

# CPAC Rome Workshop 2012

**Micro-Instrumentation (Micro-Reactor, Micro-Analytical, Micro-Separations, etc.), Process Intensification (Flow Chemistry, Separations, Environmental, Energy Reduction), and Future Manufacturing (Process Control, Scale-Out, and Modularity)**

## March 19–22, 2012

The APL/CPAC workshop at the UW Rome Center is held for the purpose of bringing together US and European scientists and engineers of similar expertise in the field of micro-instrumentation. The goal is to catalyze transatlantic collaborations in the areas of micro-reactors and the related enabling technologies of sampling and micro-analytical technologies, with an emphasis on bio-technologies.

The workshop will provide continuing educational opportunities in the areas of **Micro-Instrumentation (Micro-Reactor, Micro-Analytical, Micro-Separations, etc.)**, **Process Intensification (Flow Chemistry, Separations, Environmental, Energy Reduction)**, and **Future Chemical Factories (Process Control, Scale-Out and Modularity)**. It will be a forum for presenting and discussing advances in continuous unit operations and measurement sciences linked to improved process control incorporating Quality by Design (**QbD**) approaches in pharmaceutical applications. The presentations will include challenges in the selected areas, case studies, and new technical advances including emerging applications for **NeSSI™ (New Sampling/Sensor Initiative)**.

Monday afternoon, Tuesday, and Wednesday morning will focus on the impact of micro-instrumentation to achieve the goals of Process Intensification for assessing New Manufacturing Platforms based on the value of continuous flow processing. Wednesday afternoon and Thursday morning will feature aspects of Process Optimization for Achieving REACH Compliance and Green Chemistry attributes including reduced energy and environmental impacts.

**Workshop attendees** include: industrial 'end-users', government scientists and engineers, instrument manufacturers, and academic researchers.

The Satellite Workshop will be held over four days - beginning at 13:30 on Monday, March 19, and ending at 12:00 on Thursday, March 22. The Workshop Presentations will serve as a basis for open discussions with a futuristic outlook toward the technology presented and its impact on the future of Process Analytical Technology (PAT). The official language for the workshop will be English.

An informal reception for the Satellite Workshop attendees who are already in Rome will be held on Sunday.

## 2012 Rome Agenda

Monday, March 19 -

### Plenary Talks on Micro-Instrumentation, Process Intensification, and Future Manufacturing

12:00

Meeting Registration Opens - **UW Rome Center**

Introduction

13:15

**Brian Marquardt** and **Mel Koch** - Applied Physics Laboratory, Univ. of Washington, USA

- 13:45 Process Development in Continuous Flow Chemistry  
**Jack Dever** - MATRIC US
- Modular Microstructured Reactors in Industrial Scale and Container-based Plants –  
Breaking New Ground in Chemical Industry  
**Ulrich Krtschil**, Christian Hofmann and Patrick Löb - Institut für Mikrotechnik Mainz GmbH
- 14:30 (IMM), Jürgen Lang - Evonik Industries AG, and Volker Hessel - Eindhoven University of  
Technology
- 15:00 UWRC Welcome, Sheryl Brandalik, Director - UWRC, Italy
- 15:20 Break**
- Smart Manufacturing - Optimizing Industrial Performance by Eliminating Unintentional  
Variation  
15:45 **Olav Kvalheim** - University of Bergen; Frode Brakstad, Tel-Tek, Porsgrunn, Norway
- 16:15 Analysis and control of continuous flow reactors using online analytics  
**Brian Marquardt** - CPAC/APL University of Washington
- 16:45 Introduction of Meeting Participants
- 17:15 Discussion
- 17:30-20:00 CPAC Reception '*con Apertivo*', Director's Apartment, UW Rome Center, UW, Italy

## Tuesday, March 20 -Featuring Advances in Measurement Technology and Process Unit Operations

- 9:00 Introduction to Tuesday Sessions
- 9:15 Following Successful Reactions: There is a need for Separation and Purification  
**Ray Chrisman** - MATRIC Europa, Gerenzano, Italy
- 9:45 Novel Separation Unit Operations  
**Metin Bulut** and Ludo Diels – VITO, Belgium
- Continuous Manufacturing in Secondary Pharmaceutical Production  
**Jose C. Menezes**, University of Lisbon, Portugal; Simon Fraser, Stefan Sacher, Stefan Radl, Johannes G. Khinast - Institute for Process and Particle Engineering, TU Graz  
Institute of Pharmaceutical Sciences, KFU Research Center Pharmaceutical Engineering GmbH, Austria
- 10:15
- 10:45 Break**
- 11:15 Recent advances on microreactors technology and synthetic chemistry  
**Vincenzo Fusillo** – MATRIC Europa, Gerenzano, Italy
- 11:45 Case Study for Developing a Spectroscopic Probe for High Temperature Applications  
**Giuseppe Caire** – Infineum, Savona, Italy (TBC)
- 12:15  
Lunch in *Ristorante da Pancrazio* located in the Palazzo Pio
- 14:15 Wireless Sensor Platform developments  
**Ilkka Lähdesmäki** and Brian Otis – Electrical Engineering, U of Washington, US
- 14:45 Microfluidics for on-chip chemistry and biosensing  
**Valentina Arima** – U of Lecce Nano Technology Center, Italy

**15:15**      **Break**

15:45      New Tools for Raman Spectroscopy  
**Hervé Lucas** - Kaiser Systems, France

16:15  
Discussion

**17:30-20:00**    **CPAC Reception 'con Apertivo', Director's Apartment, UW Rome Center, Italy**

**Wednesday, March 21**

**Featuring Advances in Measurement Technology and Process Unit Operations utilizing NeSSI (New Sampling/Sensor Initiative)**

9:00      Introduction to Wednesday Sessions

Smart Sampling Systems

**Mel Koch** - CPAC/APL, UW, and Doug Nordstrom - Swagelok, US

9:15

9:45      On-line Analyzer Technology for Post Combustion Carbon Capture Plants

**Stefan Malcharek** and Rudi Spinner – Siemens, Germany

**10:15**      **Break**

10:45      System Engineering of Intensified Continuous Production of Fine Chemicals

**Philippe Caze** – Novelia Engineering, France

11:15      Research in Sensor Technologies

**Barbara Panella** - ABB Zurich, Switzerland

- 12:00 Lunch on your own
- 14:00 Process Optimization: The Impact of Raw Material and Media Characterization  
**Giorgio Borghi** and Ray Chrisman – MATRIC Europa, Gerenzano, Italy
- 14:30 Demonstrating the Value of Data Fusion  
**Tom Dearing** - CPAC/APL University of Washington
- 15:00 Useful Applications of Smart Micro-Gas Chromatography with the NeSSI™ Platform  
**Marco Quiles** and John Crandall - Falcon Analytical, US
- 15:30  
**Break**
- 15:50 Increasing Performance of Field Capable Micro-GC using Two Different Carrier Gases  
**Stefan Malcharek** – Siemens, Germany
- 16:20 On-line Monitoring of the Environmental Parameters in a Controlled Environment  
**Antonio Rachini** – RIGEL Life Sciences, Italy
- 16:50 Discussion
- 17:40-20:00 **CPAC Reception 'con Apertivo', Director's Apartment, UW Rome Center, Italy**

## Thursday, March 22

# Summary of Discussion Topics and Action Plans

9:00

Overview of Meeting Discussion Topics: **Brian Marquardt** and **Mel Koch** - CPAC/APL, UW and **Ray Chrisman**, MATRIC Europa, Italy

Group Discussion on the following Topics

- Process Optimization vs Traditional Approaches to Process Improvement
- Better Measurement and Data Handling Technology
- Concern of Understanding a Total System
- Acceptance of New Ideas takes Time
- Industry concern is focused on Process Costs vs Process Performance
- What Measurement Tools/Sensors would be of Value on Wireless Platform

9:30-10:30

- General Concern about the Status of Education for Process Engineering Graduates in Western World

Future Topics

- Work toward more End-User/Manufacturing companies to attend Rome Workshop

**10:30-11:00**

- Include examples of Process Optimization and Solid Handling Technology

**11:30**

**Meeting Concludes**