



CPAC Rome Workshop 2017
Utilization of New Concepts in Process
Modeling to Facilitate the Design of Integrated
Continuous Processes
March 20-22, 2017, University of Washington Rome Center
Piazza del Biscione 95, Rome, Italy 00186

Rome Workshop Organizers: Ray Chrisman and Mel Koch, MK Optimization and Control LLC

Rome Workshop Advisory Steering Committee: Giancarlo Cravotto, U Turin; Claude De Bellefon, U Lyon; Ludo Diels, VITO; Volker Hessel, Eindhoven U Technology; Simone Maccagnan, Gimac Microextruders; Peter Poechlauer, Patheon; Kurt VandenBussche, UOP; Paul Watts, Nelson Mandela U

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The evolution of flow microscale reaction technology has led to a wide range of process intensification developments in unit operations used for chemical processing in specialty chemicals, pharmaceuticals and renewables. The key next step is the integration of these unit operations into end to end optimized continuous processes. The focus of this year's meeting is on advanced process modeling technologies that will facilitate the efficient integration of unit operations for long term reliable production.

The meeting will begin with several perspectives on the current state of process modeling to build understanding of how it is effectively being developed and applied to insure long term optimized continuous production. The second part of the meeting will focus on flow technology advances in all phases of processing including advances in the use of homogeneous catalysis, separations and purifications, and new sections on the rapid developing areas of continuous fermentation and the control of the physical properties of solids. Advances in the use of process analytics to insure optimum performance in these developments will be discussed and should offer the way to effectively integrate these advances and tie them into the new process models.

For renewable materials the goal is to enable more efficient production processes that facilitate the conversion to a 'green economy'. For traditional materials the goal is to make them as efficiently as possible to minimize waste and improve quality. Thus the meeting format is designed to facilitate discussions among the multifunctional experts presenting in the various areas while offering the potential of those new to a field to be exposed to new developments. This has catalyzed international collaborations in these important areas.

Monday, March 20, Conference Room, 3rd Floor

12:00	Registration Opens
13:15	Introduction Mel Koch, CPAC/APL, University of Washington, USA
13:30	Welcome from the US Embassy in Rome, Italy
Session One	Examples of New Concepts in Process Modeling to Facilitate Process Optimization
13:45	Designing and Operating the Modular Chemical Plants of the Future, through Better Process Models and the Use of Advanced Analytics Kurt VandenBussche, UOP Honeywell, USA
14:20	Toward Achieving Online Quality Control During Biopharmaceutical Production Babatunde Ogunnaike, University of Delaware, USA
Session Two	
14:50	From Vertical Compartmentalization of Multi-Step Flow Synthesis to the Horizontally Structured 'Spaciant Factory' Volker Hessel, Eindhoven University of Technology, Netherlands
15:20	Break
15:35	University of Washington Rome Center Welcome Sheryl Brandalik, Director, UWRC, Italy
15:45	Introduction of Participants
16:15	Integrated Continuous Flow Processing of Fine Chemical and Pharmaceutical Products Paul Watts, Nelson Mandela University, South Africa
16:45	Discussion: Ray Chrisman, MK Optimization and Control LLC, USA
17:30	Con Apertivo, UW Rome Center, Apartment 422, 4th Floor

Tuesday, March 21, Conference Room, 3rd Floor

Session Two	Coupling Multiple Unit Operations for Continuous Processing
9:00	Introduction Mel Koch, CPAC, University of Washington, USA

9:10	The Medicines For All Initiative Frank Gupton, Virginia Commonwealth University, USA
9:40	Microfluidics with <i>In Situ</i> Raman Spectroscopy for the Characterization of Non-Polar/Aqueous Interfaces Ryan Hartman, New York University, USA
10:10	Break
10:35	Developing Process Control for Flow Chemical Reactions – Using Unique Approaches to Sampling, Sensing, and Data Handling Brian Marquardt, CPAC, University of Washington, MarqMetrix, USA
11:05	Linking the Manufacture of Pharmaceutical Ingredients to their Formulation Peter Poechlauer, Patheon, Austria
11:35	Cascade Reactions: From Batch to Flow Claude de Bellefon, University of Lyon, France
12:05	Lunch, Da Pancrazio, Palazzo Pio, Ground Floor

Session Two	Coupling Multiple Unit Operations for Accomplishing Continuous Processing
14:00	Engineering Chemistry: Integrating Batch and Flow Processes using an Internet-Based Control System Daniel Fitzpatrick, Cambridge University, UK
14:30	Process Intensification in Bio-based Industries Ludo Diels, VITO, Belgium
Session Three	Sampling, Sensing, and Multivariate Analysis, MVA of Large Data Sets for Optimized Process Control
15:00	Rapid Process Development using Self-Optimising Flow Reactors Richard Bourne, Leeds University, UK
15:30	Break
15:50	Using PAT Based Knowledge Management in a Continuous Manufacturing Environment Martin Gadsby, Optimal Industry Automation Ltd., UK
16:20	Developing Information from Data Bases Brian Otis, Verily Life Sciences, USA

16:50	Accelerating the Generation of Multistep Kinetic Models Using Flow Technologies Christopher Hone, U of Leeds/U of Graz, UK/Austria
17:20	Discussion: Ray Chrisman, MK Optimization and Control LLC, USA
17:40	Reception Con Apertivo, UW Rome Center, Apartment 422

Wednesday, March 22, Conference Room, 3rd Floor

Session Four	Advances in Process Unit Operations and Solution Providers
9:00	Introduction Mel Koch, CPAC, University of Washington, USA
9:10	Harnessing Innovation for Efficient Chemical Processes and Sustainable Growth Prof. Giancarlo Cravotto, DSTF Director (Drug Science and Technology, U Turin) and ESS President (European Society of Sonochemistry), Italy
9:40	Optimization of Biomass Gasification Process for the Production of Hydrogen-Rich Gas Dalia Heggo, National Research Centre, Egypt
10:10	Advances in Micro-Extruders Simone Maccagnan, Gimac, Italy
10:40	Break
11:00	Fiber Spectroscopy for Remote Media Analysis Dr. Viacheslav Artyushenko, art photonics, Germany
11:30	Crystallization of Drug Substances: QbD and PAT application for CQAs assessment Marino Nebuloni, U Parma, Italy
12:00	To be announced
12:30	Lunch on your own
14:00	A Scalable, High-density ECoG Recording Architecture for Chronic Bi-directional Brain Computer Interfaces William Anthony Smith, UW Electrical Engineering, USA
14:30	Photo-High-p,T Micro-Flow Process for the Production of Vitamin D3 with In-Flow Crystallization Marc Escriba, Eindhoven University of Technology, Netherlands

15:00	Useful Applications of Smart Micro-Gas Chromatography with the NeSSI™ Platform John Crandall, Falcon Analytical, USA
15:30	Automation for Continuous Manufacturing and Microscale Production Marco Banti, ABB, Italy
16:00	Final Discussion and Action Plans
16:30	Conclusion of Rome Workshop