



The
University
Of
Sheffield.

10th International Granulation Workshop

Sheffield, UK, June 2023

Granulation Course: 19th - 20th June

Granulation Conference: 21st - 23rd June

10th International Granulation Workshop, Sheffield, UK

Course: 19th-20th June 2023

Conference: 21st-23rd June 2023

Granulation and agglomeration technology is a popular topic and of growing interest for different industries - and, therefore, academia - as it is such a key process in the manufacture of many solid products. Growing interest in the field has led to the development of International Granulation Workshop, which has become the one of the world's largest forum for industry and academia to share and discuss recent developments in this complex and evolving field.

The 10th edition of this workshop will take place in 2023 in Sheffield, United Kingdom. It will consist of two parts: a 2-day hands-on Course to serve as an introduction to agglomeration technologies, hosted by some of the world's leading experts in granulation in industry and academia, followed by a 3-day scientific conference, during which cutting-edge research in the field will be presented. The workshop will cover a variety of important topics and will offer a platform for participants to present their latest results, to discuss ideas and to establish new collaborations.

In addition to being a platform for interaction between industry and academia, we also strive to make the workshop a prime venue for professional networking, with a friendly atmosphere and social events included in the conference program.

We look forward to welcoming you to Sheffield in 2023,

Prof. Agba Salman
Dr Riyadh Al-Asady

Plenary Speakers

Prof. Jim Litster: "Artificial Intelligence in granulation control"
The University of Sheffield, UK

Prof. Stefan Palzer: "Quo vadis particle technology"
Nestlé Research Center, Switzerland

Prof. Peter Kleinebudde: "The future of the pharmaceutical granulation"
Heinrich-Heine-University Dusseldorf, Germany

Prof. Charley Wu: "Predicting bulk powder behaviours based upon individual particle properties – ADEM approach"
University of Surrey, UK

Prof. Gavin Reynolds: "Starting with the end in mind – systems modelling of pharmaceutical processes"
AstraZeneca, UK

Prof. Gabriel Meesters: "Particle coating"
Delft University of Technology, Netherlands

Granulation Course

19th-20th June 2023

Prior to the Conference there will be a 2 day Granulation Course, led by experts from the food, detergent and pharmaceutical industries. This course is designed for you if *you work in industrial granulation or are a PhD student*. At the course you will get hands-on granulation experience and knowledge from renowned experts in the field.

Topics:

- Material science for powder.
- Elements of granulation technology – wet granulation regime map.
- Understanding granule formation: Mechanisms in agglomeration – mechanisms of size enlargement, effects of liquid distribution, binder selection, control of granule size.
- Equipment for granulation, including: low and high shear mixers, fluid bed granulators, roller compaction, tableting, extrusion and spheronisation.
- Drying, milling, and tableting.
- Continuous and batch granulation.
- Finished product characterization; Key finished particle properties will be investigated.

Scientific Committee

Prof. Evangelos Tsotsas, Otto von Guericke University Magdeburg, Germany
Dr. Abderrahim Michrafy, Ecole Mines-Albi, France

Prof. Anders Rasmuson, Chalmers University of Technology, Sweden

Prof. Chuan-Yu Wu, University of Surrey, UK

Prof. Chris Vervaet, Ghent University, Belgium

A. Prof. Gabriele Meesters, Delft University of Technology, The Netherlands

Prof. Gavin Walker, University of Limerick, Ireland

Sander van den Ban, Almac Group, UK

Prof. Göran Alderborn, Uppsala University, Sweden

Dr. Ingela Niklasson Björn, AstraZeneca, Sweden

Prof. James Michaels, University of Delaware, USA

Mr Steve Holt, GEA, UK

Prof. Haifeng Lu, East China University of Science and Technology, China

Prof. Bindhu Gururajan, Novartis, Switzerland

Prof. Khashayar Saleh, Université de Technologie de Compiègne, France

Prof. Hans Kuipers, Technical University of Eindhoven, The Netherlands

Prof. Mike Adams, University of Birmingham, UK

Dr Laurent Forné, Nestlé, Switzerland

Prof. Peter Kleinebudde, Heinrich-Heine-University Dusseldorf, Germany

Prof. Gavin Reynolds, AstraZeneca, UK

Prof. Rohit Ramachandran, Rutgers university, USA

Prof. Stefan Heinrich, Technical University Hamburg-Harburg, Germany

Dr. Hong Sing Tan, Procter & Gamble Co, China

Prof. Markus Thommes, TU Dortmund University, Germany

Prof. Frank Kleine Jaeger, BASF, Germany

Prof. Marcial Gonzalez, Purdue, USA

Dr. Kimiaki Washino, Osaka University, Japan

Prof. Frantisek Stepanek, Institute of Chemical Technology, Prague, CZ

Prof. Jukka Rantanen, University of Copenhagen, Denmark

Dr Neil Dawson, Pfizer, UK

Prof. Csaba Sinka, University of Leicester, UK

Dr Kendal Pitt, GSK, UK

Prof. Gavin Andrews, Queen's University of Belfast, UK

Prof. Bertram Wolf, Hochschule Anhalt University, Germany

Prof. Gerhard Niederreiter, Nestlé, Switzerland

Prof. Jim Litster, University of Sheffield, UK

Prof. Stefan Palzer, Nestlé, Switzerland

Prof. Agba Salman, University of Sheffield, UK

Workshop Themes

The Macro Scale I: Processing for Granulation

Processes

- Fluidised Bed Granulation
- High Shear Granulation
- Twin Screw Granulation
- Roller Compaction
- Spray Drying
- Extrusion-Spheronisation and Pelletisation
- Tableting
- Coating and Encapsulation

The Macro Scale II: Applications

- Agglomeration in the Food Industry
- Sensory Perception and Mouthfeel of Food Particles
- Pharmaceutical Granulation
- Fertiliser Granulation
- Detergent and Personal Care Products
- Agglomeration in the Metallurgical Industry
- Agglomeration in Suspension-Flocculation
- Nanoparticle-Granulation
- Agglomeration in Catalysts
- Bio-granulation-Aerobic granulation
- Undesired Agglomeration and Powder Caking
- Green Granulation - Innovative Processes

The Meso Scale: Mechanistic Description

- Wetting and Nucleation, and Growth and Consolidation
- Granulation Rate Processes
- Breakage in Granulation
- Transport Phenomena during Granulation

The Micro Scale: Granules and Smaller

- Structure-Property (Granule Structure, Product Performance)
- Droplet; wetting, spreading, drying and rebound phenomena
- Interparticle Forces – Particle Adhesion – Sintering – Liquid bridge
- New Granule Characterisation Methods
- Hierarchically Structured Granules

Science & Technology of Reconstitution

- Fundamentals of Reconstitution: Wetting, Capillarity, Dispersion, Dissolution
- Innovative Analytical Methods to measure Reconstitution
- Mathematical Modelling of Reconstitution Processes
- Powder Processing Technologies to enhance Reconstitution
- Effect of Powder Structure on Reconstitution and related Functional Properties

Systems Engineering of Granulation Processes

- Control of Granulation Processes
- Control and Optimisation of Flowsheets
- Dynamic Flowsheet Modelling

General Topics

- Continuous Granulation (including Feeding, Blending and Granule Composition)
- Process Control in Continuous and Batch Systems
- Tools for Process Control and PAT
- Scale-Up
- Powder Mixing
- Toxicity of Nanoparticles
- Evaluating Product Performance
- Environmental Aspects / Energy Consumption
- Granulation: Variability and Error
- On-line measurement
- Affordability/Economics of Granulation
- Industrial Challenges in Manufacturing
- Feed Forward Control based on Powder Characterisation
- Fast Start up and Shut downs and Quality Monitoring
- Advances in numerical modelling of powders and powder processing
- Machine learning and AI applied to granulation
- Granulation and 3D printing

How to register

To register please visit:

<https://www.sheffield.ac.uk/agglom/registration-2023>

Organisation Committee

- Dr. Riyadh Al-asady
- Dr. Vincent Meunier
- Dr. Chalak Omar
- Dr. Syed Islam
- Dr. Kimiaki Washino
- Dr. Bilal Khorsheed
- Dr. Ranjit Dhenge
- Dr. Wafaa Al Alaween
- Dr. Chiamaka Nnaedozie
- Dr. Chi Mangwandi

Local Organisation Committee:

- Dr Riyadh Al-Asady
- Miss Jeanina Bungau
- Mr Shengda Hou
- Mr Zheng Wang
- Mr Yashodh H Karunanayake
- Mr Luc Dewulf
- Mr Mohammed Mohammed
- Miss Yang Sarah Mohamad
- Mr Xuqian Li
- Yongang Ma
- Miss Ahri Wu
- Miss Yifan Sun

Abstracts

For details on how to submit an abstract/paper and the deadline, please visit:

<https://www.sheffield.ac.uk/agglom/call-abstracts>

Further Information

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Website: <https://www.sheffield.ac.uk/agglom/10th-international-granulation-workshop-2023>

Poster Competitions

There will be poster competitions at the conference, sponsored by Glatt/TTC and Alexanderwerk.

Sponsors



Conference Social Events

21st June 2023 Evening Dinner Cutlers' Hall

Cutlers' Hall, built in 1832, is an outstanding example of Victorian architecture and is described as being the most prestigious venue in Sheffield. It is home to the Company of Cutlers' in Hallamshire and, therefore, Sheffield's steel history shines through its walls.



22nd June 2023 Gala Dinner The City Hall

Sheffield City Hall is one of Sheffield's prominent historical landmarks, located in the heart of the city at Barker's Pool. It is a popular venue for numerous international and local events thanks to its famous ballroom and Concert Hall. It is also home to the Sheffield's War Memorial.

