JMBC course on Particle Technology

March, 02.-06. 2015, The Gallery, UTwente, NL

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Short Description:

Particles can be found as granular materials in our kitchen (coffee/starch/sugar), in chemical and pharmaceutical industry (tablets/medicine/powders) in nature (sand/soil), or as solids with microstructure (ceramics/composites/metal-alloys). They are everywhere in nature and constitute over 75% of all raw material feedstock to industry – providing many challenges for innovation and fundamental science. The discrete, particulate nature of these materials leads to usually unwanted and sometimes fatal phenomena.
Particle technology is the branch of science and engineering that deals with the production, handling, modification, and use of a various particulate materials (wet or dry) in sizes ranging from nanometers to centimeters; its scope and applications span a range of industries including chemical, mechanical, petrochemical, agricultural, food, pharmaceuticals, mineral processing, advanced materials, energy, and the environment.
The **purpose of this course** is to give a broad overview of most fields and applications of particle technology. Due to the broad range of particle technology, only few issues can be discussed in depth and addressed by exercises. During the course, reference will be made to various more specialized courses that are given in the near future.

Participants can be PhD students in the fields of fluid-mechanics, physics, process technology, chemical and mechanical engineering as well as geo-sciences, informatics or mathematics. However, also other researchers who want to gain a broader overview and industrial researchers and technicians will find this course interesting.

Recommended reading

M. Rhodes, Introduction to Particle Technology, Wiley
(*see the list of references therein for papers and books on special items*)

Costs

JMBC members AIOs: 250E (all incl. – also hotel, 4 nights)
Dutch PhD students (AIOs): 250E (incl. lunch/coffee+1 dinner - without hotel+travel)
International PhD students (AIOs): 400E (incl. lunch/coffee+1 dinner - without hotel+travel)
T-MAPPP members ESRs: 675E (without travel, incl. hotel, double rooms)
Industry: 1000E (incl. lunch/coffee+1 dinner - without hotel+travel)

Hotel

some rooms are pre-reserved in the Drienerburght – contact the hotel directly
http://www.drienerburght.nl/

Program/Schedule

Monday March 02, 2014
10:30 – 11:00 Welcome, coffee
11:00 - 12:45 Intro, Basics, Particles, Contacts, incl. Exercise (S. Luding, UT)
12:45 - 13:45 Lunch
13:45 - 15:30 Particle-Measurement Techniques (H. Merkus, TUD)
15:45 - 17:30 Particle-Fluid Interactions Basics (S. Luding, UT)

Tuesday March 03, 2014
09:00 - 12:15 Powder Flow, Measurement, and Silos (Phenomenology, Design, Problems) (A. Kwade and H. Zetzener) incl. Exercises
12:15 - 13:00 Lunch
13:00 - 14:45 Comminution Processes (A. Kwade and H. Zetzener)
15:00 - 16:30 Synthesis Technology, crystallization (Herman Kramer, TUD)

16:45 **EXCURSION**: Particle & ProcessTechnology at the GROLSCH brewery

Wednesday March 04, 2014
09:00 - 10:45 Advanced particle interactions modelling (S. Luding, UT)
11:00 - 12:45 Particle to Granular Flow, Rheology (V. Magnanimo, UT)
12:45 - 14:45 Lunch **with Poster Viewing (All Participants!)**
14:45 - 16:30 Two-phase flow modeling (N. Deen, TU/e)
16:45 - 18:30 Bio-Mass, Heat-transfer, energy conversion (G. Brem, UT)

Thursday March 05, 2014
09:00 - 10:45 Mixing and Segregation (A. Thornton, UT)
11:00 - 12:45 Nano-particle technology, overview (R. van Ommen, TUD)
12:45 - 13:45 Lunch
13:45 - 18:30 Sedimentation, Fluidization, Pneumatic Transport, incl. Exercise (R. van Ommen, TUD)

19:00 PARTICLE TECHNOLOGY **DINNER**

Friday March 06, 2014
09:00 - 10:45 Capillarity, Wetting, Wicking (M. Ramaioli, USurrey)
11:00 - 12:45 Population Balance Modeling (P. Vonk, DSM)
12:45 - 13:45 lunch
13:45 - 15:30 Granulation and Attrition (G. Meesters, DSM)
15:30 Conclusion/Closing

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