Utilization of New Concepts in Developing Next Generation Materials, as well as Exploring New Reaction Routes that Benefit from the Growing Use of Continuous Flow Technology

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

**Rome Workshop Advisory Steering Committee:** Giancarlo Cravotto, U Turin; Claude De Bellefon, U Lyon; Ludo Diels, VITO; Frank Gupton, VCU; Volker Hessel, Eindhoven U Technology; Simone Maccagnan, Gimac Microextruders; Brian Marquardt, U Washington and MarqMetrix, Peter Pochlauer, Patheon; Kurt VandenBussche, UOP; Paul Watts, Nelson Mandela U

**Sponsorship:** MarqMetrix Inc. and Optimal Industrial Automation Ltd

### Monday, March 19, UWRC Conference Room, 1st Floor

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>12:00</td>
<td>Registration Opens</td>
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</tbody>
</table>
| 13:00 | **Introduction**
      | Mel Koch, CPAC/APL, University of Washington, and MK Optimization and Control LLC, USA            |
| 13:10 | **Review of the Summary and Charts from the 2017 Rome Workshop and the Plan for this Year’s Event**
      | Ray Chrisman, MK Opt and Control and Peter Pochlauer, Patheon, Austria                           |
|       | **Concept One**
      | **Examples of New Concepts to Facilitate Next Generation Processes**                            |
| 13:40 | **The Circular Economy, When Problems Become Opportunities for New Thinking in Product Development and New Ways of Production**
      | Harald Sverdrup, University of Iceland and Norsemetal, Norway                                    |
**Concept Two**

14:10  
Designing and Operating the Modular Chemical Plants of the Future, through Better Process Models and the Use of Advanced Analytics  
Linda Shi Cheng, Director, Materials Characterization - Honeywell UOP, USA

Enabling Process Understanding to Enable the Integration of Multiple Unit Operations for Continuous Processing

14:40  
Development and Maintenance of Process Models - Automating the Selection and Updating of Models  
Olav Kvalheim, University of Bergen, Norway

15:10  
Break

15:25  
University of Washington Rome Center Welcome  
Amity Neumeister, Director, UWRC, Italy

15:40  
Introduction of Participants

16:15  
Leveraging Operational Intelligence Technology to Sustain Operational Excellence  
Mark Hodgkinson, The Bahrain Petroleum Company (BAPCO), Kingdom of Bahrain

16:45  
Synthetic Carbon Allotropes: a Growing Family of Fascinating Architectures with Outstanding Material Properties  
Giancarlo Cravotto, DSTF Director (Drug Science and Technology), U Turin and ESS President (European Society of Sonochemistry), Italy

17:15  
Discussion: Ray Chrisman, MK Optimization and Control LLC, USA

17:30  
Con Apertivo, UW Rome Center, Apartment 422, 4th Floor

**Tuesday, March 20, UW Rome Center Room, 1st Floor**

**Concept Three**

9:00  
**Introduction**  
Mel Koch, CPAC, University of Washington, USA

9:10  
**Integrated Continuous Flow Processing of Fine Chemical and Pharmaceutical Products**  
Paul Watts, Nelson Mandela University, South Africa

9:40  
**Process Analytical Technology in Biologics**  
Cyrus Agarabi, US FDA CDER, USA
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
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| 10:10 | **Data Analytics for Governing Big Data in Continuous Process Operations in a Digital Factory**  
Marco Banti, ABB Industrial Automation Division, Control Technologies, Pharmaceutical Industry, Italy |
| 10:40 | Break                                        |
| 10:55 | **Welcome**                                  |
Caron de Mars, US Embassy Rome, Italy |
| 11:05 | **Linking the Manufacture of Pharmaceutical Ingredients to their Formulation**  
Peter Poechlauer, Patheon, Austria |
| 11:35 | **Quality-In(Process)Line (QuIProLi) Process Intensification for a Micro-Flow UV-photo Synthesis Enabled by Online UHPLC Analysis**  
Marc Escribà-Gelonch, Elnaz Shahbazali, and Volker Hessel, Eindhoven University of Technology, The Netherlands and Maarten Honing, Maastricht University, The Netherlands. |
| 12:05 | Lunch, Da Pancrazio, Palazzo Pio, Ground Floor |
**Concept Four**  
Process Automation of Coupled Multiple Unit Operations for Continuous Processing |
| 13:30 | **Microfluidics with In Situ Raman Spectroscopy for the Characterization of Non-Polar/Aqueous Interfaces**  
Ryan Hartman, New York University, USA |
| 14:00 | **Using Lab Scale Flow Chemistry for Data Acquisition and the Development of Modularity**  
Jean-Noël Tourvieille and Flavie Sarrazon, Solvay, France |
| 14:30 | **The Medicines For All Initiative**  
Frank Gupton, Virginia Commonwealth University, USA |
**Concept Five**  
Sampling, Sensing, and Multivariate Analysis, MVA of Large Data Sets for Optimized Process Control |
| 15:00 | **Developing Process Control for Flow Chemical Reactions – Using Unique Approaches to Sampling, Sensing, and Data Handling**  
Brian Marquardt, CPAC, University of Washington, MarqMetrix, USA  
presented by Ray Chrisman, MK Optimization and Control LLC, USA |
| 15:30 | Break                                        |
| 15:50 | **Process Intensification in Bio-based Industries – particularly to Achieve Efficient Lignin Processing**  
Ludo Diels, VITO, Belgium |
| 16:20 | **Developing Technology to Convert Lignin to Useful Products**  
Per Tomani and Peter Axegård, Rise Research Institute, Sweden |
<table>
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| 16:50 | In Planta Application of CaCO3 Nanocarriers as Strategy for the Active Containment of Xylella Fastidiosa  
Giuseppe Ciccarella, U Salento & UdR INSTM di Lecce, Italy  |
| 17:20 | **Discussion:** Ray Chrisman, MK Optimization and Control LLC, USA |
| 17:40 | Reception Con Apertivo, UW Rome Center, Apartment 422               |

**Wednesday, March 21, UWRC Conference Room, 1st Floor**

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<thead>
<tr>
<th>Time</th>
<th>Session</th>
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| 9:00  | **Introduction**  
Mel Koch, CPAC, University of Washington, USA |
| 9:10  | **Evaluation of New Opportunities for Pharmaceutical Manufacturing:**  
Exploitation of Gas-Liquid Chemistry in Flow,  
Christopher Hone, University of Graz, Austria |
| 9:40  | **The Use of a C-3 Building Block for Preparing New Chemicals for Different Applications**  
Maurizio Galimberti, Politecnico University, Milan, Italy |
| 10:10 | **Real Time PAT Based Knowledge Management and Control in Continuous Processes**  
Martin Gadsby, Optimal Industrial Automation Ltd., UK |
| 10:40 | Break |
| 11:00 | **Advances in Micro-Extruders**  
Simone Maccagnan, Gimac, Italy |
| 11:30 | **Crystallization of Drug Substances: QbD and PAT Application for CQAs Assessment**  
Marino Nebuloni, U Parma, Italy |
| 12:00 | **Axel’One Innovative Platform and Axel’One Analysis**  
Franck Baco-Antoniali, IFP and Axel’One, France |
| 12:30 | **Lunch (on your own)** |
| 14:00 | **Hierarchical "Milli-Foam" Internals for Demanding G-L-S Chemistries**  
Régis Philippe University of Lyon, France |
| 14:30 | **Portable, Single-Sided NMR for Industrial Applications**  
Michele Martin, Tricia Wong, Matt Augustine, and Michael McCarthy, University of California at Davis, USA |
| 15:00 | **Recent Advances in Valve-Based Two-Dimensional Gas Chromatography and Gas Chromatographic Sensing**  
Chris E. Freye, H. Daniel Bahaghighat, and Robert E. Synovec, University of Washington, USA |
<p>| 15:30 | TBA |</p>
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| 16:00 | **Summary and Final Discussion leading to 2018 Chart Preparation and Action Plans**  
Ray Chrisman, MK Opt and Control, and Peter Poechlauer, Patheon |
| 16:30 | **Conclusion of Rome Workshop**                                      |