:15	Plenary Lecture M. Graeber, M. Heine, B. Conde-Petit, Buhler AG, Uzwil/CH Challenges in process analytics and control in food and feed processing	
10:00	Coffee Break	
Session	Novel Applications of Process Analytics in Chemical Industry	PAT in Pharmaceutical Industries
Chairs:	W.-D. Hergeth, Wacker Chemie AG, Burghausen/D	S. Folestad, AstraZeneca R&D, Mölndal/S
10:30-11:00	S. Hardy	D.M. Koller
11:00-11:30	S. Langridge	V Rimpilainen
11:30-12:00	C.B. Minnich	J. Sefcik
12:00-12:30	R. Hass	S. Folestad
12:30-13:00	D. Wilsdon	S. Bragg
13:00	Lunch	
14:00-15:15	Poster Session 2 (including tea & coffee)	
Chair:	D. Littlejohn, University of Strathclyde, Glasgow/UK	
15:15	Plenary Lecture P. Berghäuser, Siemens AG, Karlsruhe/D Combining process analyzers with smart NeSSI-based sampling systems: new opportunities to improve the intelligence of the complete solution	
Session	Novel Applications of Process Analytics in Biotechnology Industry	Innovations in Process Analysers and Sensor Technology
Chairs:	D. Littlejohn, University of Strathclyde, Glasgow/UK	D. Steinmüller, Knick Elektronische Meßgeräte GmbH & Co.KG, Berlin/D
16:00-16:30	B. Joksch	R. Lehnig
16:30-17:00	S. Birle	R.W. Kessler
17:00-17:30	J.J. Müller	S. Hoche
17:30-18:00	G. Striedner	A. Nordon
19:30	Dinner at Barony Hall	

## Programme at a Glance

Friday, April 29		
Chair:	R.W. Kessler, Reutlingen University/D	
08:45	Plenary Lecture J.A. Fernández Pierna, Centre Wallon de Recherches Agronomiques, Gembloux/B Integration of chemometric processing tools for the study of hyperspectral imaging data	
Session	Chemical Imaging and Process Tomography	Novel Process Design and Control Strategies
Chairs:	R.W. Kessler, Reutlingen University/D	P.K. de Bokx, Philips Research MiPlaza, Eindhoven, NL
09:30-10:00	S. Wöckel	G. Gins
10:00-10:30	M. Toiviainen	S. Mühlbeyer
10:30	Coffee Break	
Session	Chemical Imaging and Process Tomography	Novel Process Design and Control Strategies
11:00-11:30	E. Ostertag	D. Suzzi
11:30-12:00	L. Gradinarsky	N.A.F. Abdul Samad
12:00-12:30	F. Aiouache	C. McCready
Chair:	W.-D. Hergeth, Wacker Chemie AG, Burghausen/D	
12:30	Plenary Lecture I.A. Mariz, J.C. de la Cal, <u>J.R. Leiza</u> , The University of the Basque Country, Donostia-San Sebastian/E Process monitoring and control of emulsion polymerization reactors: a knowledge based strategy to the synthesis of high solids content latexes	
13:15	Poster Prize, Siemens Prize, Closing	
13:30	Lunch	

## Invited Speakers

Peter Berghäuser, Siemens AG, Karlsruhe/D

**Combining process analyzers with smart NeSSI-based sampling systems: new opportunities to improve the intelligence of the complete solution**

Rasmus Bro, University of Copenhagen, Frederiksberg/DK

**Chemometrics - enabling technology and a driver for process analysis**

Johannes Brückner, Max Planck Institute for Chemistry, Mainz/D

**Two robotic rovers on the red planet: application of in-situ analytical methods for the exploration of the martian surface**

M. Graeber, M. Heine, Beatrice Conde-Petit, Buhler AG, Uzwil/CH

**Challenges in process analytics and control in food and feed processing**

Juan Antonio Fernandez Pierna, Walloon Agricultural Research Centre (CRA-W), Gembloux/B

**Integration of chemometric processing tools for the study of hyperspectral imaging data**

I.A. Mariz, J.C. de la Cal, Jose Ramon Leiza, The University of the Basque Country, Donostia-San Sebastian/E

**Process monitoring and control of emulsion polymerization reactors: a knowledge based strategy to the synthesis of high solids content latexes**

Reiner Luttmann, Hamburg University of Applied Sciences HAW/D

**Novel process design in production of recombinant proteins**

Wim Oostra, A. Gerich, MSD, Oss/NL

**PAT, from feasibility to real control, a bumpy road**

Trevor Page, GEA Pharma Systems Ltd.

**Advances in monitoring and control of continuous tablet manufacturing systems**

## Pre-Conference Courses

Tuesday, April 26

- 1) Multivariate Resolution**  
Romà Tauler, CSIC, Barcelona/ES
- 2) Support Vector Machines: Non-linear Modelling Made Easy**  
Jürgen von Frese, Data Analysis Solutions DA-SOL GmbH, Greifenberg/D
- 3) Control based Quality by Design (QbD)**  
EUFEPS organised course
- 4) Introduction to PCA and PLS**  
Rasmus Bro, University of Copenhagen, Frederiksberg/DK
- 5) Particle Measuring Techniques for Reaction Monitoring**  
Michael Stintz, TU Dresden/D; Bernd Looser, Malvern Instruments Ltd./UK; Ian Haley, Mettler-Toledo Ltd./UK
- 6) Design of Experiments (DoE) for Product and Process Optimization**  
Waltraud Kessler, Steinbeis Transferzentrum, Reutlingen/D
- 7) Hyperspectral Chemical Imaging for Process Analytics**  
Rudolf W. Kessler, Reutlingen University/D

Detailed description of each pre-conference course can be found on the internet at [www.euro-pact.org](http://www.euro-pact.org). Separate registration will be necessary: Extra fee GBP 100 (students GBP 50). Participation is only possible for conference ticket holders.

## Scientific Lecture Programme

*Tuesday, April 26, 2011*

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09:00	Registration for Course Participants
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Wednesday, April 27, 2011

08:00	Registration	
08:45	Opening	
Chair:	S. Folestad, AstraZeneca R&D, Mölndal/S	
09:00	<b>Plenary Lecture "PAT in Pharmaceutical Industries"</b> <b>PAT, from feasibility to real control, a bumpy road</b> <u>W. Oostra</u> , A. Gerich, MSD, Oss/NL	
09:45	<b>Plenary Lecture "Process Chemometrics"</b> <b>Chemometrics - enabling technology and a driver for process analysis</b> R. Bro, University of Copenhagen, Frederiksberg/DK	
10:30	Coffee Break	
	Process Chemometrics	PAT in Pharmaceutical Industries
Chair:	R. Tauler, Spanish National Research Council (CSIC), Barcelona/ES	Chair: S. Folestad, AstraZeneca R&D, Mölndal/S
11:00	<b>Practical developments in process data mining</b> A. Mason, AJM Consulting Services Ltd., Grimsby/UK	<b>11:00 From process-centered to product-centered QbD: a rationale for design and implementations of QbD and PAT in manufacturing</b> J.C. Menezes, Lisbon University/P
11:30	<b>Fault detection and diagnosis performance assessment for (bio)chemical batch processes</b> <u>P. Van den Kerkhof</u> , G. Gins, J. Vanlaer, J.F.M. Van Impe, Katholieke Universiteit Leuven, Heverlee/B	<b>11:30 Studies in powder drying using <i>in situ</i> Raman spectrometry and off-line particle size analysis</b> <u>P. Hamilton</u> , A. Nordon, D. Littlejohn, J. Sefcik, University of Strathclyde, Glasgow/UK; P. Slavin, GlaxoSmithKline, Irvine/UK; P. Dallin, J. Andrews, Claires Scientific, Northampton/UK
12:00	<b>A comparison of calibration transfer algorithms for mid-infrared analysis using <i>in situ</i> ATR immersion probes</b> <u>A. McIntyre</u> , A. Nordon, D. Littlejohn, University of Strathclyde, Glasgow/UK; G. Colquhoun, V. Artyushenko, Fibre Photonics Ltd., Livingston/UK	<b>12:00 Near infrared and Raman spectroscopy as PAT tools to in-line and real-time monitor the conformational state of therapeutic proteins during freeze-drying</b> <u>S. Pieters</u> , Free University of Brussels (VUB)/B; T.R.M. De Beer, Ghent University/B; J. Kasper, W. Friess, University of Munich/D; Y. Vander Heyden, Free University of Brussels (VUB)/B
12:30	<b>Prototype methodologies for model-based scale-up</b> <u>O. Preisner</u> , J. Morris, Newcastle University, Newcastle upon Tyne/UK; J. Cooper, R. Verlinden, Centre for Process Innovation, Wilton/UK	<b>12:30 Practical aspects of operating PAT systems in a pilot development facility including a worked example of API process development and scale up</b> M.L. Yeow, <u>I. Clegg</u> , Pfizer Global Research and Development, Sandwich/UK
13:00	Lunch	
14:00	Poster Session 1 (including tea/coffee)	

Chair: H.H. Lindén, EUFEPS European Federation for Pharmaceutical Sciences, Stockholm/S			
15:15	<b>Plenary Lecture “Advances in Control of Continuous Manufacturing”</b> <b>Advances in monitoring and control of continuous tablet manufacturing systems</b> T. Page, GEA Pharma Systems Ltd.		
	<table border="1"> <tr> <td>Advances in Control of Continuous Manufacturing</td> <td>Innovations in Process Analysers and Sensor Technology</td> </tr> </table>	Advances in Control of Continuous Manufacturing	Innovations in Process Analysers and Sensor Technology
Advances in Control of Continuous Manufacturing	Innovations in Process Analysers and Sensor Technology		
Chair: H.H. Lindén, EUFEPS European Federation for Pharmaceutical Sciences, Stockholm/S	Chair: D. Steinmüller, Knick Elektronische Meßgeräte GmbH & Co.KG, Berlin/D		
16:00	<b>Novel optical measurement tools for continuous pharmaceutical manufacturing</b> <u>J. Paaso</u> , VTT Technical Research Centre of Finland, Oulu/FIN; M. Toiviainen, C. Finta, P. Teppola, VTT Technical Research Centre of Finland, Kuopio/FIN; M. Järvinen, K. Järvinen, University of Eastern Finland, Kuopio/FIN; A. Vanarase, F. Muzzio, Rutgers University, Piscataway, NJ/USA; J. Suhonen, VTT, Oulu/FIN; M. Juuti, VTT, Kuopio/FIN		
16:00	<b>An ultra-compact Fourier-Transform Spectrometer based on a novel static optical configuration</b> <u>J. Davies</u> , H. Mortimer, STFC Rutherford Appleton Laboratory, Didcot/UK		
16:30	<b>Multivariable control for anaerobic digestion processes: a simulation study</b> <u>G. Opong</u> , M. O'Brien, M. McEwan, Perceptive Engineering Ltd., Daresbury/UK; G.A. Montague, E.B. Martin, Newcastle University/UK		
16:30	<b>Fibre probes with CIP-interfaces for process-spectroscopy in spectral range from 180nm to 18µm</b> <u>V. Artyushenko</u> , J. Bollmann, Fibre Photonics Ltd., Berlin/D; G. Colquhoun, Fibre Photonics Ltd., Livingston/UK; G. Danielyan, A.R.T. Photonics GmbH, Berlin/D; J. Mannhardt, Fibre Photonics Ltd., Berlin/D; T. Sakharova, A.R.T. Photonics GmbH, Berlin/D		
17:00	<b>Intelligent process monitoring in large scale processing</b> <u>G. Yi</u> , J. Zhang, J. Morris, Newcastle University, Newcastle upon Tyne/UK		
17:00	<b>Process gas laser spectrometer using quantum cascade laser at 14µm</b> <u>J. Herbst</u> , B. Scherer, F. Singer, A. Lambrecht, FhI for Physical Measurement Techniques, Freiburg/D; C. Rathke, S. Filip, J. Kappler, ABB Automation GmbH, Frankfurt am Main/D; P. Fuchs, J. Koeth, Nanoplus GmbH, Gerbrunn/D; J. Friedl, T. Schlereth, J. Semmel, S. Höfling, L. Worschech, A. Forchel, Universität Würzburg/D		
19:00-21:00	<b>Civic Reception in Glasgow City Chambers</b> (including food)		

Thursday, April 28, 2011

Chair: W.-D. Hergeth, Wacker Chemie AG, Burghausen/D

08:30 **Plenary Lecture** “Novel Applications of Process Analytics in Chemical and Biotechnology Industry”  
**Novel process design in production of recombinant proteins**  
R. Luttmann, HAW Hamburg University of Applied Sciences/D

09:15 **Plenary Lecture** “Control in Food and Beverage Industry”  
**Challenges in process analytics and control in food and feed processing**  
M. Graeber, M. Heine, B. Conde-Petit, Buhler AG, Uzwil/CH

10:00 Coffee Break

Novel Applications of Process Analytics in Chemical Industry		PAT in Pharmaceutical Industries	
Chair: W.-D. Hergeth, Wacker Chemie AG, Burghausen/D		Chair: S. Folestad, AstraZeneca R&D, Mölndal/S	
10:30	<b>Online spectroscopy under high pressure for reaction monitoring</b> <u>S. Hardy</u> , S. Winterle, M.A. Liauw, RWTH Aachen University/D	10:30	<b>Spatially resolved process monitoring with spectroscopic PAT-tools</b> <u>D.M. Koller</u> , N. Balak, O. Scheibelhofer, S.D. Fraser, J.G. Khinast, Research Center Pharmaceutical Engineering GmbH, Graz/A
11:00	<b>New photometric techniques for multicomponent measurement in the Hydrocarbon Processing (HPI) and Associated Industries</b> S. Langridge, Ametek Process and Analytical Instruments, Pittsburgh, PA/USA	11:00	<b>Monitoring of high-shear mixing and granulation with electrical capacitance tomography</b> <u>V. Rimpiläinen</u> , L.M. Heikkinen, T. Savolainen, M. Vauhkonen, S. Poutiainen, J. Ketolainen, University of Eastern Finland, Kuopio/FIN
11:30	<b>Real-time monitoring of distillation processes with fibre-optic mid-infrared (MIR) spectroscopy</b> <u>C.B. Minnich</u> , S-PACT GmbH, Aachen/D; D. Engel, W. Marquardt, RWTH Aachen University/D; L. Greiner, DECHEMA e.V., Frankfurt am Main/D	11:30	<b>Monitoring of polymorphic outcome in cooling and antisolvent crystallisation under various flow conditions</b> K.J. Sypek, U. Schacht, <u>J. Sefcik</u> , A.J. Florence, A. Nordon, D. Littlejohn, University of Strathclyde, Glasgow/UK
12:00	<b>Process monitoring of polymerization reactions by photon density wave spectroscopy</b> <u>R. Hass</u> , O. Reich, Potsdam University/D	12:00	<b>Design and optimization of PAT sensor interfacing to processes based on CFD simulations</b> L. Gradinarsky, J. Remmelgas, I. Niklasson-Björn, <u>S. Folestad</u> , AstraZeneca R&D, Mölndal/S
12:30	<b>In-situ measurement of pigment dispersions using optical spectroscopy</b> <u>D. Wilsdon</u> , A. Nordon, D. Littlejohn, S. Thennadil, University of Strathclyde, Glasgow/UK; J. Johnson, R. McIntyre, E. Polwart, Fujifilm Imaging Colorants, Grangemouth/UK	12:30	<b>Design considerations and best practices, for the implementation of a fluorescence spectrophotometer in laboratory and plant Pharma PAT</b> <u>S. Bragg</u> , Expo Technologies, St. Louis, MO/USA; C. Dye, Expo Technologies, Cambridge/UK
13:00	Lunch		

14:00 **Poster Session 2** (including tea/coffee)

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

15:15 **Plenary Lecture** "Innovations in Process Analysers and Sensor Technology"  
**Combining process analyzers with smart NeSSI-based sampling systems: new opportunities to improve the intelligence of the complete solution**  
P. Berghäuser, Siemens AG, Karlsruhe/D

Novel Applications of Process Analytics in Biotechnology Industry

Innovations in Process Analysers and Sensor Technology

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

Chair: D. Steinmüller, Knick Elektronische Meßgeräte GmbH & Co.KG, Berlin/D

16:00 **Bioprocesses: trends, process analytical technologies and optimization**  
B. Jokschi, C. Grimm, M. Rahe, Sartorius AG, Göttingen/D

16:00 **Miniaturization of process analyzers**  
A. Schocker, K. Rebner, R. Lehnig, BASF SE, Ludwigshafen/D

16:30 **Novel approach for controlling brewers' yeast propagation process using a fuzzy logic-based expert system**  
S. Birle, M.A. Hussein, T. Becker, TU München, Freising/D

16:30 **Stray light - and photon diffusion spectroscopy - a new tool to separate chemical from morphological information**  
R.W. Kessler, K. Rebner, B. Boldrini, Reutlingen University/D; W. Kessler, STZ ProcessControl, Reutlingen/D; D. Oelkrug, University of Tuebingen/D

17:00 **Inline FT-IR in high viscous multiphase systems - reaction monitoring and mass transport determination**  
J.J. Müller, L. Hilterhaus, Hamburg University of Technology/D;  
B. Wittkamp, Mettler-Toldeo AutoChem Inc., Columbia, MD/USA;  
M. Adamczyk, Mettler-Toledo GmbH, Gießen/D; M. Eckstein,  
O. Thum, Evonik Goldschmidt GmbH, Essen/D; A. Liese, Hamburg University of Technology/D

17:00 **Ultrasound based density determination via specific acoustic impedance: review and validation of methods**  
S. Hoche, M.A. Hussein, T. Becker, TU München, Freising/D

17:30 **Implementation of Proton Transfer Reaction - Mass Spectrometry (PTR-MS) as tool in bioprocess monitoring - measurement of volatile components in the bioreactor exhaust gas**  
G. Striedner, M. Luchner, University of Applied Life Sciences and Natural Resources, Vienna/A; R. Gutmann, Ionimed Analytic GmbH, Innsbruck/A; A. Hansel, K. Bayer, University of Applied Life Sciences and Natural Resources, Vienna/A

17:30 - 18:00 **Factors affecting the production of broadband acoustic emission signals and their use in particle characterisation**  
A. Nordon, N. Townshend, Y. Carella, D. Littlejohn, M. Tramontana, A. Gachagan, G. Hayward, University of Strathclyde, Glasgow/UK

19:30 **Dinner at Barony Hall**

Friday, April 29, 2011

Chair: R.W. Kessler, Reutlingen University/D

**Plenary Lecture “Chemical Imaging and Process Tomography”**  
**Integration of chemometric processing tools for the study of hyperspectral imaging data**  
J.A. Fernandez Pierna, Walloon Agricultural Research Centre (CRA-W), Gembloux/B

Chemical Imaging and Process Tomography

Novel Process Design and Control Strategies

Chair: R.W. Kessler, Reutlingen University/D

Chair: P.K. de Bokx, Philips Research MiPlaza, Eindhoven, NL

09:30 **Enhanced signal analysis for clamp-on ultrasonic applications with complex multimodal wave propagation**  
S. Wöckel, U. Hempel, J. Auge, ifak e.V./D

09:30 **Online quality prediction and disturbance discrimination in (bio)chemical batch processes**  
G. Gins, J. Vanlaer, J.F.M. Van Impe, Katholieke Universiteit Leuven, Heverlee (Leuven)/B

10:00 **Inline monitoring of pharmaceutical tableting by real-time chemical imaging**  
M. Toiviainen, VTT Technical Research Centre of Finland, Kuopio/FIN; J. Paaso, VTT Technical Research Centre of Finland, Oulu/FIN; C. Finta, P. Teppola, VTT Technical Research Centre of Finland, Kuopio/FIN; F. Muzzio, Rutgers University, Piscataway, NJ/USA; J. Suhonen, VTT Technical Research Centre of Finland, Oulu/FIN; M. Juuti, VTT Technical Research Centre of Finland, Kuopio/FIN

10:00 **On-line gas chromatography for improvement of a production process**  
S. Haase, D. Kadjevic, A. Raichle, BASF Schwarzheide GmbH/D; S. Mühlbeyer, O. Wiedenhoff, A. Schocker, J. Tsou, BASF SE, Ludwigshafen/D

10:30 Coffee Break

10:30 Coffee Break

11:00 **Multidimensional pushbroom imaging in combination with multivariate data analysis for fast point of care testing**  
E. Ostertag, R.W. Kessler, Reutlingen University/D

11:00 **Use of computer simulations as process characterization tool for generation of mechanistic process understanding within the Quality by Design environment**  
D. Suzzi, S. Adam, M. Iannuccelli, G. Toschkoff, Research Center Pharmaceutical Engineering GmbH, Graz/A; S. Radl, J.G. Khinast, Graz University of Technology/A

11:30 **PAT based control of fluidized bed processing by electrical capacitance tomography**  
L. Gradinarsky, AstraZeneca R&D, Mölndal/S; H. Wang, University of Manchester/UK; L. Cerullo, Chalmers University of Technology, Gothenburg/S; S. Folestad, AstraZeneca R&D, Mölndal/S; W. Yang, University of Manchester/UK

11:30 **Systematic modeling and crystal size distribution control for batch cooling crystallization processes**  
N.A.F. Abdul Samad, R. Singh, G. Sin, K.V. Gernaey, R. Gani, Technical University of Denmark, Lyngby/DK

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12:00 **Screening temperature and concentration distributions in packed beds by near-infrared diffused transmittance tomography**  
M. Nic An tSoir, F. Aiouache, Queen's University Belfast/UK;  
D.L.A. Fernandes, University of Aveiro/P; J. Sa, ETH Zürich/CH;  
M. McMaster, C. Hardacre, Queen's University Belfast/UK;  
K. Kitagawa, Ecotopia Research Institute, Nagoya/J

12:00 **Model Predictive Multivariate Control (MPMC)**  
C. McCreedy, Umetrics Inc., London/CDN

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Chair: W.-D. Hergeth, Wacker Chemie AG, Burghausen/D

12:30 **Plenary Lecture “Novel Process Design and Control Strategies”**  
**Process monitoring and control of emulsion polymerization reactors: a knowledge based strategy to the synthesis of high solids content latexes**  
I.A. Mariz, J.C. de la Cal, J.R. Leiza, The University of the Basque Country, Donostia-San Sebastian/E

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13:15 **Poster Prize, Siemens Prize, Closing**

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13:30 Lunch

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## Scientific Poster Programme

Visit the posters and talk to the exhibitors and to your colleagues during the following times:

### Poster Session 1

on Wednesday, April 27, from 14:00 till 15:15 h.

### Poster Session 2

on Thursday, April 28, from 14:00 till 15:15 h.

### Last Minute Poster Submission

Further poster contributions can be accepted as last minute posters, subject to approval by the Scientific Committee and as long as space is available. These last minute posters will be announced in the last minute information available for participants at the beginning of the conference. **Submission of last minute posters is possible until February 28, 2011 at the latest.** Full information and submission via [www.euro-pact.org](http://www.euro-pact.org).

(Poster numbers will be allocated later)

Poster No.	Advances in Control of Continuous Manufacturing
A.01	<b>Calibrating in-line multi-point near infrared spectroscopy method for continuous mixing line</b> <u>M. Järvinen</u> , University of Eastern Finland, Kuopio/FIN; J. Paaso, VTT Technical Research Centre of Finland, Oulu/FIN; K. Järvinen, University of Eastern Finland, Kuopio/FIN; M. Juuti, VTT Technical Research Centre of Finland, Kuopio/FIN; F. Muzzio, Rutgers University, Piscataway, NJ/USA
Chemical Imaging and Process Tomography	
B.01	<b>Purification of soluble acetylcholinesterase from sheep liver by affinity chromatography</b> <u>K. Abass</u> , C. Kudi, J. Moody, University of Plymouth/UK
B.02	<b>"Made in China" - handling a process analytical technology project in Far East</b> H. Kaul, BASF SE, Ludwigshafen/D
B.03	<b>Pushbroom-Imaging-Technology as a tool for the online and inline control of microreaction processes</b> P. Trefz, B. Boldrini, <u>R.W. Kessler</u> , Reutlingen University/D
Innovations in Process Analysers and Sensor Technology	
C.01	<b>Driving towards manufacturing excellence - exploiting the potential of real-time particle size analysis</b> <u>B. Looser</u> , A. Blasco, Malvern Instruments Ltd./UK
C.02	<b>Flexible high precision multi-gas analyzer for industrial applications</b> J. Grübler, Sempa Systems GmbH, Dresden/D; W. Grählert, <u>O. Throl</u> , Fraunhofer IWS, Dresden/D; R. Saupe, Fraunhofer ENAS, Chemnitz/D; H. Schreck, DBI GUT, Leipzig/D
C.03	<b>Evaluation of FlashSizer 3D imaging as PAT tool during spheronization and pellet fluid bed drying</b> <u>A. Burggraeve</u> , Ghent University/B; N. Sandler, Abo Akademi University, Turku/FIN; J. Heinämäki, University of Helsinki/FIN; J.P. Remon, C. Vervaet, T. De Beer, Ghent University/B; J. Yliruusi, University of Helsinki/FIN
C.04	<b>Quantum Cascade Laser Spectroscopy (QCLS)</b> W. Kasten, BASF SE, Ludwigshafen/D
C.05	<b>Quasi in-line titration in a retractable process assembly</b> C.H. Wong, C. Schwarz, <u>N. Richter</u> , R. Lehnig, BASF SE, Ludwigshafen/D

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C.06 **Requirements for an HPLC system for online process control**  
K. Rebner, S. Butsch, P. Ohnesorg, L. Bick, BASF SE, Ludwigshafen/D

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C.07 **Mid-Infrared Spectroscopy - a powerful process analytical technique**  
W. Ferstl, BASF SE, Ludwigshafen/D

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C.08 **Process optimisation in micro-reactors based on flow rate manipulation and real-time non-invasive measurements by Raman spectrometry**  
S. Mozharov, A. Nordon, D. Littlejohn, University of Strathclyde, Glasgow/UK; J.M. Girkin, University of Durham/UK; P. Dallin, Claires Scientific, Northampton/UK; C. Wiles, P. Watts, University of Hull/UK

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Novel Applications of Process Analytics in Chemical and Biotechnology Industry

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D.01 **Methanol fuel cell monitoring employing combined process analytical techniques**  
F. Zehentbauer, E.J. Bain, J. Kiefer, University of Aberdeen/UK

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D.02 **In situ optical analysis of the gas and solid phase during the catalytic chemical vapor deposition of carbon nanotubes**  
K. Reinhold-López, A. Schmitt, A. Braeuer, N. Popovska, A. Leipertz, University of Erlangen-Nuremberg, Erlangen/D

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D.03 **Malt classification via NIR measurements using multivariate data analysis**  
D. Krause, M.A. Hussein, T. Becker, TU München, Freising/D

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D.04 **Factors affecting the properties of RF carbon gels**  
L. Anderson, A. Fletcher, A. Nordon, The University of Strathclyde, Glasgow/UK

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D.05 **Investigation of microstructure of concentrated colloidal suspensions using vis-NIR spectroscopy**  
G.E. Jose, J. Morris, S.N. Thennadil, University of Strathclyde, Glasgow/UK

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D.06 **Using nanovibrations for online monitoring of deposit formation and removal**  
A. Pereira, EnkrottQuímica, Sintra/P; C. Boxler, W. Augustin, S. Scholl, TU Braunschweig/D; L.F. Melo, University of Porto/P

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D.07 **On-line NIR monitoring of a *Xanthomonas campestris* fermentation**  
M. Black, A. Nordon, B. McNeil, University of Strathclyde, Glasgow/UK

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D.08 **H<sub>2</sub>/N<sub>2</sub> gaseous mixture separation in a hollow fiber membrane: numerical simulation and optimization studies**  
R. Miri, Iranian Offshore Oil Company, Tehran/IR; S.M.S. Niknejad, M. Soltanieh, Sharif University of Technology, Tehran/IR; F. Hosseini, S.J. Moosavi, Iranian Offshore Oil Company, Tehran/IR

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Novel Process Design and Control Strategies

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E.01 **Monitoring emulsion co-polymerization reactions using sound velocity measurements**  
W. Mauntz, DuPont Deutschland, Hamm/D; S. Engell, H. Brandt, TU Dortmund/D

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PAT in Pharmaceutical Industries

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F.01 **In-line monitoring of a continuous pharmaceutical granulation and drying process**  
M. Fonteyne, J. Vercruyse, Ghent University/B; D. Córdoba Díaz, Universidad Complutense de Madrid/E; J.P. Remon, C. Vervaet, T. De Beer, Ghent University/B

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F.02 **NIR and Raman spectroscopy as process analytical tools for in-line and real-time monitoring of a pharmaceutical hot-melt extrusion process**  
L. Saerens, J.P. Remon, C. Vervaet, T. De Beer, Ghent University/B

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F.03 **Determination of API content in low dose tablets using NIR transmission spectroscopy and SBC ("matched") calibration**  
D. Lochmann, J. Schewitz, Merck Serono, Darmstadt/D; R. Marbach, VTT Optical Instruments, Oulu/FIN; T. Schmidt-Bader, moveproTEC, Bad Homburg/D; T. Herdling, Merck Serono, Darmstadt/D

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F.04 **A generic in-line NIR method for blend uniformity control using a moving F-test**  
A. Gerich, M. Damen, T. Tran, P. Joosten, K. van den Dries, W. Oostra, MSD, Oss/NL

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F.05 **Faster optimization and troubleshooting with process analytical technology: real-time measurement of the crystal population**

T.P. Redman, B. Smith, METTLER TOLEDO, Columbia, MD/USA; I. Haley, METTLER TOLEDO, Leicester/UK; M. Barrett, Solid State Pharmaceutical Cluster (SSPC), Dublin/IRL

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F.06 **Evaluation of particle size analysis techniques: a comparative study with respect to particle shape**

P. Hamilton, N. Nordon, D. Littlejohn, J. Sefcik, University of Strathclyde, Glasgow/UK; P. Slavin, GlaxoSmithKline, Irvine/UK

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F.07 **Raman analysis of pharmaceutical powders and tablets**

N. Townshend, P. Allan, L.J. Bellamy, A. Nordon, D. Littlejohn, University of Strathclyde, Glasgow/UK; J. Andrews, P. Dallin, Clairet Scientific, Northampton/UK

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Process Chemometrics

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G.01 **Inline ATR-IR spectroscopy in biphasic systems**

M. Picard, RWTH Aachen University/D; L. Greiner, DECHEMA e.V., Frankfurt am Main/D; W. Leitner, RWTH Aachen University/D

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G.02 **Container processing within Waste Vitrification Plants**

K. Ferguson, Newcastle University & National Nuclear Laboratory, Seascale/UK

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G.03 **Modelling of highly radioactive evaporation using small scale test experiments data**

C. Steele, Sellafield Ltd., Seascale/UK; K. Ferguson, National Nuclear Laboratory, Seascale/UK; L. Maxwell, Sellafield Ltd., Seascale/UK

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G.04 **Multivariate data fusion for predictive modelling and performance monitoring**

S. Turnbull, S. Thennadil, University of Strathclyde, Glasgow/UK; J. Morris, Newcastle University, Newcastle upon Tyne/UK; C. Clarke, National Nuclear Laboratories, Springfields/UK

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**Nano photo catalytic degradation of the pharmaceutical agent Aspirin in sewage and optimization by Taguchi experimental design**

M.R. Sohrabi, S. Ghajar, Islamic Azad University, Tehran/IR

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## Grants for Students

For students a limited number of grants is available. The committee is free to decide who will receive grants. Applicants must have an **accepted** contribution to EuroPACT 2011 for poster or oral presentation (only presenting authors will be taken into consideration). For students receiving a grant the conference ticket is free of charge and EUR 500 per grant will be given at the conference office in Glasgow. Students who want to apply for grants please contact Claudia Martz at the conference office.

## Siemens Award

### Siemens Process Analytics Prize for Young Scientists

The German Working Group "Prozessanalytik" in cooperation with Siemens will award the Siemens Process Analytics Prize to a young scientist for an outstanding publication in the field of Process Analytics.

Applicants should be the first author of a paper printed or accepted for publication in an international peer-reviewed journal in 2009 or 2010. They should be no older than 30 years of age.

Applicants may apply individually or they can be recommended by another scientist. The prize is endowed with EUR 1.500.

A EuroPACT 2011 prize committee will select the winner.



# SIEMENS

Applications or recommendations should be submitted in electronic form (preferably PDF) by **December 31, 2010** and should include a copy of the paper, a CV and the reasons why the candidate merits the award.

All applications should be sent to the following address:  
Prof. Dr. rer. nat. Rudolf W. Kessler  
Hochschule Reutlingen - Reutlingen University  
Alteburgstr. 150  
D-72762 Reutlingen  
Germany

or by email to: [rudolf.kessler@reutlingen-university.de](mailto:rudolf.kessler@reutlingen-university.de)

## General Information

### Registration, Welcome Reception and Evening Lecture

The conference starts with an evening lecture on Tuesday, April 26 at 20:00 h. You have the opportunity to register from 17:30 h on and pick up your conference documents and to join colleagues during the welcome reception from 19:30-21:00 h.

### Civic Reception

The civic reception will take place at Glasgow City Chambers on Wednesday, April 27 from 19:00-21:00 h. Drinks and buffet will be served by invitation of the organisers. Transportation to Glasgow City Chambers is available.

### Conference Dinner

The conference dinner will take place on Thursday, April 28 at 19:30 at Barony Hall. The ticket is included in the registration fee; however registration is necessary as places are limited. Dinner, wine, transportation and entertainment are included.

## Conference Office

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## Conference Venue

EuroPact 2011 will take place at the Thistle Hotel Glasgow. The Hotel is located on Cambridge Street in Glasgow, near both Glasgow Central Train Station and Glasgow Queen Street Train Station, and near the Glasgow Airport as well.

Thistle Hotel Glasgow  
Cambridge Street  
Glasgow, G2 3HN  
[www.thistle.com/glasgow](http://www.thistle.com/glasgow)

Please find a detailed description of how to get to the conference venue at [www.euro-pact.org](http://www.euro-pact.org).

## Registration Fee

Early registration till February 28, 2011	395 GBP
Regular registration	450 GBP
Students with student identity card	120 GBP
<b>Extra Fee for Pre-Conference Courses</b>	
Regular participation	100 GBP
Students with student identity card	50 GBP

Included in the registration fee is the Welcome Reception on Tuesday, the Civic Reception on Wednesday in Glasgow City Chambers, the Conference Dinner on Thursday at Barony Hall, lunches, coffee/tea and soft drinks during the breaks. Registration is possible, subject to capacity, up to the beginning of the event. The deadline for inclusion in the list of participants is 3 weeks before the event begins.

## Cancellation and Refunds

Registrations cancelled no later than 3 weeks before the conference begins will be entitled to a refund minus an administration charge of 30 GBP. Thereafter 80% of the conference fee will be charged. Only written cancellations (fax, post or e-mail) will be accepted. The effective date is the date of receipt.

In case of non-attendance or drop-outs, the full conference fee is payable.

Substitute participant: We will be pleased to accept a substitute nominated by you. The nomination of a substitute must be made in writing and is free of charge. Any difference in the fees will be invoiced or credited respectively.

## **Accommodation**

Accommodation should be arranged through the Glasgow Convention Bureau by visiting their website: <https://www.conferencebookings.co.uk/delegate/GMBEUROPACT>. The Convention Bureau is holding a number of bedrooms at a variety of hotels throughout Glasgow to suit all budgets.

## **Visa Formalities**

Participants from a number of countries may need an entry visa for the United Kingdom. It is recommended that this be applied for well in advance of the conference. If a formal invitation letter is needed please contact Natalie Driscoll at the conference office in good time.