

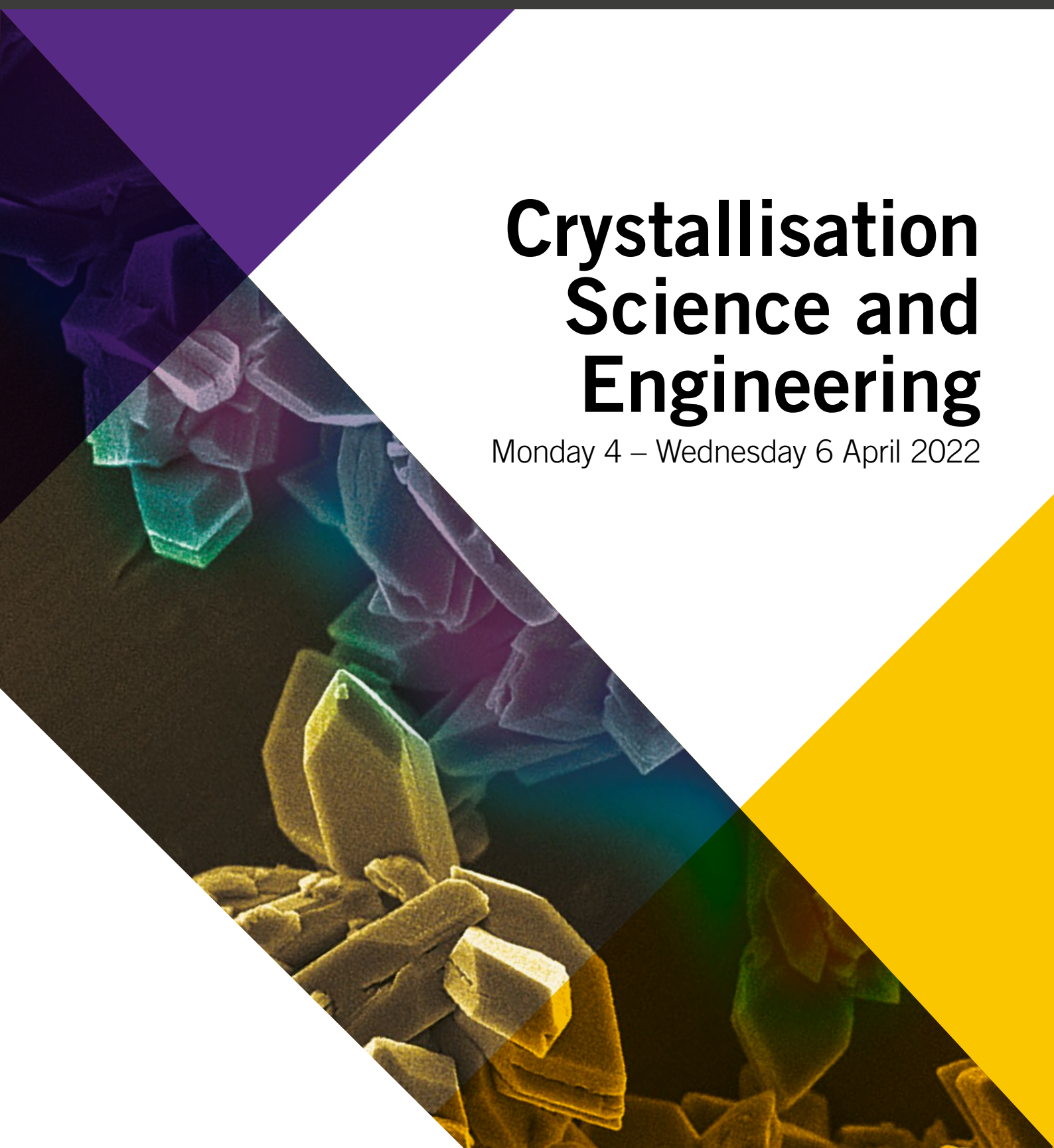
Faculty of Engineering
and Physical Sciences



UNIVERSITY OF LEEDS

Crystallisation Science and Engineering

Monday 4 – Wednesday 6 April 2022



Crystallisation Science and Engineering

Monday 4 – Wednesday 6 April 2022, University of Leeds

About the course

This 2.5 day short course will outline the fundamental science and engineering of crystallisation processes. The course will be delivered by academic and industrial experts in the field and will include real-life case studies. Please note that due to limited capacities in our labs currently due to Covid-19, we are not able to run live lab demonstrations, however delegates will have hands-on opportunities to use crystallisation modelling software.

Course aims

Delegates will leave with the fundamental knowledge that they can use in their industrial/research work and a deeper understanding of crystallisation science and technology to assist in process development and scale-up of the manufacture of crystals for desired properties. The course will also give delegates the tools to be able to better engage with experts when needed.

Who should attend

This course is aimed at engineers and scientists working in industries such as agrochemicals, biotechnology, food, fuels, personal care, pharmaceutical and speciality chemicals companies. It is relevant to those involved in crystallisation process development, scale-up, control and operations. It will also be of interest to post-graduates and post-docs involved in research in the general area of crystallisation.



Course Directors

Dr Tariq Mahmud is an Associate Professor in Chemical Engineering. His expertise lies in industrial crystallisation process development, scale up and control. He also has extensive expertise in integrated CFD-process modelling encompassing development and validation of process models coupled with CFD of turbulent and multi-phase flow systems and nano-/micro-size particulate synthesis processes via crystallisation, reactive precipitation and spray drying. He has led a number of experimental and modelling projects in these areas, as Principal- or Co-investigator, funded by the UK EPSRC, Innovate UK and industry including AstraZeneca, GSK, Pfizer, P&G, NNL and Syngenta. Tariq is currently a member of the British Association for Crystal Growth (BACG) and jointly chaired their 45th and 47th Annual Conference held in July 2014 and June 2016 at Leeds, and a Council member of the European Network for Crystal Growth.

Dr Xiaojun Lai is a Lecturer in Chemical Engineering and has research interests in the application of process-related analytical and characterisation techniques to studies of crystallisation and precipitation processes. He has used reaction calorimetry for studying process thermodynamics, Raman technique for multiple component crystallisation system characterisation, and in situ XRD for phase transformation investigation. He has also recently developed instrumentation of laser interferometry for visualising crystal growth interface and mass transfer in the boundary layer, and combined X-ray topography and multiple diffraction to characterise crystal defects and made significant use of SR techniques, for in situ probing of crystal structure during practical processing and X-ray spectroscopy for probing impurity impact on crystal growth.

What our previous delegates say:

“Very good course, with right balance of speakers from industry and academia, on crystallisation processes and solid-state chemistry.”

“The course is perfect for anyone who wants to learn the fundamentals of crystallisation science and engineering.”

Programme

Monday 4 April 2022

08:45 Registration and coffee

09:10 Introduction

Crystallisation Fundamentals

09:20 Crystallisation route map
Professor Kevin Roberts, School of Chemical and Process Engineering, University of Leeds

10:20 Nucleation and crystal growth
Dr Tom Turner, School of Chemistry, University of Leeds

11:05 Coffee

11:20 Crystal morphology and habit modification
Dr Hien Nguyen, School of Computing, University of Leeds

12:05 Fundamentals of polymorphism
Professor Sven Schroeder, School of Chemical and Process Engineering, University of Leeds

12:55 Lunch

13:40 Screening for polymorphs (solid form selection)
Dr Bob Docherty, Visiting Professor University of Leeds. Recently retired from Pfizer after 22 years having previously worked at ICI/Zeneca

14:25 Solid-state analysis
Dr Bob Docherty

15:10 Tea

15:25 Characterisation of pseudo polymorphs (TGA, DVS, IGC)
Dr Tom Turner

16:10 Panel Discussion

16:25 End of day one

Tuesday 5 April 2022

08:45 Coffee

Crystallisation Processes

09:00 Hydrodynamics, mixing and heat transfer in batch crystallisers
Dr Tariq Mahmud, School of Chemical and Process Engineering, University of Leeds

09:45 Workflow for crystallisation process development – a case study
Dr Neil George, Syngenta/ School of Chemical and Process Engineering, University of Leeds

10:45 Coffee

11:00 Continuous crystallisation processes
Christian Melches, GEA, Germany

11:45 Post crystallisation unit operations: filtration and drying
Dr Amgad Moussa, Syngenta, Switzerland

12:40 Lunch

Measurements and Control

13:25 Particle size and shape measurements and characterisation
Dr Umair Zafar, Novartis/ University of Leeds

14:10 Control of crystallisation processes for PSD
Dr Tariq Mahmud

14:55 Tea

15:10 Process spectroscopic techniques (IR, UV-vis, Raman)
Dr Xiaojun Lai, School of Chemical and Process Engineering, University of Leeds

15:55 Particle properties and performance
Dr Richard Storey, AstraZeneca

16:40 Panel Discussion

16:45 End of day two

Wednesday 6 April 2022

08:45 Coffee

Co-Crystals

09:00 Fundamentals of co-crystallisation and case studies of recent developments
Professor Mingzhong Li, De Montfort University, Leicester

Professor Anant Paradkar, University of Bradford

Crystallisation Modelling and Software Demonstrations

10:00 Molecular to crystal science modelling route map
Dr CaiYun Ma, School of Chemical and Process Engineering, University of Leeds

10:35 Software demonstration: VISUAL HABIT
Tom Hardcastle, School of Chemical and Process Engineering, University of Leeds

11:05 Coffee

11:20 Digital design of crystallization processes
Dr Niall Mitchell, Siemens Process Systems Enterprise (SPSE), London

12:05 Transfer to PC Cluster / log-in

12:15 Software demonstration: Introduction to the crystallization modules of gPROMS FormulatedProducts (Simulation & Global System Analysis)
Dr Niall Mitchell

13:00 Panel Discussion

13:15 Wrap-up and feedback from delegates
Dr Xiaojun Lai and Dr Tariq Mahmud

13:25 Lunch followed by end of course

Please note, although we remain devoted to the programme specified, we reserve the right to vary the programme in detail if required to do so by factors beyond our control.

View the full programme and book your place online at <http://eps.leeds.ac.uk/short-courses>

100% of respondents since 2017 have said the course met their aims

Further information

Course Fees

The following course fees include the cost of tuition, course materials, lunches and light refreshments:

£1075 – Monday 4 – Wednesday 6 April 2022

Discount available to full time PhD students

Venue

The course venue will be within the Faculty of Engineering and Physical Sciences at the University of Leeds. The University campus is a 20 minute walk from Leeds city train station.

Please note, car parking for visitors is unavailable at the University. The nearest public car park is Woodhouse Lane (multi-storey) at LS1 3HQ.

Accommodation

Delegates are responsible for their own accommodation (if required). A list of hotels close to the University will be sent out with the delegate joining instructions.



How to Book

Please book your place for this course through our secure Online Store, using debit or credit card, following the instructions below:

1. Visit our Online Store at: <http://store.leeds.ac.uk>
2. Select Conferences and Events in the left-hand navigation bar and 'CPD Faculty of Engineering and Physical Sciences'
3. Select the relevant course, click on 'Book Event' and complete your booking details

You will receive an automatic confirmation email within 24 hours of your booking.

Get in touch

Helen Forsyth
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University of Leeds

E: cpd@engineering.leeds.ac.uk

W: <https://eps.leeds.ac.uk/short-courses>

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 [CPD, Conference and Events Unit,
University of Leeds](https://www.linkedin.com/company/CPD-Conference-and-Events-Unit-University-of-Leeds)

Please note

The CPD team are currently working remotely and therefore not contactable by phone, if you have a query please send us an email.

Terms and conditions for booking

Payment by debit/credit card

Payment should be made at the time of booking via the Online Store.

Payment via purchase order and invoice

A purchase order document should accompany your booking form. Our standard terms of payment are 30 days from date of invoice, however payment must be made prior to attendance. Attendance may be refused if payment has not been received.

Changes made by the University of Leeds

The course programme may have to be re-scheduled or the speakers changed for reasons outside our control. The University of Leeds reserves the right to cancel or postpone a course, in which case fees will be refunded in full. In the event of cancellation, the University will not be held liable for delegates' travel or accommodation expenses.

Where a delegate cancels a registration

For cancellations made within seven days of booking: a full refund is payable unless the course starts within the next seven days, in which case the full fee is payable and no refunds will be made.

For cancellations made after seven days of booking: written cancellations received up to 15 working days before the course will be subject to an administrative charge of 20% of the total fee. Within 15 working days of the course the full fee is payable and no refunds will be made.

For non-attendance: the full fee is payable and no refunds will be made but copies of the course materials will be sent to the registered delegate. Substitutions may be made at any time.

For Covid-19 related cancellations please view our revised terms and conditions for booking during the Covid-19 crisis at <https://eps.leeds.ac.uk/faculty-engineering-physical-sciences/doc/cpd-terms-conditions>

Data/Privacy

Your right to privacy is important to us. We will only use your information to provide information on our CPD courses and relevant events. We will not pass your details on to any other organisations. The ways in which your personal data may be used when you provide it to us are defined in our Privacy Notice at <https://eps.leeds.ac.uk/privacy>.

If you have opted in to receive details of future CPD courses from us you can unsubscribe at any time by emailing us at cpd@engineering.leeds.ac.uk and your details will be removed from our database.



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