
**Mixing XXII Conference**
June 20-25, 2010 • Hotel Grand Pacific • Victoria, British Columbia, Canada
www.mixing.net/Conferences/mix22/index.htm

# PROGRAM

## SUNDAY, JUNE 20

| Time | Title | Author / Presenter | Affiliation |
|---|---|---|---|
| 9 AM - 2 PM | Mixing Short Course *(South Pender Island Ballroom)* | | |
| 10 AM - 2 PM | NAMF Executive Council Meeting *(Room 612)* | | |
| 2:30 - 6 PM | Registration (*Lobby area)* | | |
| 5:00 PM | Social hour and welcome dinner *(Vancouver Island Ballroom)* | | |

*All Conference Sessions in the Pender Island Ballroom | All meals in Vancouver Island Ballroom | All social hours held on the second floor*

**SESSION 1: Fundamentals on mixing technology and mixing education** — **Chairs: R. Calabrese and J.Gilchrist**

| | | | |
|---|---|---|---|
| 7:00 PM | Opening Comments from Conference Chairs | Suzanne Kresta | University of Alberta |
| | | Clara Gomez | University of British Columbia |
| 7:05 PM | PLENARY: Mixing and Age Distribution in Chemical Reactors: 50 Years After Danckwerts and Zwietering | Minye Liu | DuPont Company |
| 7:50 PM | Measuring the Scale of Segregation in Mixing Applications | Alena Kukukova | University of Alberta |
| 8:15 PM | A Comparison of Top Entry vs. Side Entry Agitator Performance in Low Viscosity Blending | Richard Kehn | SPX LIGHTNIN, NY |
| 8:40 PM | Break | | |
| 9:00PM | Laboratory and Table-Top Fluid Mixing Experiments for the Laboratory or Classroom | William Roy Penney | Dep. Chem. Eng., University of Arkansas |
| 9:25 PM | Mixing Time Study for Wide Range of Fluid Viscosity | Katsuhide Takenaka | Sumitomo, USA |
| 9:50 - 11:00 PM | Social Hour and Exhibit *(2 floor)* | | |

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## MONDAY, JUNE 21

| Time | Title | Author/ Presenter | Affiliation |
|---|---|---|---|
| 7:00 - 8:00 AM | Breakfast | | |
| **SESSION 2: Mixing of solids I** | | **Chairs: K. Myers and D. Brown** | |
| 8:00 AM | PLENARY: Slurry Pipeline Flows: Coarse Behaviour From Some Otherwise Fine Particles | Sean Sanders | University of Alberta, Canada |
| 8:45 AM | Solids Suspension in Tall Tanks | Richard F. Cope | The Dow Chemical Company |
| 9:10 AM | Pulse Jet Mixers- The Known and Unknown about Solids Suspensions | David Dickey | MixTech Inc. |
| 9:35 AM | Effect of a High Shear Homogenizer on Mixing Time in a Fully Baffled Stirred Tank | Micaela Caramellino (student finalist) | New Jersey Institute of Technology |
| 10:00 AM | Break | | |
| 10:20 AM | Experimental and Computational Characterization of Flow and Mixing Behaviour in a Continuous Powder Mixer | Fernardo Muzzio | Chem & Biochem Eng., Rutgers University |
| 10:45 AM | Solving Granular Segregation Problems Using a Viaxial Rotary Mixer | Bodhisattwa Chaudhuri | Pharmaceutical Sciences, Univeristy of Conneticut |
| 11:10 AM | An Investigation of the Mixing and Segregation of Powders in a Spheronizer | Francois Bertrand | Chem. Eng., Ecole Polytechnique de Montreal |
| 11:35 AM | Solid Velocity Profiles Using UVP and CFD Simulations | Madhavi Sardeshpande | National Chemical Laboratory, India |
| 12:00 - 1:00 PM | Lunch | | |
| 5:00 - 5:40 PM | Social Hour and Exhibit | | |
| 5:40 - 7:00 PM | Dinner | | |
| **SESSION 3: In line mixers and micro mixing** | | **Chairs: M. Liu and E. Galindo** | |
| 7:00 PM | Segregation of Suspensions in Microscale In-line Mixers | James F. Gilchrist | Dept. Chem. Eng., Lehigh University |
| 7:25 PM | Novel Transfer Inline Mixing Process and Mixer Based Receptivity | Guiren Wang | Mech & Biomed Eng., University of South Carolina |
| 7:50 PM | The Effect of Surfactants on the Breakup of and Axisymmetric Laminar Jet | Justin Walker (student finalist) | University of Maryland |
| 8:15 PM | Break | | |
| 8:35 PM | Scaling Up of Silverson Rotor-Stator Mixers | Steven Hall | School of Chem. Eng., University of Birmingham |
| 9:00 PM | Flow and Power Characteristics of Three Types of Rotor-Stator Heads | Gul Ozcan | DOMINO, BHR Group |
| 9:25 PM | Characteristics of Rotor-Stator Batch Mixer Performance Elucidated by Shaft Torque and Angle Resolved PIV Measurements | HansHenrik Mortensen | Tetra Pak Scanima |
| 9:50 - 11:30 PM | Social Hour and Exhibit | | |

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## TUESDAY, JUNE 22

| Time | Title | Author/ Presenter | Affiliation |
|---|---|---|---|
| 7:00 - 8:00 AM | Breakfast | | |
| **SESSION 4: CFD of mixing processes** | | Chairs: O. Akiti and J. Spinti | |
| 8:00 AM | PLENARY: A Mix of Computational Techniques for a Better Blend | Francois Bertrand | Chem. Eng., Ecole Polytechnique de Montreal |
| 8:45 AM | Blending of Liquids with Density Differences | Jos Dersken | Chem. & Materials Eng. University of Alberta |
| 9:10 AM | Stochastic Simulation of Crystal Particle Attrition Based on the Statistic of the Lagrangian Particle Simulation in a Stirred Vessel | Ryuta Misumi | Material Sci & Chem. Eng., Yokohama University, Japan |
| 9:35 AM | Simulation of an Opposed Jet, Process Flow Geometry and its Experimental Verification | Robert S. Brodkey | Chem & Biomolec. Eng., Ohio State University |
| 10:00 AM | Break | | |
| 10:20 AM | An Investigation of Numerical and Modeling Issues Regarding CFD Predictions of Velocity in a Stirred Tank with the RANS k-w Turbulence Model | Peter Farber | IMH - Institute of Modeling and High performance computing, Hoschshule Niederrherim, Germany |
| 10:45 AM | Direct Numerical Simulations and Large Eddy Simulations of the Turbulent Flow in a Baffled Tank Driven by a Rushton Turbine | Harry van den Akker | University of Technology - Delft |
| 11:10 AM | Ongoing Studies of the Flow in Annular Centrifugal Contactors | Kent E. Wardle | Chem Sci & Eng. Division, Argonne National Laboratory |
| 11:35 AM | Computational Fluid Dynamics Simulation of a Quadrupole Magnetic Sorter Flow Channel | Thomas R. Hanley | Chem Eng., Auburn University |
| 12:00 - 1:00 PM | Lunch | | |
| 5:00 - 5:40 PM | Social Hour and Exhibit | | |
| 5:40 - 7:00 PM | Dinner | | |
| **SESSION 5: Experimental methods** | | Chairs: G. Padron and G. Zhou | |
| 7:00 PM | The use of Physical Modelling to Investigate Complex Industrial Mixing Problems | Darwin Kiel | Coanda Research & Development |
| 7:25 PM | Mixer Performance Characteristics: Impeller and Process Efficiency | David A.R. Brown | BHR Group |
| 7:50 PM | The Effect of Process Variables on Blend Time in a Continuous Stirred Tank | Joelle Aubin | Laboratory of Chemical Engineering - University of Toulouse |
| 8:15 PM | Break | | |
| 8:35 PM | Comparison Between Electrical Resistance Tomography, CFD and Other Measurement Techniques for Gas-Liquid Mixing | Jonathan Ritson | Industrial Tomography Systems |
| 9:00 PM | Understanding Multiphase Dispersions Occurring in Bioprocesses | Enrique Galindo | Universidad Nacional Autonoma de Mexico |
| 9:25 PM | Suspension of Slurries with Solids of Mixed Densities | Arthur W. Etchells | Etchells & Rowan University, NJ. |
| 9:50 - 11:30 PM | Social Hour and Exhibit | | |

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## WEDNESDAY, JUNE 23

| Time | Title | Author/ Presenter | Affiliation |
|---|---|---|---|
| 7:00 - 8:00 AM | Breakfast | | |
| **SESSION 6: Mixing of multiphase systems** | | **Chairs: A. Etchells and T. Hutchinson** | |
| 8:00 AM | PLENARY: Lessons from mixing in fluidized beds and related systems | John Grace | University of British Columbia |
| 8:45 AM | An Improved Correlation to Predict "Just Suspension" Speed for Solid-Liquid Mixtures with Axial Flow Impellers in Stirred Tanks | Richard K. Grenville | DuPont Engineering |
| 9:10 AM | Effect of Geometry Variations on the Performance of Gas Dispersion Impellers with Semicircular Blades | Julian Fasano | Mixer Engineering Company |
| 9:35 AM | Effect of Rheology on $K_{La}$ and Mixing Time in 42 & 340L Stirred Reactors | Frederic Augier | IFP - Lyon (Process Development and Engineering Division) |
| 10:00 AM | Break | | |
| 10:20 AM | Low Frequency Acoustic Mixing of Complex and Multiphase Systems | Peter Lucon | Resodyn Corporation |
| 10:45 AM | Gas Handling and Power Consumption of High Solidity Hydrofoils: Philadelphia Mixing Solutions' HS and Lightning's A315 Impellers | Thomas Post | Post Mixing Optimization and Solutions |
| 11:10 AM | Effect of Dispersed Phase Fraction on Drop Size in Immiscible Liquid-Liquid Dispersions: Coalescence or Turbulence Damping? | Gustavo Padron | BHR Group |
| 11:35 AM | Experimental and Numerical Investigations of Drop Size Distributions in Stirred Liquid-Liquid Systems | Stephanie Hermann | TU Berlin |
| 12:00 - 1:00 PM | Lunch | | |
| 4:00 - 5:40 PM | POSTERS<br>Social Hour and Exhibit | **Chairs: Hahn Vo and Kishore Kar** | |
| 5:40 - 7:00 PM | Dinner | | |
| **SESSION 7: Mixing and chemical reaction** | | **Chairs: R. Schisla and R.Cope** | |
| 7:00 PM | Correlation of Reaction Yield on Suspended Catalysts | Gary K. Patterson | Chem. & Bio. Eng., Missouri University |
| 7:25 PM | Solids Suspension and Mixing Time in a Torispherical-Bottomed Pharmaceutical Reactor Under Different Baffling Conditions | Piero M. Armenante | New Jersey Institute of Technology |
| 7:50 PM | Effect of Geometry on the Mechanisms for off-Bottom Solids Suspension | Inci Ayaranci (student finalist) | University of Alberta |
| 8:15 PM | Break | | |
| 8:35 PM | Oxy-Gas Combustion for Efficient CO2 Capture: Effect of Near Burner Mixing on Velocity and Composition Fields | Jennifer P. Spinti | Institute for Clean and Secure Energy, University of Utah |
| 9:00 PM | A New Diagnostic: Mixing Sensitive Chemistry with Phase Change | Patil Pramod | The Dow Chemical Company |
| 9:25 PM | Micromixing in Two-phase (g-l and s-l) Systems in a Stirred Vessel | Julia Hofinger | School of Chem. Eng., University of Birmingham |
| 9:50 - 11:30 PM | Social Hour and Exhibit | | |

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## THURSDAY, JUNE 24

| Time | Title | Author/ Presenter | Affiliation |
|---|---|---|---|
| 7:00 - 8:00 AM | Breakfast | | |
| **SESSION 8: Industrial mixing** | | Chairs: L.Fradette and D. Dickey | |
| 8:00 AM | PLENARY: Stirred, Not Shaken; Mixing Myths in the Process Industries | Alvin Nienow | School of Chem. Eng., University of Birmingham |
| 8:45 AM | Novel Design for a Magnesium-Enhanced Lime Ex-Situ Gypsum Crystallizer | Chris Hibshman | Philadelphia Mixing Solutions |
| 9:10 AM | Energy Efficient Mixing in Anaerobic and Anoxic Tanks | Marcus Hoefken | INVENT Umwelt-und Verfahrentechink AG, Germany |
| 9:35 AM | Measurement and Interpretation of Cavitation and Noise in a Hybrid Hydrodynamic Cavitating Device | Ke-ming Quan | Procter & Gamble Company |
| 10:00 AM | Break | | |
| 10:20 AM | Design of Agitated Pulp Stock Chests with Side-Entering Impellers | Clara Gomez | Department of Chem. & Biol. Engineering, UBC |
| 10:45 AM | CFD Modeling of Erosion of a Solid Bed by Jet Impingement | Brigette Rosendall | Bechtel National Inc. |
| 11:10 AM | Effect of Rheology on the Performance of Maxblend and Superblend Mixers | Louis Fradette | Chem. Eng., Ecole Polytechnique de Montreal |
| 11:35 AM | Energy Savings Option by Modified Stirrer Configuration and Aeration Strategy | Piet Brocken | DSM, the Netherlands |
| 12:00 - 1:00 PM | Lunch | | |
| 4:00 PM | POSTERS<br>Social Hour and Exhibit | Chairs: Hahn Vo and Kishore Kar | |
| 5:30 - 7:30 PM | AWARDS DINNER (starting with NAMF General meeting 5:30 - 6:00 PM) | | |
| **SESSION 9 : CFD Modeling and validation** | | Chairs: F. Bertrand and S. Jaffer | |
| 7:30 PM | Wall Shear Stress in an Orbiting Culture Dish Using CFD with PIV Validation | R. Eric Berson | Chemical Engineering, University of Louisville |
| 7:55 PM | Modeling surface gas transfer in agitated vessels using Computational Fluid Dynamics. | Nulu Suresh | Amgen |
| 8:20 PM | Modeling Cavitation in a High Intensity Agitation Flotation Cell | July K. Jose | Chem. & Materials Eng. University of Alberta |
| 8:45 PM | Break | | |
| 9:00 PM | Comparing Two Experimental Techniques and Modeling to Validate Mixing Time in a Dual Impeller Agitated Vessel | Olli Visuri | Biotech. & Chem. Tech., Aalto University, Finland |
| 9:25 PM | Estimation for the Prediction of Agglomeration Rate in Emulsion Polymerization | Koji Takahashi | Chem. Eng., Yamagata University, Japan |
| 9:50 - 11:30 PM | Social Hour and Exhibit | | |

## FRIDAY, JUNE 25

| Time | |
|---|---|
| 8:00 - 11:00 AM | Farewell brunch |