

## PLENARY AND KEYNOTE LECTURES

### MONDAY, AUGUST 28, 2006

1. **Observations Based on Personal Industrial Exposure to Particulate Solids in Various Industries - Aerospace, Minerals, Pharmaceuticals**  
**G. Fortuna**, Teva Pharmaceuticals Industries LTD, Israel (Opening – 09:20)
2. **Attrition of Particulate Solids**  
**M. Ghadiri**, University of Leeds, UK (Keynote – Session B1 – 10:40)
3. **Solids Handling in Waste Treatment**  
**P.C. Rem**, Delft University of Technology, The Netherlands (Keynote – Session D2 – 13:20)

### TUESDAY, AUGUST 29, 2006

4. **Brian Scarlett – 45 Years of Impact - 45 Years of Friendship**  
**R. Davies**, PERC Advisor, University of Florida, USA (Plenary 1 - 08:30)
5. **The Transport Loss Factor Revisited**  
**G. Lodewijks**, Delft University of Technology, the Netherlands (Plenary 1 – 09:20)
6. **Industrial Powder Mixing : Present Practices and Future Revolutions**  
**H. Berthiaux**, Ecole des Mines d'Albi-Carmaux, France (Keynote – Session B5 – 13:20)

### WEDNESDAY, AUGUST 30, 2006

7. **Powder and Particulate Solids Techology Issues for Sustainability and Survival**  
**M. Horio**, Tokyo University of Agriculture and Technology, Japan (Plenary 2 – 08:30)
8. **About Particulate Solids Modelling with Discrete Element Methods**  
**S. Luding**, TU Delft, the Netherlands (Plenary 2 – 09:20)
9. **Powder Mechanics Principles Applied to Compaction Process**  
**V.M. Puri**, Penn State University, USA (Keynote – Session B7 – 10:40)
10. **A Continuum - Mechanics View of the Flow of Dry, Fine Powders**  
**G.I. Tardos**, The City College of the City University of New York, USA  
(Keynote – Session C8 – 13:20)
11. **Advances in Direct Measurement of Structure and Permeability from 3D Tomographic Imaging**  
**R.A. Williams**, University of Leeds, UK (Keynote – Session D9 – 16:20)

### THURSDAY, AUGUST 31, 2006

12. **Production and Handling of Nanoparticles**  
**W. Peukert**, University of Erlangen-Nuremberg, Germany (Plenary 3 – 08:30)
13. **Size Enlargement**  
**M.J. Hounslow, G.K. Reynolds & M. Oullion**, the University of Sheffield, UK (Plenary 3 – 09:20) Supported by BASF
14. **Nanomaterials as Flow Regulators in Dry Powders**  
**I. Zimmermann, K. Meyer & M. Eber**, University of Würzburg, Germany  
(Keynote – Session D11 – 13:20)

# GENERAL PROGRAM

## SUNDAY, AUGUST 27, 2006

11:00 – 13:00	<b>Meeting of Members of the International Scientific Council of CHoPS</b> H. Kalman
13:00 – 14:00	<b>LUNCH</b> For Members of the International Scientific Council of CHoPS
14:00 – 16:00	<b>Meeting of Members of the EFCE Working Party for Mechanics of Particulate Solids</b> H. Feise
16:00 – 16:30	Coffee Break
16:30 – 18:30	<b>Meeting of Members of the EFCE Working Party for Mechanics of Particulate Solids</b> H. Feise
18:00 – 20:30	<b>Registration at Hilton Hotel, Sorrento</b>
20:30 – 22:00	<b>Get Together Reception at Hilton Hotel, Sorrento</b> <b>Host: Organizing and International Scientific Committees</b>

## MONDAY, AUGUST 28, 2006

08:00 – 09:00	Registration			
09:00 – 10:10	<b>OPENING SESSION</b>			
10:10 – 10:40	Coffee Break			
	<b>Track A</b> Supported by <b>IFPS</b>	<b>Track B</b>	<b>Track C</b>	<b>Track D</b>
10:40 – 12:20	<b>SESSION A1</b> Pneumatic Conveying I	<b>SESSION B1</b> Attrition & Processing	<b>SESSION C1</b> Flowability I	<b>SESSION D1</b> Environmental Aspects I
12:20 – 13:20	Lunch			
13:20 – 15:00	<b>SESSION A2</b> Pneumatic Conveying II	<b>SESSION B2</b> Caking	<b>SESSION C2</b> Flowability II	<b>SESSION D2</b> Environmental Aspects II
15:00 – 15:50	<b>POSTER SESSION 1</b> Pneumatic Conveying – Heat & Mass Transfer – Flowability – Environmental Aspects – Education – Caking			
15:50 – 16:20	Coffee Break			
16:20 – 18:00	<b>SESSION A3</b> Pneumatic Conveying III	<b>SESSION B3</b> Heat & Mass Transfer	<b>SESSION C3</b> Flowability III	<b>SESSION D3</b> Dust & Explosion Hazards
18:00 – 19:00	<b>Happy Hour at the Hilton Sorrento Bar (cash bar)</b>			
20:30	<b>Dinner for IFPS Directors</b>			

## TUESDAY, AUGUST 29, 2006

08:30 – 10:10	<b>PLENARY SESSION 1</b>			
10:10 – 10:40	Coffee Break			
10:40 – 12:20	<b>SESSION A4</b> Pneum. Conv. IV	<b>SESSION B4</b> Segregation	<b>SESSION C4</b> Storage I	<b>WORKSHOP D4</b> Dust Hazards
12:20 – 13:20	Lunch			
13:20 – 15:00	<b>SESSION A5</b> Pneum. Conv. V	<b>SESSION B5</b> Mixing I	<b>SESSION C5</b> Storage II	<b>SESSION D5</b> DEM-I
15:00 – 15:50	<b>POSTER SESSION 2</b> Processing – Segregation & Mixing – Storage – DEM – Slurry & Capsule Transport			
15:50 – 16:20	Coffee Break			
16:20 – 18:00	<b>SESSION A6</b> Pneum. Conv. VI	<b>SESSION B6</b> Mixing II	<b>SESSION C6</b> Storage III	<b>SESSION D6</b> DEM-II
19:30	<b>Authentic Neapolitan Dinner at O'Parrucchiano Restaurant with Entertainment</b>			

## WEDNESDAY, AUGUST 30, 2006

08:30 – 10:10	<b>PLENARY SESSION 2</b>			
10:10 – 10:40	Coffee Break			
	<b>Track A</b>	<b>Track B</b>	<b>Track C</b>	<b>Track D</b>
10:40 – 12:20	<b>SESSION A7</b> Slurry I	<b>SESSION B7</b> Compaction	<b>SESSION C7</b> Characterization	<b>WORKSHOP D7</b> DEM
12:20 – 13:20	Lunch			
13:20 – 15:00	<b>SESSION A8</b> Slurry II	<b>SESSION B8</b> Separation & Classification	<b>SESSION C8</b> Flow of Powders	<b>WORKSHOP D8</b> DEM
15:00 – 15:50	<b>POSTER SESSION 3</b> Separation & Classification – Size Enlargement – Compaction – Characterization – Flow of Powders – Fundamentals & Modeling			
15:50 – 16:20	Coffee Break			
16:20 – 18:00	<b>WORKSHOP A9</b> Pneumatic Conveying	<b>SESSION B9</b> Size Enlargement	<b>SESSION C9</b> Cohesive Powders	<b>SESSION D9</b> Tomography
19:30	<b>Dine Around at Selected Restaurants in Sorrento (Optional)</b>			

## THURSDAY, AUGUST 31, 2006

08:30 – 10:10	<b>PLENARY SESSION 3</b>			
10:10 – 10:40	Coffee Break			
10:40 – 12:20	<b>SESSION A10</b> Capsule Conveying	<b>SESSION B10</b> Size Reduction I	<b>SESSION C10</b> Mechanical Conveyors	<b>SESSION D10</b> Fundamentals
12:20 – 13:20	Lunch			
13:30 – 15:00	<b>SESSION A11</b> Fluidization	<b>SESSION B11</b> Size Reduction II	<b>SESSION C11</b> Belt Conveyors	<b>SESSION D11</b> Nano Technology
15:00 – 15:50	<b>POSTER SESSION 4</b> Fluidization – Size Reduction – Mechanical Conveyors – Tomography – Measurements – Nano Technology			
15:50 – 16:20	Coffee Break			
16:20 – 18:00	<b>SESSION A12</b> Fluidizing of Fine Powders	<b>SESSION B12</b> Size Reduction III	<b>SESSION C12</b> Mining Aspects	<b>SESSION D12</b> Modeling
19:30	<b>Farewell Dinner (Optional)</b>			

# PRELIMINARY PROGRAM

(Subject to changes)

## MONDAY, AUGUST 28, 2006

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09:00 – 10:10	<b>OPENING SESSION</b> CHAIR: <i>G. Bonifazi</i> , Universita' Degli Studi di Roma "LA SAPIENZA", Italy
09:00 – 09:20	<b>General Information and Greetings</b> <i>G. Bonifazi</i> , Conference Co-Chair
09:20 – 10:10	<b>Observations Based on Personal Industrial Exposure to Particulate Solids in Various Industries - Aerospace, Minerals, Pharmaceuticals</b> <i>G. Fortuna</i> , Teva Pharmaceuticals Industries LTD, Israel
10:10 – 10:40	<b>COFFEE BREAK</b>
10:40 – 12:20	<b>SESSION A1: PNEUMATIC CONVEYING I</b> CHAIR: <i>M. Jones</i> , The University of Newcastle, Australia
10:40 – 11:05	<b>Pressure Fluctuations in Assessing Flow Regimes in Pneumatic Conveying of Polymer Pellets</b> <i>J.B. Pahl, I. Sahin &amp; G.E. Klinzing</i> , University of Pittsburgh, USA
11:05 – 11:30	<b>Scaling up Technique to Determine the Minimum Conveying Boundary of a Pneumatic Transport System</b> <i>C. Ratnavaka<sup>1</sup>, B.K. Datta<sup>1</sup> &amp; M.C. Melaaen<sup>1,2</sup></i> , <sup>1</sup> Telemark Technological R & D Centre, Norway. <sup>2</sup> Telemark University College, Norway
11:30 – 11:55	<b>Master Curve for Threshold Velocities in Particle-Fluid Systems</b> <i>E. Rabinovich, Y. Weiss &amp; H. Kalman</i> , Ben-Gurion University of the Negev, Israel
11:55 – 12:20	<b>Challenges in the Design and Scale-Up of Pneumatic Conveying Systems</b> <i>P. Wypych</i> , University of Wollongong, Australia
10:40 – 12:20	<b>SESSION B1: ATTRITION &amp; PROCESSING</b> CHAIR: <i>J. Gyenis</i> , University of Veszprém, Hungary
10:40 – 11:30	<b>KEYNOTE: Attrition of Particulate Solids</b> <i>M. Ghadiri</i> , University of Leeds, UK
11:30 – 11:55	<b>Some Physical and Chemical Aspects of Obtaining the Special Cements on the Base of Calcium Aluminates and Barium Ferrites</b> <i>V. Taranenkova, G. Shabanova &amp; D. Byelov</i> , National Technical University "Kharkov Polytechnic Institute", Ukraine
11:55 – 12:20	<b>Effect of Surrounding Gas on Mechanochemical Synthesis of <math>\alpha</math>-Al<sub>2</sub>O<sub>3</sub> Nanopowders</b> <i>A.L. Myz, G.R. Karagedov &amp; N.Z. Lyakhov</i> , The Siberian Branch of the Russian Academy of Science, Russia
10:40 – 12:20	<b>SESSION C1: FLOWABILITY I</b> CHAIR: <i>A. Roberts</i> , The University of Newcastle, Australia
10:40 – 11:05	<b>Evaluation of a Large Size Jenike Tester for Granular Material</b> <i>M.J. Verwijs, R. Bucklin &amp; K. Johanson</i> , University of Florida, USA
11:05 – 11:30	<b>An Investigation of the Effect of Annular Shear Cell Geometric Factors on the Measured Failure Loci and Derived Failure Functions</b> <i>R.J. Berry &amp; M.S.A Bradley</i> , The University of Greenwich, UK
11:30 – 11:55	<b>Shear Experiments on Cohesive Powders in an Aerated Rotational Shear Cell</b> <i>D. Barletta, G. Donsi, G. Ferrari, G. Ferrentino &amp; M. Poletto</i> , Università degli Studi di Salerno, Italy
11:55 – 12:20	<b>A Novel Approach to Describing the Flow Related Aspects of Bulk Solids</b> <i>E. McGee<sup>1</sup> &amp; D. McGlinchey<sup>2</sup></i> , <sup>1</sup> Ajax Equipment Limited, UK. <sup>2</sup> Glasgow Caledonian University, UK

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10:40 – 12:20	<b><u>SESSION D1: ENVIRONMENTAL ASPECTS I</u></b> CHAIR: <i>S. Serranti</i> , Universita Degli Studi di Roma "LA SAPIENZA", Italy
10:40 – 11:05	<b>Dust Emissions Generated During the Down Movement of Free Falling Bulk Solids</b> <i>G. Rheina-Wolbeck &amp; W. Höflinger</i> , Technical University of Vienna, Austria
11:05 – 11:30	<b>Management of Fugitive Dust in Ports. The Port of Thessaloniki Case Study</b> <i>C. Koutitas<sup>1</sup>, G. Palantzas<sup>2</sup> &amp; E. Vafaki<sup>1</sup></i> , <sup>1</sup> Thessaloniki Port Authority S.A., Greece. <sup>2</sup> Aristotle University of Thessaloniki, Greece
11:30 – 11:55	<b>Air Pollution Control Strategies at Ports from Origin to Control of Particulate Pollution in Bulk Coal Handling Terminals</b> <i>V. Bhardwaj</i> , South West Port Limited, India
11:55 – 12:20	<b>Morphological and Morphometrical Characterization of Ornamental Stone Airborne Dust: Equipment and Methods</b> <i>G. Bonifazi, V. Giancontieri &amp; S. Serranti</i> , Universita' Degli Studi di Roma "LA SAPIENZA", Italy
<b>12:20 – 13:20</b>	<b>LUNCH</b>
13:20 – 15:00	<b><u>SESSION A2: PNEUMATIC CONVEYING II</u></b> CHAIR: <i>G.E. Klinzing</i> , University of Pittsburgh, USA
13:20 – 13:45	<b>New Component Technology for Bulk Powder Conveying Systems</b> <i>B. Zinser &amp; R. Ernst</i> , Coperion Waeschle GmbH & Co. KG, Germany
13:45 – 14:10	<b>Investigations into Rotary Valve Air Leakage</b> <i>P. Wypych</i> , University of Wollongong, Australia
14:10 – 14:35	<b>The Study of Air Pressure Drop in Bends Manufactured from Spiraled Grooves Pipe</b> <i>D. Ionescu</i> , University of Johannesburg, South Africa
14:35 – 15:00	<b>Bend Losses Associated with the Pneumatic Conveying of Polyethylene Pellets</b> <i>D. Mills</i> , Consultant, UK
13:20 – 15:00	<b><u>SESSION B2: CAKING</u></b> CHAIR: <i>TBA</i>
13:20 – 13:45	<b>Glass Transition and the Caking of Food Powders</b> <i>J.J. Fitzpatrick, M. Twomey, P.S.M. Cerqueira, N. Descamps &amp; Y.H. Roos</i> , University College, Cork, Ireland
13:45 – 14:10	<b>Predicting the Cake Strength of Granular Materials</b> <i>D. Specht, S. Svoronos &amp; K. Johanson</i> , University of Florida, USA
14:10 – 14:35	<b>Fracture Stress Measurements and Images of Caked Particles of KCl and NaCl</b> <i>J. Sun, R.W. Besant &amp; R.W. Evitts</i> , University of Saskatchewan, Canada
14:35 – 15:00	<b>Measurement of Cake Strength in a Potash Bed</b> <i>Y. Wang, R.W. Evitts, R.W. Besant, &amp; A. Dolovich</i> , University of Saskatchewan, Canada
13:20 – 15:00	<b><u>SESSION C2: FLOWABILITY II</u></b> CHAIR: <i>J.M. Rotter</i> , University of Edinburgh, UK
13:20 – 13:45	<b>Effects of Cyclic Loading and Various Test Conditions in a Uniaxial Tester</b> <i>T.O. Nysaeter<sup>1</sup>, A. Kleppe<sup>1</sup>, G.G. Enstad<sup>2</sup></i> , <sup>1</sup> Telemark University College, Norway. <sup>2</sup> Tel-Tek, Norway
13:45 – 14:10	<b>Using Data from Vertical Shear Cell Tests to Define the Flowability of Bulk Solids</b> <i>E. McGee<sup>1</sup> &amp; D. McGlinchey<sup>2</sup></i> , <sup>1</sup> Ajax Equipment Limited, UK. <sup>2</sup> Glasgow Caledonian University, UK
14:10 – 14:35	<b>Surface Characterization of Pharmaceutical Excipients – Influence of Surface Roughness on Powder Flowability</b> <i>C. Pabel &amp; I. Zimmermann</i> , University of Würzburg, Germany
14:35 – 15:00	<b>Comparisons Between Observed Powder Behaviour in Industrial Feeders and Measured Powder Failure Properties Obtained Using a Short Cut Silo Design Procedure</b> <i>R.J. Berry &amp; M.S.A Bradley</i> , The University of Greenwich, UK

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13:20 – 15:00	<b>SESSION D2: ENVIRONMENTAL ASPECTS II</b> CHAIR: <u>L. Piga</u> , Università degli Studi di Roma “LA SAPIENZA”, Italy
13:20 – 14:10	<b>KEYNOTE: Solids Handling in Waste Treatment</b> <u>P.C. Rem</u> , Delft University of Technology, The Netherlands
14:10 – 14:35	<b>Dispersion of High Aspect Ratio Flakes in Air</b> <u>S. Tedeschi</u> <sup>1</sup> , <u>K. Powers</u> <sup>1</sup> , <u>A. Ranade</u> <sup>2</sup> & <u>H. El Shall</u> <sup>1</sup> , <sup>1</sup> University of Florida, USA. <sup>2</sup> Particle Technology, LLC, USA
14:35 – 15:00	<b>Characterization of Metals Contaminated Soils by Hyperspectral Imaging</b> <u>L. Piga</u> , <u>S. Serranti</u> & <u>G. Bonifazi</u> , Università degli Studi di Roma “LA SAPIENZA”, Italy

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15:00 – 15:50	<b>POSTER SESSION 1</b>
	<b>PNEUMATIC CONVEYING</b>
PS 1.01	<b>Theories for Dynamic Pressure Analysis of Low-Velocity Single-Slug-Flow Pneumatic Conveying</b> <u>S. Tan</u> , <u>K.C. Williams</u> & <u>M.G. Jones</u> , The University of Newcastle, Australia
PS 1.02	<b>Influence of Material Type and Degradation on the Pneumatic Conveying System Design</b> <u>D. Mills</u> <sup>1</sup> & <u>V.K. Agarwal</u> <sup>2</sup> , <sup>1</sup> Consultant, UK <sup>2</sup> IIT, India.
PS 1.03	<b>Pressure Drop Gradient in a Straight Horizontal Pipe for Dense Phase Pneumatic Conveying of Calcium Hydroxide</b> <u>T. Deng</u> , <u>R.J. Farnish</u> & <u>M.S.A. Bradley</u> , University of Greenwich, UK
PS 1.04	<b>The Progressive Method of Pneumatic Conveying of Powder Bulk Materials From Silos and Bag Filters or Electrostatic Precipitators</b> <u>P. Rayman</u> & <u>I. Raymanova</u> , Rayman spol. s r. o. Kladno, Czech Republic
PS 1.05	<b>Non Intrusive Mass Flow Measurements in Pneumatic Transport</b> <u>C. Arakaki</u> <sup>1</sup> , <u>A. Ghaderi</u> <sup>1</sup> , <u>B.K. Datta</u> <sup>1</sup> & <u>B. Lie</u> <sup>2</sup> , <sup>1</sup> Telemark Technological R&D Centre, Norway. <sup>2</sup> Telemark University College, Norway
PS 1.06	<b>A Pneumatic Conveying System for Addition of Lime Fines in Sintering at Sinter Plant-II, Durgapur Steel Plant, India</b> <u>S. Thirumalai Selvam</u> , <u>M.T. Raju</u> , <u>S.A. Balaji</u> , <u>A.C. Nigam</u> , <u>S. Chaudhuri</u> & <u>A.K.P. Singh</u> , Steel Authority of India Limited, India
PS 1.07	<b>Experimental Studies of Dilute Vertical Pneumatic Transport</b> <u>A. Mathisen</u> & <u>M.C. Melaaen</u> , Telemark University College, Norway
PS 1.08	<b>Dense-Phase Pneumatic Conveying of Wet Particles (Ice in Various Forms) Through Plastic Pipelines</b> <u>T.J. Sheer</u> , <u>C.Y. Chan</u> & <u>T.W. Manyaz</u> , University of the Witwatersrand, South Africa
PS 1.09	<b>An Investigation into the Effect of Product Type and Pipeline Diameter in Pneumatic Conveying Through Vertical Pipelines</b> <u>K. Hettiaratchi</u> , <u>M.S.A. Bradley</u> , <u>A.R. Reed</u> & <u>M. Smith</u> , University of Greenwich, UK
	<b>HEAT &amp; MASS TRANSFER</b>
PS 1.10	<b>Application of the Theory of Markov Chains to Model Heat and Mass Transfer Between Stochastically Moving Particulate and Gas Flows</b> <u>V. Mizonov</u> <sup>1</sup> , <u>H. Berthiaux</u> <sup>2</sup> , <u>P. Arlabosse</u> <sup>2</sup> & <u>D. Djerroud</u> <sup>2</sup> , <sup>1</sup> Ivanovo Power Eng. State University, Russia. <sup>2</sup> Ecole des Mines d’Albi – Carmaux, France
PS 1.11	<b>Numerical Simulation of Moisture Uptake and Transport in a Bed of Urea Particles</b> <u>X. Nie</u> , <u>R. Evitts</u> & <u>R.W. Besant</u> , University of Saskatchewan, Canada
PS 1.12	<b>Kinetics of Wetting and Drying of a Hygroscopic Solid: Modelling and Experiment</b> <u>L. Komunjer</u> , <u>C. Affolter</u> , <u>L. Forny</u> & <u>I. Pezron</u> , Université de Technologie de Compiègne, France
PS 1.13	<b>Aplicability of the Spouting Regime for Drying of Biomass Wastes in Conical Spouted Beds with a Draft Tube</b> <u>M.J. San José</u> , <u>S. Alvarez</u> , <u>A. Ortiz de Salazar</u> , <u>A. Morales</u> & <u>J. Bilbao</u> , Universidad del País Vasco, Spain
PS 1.14	<b>Drying Sludge with Hot Steel Balls</b> <u>G.W. van Gemert</u> & <u>P.C. Rem</u> , Delft University of Technology, The Netherlands

#### FLOWABILITY

- PS 1.15 **Flow - Ability Measuring Techniques- Interrelation and Sensitivity to Change in Composition**  
P.A. Kulkarni, M.S.A. Bradley & R.J. Berry, The University of Greenwich, UK
- PS 1.16 **The Effect of Grinding on the Ground Material Flowability**  
E. Grant & H. Kalman, Ben-Gurion University of the Negev, Israel
- PS 1.17 **Development of New Approaches to Investigate the Action Mechanism and the Potency of Flow Regulators**  
J. Spuziak, C. Pabel & I. Zimmermann, University of Würzburg, Germany
- PS 1.18 **Fragmentation of Nanoscaled Flow Regulators as Criterion for Their Potency**  
A.-K. Peter & I. Zimmermann, University of Würzburg, Germany

#### ENVIRONMENTAL ASPECTS

- PS 1.19 **Physicochemical Characterization and Application of Wasted Fly Ashes**  
Z. Sarbak & M. Kramer-Wachowiak, Adam Mickiewicz University, Poland
- PS 1.20 **Coal Fly Ash Zeolitization in Blended Cement Binders**  
J. Junak, Technical University of Košice, Slovakia

#### EDUCATION

- PS 1.21 **Educational Web Environment for Chemical Engineering**  
T.A. Carvalho, L.N. Souza, V.H.S. Miranda & K. Tannous, State University of Campinas, Brazil

#### CAKING

- PS 1.22 **Caking Behaviour Investigation of Biomass/Coal Mixes Using Uniaxial Tester**  
N.S. Khan, M.S.A. Bradley & R.J. Berry, University of Greenwich, UK
- PS 1.23 **The Effect of Particle Size and Magnesium Content on the Strength of Caked Potash**  
D. Gillies, Y. Wang, R.W. Evitts & R.W. Besant, University of Saskatchewan, Canada

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**15:50 – 16:20 COFFEE BREAK**

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**16:20 – 18:00 SESSION A3: PNEUMATIC CONVEYING III**

CHAIR: D. Mills, Consultant, UK

- 16:20 – 16:45 **An Investigation in the Micro-Mechanical Failure Mode of Severe Localised Wear in Pneumatic Conveying of Alumina**  
K.C. Williams, A.A. Cenna & M.G. Jones, The University of Newcastle, Australia
- 16:45 – 17:10 **Numerical and Experimental Studies of Dilute Vertical Pneumatic Transport**  
A. Mathisen & M.C. Melaen, Telemark University College, Norway
- 17:10 – 17:35 **Dispersion of Solid Particles in Conveying Jets**  
K. Luo, J.R. Fan & K.F. Cen, Zhejiang University, P.R. China
- 17:35 – 18:00 **A Comparison of Pressure Drop Relations and Flow Patterns Between Experiment and a CFD Model of a Section of Pneumatic Conveying Pipeline**  
D. McGlinchey, A. Cowell, V. Cheung, J.R. Pugh & E.A. Knight, Glasgow Caledonian University, UK

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**16:20 – 18:00 SESSION B3: HEAT & MASS TRANSFER**

CHAIR: A. Levy, Ben-Gurion University of the Negev, Israel

- 16:20 – 16:45 **Preparation of Defined Bulk Densities for Using the Capillary Rise Method in the Case of Fine Powders**  
S. Thümmeler, D. Höhne & K. Husemann, Freiberg University of Mining and Technology, Germany
- 16:45 – 17:10 **Measurement of Moisture Uptake and Transport in a Bed of Urea Particles**  
X. Nie, R.W. Besant & R. Evitts, University of Saskatchewan, Canada
- 17:10 – 17:35 **Spray Drying of Wet Particles**  
M. Mezhericher, A. Levy & I. Borde, Ben-Gurion University of the Negev, Israel
- 17:35 – 18:00
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16:20 – 18:00	<b><u>SESSION C3: FLOWABILITY III</u></b> CHAIR: <i>M. Poletto</i> , Università degli Studi di Salerno, Italy
16:20 – 16:45	<b>A New Microtriaxial Tester for the Characterization of Fine Particulate Systems</b> <i>A. Abdel-Hadi</i> , The University of Georgia, USA
16:45 – 17:10	<b>The Control of Powder Flowability by Particle Surface Additives is Monitored by Measuring Interparticle Forces</b> <i>M.A.S. Quintanilla, J.M. Valverde &amp; A. Castellanos</i> , University of Seville, Spain
17:10 – 17:35	<b>Handling Characteristics of Biomass / Coal Mixes for Co-firing: Failure Properties of Mixes</b> <i>N.S. Khan, M.S.A. Bradley &amp; R.J. Berry</i> , University of Greenwich at Medway, UK
17:35 – 18:00	<b>Flow Properties Measurement for a Lignocellulosic Particulate Material</b> <i>A. Escamilla-Martinez</i> , CIATEQ AC Advanced Technology Center, Mexico

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16:20 – 18:00	<b><u>SESSION D3: DUST &amp; EXPLOSION HAZARDS</u></b> CHAIR: <i>C. Koutitas</i> , Thessaloniki Port Authority S.A., Greece
16:20 – 16:45	<b>Bulk Solids Fires – A Potential Explosion Hazard</b> <i>P. Wypych</i> , University of Wollongong, Australia
16:45 – 17:10	<b>Static Charging Elimination in Solid Particulates: Application to Polymer Production</b> <i>J. Taillet</i> , Scientific Adviser, VALITEC, France
17:10 – 17:35	<b>Analysis of Enzyme Dust Formation in Detergent Manufacturing Plants</b> <i>H. Ahmadian &amp; M. Ghadiri</i> , University of Leeds, UK
17:35 – 18:00	<b>Safe with Explosions: From Evasion to controlled Venting – a Comprehensive Overview of the State-of-the-art Explosion Protection Means and Measures to Make Modern Industrial Solid Processes Safe</b> <i>S. Penno</i> , REMBE GmbH, Germany

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## TUESDAY, AUGUST 29, 2006

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08:30 – 10:10	<b>PLENARY 1: TO THE MEMORY OF PROF. BRIAN SCARLETT AND PROF. MUHAMED FAYED</b> CHAIR: <i>H. Kalman</i> , Ben-Gurion University of the Negev, Israel
08:30 – 09:20	<b>Brian Scarlett – 45 Years of Impact - 45 Years of Friendship</b> <i>R. Davies</i> , PERC Advisor, University of Florida, USA
09:20 – 10:10	<b>The Transport Loss Factor Revisited</b> <i>G. Lodewijks</i> , Delft University of Technology, the Netherlands
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10:10 – 10:40	<b>COFFEE BREAK</b>
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10:40 – 12:20	<b>SESSION A4: PNEUMATIC CONVEYING IV</b> CHAIR: <i>F. Rizk</i> , BASF, Germany
10:40 – 11:05	<b>An Innovative System for Investigating Materials in a Pneumatic Conveying Pipeline</b> <i>A. Mason</i> , <i>D. McGlinchey</i> & <i>A. Cowell</i> , Glasgow Caledonian University, UK
11:05 – 11:30	<b>Problems for Pneumatic Conveying Extra-Dense Materials</b> <i>T. Deng</i> , <i>R.J. Farnish</i> & <i>M.S.A. Bradley</i> , University of Greenwich, UK
11:30 – 11:55	<b>Controlling Impact Forces During Plug Conveying</b> <i>R. Ernst</i> , Coperion Waeschle GmbH, Germany
11:55 – 12:20	<b>Investigations into the Factors Influencing the Fluidized Motion Conveying of Flyash</b> <i>S.K. Gupta</i> <sup>1</sup> , <i>V.K. Agarwal</i> <sup>2</sup> , <i>V. Seshadri</i> <sup>2</sup> , <i>S.N. Singh</i> <sup>2</sup> & <i>D. Mills</i> <sup>3</sup> , <sup>1</sup> NEERIST, Arunachal Pradesh, India. <sup>2</sup> IIT, India. <sup>3</sup> Consultant, UK
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10:40 – 12:20	<b>SESSION B4: SEGREGATION</b> CHAIR: <i>G. Ferrari</i> , Università degli Studi di Salerno, Italy
10:40 – 11:05	<b>Percolation Segregation Model for Similar and Differing Constituents</b> <i>P. Tang</i> & <i>V.M. Puri</i> , Penn State University, USA
11:05 – 11:30	<b>Single Particle Properties Vs. Bulk Flowability</b> <i>A. Santomaso</i> & <i>P. Canu</i> , University of Padua, Italy
11:30 – 11:55	<b>Segregation due to Air Flow While Filling Bulk Material Silos</b> <i>K. Gottschalk</i> & <i>Ch. Fülll</i> , Leibniz-Institut für Agrartechnik Bornim, Germany
11:55 – 12:20	<b>Transport, Mixing and Segregation of Granular Material on Vibrating Conveyors</b> <i>R. Grochowski</i> & <i>P. Walzel</i> , University of Dortmund, Germany
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10:40 – 12:20	<b>SESSION C4: STORAGE I</b> CHAIR: <i>U. Tuzun</i> , University of Surrey, UK
10:40 – 11:05	<b>Modal Analysis of Coal Bunkers and Silos with Special Reference to Thermal Power Stations</b> <i>S. Venkatesh</i> <sup>1</sup> & <i>E.P. Koorapati</i> <sup>2</sup> , <sup>1</sup> Osmania University, India. <sup>2</sup> JNTUniversity College of Engineering, India
11:05 – 11:30	<b>Analysis of Bulk Terminals: Chances for Exploration</b> <i>D.L. Schott</i> & <i>G. Lodewijks</i> , Delft University of Technology, The Netherlands
11:30 – 11:55	<b>Coal Handlability Using Real-Time Testing: An Overview</b> <i>Z. Zhong</i> , <i>J.Y. Ooi</i> & <i>J.M. Rotter</i> , University of Edinburgh, UK
11:55 – 12:20	<b>Influence of Moisture of Powder Material on the External Angle of Friction</b> <i>R. Fekete</i> , <i>M. Peciar</i> & <i>M. Hanzel</i> , Slovak University of Technology In Bratislava, Slovakia

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10:40 – 12:20

**WORKSHOP D4: DUST HAZARDS**

CHAIR: *P. Wypych*, University of Wollongong, Australia

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**Dust Hazards – Minimisation and Control**

Dust emissions in the workplace can be hazardous to health and damaging to equipment and instrumentation, affecting plant reliability. Under the right conditions of concentration, ignition and oxidant, dust clouds also can create explosion hazards inside and outside process components (e.g. bins, mixers, screens, etc). The build-up of explosible dust over time can provide the opportunity of secondary explosions, which can be far more devastating than the initial or primary explosion.

The purpose of this workshop is to discuss some of the more important considerations that should be made when designing, operating, analysing or auditing powder handling systems and processes. Emphasis is placed on:

- Damaging nature of dust, in terms of human health, equipment damage and explosions;
- Dust generation and air entrainment mechanisms;
- Effect of product temperature on dust generation;
- Design/operation of plant to minimise generation/turbulence of dust – including risk and severity of dust emissions and explosions;
- Safe handling/processing of highly explosible powders - new technologies;
- Safe fire control methods to prevent dust explosions.

Recent research findings and several industrial case studies are used to demonstrate and emphasise particular issues.

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12:20 – 13:20

**LUNCH**

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13:20 – 15:00

**SESSION A5: PNEUMATIC CONVEYING V**

CHAIR: *D. McGlinchey*, Glasgow Caledonian University, UK

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13:20 – 13:45

**Influence of the Isometric in Plug Phase Conveying System**

*T. Destoop*, NEU International, France

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13:45 – 14:10

**Plug Formation and Flow Regimes in Dense-Phase Pneumatic Conveying**

*F.A.V. Silvano*<sup>1</sup> & *S.S. Pandiella*<sup>2</sup>, <sup>1</sup>Instituto Politécnico de Leiria, Portugal. <sup>2</sup>The University of Manchester, UK

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14:10 – 14:35

**Measurement of Wall Friction in SLUG FLOW Pneumatic Conveying**

*T. Krull*, *M.G. Jones* & *A.W. Roberts*, The University of Newcastle, Australia

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14:35 – 15:00

**Verification of Pressure Drop Model Over a Single Slug Based on Conservation of Air Mass**

*S. Tan*, *K.C. Williams* & *M.G. Jones*, The University of Newcastle, Australia

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13:20 – 15:00

**SESSION B5: MIXING I**

CHAIR: *V.M. Puri*, Penn State University, USA

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13:20 – 14:10

**KEYNOTE: Industrial Powder Mixing : Present Practices and Future Revolutions**

*H. Berthiaux* & *Cendrine Gatamel*, Ecole des Mines d'Albi-Carmaux, France

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14:10 – 14:35

**Aerated Discharge of Horizontally Segregated Glass Beads of Different Sizes from Two- and Three-Dimensional Silos**

*A. D'Arco*, *G. Donsi*, *G. Ferrari*, *M. Montesano* and *M. Poletto*, Università degli Studi di Salerno, Italy

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14:35 – 15:00

**Improving Efficiency of Granular Material Mixing**

*V. Royzen* & *M. Shapiro*, Technion – Israel Institute of Technology, Israel

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13:20 – 15:00

**SESSION C5: STORAGE II**

CHAIR: *J.M. Rotter*, University of Edinburgh, UK

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13:20 – 13:45

**Piping in a Silo-Centrifuge**

*A. Cannavacciuolo*, *J. Schwedes* & *A. Kwade*, Technical University Braunschweig, Germany

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13:45 – 14:10

**FE-Investigations of Shear Localization During Quasi-Static Granular Silo Flow**

*J. Tejchman*, Gdansk University of Technology, Poland

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14:10 – 14:35

**Bulk Solid Pressure Effects due to Eccentric Discharging of Circular Silo Bin**

*A. Lapko* & *W. Konopacki*, Bialystok Technical University, Poland

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14:35 – 15:00

**Critical Pressure Conditions in Silos**

*J.M. Rotter*, *J.Y. Ooi* & *Z. Zhong*, University of Edinburgh, UK

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13:20 – 15:00	<b><u>SESSION D5: DEM-I</u></b> CHAIR: <i>U. Tuzun</i> , University of Surrey, UK
13:20 – 13:45	<b>Post-Simulation Analyses of Large Datasets Using Wavelets to Probe Dynamic Evolution of Stress, Strain-Rate and Voidage Coupling in Granular Media</b> <i>U. Tuzun</i> , University of Surrey, UK
13:45 – 14:10	<b>Influence of Filling Method on Packing Structure in Model Silo and DEM Simulations</b> <i>J. Sykut, M. Molenda &amp; J. Horabik</i> , Polish Academy of Sciences, Poland
14:10 – 14:35	<b>Modelling Glued Particle Contacts with DEM</b> <i>L. Brendel</i> , University Duisburg-Essen, Germany
14:35 – 15:00	<b>Shear Dynamics of Ultrafine Cohesive Powders: Simulations and Experiments</b> <i>R. Tykhoniuk &amp; J. Tomas</i> , Otto-von-Guericke University of Magdeburg, Germany

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15:00 – 15:50 **POSTER SESSION 2**

**PROCESSING**

- PS 2.01 **Manufacturing of Ceramic Body for Moisture Control with Excellent Self-Absorbing and Moisture-Releasing Functions**  
*B.G. Kim<sup>1</sup>, C.L. Park, Y.I. Kim<sup>2</sup>, H.S. Jeon<sup>1</sup> & D.S. Jang<sup>3</sup>*, <sup>1</sup>Korea Institute of Geoscience & Mineral Resources, Korea. <sup>2</sup>KangWon National University, Korea. <sup>3</sup>Eco-Safe Co. Ltd., Korea
- PS 2.02 **The Coal's Preparation for the Production of CWF**  
*A. Bonoli, A. Parisi & S. Goldoni*, Università degli Studi di Bologna, Italy
- PS 2.03 **Influences of the Synthesis Parameters on the Morphology of the Hydroxyapatite Particles Obtained by Hydrothermal Decomposition of Urea and Edta Chelates**  
*B. Jokic, I. Jankovic-Castvan, Dj. Veljovic, R. Petrovic, S. Lazarevic, D. Tanaskovic & Dj. Janackovic*, Faculty of Technology and Metallurgy, Serbia and Montenegro
- PS 2.04 **Simultaneous Powder Deposition in Three Parallel-Oriented Cylindrical Dies**  
*X. Xie & V.M. Puri*, Penn State University, USA
- PS 2.05 **Comparison Between Different Tests of Sag Grinding for the Determination of the Specific Energy for the Comminution of a Sulfide Copper Ore**  
*P.E.C. Pereira<sup>1</sup> & A.E.C. Peres<sup>2</sup>*, <sup>1</sup>ECM S.A. – Projetos Industriais, Brazil. <sup>2</sup>Federal University of Minas Gerais UFMG, Brazil

**SEGREGATION & MIXING**

- PS 2.06 **A Non-Linear Model of Particulate Flow in a Continuous Blade Mixer**  
*D. Ponomarev<sup>1</sup>, V. Mizonov<sup>1</sup>, H. Berthiaux<sup>2</sup> & E. Barantseva<sup>1</sup>*, <sup>1</sup>Ivanovo State Power Engineering University, Russia. <sup>2</sup>Ecole des Mines d'Albi – Carmaux, France
- PS 2.07 **An Investigation into the Mixing and Segregation of Non-Spherical Particles Using a Digitalpacking Algorithm**  
*R. Caulkin, X. Jia, M. Fairweather & R.A. Williams*, University of Leeds, UK

**STORAGE**

- PS 2.08 **The Experimental and Theoretical Analysis of the Flow Behaviour of Granular Materials in Silos With Inserts**  
*M. Wójcik & J. Tejchman*, Gdansk University of Technology, Poland
- PS 2.09 **Investigations of Density Changes During Granular Silo Flow Using Electrical Capacitance Tomography and Particle Image Velocimetry**  
*M. Niedostatkiewicz & J. Tejchman*, Gdansk University of Technology, Poland
- PS 2.10 **Pressure Measurements in Full-Scale Steel Silos with Eccentric Hoppers**  
*A. Ramirez<sup>1</sup>, J. Nielsen<sup>2,3</sup>, F. Ayuga<sup>1</sup> & J. Munch-Andersen<sup>2</sup>*, <sup>1</sup>Polytechnic University of Madrid, Spain. <sup>2</sup>Danish Building Research Institute, Denmark. <sup>3</sup>Brunel University, UK
- PS 2.11 **Elastic Predictions of Pressures in Granular Materials in Converging Hopper**  
*I. Sielamowicz*, Bialystok Technical University, Poland
- PS 2.12 **Prediction of Honking Frequency Based on a Study of Five Honking Silos**  
*J.Y. Ooi, Pankaj & J. Chavez-Sagarnaga*, University of Edinburgh, UK

- PS 2.13            **Reliability Analysis for Reinforced Concrete Silos**  
A. Lapko, Bialystok Technical University, Poland
- PS 2.14            **Numerical and Experimental Modelling of Hydro – Thermal Effects in Grain Stored in Cylindrical Silo Bin**  
J.A. Prusiel & A. Lapko, Bialystok Technical University, Poland
- PS 2.15            **Ideal Bulk Material: Interpretation of yield Coefficient and Tangent of Angle of Internal Friction Product**  
J. Zegzulka & O. Dokoupil, VŠB-Technical university Ostrava-Poruba, Czech Republic
- PS 2.16            **Granular State of Material Aggregation: Comparison of Ideal Bulk Material with Ideal Fluid and Ideal Solid Matter**  
J. Zegzulka & O. Dokoupil, VŠB-Technical university Ostrava-Poruba, Czech Republic

#### DEM

- PS 2.17            **Modifications on a Transition Chute for Dust Reduction Aided by Discrete Element Simulations**  
T. Gröger<sup>1</sup> & P. Kisters<sup>2</sup>, <sup>1</sup>Itasca Consultants GmbH, Germany, <sup>2</sup>AUMUND Fördererbau, Germany
- PS 2.18            **Experimental Study and DEM Simulation of Granular Breakage by Impact**  
S. Antonyuk, J. Tomas, S. Heinrich & L. Mörl, Otto-von-Guericke-University of Magdeburg, Germany
- PS 2.19            **Recent Results of Experimentation and DEM Modeling of Centrifugal Fertilizer Spreading**  
E. Tijskens<sup>1</sup>, P. Van Liedekerke<sup>1</sup>, E. Piron<sup>2</sup>, J. Van Geyte<sup>3</sup>, S. Villette<sup>4</sup> & H. Ramon<sup>1</sup>, <sup>1</sup>Katholieke Universiteit Leuven, Belgium. <sup>2</sup>Cemagref, France. <sup>3</sup>Centre of Agricultural Research, Belgium. <sup>4</sup>UMR ENESAD-Cemagref CPAP, France
- PS 2.20            **Discrete Element Simulation of Direct Shear Test with Experimental Validation**  
J. Haertl & J.Y. Ooi, University of Edinburgh, UK

#### SLURRY & CAPSULE TRANSPORT

- PS 2.21            **Flow of Non-Newtonian Fluid Over a Smooth Surface**  
B. Horení, Z. Chara & P. Vlasák, Institute of Hydrodynamics of Academy of Sciences of the Czech Republic, Czech Republic
- PS 2.22            **A Physical Model for Yield Plastic Fluids**  
D. Hallbom<sup>1,2</sup> & B. Klein<sup>2</sup>, <sup>1</sup>Pipeline Systems Inc., Canada. <sup>2</sup>University of British Columbia, Canada

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**15:50 – 16:20            COFFEE BREAK**

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#### **16:20 – 18:00            SESSION A6: PNEUMATIC CONVEYING VI**

CHAIR: T. Destoop, NEU International, France

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- 16:20 – 16:45            **Air Extraction - A Viable Alternative to Stepped Pipelines**  
D. Mills, Consultant, UK
- 16:45-17:10            **Study on Double-Tube-System for Long Distance Pneumatic Ash Handling**  
L. Xiangyang, Electric Power Construction Research Institute, P.R.China
- 17:10 – 17:35            **New Pneumatic Dense Phase Conveying Technology for Powders**  
R. Ernst, Coperion Waeschle GmbH, Germany
- 17:35 – 18:00            **Performance Comparisons for By-Pass Pipelines**  
D. Mills, Consultant, UK
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16:20 – 18:00	<b>SESSION B6: MIXING II</b> CHAIR: <u>M. Shapiro</u> , Technion – Israel Institute of Technology, Israel
16:20 – 16:45	<b>Mixing of Cohesive Material in Low Shear Mixers</b> <u>M. Hubert</u> , <u>M. Djomlija</u> , <u>K. Johanson</u> & <u>B. Scarlett</u> , University of Florida, USA
16:45 – 17:10	<b>Investigating Mixing of Wet Monohydrate Crystals in a Horizontal Rotating Cylinder</b> <u>A.A. Shaikh</u> <sup>1</sup> , <u>A.D. Salman</u> <sup>1</sup> , <u>S. McNamara</u> <sup>2</sup> , <u>G. Littlewood</u> <sup>2</sup> & <u>M.J.Hounslow</u> <sup>1</sup> , <sup>1</sup> University of Sheffield, UK. <sup>2</sup> Brunner Mond (UK) Ltd., UK
17:10 – 17:35	<b>Batch Mixing Study of Granular Materials in an Innovative Mixer: The Triaxe</b> <u>J.-F. Demevre</u> <sup>1,2</sup> , <u>C. Gatamel</u> <sup>1</sup> , <u>H. Berthiaux</u> <sup>1</sup> & <u>M. Grandjean</u> <sup>2</sup> , <sup>1</sup> Ecole des Mines d'Albi-Carmaux, France. <sup>2</sup> Hognon SA, France
17:35 – 18:00	<b>Modelling and Experimental Investigation in Continuous Dynamic Powder Mixing by Means of the Fokker-Planck-Equation</b> <u>D. Dopfer</u> & <u>K. Sommer</u> , Lehrstuhl für Maschinen- und Apparatekunde, Germany
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16:20 – 18:00	<b>SESSION C6: STORAGE III</b> CHAIR: <u>D.L. Schott</u> , Delft University of Technology, The Netherlands
16:20 – 16:45	<b>Loads on Support Structural Elements Buried in Bins and Stockpiles</b> <u>A.W. Roberts</u> , The University of Newcastle, Australia
16:45 – 17:10	<b>Experimental Investigation of Flow Pattern and Wall Pressure Distribution in a Silo with Double-Cone Insert</b> <u>M. Wojcik</u> <sup>1</sup> , <u>J. Härtl</u> <sup>2</sup> , <u>J. Ooi</u> <sup>2</sup> , <u>J.M. Rotter</u> <sup>2</sup> , <u>S. Ding</u> <sup>3</sup> & <u>G.G. Enstad</u> <sup>3</sup> , <sup>1</sup> Gdańsk University of Technology, Poland. <sup>2</sup> University of Edinburgh, UK, <sup>3</sup> Tel-Tek, Norway
17:10 – 17:35	<b>Calculation of the Bulk Material Stress in Former Funnel Flow Silos with “Cone in Cone” Inserts with Use of a New Material Law</b> <u>Th. Schuricht</u> <sup>1</sup> , <u>Ch. Füll</u> <sup>2</sup> & <u>K. Gottschalk</u> <sup>2</sup> , <sup>1</sup> Warnowdesign, Rostock, Germany. <sup>2</sup> Leibniz-Institut für Agrartechnik Bornim, Germany
17:35 – 18:00	<b>Non-Axial Stress State in a Model Silo Generated by Eccentric Filling and Internal Inserts</b> <u>M. Molenda</u> <sup>1</sup> , <u>M.D. Montross</u> <sup>2</sup> , <u>J. Horabik</u> <sup>1</sup> , <sup>1</sup> Polish Academy of Sciences, Poland. <sup>2</sup> University of Kentucky, USA
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16:20 – 18:00	<b>SESSION D6: DEM-II</b> CHAIR: <u>J. Ooi</u> , University of Edinburgh, UK
16:20 – 16:45	<b>Towards a Better Understanding of Granular Material Processes: The Coupling of Micro-Mechanical Models Within a Computational Fluid Dynamics Framework</b> <u>M.K. Patel</u> <sup>1</sup> , <u>N. Christakis</u> <sup>2</sup> , <u>P. Chapelle</u> <sup>3</sup> & <u>M. Cross</u> <sup>4</sup> , <sup>1</sup> University of Greenwich, UK. <sup>2</sup> University of Crete, Greece. <sup>3</sup> Ecole des Mines, Parc de Saurupt, France. <sup>4</sup> University of Wales, UK
16:45 – 17:10	<b>Large Scale DEM computation – Expectations and Recent Results</b> <u>E. Tijskens</u> , <u>B. Van Besien</u> , <u>S. Vandewalle</u> & <u>H. Ramon</u> , Katholieke Universiteit Leuven, Belgium
17:10 – 17:35	<b>On the Numerical Calibration of Discrete Element Models for the Simulation of Bulk Solids</b> <u>T. Gröger</u> <sup>1</sup> & <u>A. Katterfeld</u> <sup>2</sup> , <sup>1</sup> Itasca Consultants GmbH, Germany, <sup>2</sup> IFSL, OvG-University of Magdeburg, Germany
17:35 – 18:00	<b>Assessment of Mill Lifter Bar Deflection Measurements Using Wavelets and Discrete Element Methods</b> <u>K.T. Tano</u> <sup>1</sup> & <u>B.I. Pålsson</u> <sup>2</sup> , <sup>1</sup> LKAB, Research and Development, Sweden. <sup>2</sup> Luleå University of Technology, Sweden

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## WEDNESDAY, AUGUST 30, 2006

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08:30 – 10:10	<b><u>PLENARY 2</u></b> CHAIR: <i>J. Tomas</i> , Otto-von-Guericke-University Magdeburg, Germany
08:30 – 09:20	<b>Powder and Particulate Solids Technology Issues for Sustainability and Survival</b> <i>M. Horio</i> , Tokyo University of Agriculture and Technology, Japan
09:20 – 10:10	<b>About Particulate Solids Modelling with Discrete Element Methods</b> <i>S. Luding</i> , TU Delft, the Netherlands
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10:10 – 10:40	<b>COFFEE BREAK</b>
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10:40 – 12:20	<b><u>SESSION A7: SLURRY I</u></b> CHAIR: <i>P. Vlasák</i> , Institute of Hydrodynamics of Academy of Sciences of the Czech Republic, Czech Republic
10:40 – 11:05	<b>Pressure Drops for Pipeline Transport of Slurries with Broad Grading</b> <i>A. Sellgren</i> <sup>1</sup> & <i>K.C. Wilson</i> <sup>2</sup> , <sup>1</sup> Lulea University of Technology, Sweden. <sup>2</sup> Queen's University, Canada
11:05 – 11:30	<b>Solids Stress at Wall of Vertical Slurry-Pipe</b> <i>V. Matoušek</i> , Czech Academy of Sciences, Czech Republic
11:30 – 11:55	<b>Concentration Distribution in Pipeline Flow of Highly Concentrated Slurry</b> <i>D.R. Kaushal</i> <sup>1</sup> & <i>Y. Tomita</i> <sup>2</sup> , <sup>1</sup> IIT Delhi, India. <sup>2</sup> Kyushu Institute of Technology, Japan
11:55 – 12:20	<b>Effect of Fine Particles on the Flow of Bi-Modal Slurry Downstream of a 90° Bend at Medium Concentration</b> <i>U. Kumar</i> <sup>1</sup> , <i>S.N. Singh</i> <sup>2</sup> & <i>V. Seshadri</i> <sup>2</sup> , <sup>1</sup> BIET Jhansi, India. <sup>2</sup> IIT Delhi, India
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10:40 – 12:20	<b><u>SESSION B7: COMPACTION</u></b> CHAIR: <i>J. Tomas</i> , Otto-von-Guericke-University Magdeburg, Germany
10:40 – 11:30	<b><u>KEYNOTE: Powder Mechanics Principles Applied to Compaction Process</u></b> <i>V.M. Puri</i> , Penn State University, USA
11:30 – 11:55	<b>Geometric Analysis of Bi-Layered Tablets of Microcrystalline Cellulose (MCC) Using Laser Profilometry and the Relevance to Their Resistance to Fracture</b> <i>S.J. Inman</i> <sup>1</sup> , <i>B.J. Briscoe</i> <sup>1</sup> & <i>K.G. Pitt</i> <sup>1</sup> , <sup>1</sup> Imperial College London, UK, <sup>2</sup> Merck, Sharp and Dohme, UK
11:55 – 12:20	<b>Mechanical Properties of Dense Pharmaceutical Compacts Made with Binary Mixtures of 3 Different Excipients: Experiments &amp; Modeling</b> <i>P. Evesque</i> , <i>V. Busignies</i> , <i>B. Leclerc</i> , <i>G. Couarraze</i> , <i>P. Tchoreloff</i> & <i>P. Porion</i> , Ecole Centrale Paris, France
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10:40 – 12:20	<b><u>SESSION C7: CHARACTERIZATION</u></b> CHAIR: <i>P. Bevilacqua</i> , University of Trieste, Italy
10:40 – 11:05	<b>Sophisticated Sampling Systems Improve Process Safety and Efficiency – a Guide to Choose the Right Device for the Right Application</b> <i>S. Penno</i> , Kersting Industrieausrüstungen GmbH, Germany
11:05 – 11:30	<b>2D Fractal Based Algorithms for Fine and Ultra-fine Particulate Solids Systems Characterization</b> <i>G. Bonifazi</i> , Università Degli Studi di Roma "La Sapienza", Italy
11:30 – 11:55	<b>Size Characterization of Coal Particles by Using Mechanical and Optical Methods: An Empirical Correlation</b> <i>S. Maggiolino</i> , <i>S. Birtig</i> & <i>L. Modolo</i> , University of Trieste, Italy
11:55 – 12:20	<b>Measurement of Electrostatic Charge Transfer by Single Particle Impact with a Metal Plate</b> <i>H. Watanabe</i> <sup>1</sup> , <i>Y. Ding</i> <sup>1</sup> , <i>M. Ghadiri</i> <sup>1</sup> , <i>T. Matsuyama</i> <sup>2</sup> , <i>K.G. Pitt</i> <sup>3</sup> , <i>H. Maruyama</i> <sup>4</sup> , <i>S. Matsusaka</i> <sup>4</sup> & <i>H. Masuda</i> <sup>4</sup> , <sup>1</sup> University of Leeds, UK. <sup>2</sup> Soka University, Japan. <sup>3</sup> Merck Sharp and Dohme, UK. <sup>4</sup> Kyoto University, Japan

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10:40 – 12:20

**WORKSHOP D7: DEM**

CHAIRS: **S. Luding**, TU Delft, the Netherlands, S.Luding@tnw.tudelft.nl  
**U. Tuzun**, University of Surrey, UK, U.Tuzun@surrey.ac.uk  
**J. Ooi**, University of Edinburgh, UK, j.ooi@ed.ac.uk

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**EFCE Working Party on Mechanics of Particulate Solids**

DEM is currently being used extensively in bulk solids handling research. However, for wider acceptance the DEM-codes for simulation of bulk solids behavior need to be validated. This requires carefully selected problems with a good experimental database for test runs. The workshop is intended to help identify a suitable set of problems for the quantitative validation and verification of DEM type models in the area of bulk solids handling. The workshop will commence with introductory presentations on the issues and methods relating to validation currently used in chemical, mining and agricultural engineering and physics research, as well as in industry. This will be followed by a discussion session by all workshop participants.

The workshop shall produce a framework for engagement between academic researchers, professional software companies and potential industrial beneficiaries of DEM numerical simulations that will identify areas that need significant further development both in terms of computational methodologies as well as the experimental validation procedures. It is hoped that in the longer term, the group of researchers brought together for the event will form the nucleus of a wider project formation aimed at setting the European/International standards of "best practice" in DEM Simulation software development and implementation in a broad range of industry sectors

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12:20 – 13:20

**LUNCH**

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13:20 – 15:00

**SESSION A8: SLURRY II**

CHAIR: **V. Matoušek**, Academy of Sciences, Czech Republic

13:20 – 13:45

**Conveying of Solid Particles in Newtonian and Non-Newtonian Carrier**

**P. Vlasák, Z. Chára & J. Konfršt**, Institute of Hydrodynamics of Academy of Sciences of the Czech Republic, Czech Republic

13:45 – 14:10

**Sedimentation of Particles in Developed Turbulent Flow in Rough Pipes**

**A. Sarimeseli**, Inonu University, Turkey

14:10 – 14:35

**A Phenomenological Model for Yield Plastic Fluids**

**D. Hallbom**<sup>1,2</sup> & **B. Klein**<sup>2</sup>, <sup>1</sup>Pipeline Systems Inc., Canada. <sup>2</sup>University of British Columbia, Canada

14:35 – 15:00

**The Effect of Particle Size Distribution on the Rheology of Fly Ash Slurries**

**T.F. Bunn, M.G. Jones & C. Wheeler**, The University of Newcastle, Australia

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13:20 – 15:00

**SESSION B8: SEPARATION & CLASSIFICATION**

CHAIR: **TBA**

13:20 – 13:45

**Modeling the Filtration and Consolidation Dynamics of Flocculated and Not Flocculated Ultrafine Limestone Suspensions**

**J. Tomas & T. Mladenchev**, Otto-von-Guericke-University Magdeburg, Germany

13:45 – 14:10

**An Effective Technology to Minimize Rejects Stockpiles**

**P. Bozzato**<sup>1</sup> & **P. Bevilacqua**<sup>2</sup>, <sup>1</sup>Ecomin S.r.l., Italy. <sup>2</sup>University of Trieste, Italy

14:10 – 14:35

**Using Digital Monitoring Technologies to Optimize the Performance of Vibratory Screen Separation Equipment**

**E. Johnson**, SWECO, USA

14:35 – 15:00

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13:20 – 15:00

**SESSION C8: FLOW OF POWDERS**

CHAIR: **M.S.A Bradley**, The University of Greenwich, UK

13:20 – 14:10

**KEYNOTE: A Continuum - Mechanics View of the Flow of Dry, Fine Powders**

**G.I. Tardos**, The City College of the City University of New York, USA

14:10 – 14:35

**Characterization of Cohesive Powders at the Single Particle Level**

**X. Ling**<sup>1</sup>, **L. Heim**<sup>1</sup>, **R. Tykhoniuk**<sup>2</sup>, **J. Tomas**<sup>2</sup>, **S. Luding**<sup>3</sup>, **M. Kappl**<sup>1</sup>, & **H.-J. Butt**<sup>1</sup>, <sup>1</sup>Max Planck Institute for Polymer Research, Germany. <sup>2</sup>Otto-von-Guericke-University, Germany. <sup>3</sup>DelftChemTech, The Netherlands

14:35 – 15:00

**DPIV Technique in Measurements of Eccentric Granular Material Flows in Plane Hoppers**

**I. Sielamowicz**<sup>1</sup> & **T.A. Kowalewski**<sup>2</sup>, <sup>1</sup>Bialystok Technical University, Poland. <sup>2</sup>Institute of Fundamental Technological Research, Poland

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13:20 – 15:00

**WORKSHOP D8: DEM**

CHAIRS: **S. Luding**, TU Delft, the Netherlands, S.Luding@tnw.tudelft.nl  
**U. Tuzun**, University of Surrey, UK, U.Tuzun@surrey.ac.uk  
**J. Ooi**, University of Edinburgh, UK, j.ooi@ed.ac.uk

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CONTINUE

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15:00 – 15:50

**POSTER SESSION 3**

**SEPARATION & CLASSIFICATION**

PS 3.01

**Granular Material Velocity on a Sieve**  
**R. Modrzewski & P. Wodziński**, Technical University of Łódź, Poland

PS 3.02

**Magneto-Hydrostatic Separation of Pet**  
**E.J. Bakker & P.C. Rem**, Delft University of Technology, the Netherlands

**SIZE ENLARGEMENT**

PS 3.03

**Sucrose Crystallization from a Multicomponent Solution Using Fondant as Model System**  
**M.B. Queiroz<sup>1</sup>, I.R.L. Braúna<sup>1</sup> & T.G. Kieckbusch<sup>2</sup>**, <sup>1</sup>CEREAL CHOCOTEC - Instituto de Tecnologia de Alimentos, Italy. <sup>2</sup>Universidade Estadual de Campinas, Brazil

PS 3.04

**Influence of Oil Content, Temperature and Steam Pressure on Steam Jet Agglomeration of Maltodextrin Powders**  
**P.C.Martins & T.G. Kieckbusch**, Universidade Estadual de Campinas, Brazil

PS 3.05

**Snow Granulation by Rotary Snow Plow**  
**T. Kobayashi**, Nagaoka Institute of Snow and Ice Studies, Japan

PS 3.06

**Energy Input for Disk Granulation**  
**A. Heim, R. Kaźmierczak & A. Obraniak**, Technical University of Lodz, Poland

PS 3.07

**Model of Tumbling Agglomeration in a Rotary Drum**  
**A. Obraniak, T. Gluba**, Technical University of Lodz, Poland

PS 3.08

**The Effect of Equipment and Process Parameters on Energy Consumption in Drum Granulation**  
**T. Gluba**, Technical University of Lodz, Poland

PS 3.09

**Development of Edible Coatings for Application in Blackberries**  
**F.M. Fakhouri, R.C. Monteiro, T.G. Kieckbusch & F.P. Collares**, Universidade Estadual de Campinas – UNICAMP, Brazil

**COMPACTION**

PS 3.10

**Jamming and Compaction of Fine and Ultrafine Powders**  
**J.M. Valverde & A. Castellanos**, University of Seville, Spain

**CHARACTERIZATION**

PS 3.11

**Hyperspectral Imaging Based Techniques in Particles and Particulate Solids Systems Characterization**  
**G. Bonifazi & S. Serranti**, Universita' Degli Studi di Roma "La Sapienza", Italy

PS 3.12

**Effect of the Mineral Filler on the Surface Properties of Co-Ground Polymeric Composites**  
**C. Zapata-Massot & N. Le Bolav**, Laboratoire de Génie Chimique – UMR CNRS 5503 – INP-ENSIACET, France

PS 3.13

**Relative Permeability of Solid Mixtures**  
**M.N.N. Miranda, L.F. Domingues & M.A. Silva**, State University of Campinas, Brazil

PS 3.14

**Morphological and Mechanical Properties of Instantized Maltodextrins of Different Dextrose-Equivalent Degrees**  
**C.Y. Takeiti, T.G. Kieckbusch & F.P. Collares**, State University of Campinas, Brazil

PS 3.15

**Physical Properties of Maltodextrins of Different Dextrose-Equivalent (DE) and of the Agglomerates Obtained by Steam Jet Agglomeration**  
**C.Y. Takeiti, T.G. Kieckbusch & F.P. Collares**, State University of Campinas, Brazil

**FLOW OF POWDERS**



- PS 3.16            **The Flow and Damping Behaviours of Ultrafine Powders**  
A. Haack, G. Kache & J. Tomas, Otto-von-Guericke-University Magdeburg, Germany
- PS 3.17            **The Correlation Between Stick-Slip and Cohesion**  
M.J. Verwijs, S. Svoronos & K. Johanson, University of Florida, USA
- FUNDAMENTALS & MODELING**
- PS 3.18            **Particle/Gas Interactions in Taylor-Couette Flow**  
A.J. Gyllensten<sup>1,2</sup>, M.C. Melaen<sup>1</sup> & E. Manger<sup>2</sup>, <sup>1</sup>Telemark University College, Norway. <sup>2</sup>Norsk Hydro ASA, Norway
- PS 3.19            **Quasi-Spherical Model of Solid Particle Reaction for Ion Exchange Process**  
F. Aurelian, National Institute for Metals and Radioactive Resources-ICPMRR, Romania
- PS 3.20            **Simulator Software Applied to Fluidized Bed Reactor - Serea**  
D. Rimoli, D.M. Assis & K. Tannous<sup>3</sup>, State University of Campinas, Brazil
- PS 3.21            **A Numerical Investigation into the Simulated Packing of Multi-Tubular Catalytic Reactors**  
R. Caulkin, M. Fairweather, X. Jia & R.A. Williams, University of Leeds, UK
- PS 3.22            **A Particle Packing Algorithm for Packed Beds with Size Distribution**  
G.A. Georgalli<sup>1</sup> & M.A. Reuter<sup>2</sup>, <sup>1</sup>Technical University of Delft, The Netherlands. <sup>2</sup>University of Melbourne, Australia

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**15:50 – 16:20                      COFFEE BREAK**

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**13:20 – 15:00                      WORKSHOP A9: PNEUMATIC CONVEYING**  
CHAIR: *F. Rizk*, BASF, Germany

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**Pneumatic Conveying Workshop 7 / International Working Party (IWP)**

Theme: Evolution or Revolution in the Two-Phase Flow Gas/Solids

The IWP decided at the '4th International Conference Conveying and Handling of Particulate Solids in Budapest / Hungary in 2003 to tackle the issue: 'Prediction to Design of Full-Scale Pneumatic Conveying Systems on the basis of small Product Samples'.

Proposals for discussion:

- Above stated Issue as main Challenge
- 2 Characteristic Models describing the Flow in Pipes
- Parameters Influencing the Two-Phase Flow
- Scale-up Factors
- Why Dimensionless Numbers?
- Data-Base
- Etc.

Other Points of Interest regarding Experiences, Observations and Maintenance of performing Pneumatic Conveying Systems can be presented and discussed. Presentation and discussion time will be adopted to the number of speakers. For organization reasons a short memo i.e. speaker's name, title of item and req. time for presentation would be helpful. This is not obligatory. For further questions contact: [info@frizk.de](mailto:info@frizk.de) <<mailto:info@frizk.de>>

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**16:20 – 18:00                      SESSION B9: SIZE ENLARGEMENT**  
CHAIR: *M.J. Hounslow*, University of Sheffield, UK

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16:20 – 16:45            **A Micro-Level Study of the Morphology and Strength of Solidifying Inter-Particle Bridges in a Granule**  
G.I. Tardos, The City University of New York, USA

16:45 – 17:10            **Influence of the Bulk Properties on the Design of Roller Press**  
P. Müller, L. Grossmann & J. Tomas, Otto-von-Guericke-University Magdeburg, Germany

17:10 – 17:35            **Compaction Properties of Pregelatinized Starch (Starch 1500™): Viscoelasticity and Strain Rate Sensitivity**  
S. Toson<sup>1</sup>, B.J. Briscoe<sup>1</sup> & K.G. Pitt<sup>2</sup>, <sup>1</sup>Imperial College London, UK, <sup>2</sup>Merck Sharp & Dohme Limited, UK

17:35 – 18:00            **Mixing Effect on Crystal Size Distribution of Crystalline Products: A Semibatch Reactive Crystallization of Maneb**  
A. Abbasi & A. Alamdari, Shiraz University, Iran

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16:20 – 18:00	<b>SESSION C9: COHESIVE POWDERS</b> CHAIR: <i>D. Barletta</i> , Università degli Studi di Salerno, Italy
16:20 – 16:45	<b>Mechanics of Particle Adhesion</b> <i>J. Tomas</i> , Otto-von-Guericke-University Magdeburg, Germany
16:45 – 17:10	<b>Steady State Flow of Cohesive and Non Cohesive Powders</b> <i>M. Roeck</i> <sup>1</sup> , <i>M. Morgeneuer</i> <sup>1</sup> , <i>J. Schwedes</i> <sup>1</sup> , <i>D. Kadau</i> <sup>2,3</sup> , <i>L. Brendel</i> <sup>2</sup> & <i>D.E. Wolf</i> <sup>2</sup> , <sup>1</sup> Technical University Braunschweig, Germany. <sup>2</sup> University Duisburg–Essen, Germany. <sup>3</sup> Institute for Building Materials, Switzerland
17:10 – 17:35	<b>Effect of Hydrophobic Surfaces on Bulk Unconfined Yield Strength</b> <i>K. Johanson</i> , University of Florida, USA
17:35 – 18:00	<b>Modification of the Flow Properties of Cohesive Bulk Solids with Surface Active Agents</b> <i>M. Schumann</i> <sup>1</sup> , <i>D. Höhne</i> <sup>2</sup> , <i>S. Thümmeler</i> <sup>2</sup> & <i>K. Husemann</i> <sup>2</sup> , <sup>1</sup> Saint-Gobain CREE, France. <sup>2</sup> TU Bergakademie Freiberg, Germany

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16:20 – 18:00	<b>SESSION D9: TOMOGRAPHY</b> CHAIR: <i>M. Takei</i> , Nihon University, Japan
16:20 – 17:10	<b>KEYNOTE: Advances in Direct Measurement of Structure and Permeability from 3D Tomographic Imaging</b> <i>R.A. Williams</i> , University of Leeds, UK
17:10 – 17:35 a	<b>Complex Approach Based Using Controlling Fluidized Bed Dryers by Using Distributed Sensors</b> <i>W.Q. Yang</i> <sup>1</sup> , <i>T. Dvukowski</i> <sup>1</sup> , <i>H. Waigang</i> <sup>1</sup> , <i>P. Senior</i> <sup>1</sup> , <i>R. Rambali</i> <sup>1</sup> , <i>S. Duncan</i> <sup>2</sup> & <i>M. Li</i> <sup>2</sup> , <sup>1</sup> The University of Manchester, UK. <sup>2</sup> University of Oxford, UK
17:35 – 18:00	<b>Measurement of Particle Concentration in Powder Coating Process Using Capacitance Computed Tomography</b> <i>M. Takei</i> & <i>M. Ochi</i> , Nihon University, Japan

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## THURSDAY, AUGUST 31, 2006

08:30 – 10:10	<b>PLENARY 3</b> CHAIR: <i>G.I. Tardos</i> , The City College of the City University of New York, USA
08:30 – 09:20	<b>Production and Handling of Nanoparticles</b> <i>W. Peukert</i> , University of Erlangen-Nuremberg, Germany
09:20 – 10:10	<b>Size Enlargement</b> <i>M.J. Hounslow, G.K. Reynolds &amp; M. Oullion</i> , the University of Sheffield, UK Supported by BASF
10:10 – 10:40	<b>COFFEE BREAK</b>
10:40 – 12:20	<b>SESSION A10: CAPSULE CONVEYING</b> CHAIR: <i>D. Ulusarlan</i> , Yildiz Technical University, Turkey
10:40 – 11:05	<b>Experimental Set-Up and Capsule Feeding System Designed for Spherical Capsule Train Flows</b> <i>D. Ulusarlan &amp; I. Teke</i> , Yildiz Technical University, Turkey
11:05 – 11:30	<b>Motion of Large Particles in a Horizontal Pneumatic Pipe</b> <i>H. Tashiro</i> <sup>1</sup> & <i>Y. Tomita</i> <sup>2</sup> , <sup>1</sup> Kurume Institute of Technology, Japan, <sup>2</sup> Kyushu Institute of Technology, Japan
11:30 – 11:55	<b>Comparison of Empirical Expressions and Experimental Findings for Pressure Drops in the Flow of Low Density Spherical Capsule Train with General Expressions Regarding Spherical Capsule Train Flows</b> <i>D. Ulusarlan &amp; I. Teke</i> , Yildiz Technical University, Turkey
11:55 – 12:20	<b>The Application and Development of Freight Pipeline in China</b> <i>H. Chen</i> , Waterborne Transportation Institute, Ministry of Communication, China
10:40 – 12:20	<b>SESSION B10: SIZE REDUCTION I</b> CHAIR: <i>F. La Marca</i> , Università di Roma “La Sapienza”, Italy
10:40 – 11:05	<b>An Industrial Perspective on Bulk Solids Attrition in Pneumatic Conveying</b> <i>L. Fryc</i> <sup>1</sup> & <i>W. Peukert</i> <sup>2</sup> , <sup>1</sup> BASF AG, Germany. <sup>2</sup> University of Erlangen-Nuremberg, Germany
11:05 – 11:30	<b>PIV Analyses and CFD Simulations within an Air Classifier Mill</b> <i>P. Toneya, W. Peukert &amp; K.E. Wirth</i> , Friedrich-Alexander University Erlangen-Nuremberg, Germany
11:30 – 11:55	<b>DEM Simulation of Particle Breakage due to Fatigue</b> <i>V. Rodnianski, M. Haim &amp; H. Kalman</i> , Ben-Gurion University of the Negev, Israel
11:55 – 12:20	<b>On Correlation Between the Fraction Mass Balance and Energy Balance in Models of Grinding</b> <i>V. Mizonov</i> <sup>1</sup> , <i>H. Berthiaux</i> <sup>2</sup> & <i>V. Zhukov</i> <sup>1</sup> , <sup>1</sup> Ivanovo Power Eng. State University, Russia. <sup>2</sup> Ecole des Mines d’Albi – Carmaux, France
10:40 – 12:20	<b>SESSION C10: MECHANICAL CONVEYORS</b> CHAIR: <i>K. Hoffmann</i> , Vienna Technical University, Austria
10:40 – 11:05	<b>Coreless Screw Extraction and Proportioning Machinery and the Properties of Food Powders: A Cobweb of Interactions</b> <i>J-L. Ilari</i> , ENITIAA, Nantes, France
11:05 – 11:30	<b>Guidance of a Flat Belt by Angled Pulley Axis</b> <i>M. Egger</i> <sup>1</sup> , <i>K. Hoffmann</i> <sup>2</sup> & <i>A. Pirko</i> <sup>2</sup> , <sup>1</sup> Upper Austria University of Applied Science, Austria. <sup>2</sup> Vienna Technical University, Austria
11:30 – 11:55	<b>Simulation-Based Knowledge Acquisition for Intelligent Belt Conveyor Monitoring</b> <i>Y. Pang &amp; G. Lodewijks</i> , Delft University of Technology, The Netherlands
11:55 – 12:20	<b>Design of a Self-Compensating Soft Loading Hood</b> <i>W. McBride &amp; D. Ilic</i> , University of Newcastle, Australia

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10:40 – 12:20	<b>SESSION D10: FUNDAMENTALS</b> CHAIR: <u>L.-O. Heim</u> , Max Planck Institute for Polymer Research, Germany
10:40 – 11:05	<b>Behaviour of Granular Matter in 0 Gravity</b> <u>P. Evesque</u> , Y. Garrabos, M. Leconte & D. Beysens, Ecole Centrale Paris, France
11:05 – 11:30	<b>Handling of Particulate Solids on the International Space Station</b> <u>J. Blum</u> <sup>1</sup> , R. Schröpfer <sup>1</sup> , T. Poppe <sup>1</sup> & G. Borst <sup>2</sup> , <sup>1</sup> Technical University at Braunschweig, Germany. <sup>2</sup> Dutch Space B.V., The Netherlands
11:30 – 11:55	<b>Characterization of Voids in Spherical Particles Systems by Delaunay Empty Spheres</b> <u>S. Remond</u> , J.L. Gallias & A. Mizrahi, Université de Cergy-Pontoise, France
11:55 – 12:20	<b>A New Method to Investigate Mechanical Properties of High-Porosity Microscopic Agglomerates</b> <u>L.-O. Heim</u> <sup>1</sup> , H.-J. Butt, J. Blum <sup>2</sup> & R. Schröpfer <sup>2</sup> , <sup>1</sup> Max Planck Institute for Polymer Research, Germany. <sup>2</sup> Technical University of Braunschweig, Germany
12:20 – 13:20	<b>LUNCH</b>
13:20 – 15:00	<b>SESSION A11: FLUIDIZATION</b> CHAIR: <u>Y. Tomita</u> , Kyushu Institute of Technology, Japan
13:20 – 13:45	<b>Hydrodynamic Parameters of a Solid-Gas Semi-Fluidized Bed</b> <u>Y. Kechroud</u> & <u>K. Allia</u> , University of Sciences and Technology «Houari Boumediene», Algeria
13:45 – 14:10	<b>Entrainment of Heterogeneous Particles in a Laboratory Scale Fluidized Bed</b> <u>L.A. Obata</u> , M.W. Donida & <u>K. Tannous</u> , State University of Campinas, Brazil
14:10 – 14:35	<b>Spouting of Fine Powder by the Injection of Air from Top and Bottom of Powder Bed</b> <u>K. Ogata</u> , Oshima National College of Maritime Technology, Japan
14:35 – 15:00	<b>Solids Motion Analysis in the Jet Region of a Gas Fluidized Bed</b> <u>L. Mirmomen</u> & <u>M. Alavi</u> , Iran University of Science and Technology Tehran, Iran
13:20 – 15:00	<b>SESSION B11: SIZE REDUCTION II</b> CHAIR: <u>A. Heim</u> , Lodz Technical University, Poland
13:20 – 13:45	<b>Analysis of Soda Ash Comminution Using Fatigue Functions</b> <u>L. Berg</u> <sup>1</sup> , P. Mort <sup>1</sup> & <u>H. Kalman</u> <sup>2</sup> , <sup>1</sup> Procter & Gamble Co., USA. <sup>2</sup> Ben-Gurion University of the Negev, Israel
13:45 – 14:10	<b>Milling Experiments with Prototypes of the Quadro Fine-Grind F-10 Mill</b> <u>G. Samburski</u> <sup>1</sup> , Y. Ovadia & S. Hutton <sup>2</sup> , <sup>1</sup> Teva Pharmaceutical Industries, Israel. <sup>2</sup> Quadro Engineering, Canada
14:10 – 14:35	<b>The Pattern of Cryo-Comminution Products</b> <u>V. Gente</u> , V. Giancontieri, <u>F. La Marca</u> & P. Massacci, Università di Roma “La Sapienza”, Italy
14:35 – 15:00	<b>Production of High Aspect Ratio Metal Flakes by Stirred Media Milling</b> <u>R. Hamey</u> , K. Powers, A. Ranade & H. El-Shall, University of Florida, USA
13:20 – 15:00	<b>SESSION C11: BELT CONVEYORS</b> CHAIR: <u>J.-L. Ilari</u> , ENITIAA, Nantes, France
13:20 – 13:45	<b>Dynamics of Multiple Drive Belt Conveyor Systems</b> <u>A.J.G. Nuttall</u> & G. Lodewijks, Delft University of Technology, The Netherlands
13:45 – 14:10	<b>Minimising the Motion Resistances of Belt Conveyors</b> <u>C. Wheeler</u> , The University of Newcastle, Australia
14:10 – 14:35	<b>Net Present Value Analysis in Idler Selection Optimisation for Design of Overland Conveyor Systems</b> <u>M. Louda</u> , Parsons Brinckerhoff, Australia
14:35 – 15:00	<b>RopeCon – A New Long Distance Conveyor Based on Ropeway Technology</b> <u>K. Hoffmann</u> , Vienna University of Technology, Austria

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13:20 – 15:00	<b><u>SESSION D11: NANO TECHNOLOGY</u></b> CHAIR: <i>W. Peukert</i> , University of Erlangen-Nuremberg, Germany
13:20 – 14:10	<b><u>KEYNOTE: Nanomaterials as Flow Regulators in Dry Powders</u></b> <i>I. Zimmermann</i> , University of Würzburg, Germany
14:10 – 14:35	<b>Preparation of Protein Containing Nano and Microparticles</b> <i>T. Feczko, J. Tóth &amp; J. Gyenis</i> , University of Veszprém, Hungary
14:35 – 15:00	<b>Nanoparticle Structural Organisation and Scaffolding in Organic Media</b> <i>O. Gundogdu<sup>1</sup>, M. Roso<sup>2</sup>, G.C. Stevens<sup>1</sup> &amp; U. Tuzun<sup>1</sup></i> , <sup>1</sup> University of Surrey, UK. <sup>2</sup> University of Padova, Italy

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15:00 – 15:50	<b><u>POSTER SESSION 4</u></b> CHAIRS: <b>FLUIDIZATION</b>
PS 4.01	<b>Fluidization of Cohesive Particles by Surface Modification</b> <i>R. Dave</i> , New Jersey Institute of Technology, USA
	<b>SIZE REDUCTION</b>
PS 4.02	<b>Some Problems with Accurate Milling of Plastics</b> <i>J. Flizikowski<sup>1</sup> &amp; M. Macko<sup>2</sup></i> , <sup>1</sup> University of Agricultural and Technology, Poland. <sup>2</sup> Kazimierz Wielki University, Poland
PS 4.03	<b>Fatigue Function for use in Population Balance Models</b> <i>M. Schvartzman &amp; H. Kalman</i> , Ben-Gurion University of the Negev, Israel
PS 4.04	<b>Experimental Analysis of a Spiral Jet-Mill Performance</b> <i>A. Catz &amp; H. Kalman</i> , Ben-Gurion University of the Negev, Israel
PS 4.05	<b>Attrition of Particles due to Shear Loads</b> <i>E. Grant &amp; H. Kalman</i> , Ben-Gurion University of the Negev, Israel
PS 4.06	<b>Modelling of Comminution Rate of Ceramic Body in a Pilot-Plant Ball Mill</b> <i>A. Heim &amp; T.P. Olejnik</i> , Lodz Technical University, Poland
PS 4.07	<b>The Simulation of the Grinding Using CAD</b> <i>M. Macko</i> , Kazimierz Wielki University, Poland
PS 4.08	<b>Disintegration of Microorganisms in a Bead Mill</b> <i>M. Solecki</i> , Technical University of Lodz, Poland
	<b>MECHANICAL CONVEYORS</b>
PS 4.09	<b>The Application of Saaty's Priority Principle in Bulk Solids Handling and Conveying</b> <i>G. Lodewijks</i> , Delft University of Technology, the Netherlands
PS 4.10	<b>The Design of Conveyor Belting for Pipe Conveyors</b> <i>P. Staples<sup>1</sup> &amp; G. Lodewijks<sup>2</sup></i> , <sup>1</sup> CKIT Conveyor Engineers, Republic of South Africa. <sup>2</sup> Delft University of Technology, The Netherlands
PS 4.11	<b>Mechatronics Based Integrated Belt-Conveyor Optimum System Design for Bulk Solid Handling</b> <i>B.S. Choudhary</i> , B.I.T. Mesra Ranchi, India
PS 4.12	<b>Bulk Solid and Conveyor Belt Interactions in Belt Conveying Systems: Transition Zone</b> <i>D. Ilic, C. Wheeler &amp; A.W. Roberts</i> , University of Newcastle, NSW, Australia
	<b>TOMOGRAPHY</b>
PS 4.13 b	<b>Controlling Fluidized Bed Dryers by Applying Electrical Tomography</b> <i>W.Q. Yang<sup>1</sup>, T. Dvukowski<sup>1</sup>, H. Waigang<sup>1</sup>, P. Senior<sup>1</sup>, R. Rambali<sup>1</sup>, S. Duncan<sup>2</sup> &amp; M. Li<sup>2</sup></i> , <sup>1</sup> The University of Manchester, UK. <sup>2</sup> University of Oxford, UK
PS 4.14	<b>Micro-tomographic Techniques Applied to Particulate Solids Based Products Characterization</b> <i>G. Bonifazi, P. Massacci &amp; S. Serranti</i> , Universita' Degli Studi di Roma "La Sapienza", Italy

**MEASUREMENTS**

- PS 4.15 **VHF Electromagnetic Sensor for On-Line Measurement of Moisture Content in Granular Material**  
M. Huang<sup>1</sup>, W. Wang<sup>1</sup>, J. Yang<sup>1</sup> & X. Gu<sup>2</sup>, <sup>1</sup>Yunnan University, P.R.China. <sup>2</sup>Kunming Jin-Hui-Tong Wireless & Microwave Sensor Institute, P.R.China
- PS 4.16 **An Investigation of Gas-To-Particle Heat Transfer for Non-Invasive Mass Flow Measurement In Pneumatic Conveying**  
Y. Zheng, J.R. Pugh, D. McGlinchey & R.O. Ansell, Glasgow Caledonian University, UK
- PS 4.17 **Evaluation of an Image Based Bulk Particulate Size Distribution Analyzer**  
S. Al-Thyabat, AL-Hussein Bin Talal University, Jordan

**NANO TECHNOLOGY**

- PS 4.18 **Investigation of Tritonx-100-Based Microemulsions for the Controlled Synthesis of CuO Nanoparticles**  
D.Y. Han, H.Y. Yang & F.H. Wang, The Chinese Academy of Sciences, China
- PS 4.19 **Characterization of Silane-Modified Nano-ZrO<sub>2</sub> Particles**  
A.I. Desheng<sup>1</sup> & L. Binyuan<sup>2</sup>, <sup>1</sup>Tsinghua University, China. <sup>2</sup>Hebei University of Technology, China

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**15:50 – 16:20 COFFEE BREAK**

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- 16:20 – 18:00 SESSION A12: FLUIDIZING FINE POWDERS**  
CHAIR: H. Tashiro, Kurume Institute of Technology, Japan
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- 16:20 – 16:45 **Flushing Phenomenon of Fine Powder due to the Head**  
H. Tashiro<sup>1</sup>, K. Ogata<sup>2</sup>, Y. Wakamizu<sup>3</sup>, K. Fanatsu<sup>4</sup> & Y. Tomita<sup>4</sup>, <sup>1</sup>Kurume Institute of Technology, Japan. <sup>2</sup>Oshima National College of Maritime Technology, Japan. <sup>3</sup>Imaging Company, Nikon Corporation, Japan. <sup>4</sup>Kyushu Institute of Technology, Japan
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- 16:45 – 17:10 **Effect of Gas Viscosity and Particle Agglomeration on the Fluidization Behavior of Fine Particles**  
J.M. Valverde & A. Castellanos, University of Seville, Spain
- 17:10 – 17:35 **An Experimental Study on Fluidisation Behaviour of Geldart C Glass Powders**  
X.B. Cami, K. Saleh, A. Thomas & P. Guigon, Compiègne University of Technology, France
- 17:35 – 18:00 **Microstructural Investigations of Nano Particle Fluidisation in Model 2-D and 3-D Beds Using High Speed X-Ray Imaging and Microtomography**  
O. Gundogdu, U. Tuzun & P. Jennesson, University of Surrey, UK

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- 16:20 – 18:00 SESSION B12: SIZE REDUCTION III**  
CHAIR: V. Mizonov, Ivanovo Power Eng. State University, Russia
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- 16:20 – 16:45
- 16:45 – 17:10 **The Effect of a Rotating Magnetic Field on Collision Attrition of Magnetic Powder**  
C-S. Chou & T-H. Wu, National Pingtung University of Science and Technology, Taiwan
- 17:10 – 17:35 **Rheological Behaviours in Wet Ultra-Fine Grinding of Limestone**  
M. He<sup>1</sup>, Y. Wang<sup>1,2</sup> & E. Forssberg<sup>1</sup>, <sup>1</sup>Luleå University of Technology, Sweden, <sup>2</sup>South China University of Technology, China
- 17:35 – 18:00 **Restructuring and Crack Growth in Particle Clusters under Fluid Stress**  
S. Harada, R. Tanaka & K. Asakura, Hokkaido University, Japan
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<b>16:20 – 18:00</b>	<b><u>SESSION C12: MINING ASPECTS</u></b> CHAIR: <b><i>K. Gottschalk</i></b> , Leibniz-Institut für Agrartechnik Bornim, Germany
<b>16:20 – 16:45</b>	<b>Energy Saving Conveyor Belting – Design Considerations, Applications, Experiences</b> <b>M. Keller</b> , ContiTech Conveyor Belt Group, Germany
<b>16:45 – 17:10</b>	<b>Ore and Waste Rock in-Pit Crushing and Conveying Systems at Open Pit Mining in Russia</b> <b>N.N. Melnikov &amp; S.P. Reshetnyak</b> , Russian Academy of Sciences, Russia
<b>17:10 – 17:35</b>	<b>An Examination of Re-Handling Costs in Coal Mines</b> <b>J. Salmond</b> , Parsons Brinckerhoff, Australia
<b>17:35 – 18:00</b>	<b>Numerical Investigation of Thermal Stress and Failure Process of Composite Induced by Thermal Mismatch</b> <b>S. Tang</b> , Center for Rock Instability & Seismicity Research, China

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<b>16:20 – 18:00</b>	<b><u>SESSION D12: MODELING</u></b> CHAIR: <b><i>A. Levy</i></b> , Ben-Gurion University of the Negev, Israel
<b>16:20 – 16:45</b>	<b>Further Development of a CFD model of the Stable Microsystems Powder Flow Analyser (PFA)</b> <b>A. Cowell, D. McGlinchey &amp; R. Ansell</b> , Glasgow Caledonian University, UK
<b>16:45 – 17:10</b>	<b>Investigation of Bidisperse Powders</b> <b>M. Morgenever<sup>1</sup>, M. Roeck<sup>1</sup>, L. Brendel<sup>2</sup> &amp; J. Schwedes<sup>1</sup></b> , <sup>1</sup> Technical University Braunschweig, Germany. <sup>2</sup> University Duisburg–Essen, Germany
<b>17:10 – 17:35</b>	<b>Behavior of Granular Material in Packed Bed under Influence of Gas Injected Through a Nozzle</b> <b>V. Singh &amp; G.S. Gupta</b> , Indian Institute of Science, India
<b>17:35 – 18:00</b>	<b>Computational Fluid Dynamic Simulation of Ethylene Hydrogenation in a Fluidized Bed Reactor</b> <b>R. Yusuf<sup>1</sup>, V. Mathiesen<sup>2</sup> &amp; M.C. Melaen<sup>1</sup></b> , <sup>1</sup> Telemark University College, Norway. <sup>2</sup> Hydro Corporate Research Centre, Norway

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