



CENTRE FOR PROCESS ANALYTICS AND CONTROL TECHNOLOGY



www.apact.co.uk



The APACT 15 conference will take place on the 22-24th April 2015 at the Hilton Deansgate Hotel in Manchester (pre-conference courses will also be held on 21st April at the University of Manchester).

Speakers at the event include:

Tom Fearn, University College London, UK – “Title to be confirmed”

Alasdair Graham, Infineum, UK – “Modelling additive systems”

Dylan Jones, Sanofi, UK – “How PAT can drive innovation in manufacturing”

Barry Lennox, Manchester University, UK – “Using multivariate statistics to improve the control and optimisation of fermentation processes”

Gawayne Mahboubian-Jones, Philip Morris International, Switzerland – “Regulatory engagement through QbD and PAT: The view from another industry”

Jose C Menezes, Institute of Biotechnology and Bioengineering, IST, Portugal – “Science-based data-driven technologies in Pharma: Development and manufacturing with QbD 2.0”

Paul Sharratt, ICES, Singapore—“Convergence of analytics and understanding—enabling better processes”

Kevin Sutcliffe, AstraZeneca, UK – “The changing face of PAT in the pharmaceutical industry. An AstraZeneca perspective from drug development to commercial supply”

Jesus Zurdo, Lonza Biologics plc, UK – “Alternatives to one-size-fits-all in biopharmaceutical process development. Developability and early risk management as an enabler for preclinical and clinical success”

APACT is an open forum for the presentation and discussion of recent scientific and engineering advances relevant to process analytics and control technologies. Plenary and keynote speakers will report recent advances in the development and application of novel process analytics, predictive modelling and control technologies, and will review the benefits achieved. Following the success of previous conferences, APACT 15 will be a 3 day meeting featuring plenary and parallel sessions on topics crucial to the achievement of manufacturing excellence. We look forward to seeing you in Manchester :)

CPACT PROMOTIONAL MATERIAL

Members were reminded to contact Natalie Kerr (natalie@cpact.com) if they wished CPACT publicity material. We have the following information available: a poster; general presentation and factsheets that can be sent to you should you wish to promote CPACT either internally in your organisation or on your travels.

CPACT NEWSLETTER

Do you have an article to contribute to the CPACT newsletter? If so, we would love to hear from you. Please email your articles to: natalie.kerr@strath.ac.uk

www.cpact.com



An Introduction to the Company.

For over 40 years Polytec has provided high-technology, optically-based measurement solutions to researchers and engineers. Our commitment is to provide the most precise and reliable optical instruments and sensors available for non-contact measurement, setting Polytec apart from the competition as the gold standard in the design and manufacture of spectrometer systems. Our innovations answer many pressing manufacturing and engineering challenges. Importantly, Polytec provides a variety of [optical systems for analytical measurements](#) in laboratories and in factory settings for process control and monitoring utilising both VIS/NIR and Raman spectroscopy based technologies.

However, we are much more than just a vendor/equipment supplier. As a company and valued member of CPACT we can bring both an experienced industrial and academic point of view to the table. As a complete package we offer engineering services, advanced hardware and software provision and service/support, training and product development at both Polytec and the customer.

Scientific and technology seminars are also good opportunities where Polytec shares its unique expertise with customers and specialists. In addition, Polytec sponsors regional user conferences for discussion, presentation and refinement of innovative measurement applications in research, development, manufacturing and maintenance.

We at Polytec acknowledge CPACT as one of the first and better UK Centres established by the Foresight Initiative. Your aim to provide a "one stop shop" for those seeking advice and research on all aspects of process control is shared by us and we feel strongly that we will make a significant contribution. By combining leading universities with technology vendors working in conjunction with leading UK companies, CPACT provides a perfect opportunity for us to make contact and network with the best in the field. We will gain new knowledge and advice from other members and by this, help to extend the scope of CPACT and its influence on the world of process control, process optimization and chemical analysis / chemometrics.

We look forward to a stimulating and rewarding future working with everyone inside and outside CPACT.



Polytec GmbH. Contact: Dr Stuart Turnbull. (07909) 901229 Email: s.turnbull@polytec-ltd.co.uk
Polytec GmbH, Polytec-Platz 1-7, D-76337 Waldbronn. Germany. Tel: +49 7243 604 1600. analytics@polytec.de



Malcolm McIvor Prize 2014

Malcolm McIvor was one of the key people in ICI who helped establish CPACT in 1997 and he played a prominent role in project supervision during the early stages of CPACT's activities.

Malcolm enjoyed his engagement with CPACT and has generously endowed a prize to be awarded annually to a postgraduate student at a CPACT partner university in recognition of that student's achievement in process analytics and control technologies. The prize will recognise an individual's excellence in terms of academic achievement, creative thinking and/or engagement between academia and industry.



David Knox, Malcolm McIvor & Megan Holden

The CPACT Chairman and the selection panel, which comprised the CPACT Chairman and academic and industrial members of the CPACT Industrial Management Board, found it very difficult to distinguish between two excellent candidates, therefore, it was decided to award a joint prize for 2014.

Well done to both winners, Megan Holden (University of Strathclyde) and David Knox (University of Manchester). Both Megan and David gave a presentation at the CPACT Research Day on 7th October at the University of Strathclyde and were presented with their prizes by Malcolm (see photograph).

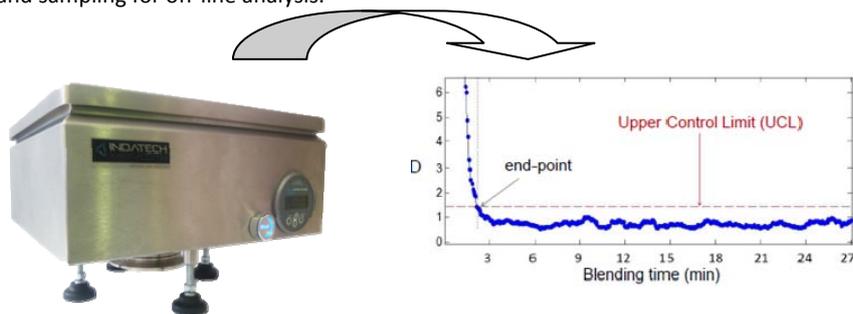
David said that winning the prize was as a happy surprise - and a great honour to be the joint first recipient with Megan. "It was great chatting to Malcolm over morning coffee, having lunch with him on the presentation day, and also hearing from him about how process analytics have changed over the years, especially with how it has been realised and adopted across industry".

Megan was equally pleased to receive the Malcolm McIvor CPACT prize. "It has been very encouraging to have my work recognised in this way, and as I am just coming to the end of my project this award has been a great way to round off my three years of PhD research. I enjoyed meeting Malcolm on the day of our presentations; it was great to find out more about the origins of CPACT from one of the key founders and to learn how far process analytics has developed over this time."

Wireless monitoring of powder blending

Powder mixing is a widespread unit operation in many industries. With the advent of in-line near infrared (NIR) spectroscopy and Quality by Design principles, application of Process Analytical Technology (PAT) to monitor blend uniformity (BU) is taking a more prominent role. It is now possible to obtain timely information on the status of blending operations to identify the time required to achieve a homogeneous mixture and avoid over-blending.

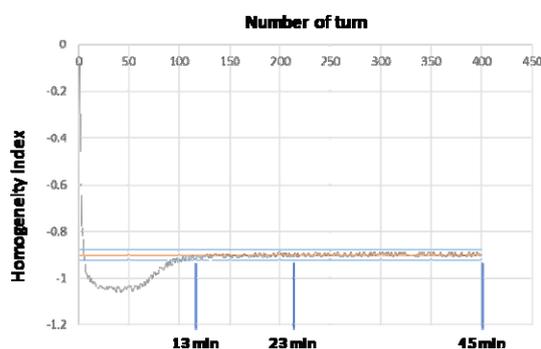
INDATECH is active in the PAT field and offers advanced solutions for process understanding and monitoring. Mixif-Hy® is our in-line monitoring tool for powder blending. From feasibility studies on blends to calibration and implementation of the best models in your software, Mixif-Hy is a real Plug&Play solution. Coming with a 4h autonomy battery and wifi communication for remote control, it is fully embedded into a blender to replace time-defined end point operations and hazardous hand sampling for off-line analysis.



Case Study - The aim was to reduce the lead time of a process through non time-dependent endpoint decision making for a powder mixture.

The powder was composed of three excipients (including talc and calcium carbonate) and one API (about 4 %). The process was formerly calibrated with a fixed mixing time of 45 minutes. After Risk Analysis, the Mixif-Hy was fixed on the blender to make measurements during current production. Several calibration models were tested and optimized on recorded data. At the end of this study, it was possible to compare the optimal mixing time given by each model.

Example of homogeneity curve obtained with moving block standard deviation



Model	Result given by Mixif-Hy	Initial mixing time
Moving Block Standard Deviation (MBSD)	24 min	45 min
Monitoring the evolution of the peak of the active principle	23 min	
Comparison to a target spectrum	23 min	
PCA	25 min	

Use of the Mixif-Hy enabled a considerably reduced mixing time to be used.

If you would like to learn more about the Mixif-Hy instrument and possible applications in the monitoring of mixing operations, contact sales@indatech.eu

Jaclyn Dunn joins the CPACT team!



Jaclyn started her post on 1st October 2014 and is employed part-time to work on the CPACT Feasibility Studies.

Feasibility studies could be based on a wide range of questions: for example, there might be an interest in assessing a new instrument or instrumental method for process applications; there might be a need to compare different data analysis methods for particular applications; or there may be a need to do some literature evaluation to assess the current status of a developing technology relevant to process analysis or process control. These are just a few examples and it would be up to individual companies to suggest the type of brief study that might be of benefit.

If members are interested in submitting a feasibility study or would like more information, please contact Jaclyn via email for the pro-forma (jaclyn.dunn.100@strath.ac.uk)

Information can also be found on the members only section of the CPACT website www.cpacct.com

CPACT TEAM



Julian Morris
Technical Director
CPACT Newcastle
E: morris@morrisassociates-uk.co.uk

T: 0191 222 7342



Natalie Kerr
Administration Manager
CPACT Strathclyde
E: natalie@cpact.com

T: 0141 548 4836



Christine Stevenson
Administrator
CPACT Strathclyde
E: christine.stevenson@strath.ac.uk

T: 0141 548 4787

DATES FOR YOUR DIARY

FORTHCOMING WEBINARS

Introduction to Design of
Experiments Series
21st, 28th May, 4th, 11th June
2015

Top Tips for Design of
Experiments Practice
2nd July 2015

Exploration of Designs
10th September 2015

MANAGEMENT MEETINGS

CPACT Research Day/Industrial
Management Board
11/12 March 2015
University of Strathclyde

CPACT Steering Committee
9/10 June 2015
Ross Priory, Loch Lomond

CONFERENCE

APACT 15
22 - 24 April 2015

PLANNED COURSES

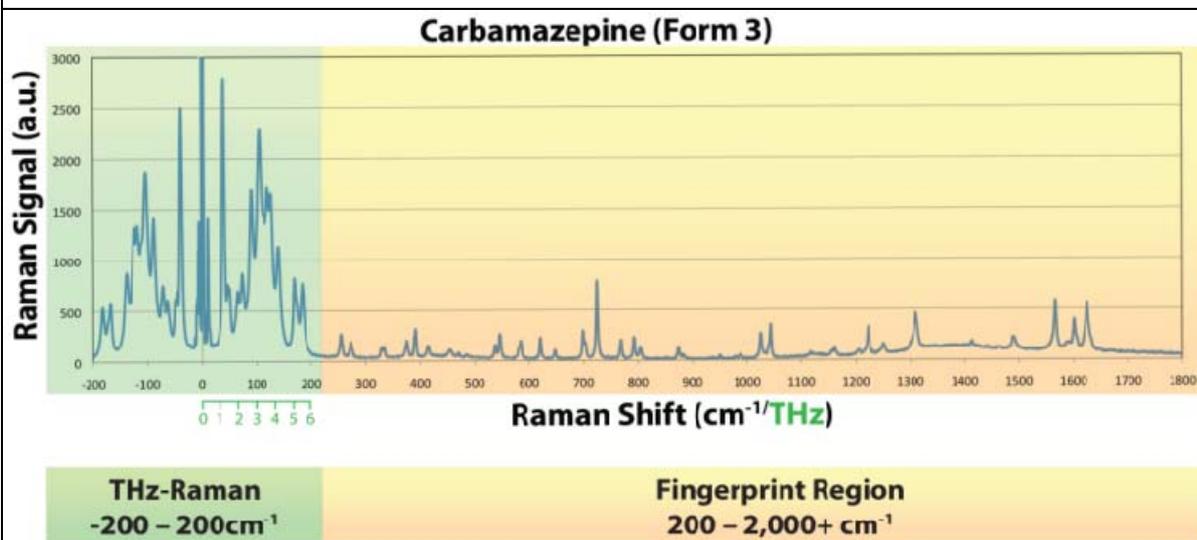
Process Spectroscopy
13-15 January 2015
Clairet Scientific, Northampton



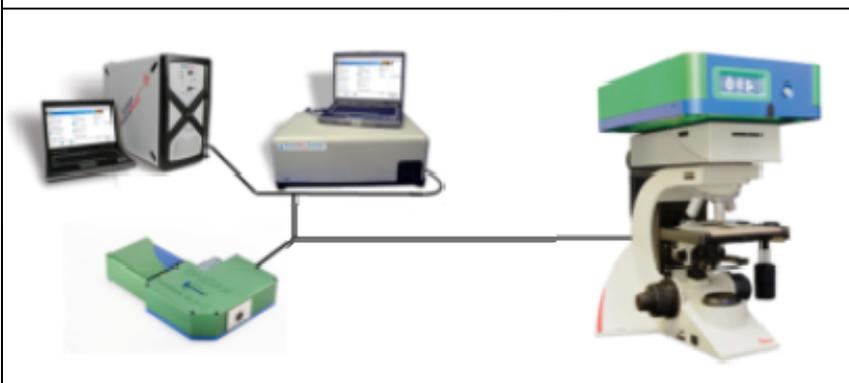
Terahertz Raman spectrometry

The **Ondax XLF-CLM Terahertz Raman** system from Clairet Scientific extends the range of conventional notch filter based dispersive instruments below 200 cm^{-1} down to 5 cm^{-1} .

Spectral bands in this region give valuable information on crystallinity ("lattice modes") and some vibrations of heavy atoms such as metal-metal stretching modes. Lattice modes are highly specific to crystal structure (their absence also gives a measure of how amorphous a compound might be) and highly diagnostic for polymorphs. As a bonus, lattice modes can be an order of magnitude more intense than the rest of the Raman spectrum (see carbamazepine spectrum)



The Ondax XLF is a fully integrated "benchtop" confocal Raman unit that includes an ultra-narrowband laser excitation source, polarization control, filters, fibre optic cable, and sample compartment with cuvette/vial adapter or focussing microscope objective. The **XLF** connects to a Raman instrument via fibre optics. The **MICRO** is designed to mount directly to a Kaiser Raman Workstation or Microscope accessory, enabling accurate sample positioning and mapping. All THz-Raman probes are ultra-compact and simple to connect to your existing Kaiser spectrometer (RXN1, RXN2, Microscope or Raman Workstation).



There is a choice of excitation laser frequencies: 532, 633, 785, 830 and 976 nm (but consult Clairet for compatibility and spectral range achievable with existing Kaiser Raman instruments)

For further information contact: info@clairet.co.uk