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 (IMM), Jürgen Lang - Evonik Industries AG, and Volker Hessel - Eindhoven University of Technology

14:30

15:00  UWRC Welcome, Sheryl Brandalik, Director - UWRC, Italy

15:20  Break

15:45  Smart Manufacturing - Optimizing Industrial Performance by Eliminating Unintentional Variation  
**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  Break

10:45  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

9:15  Smart Sampling Systems
Mel Koch - CPAC/APL, UW, and Doug Nordstrom - Swagelok, US

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

9:30-10:30

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