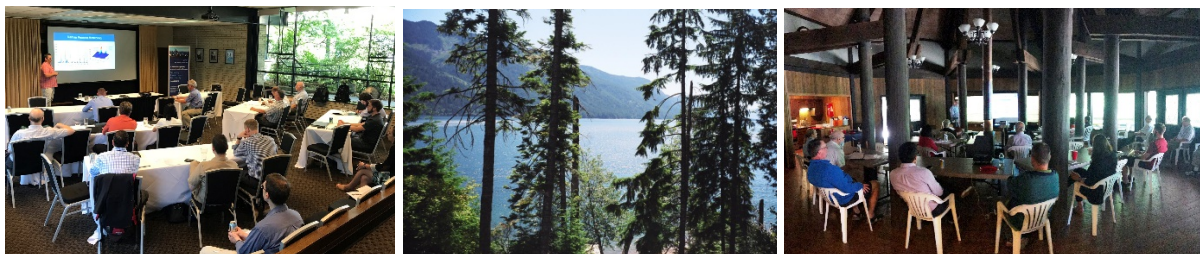


CPAC 2022 Summer Institute, 19-21 July 2022



A key enabler of the move to a Circular Economy will be process intensification that offers sustainable processing of lower volume distributed waste streams to generate a broad range of new platform chemicals including a growing list of biomass derived molecules. Bio-based projects are a large part of the path to a Circular Economy. The 2022 CPAC Summer Institute will build on **two themes**.

- **Next generation processing approaches to enable maximum efficiency in the production of sustainable pharmaceuticals, chemicals, and biomaterials**
- **Expanding process understanding based on the use of sensors and data handling – Enabling more efficient personalized medicine and complex process optimization of bio-based processes and petrochemical operations**

The **first theme** of sustainable process development and production will include an emphasis on exploring new reaction routes that benefit from the growing use of continuous flow technology and effective monitoring concepts. The evolution of flow microscale reaction technology has led to a wide range of process intensification developments. These include, often using novel operating windows for one-pot and cascade reactions, in the various steps that result in the ability to rapidly evaluate and optimize new reaction routes as well as offering more cost-effective processing. The key next step is the integration of these unit operations into end-to-end optimized continuous processes.

Next generation continuous manufacturing concepts will enable efficient end-to-end bio-processing for the implementation of a sustainable circular economy; based on the data from process analytical technology, PAT, required for rapid characterization of organism growth as well as post reaction processing including product separation and purification.

The **second theme** will be based on powerful new applications of continuous sensing and control. Just as continuous monitoring can have a significant impact on stable, high efficiency production of chemicals it has also been shown to have a significant impact in the Personalized Medicine area. This second theme will explore the potential of using the pattern of data from groups of simple sensors for faster and better control in a range of simple sensors for applications in personal health, process development including organism growth to enable better product synthesis, and then more efficient post reaction processing.

Of importance to both themes are:

- **Recent advances in PAT** for the real time characterization of raw materials, process streams, and complex biomass streams – to improve process understanding. This data can be used for rapid process development and for feed forward and feedback control to enable high-quality, cost effective products.
- **Utilization of new approaches in data handling** including the use of big data — for end-to-end understanding and value extraction from chemical and biomass processing.
- **Recognition of the importance of solution providers** – those companies and academic research groups that have developed measurement approaches, data handling approaches, and engineering concepts for process control

The three day schedule ends on Thursday evening with a BBQ dinner off-site event. The final afternoon will summarize the technical areas and meld the conclusions into a broader look at the future impact of Process Analytical Technology (PAT) for achieving Process Optimization.

CPAC has an established track record in fostering academic/industrial/national laboratory interactions, which aims at bridging the gap between basic research and full-scale process/product development. CPAC's Summer Institute will provide continuing education opportunities in the areas of advances in measurement science linked to process control.

The CPAC Summer Institutes are held in an informal format, with technical presentations, and time allotted for open discussion and brainstorming on topics that arise from this interaction. The informal environment has created a successful format for bringing together chemists, biologists, measurement scientists, and process engineers from industry, government, and academic institutions drawn from both CPAC and non-CPAC members.

REGISTRATION

Registration Fees for the 2022 Summer Institute are \$500.00 US Dollars. The fees cover all meeting materials, lunches, and a BBQ dinner on Thursday. Please complete the registration form on the following site:

<http://mkcontrol.com/summer-institute-2022.html>

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