

# ICBMH2023

## The 14th International Conference on Bulk Materials Storage, Handling and Transportation

Venue: The Sage Hotel, Wollongong, NSW, Australia

Dates: 11-13 July 2023

[www.icbmh2023.com.au](http://www.icbmh2023.com.au)

# FINAL PROGRAM

Organised By



Conference Sponsors



**Monday 10-7-2023**

<b>18:00 - 19:30</b>	<b>Welcome Reception</b> <b>The Illawarra Brewery (Boardroom and Courtyard)</b> <b>Eastern Terrace, Win Entertainment Centre, Crown Street, Wollongong</b>
----------------------	--

**Tuesday 11-7-2023**

<b>8:30 - 9:00</b>	<b>Conference Registration</b>
<b>9:00 - 9:10</b>	<b>Welcome by Conference Chair</b>
<b>9:10 - 9:30</b>	<b>Welcome Address - Cr Tania Brown - Deputy Lord Mayor, Wollongong City Council</b>
<b>9:30 - 10:05</b>	<b>KEYNOTE 1 - GRAND PACIFIC BALLROOM</b> <b>140 Years of Developments in Bulk Solids Handling Focusing on Bin and Silo Loads</b> <b>Em/Prof Alan W. Roberts</b>

<b>10:05 - 10:40</b>	<b>Morning tea</b>
----------------------	--------------------

<b>SESSION 1</b>	<b>SESSION 1A - ESCARPMENT ROOM</b> Simulation Session Chair:	<b>SESSION 1B - FORESHORE ROOM</b> Bins and Hoppers Session Chair:	<b>SESSION 1C - FORESHORE ROOM</b> Environmental Session Chair:
<b>10:40 - 11:05</b>	Application of New DEM-SPH fully coupled approach in prediction of slurry-particle flow in a SAG mill <u>Vinicius Daroz</u> , <u>Lucilla Almeida</u> , <u>Rahul Bharadwaj</u> , <u>Alexander Potapov</u> , <u>Lewis Clark</u>	A Stochastic Model to Evaluate Performance of Mass-Flow Bins <u>Priscilla G. Freire</u> , <u>Shaun Reid</u> , <u>Ognjen Orozovic</u>	Recommendations for the Design of Effective Water Spraying Airborne Dust Suppression Systems <u>Jon M. Roberts</u> , <u>Rongfu Liao</u> , <u>Peter W. Wypych</u> , <u>Ming Qiao</u> , and <u>David B. Hastie</u>
<b>11:05 - 11:30</b>	Preliminary DEM Model Validation of HIP Canister Filling with Idaho Calcine Simulant <u>Simon Chung</u> , <u>Charles Edgar</u> , <u>Peter W. Wypych</u> , <u>David B. Hastie</u> , <u>Andrew P. Grima</u> and <u>Sam Moricca</u>	Rapid Determination of the Volume of Granular Material in a Hopper Using Helmholtz Resonance <u>Mohammad Barzegar</u> , <u>Clive E. Davies</u> , <u>Miles C. Grafton</u>	Dust Monitoring and CFD Modelling for Dust Control in Development Gateroad Panels <u>Ting Ren</u> , <u>Ming Qiao</u> , <u>Jon M. Roberts</u> and <u>Jennifer Hines</u>
<b>11:30 - 11:55</b>	DEM Modelling and Calibration of the Interlocking Behaviour of Compost and Validation using a Commercial Compost Turner (eWender) <u>Mohsin Ajmal</u> and <u>André Katterfeld</u>	Advancements in Bulk Storage Vessel Design Utilising Finite Element Analysis and Discrete Element Method Modelling <u>Luke E. Stone</u>	Simulation of Dust Elimination During Hot Casting Residue Dumping Process <u>Ting Ye</u> , <u>Haozhi Guo</u> , <u>Jingye Tian</u> , <u>Kejiang Zang</u> , <u>Shaozong Cai</u>

<b>12:00 - 13:30</b>	<b>Lunch</b>
----------------------	--------------

<b>SESSION 2</b>	<b>SESSION 2A - GRAND PACIFIC BALLROOM</b> Belt Conveying Session Chair:	<b>SESSION 2B - ESCARPMENT ROOM</b> Simulation Session Chair:	<b>SESSION 2C - GRAND PACIFIC BALLROOM</b> Environmental Session Chair:
<b>13:30 - 13:55</b>	The Effect of Large Diameter Idler Rollers on the Indentation Rolling Resistance of Belt Conveying Systems <u>Jayne O'Shea</u> , <u>Peter Robinson</u> , <u>Yusuf Badat</u> , <u>Craig Wheeler</u>	<b>Workshop</b>  Panel Discussion on Simulation - DEM, CFD, FEA, MBD, SPH	Determination of the Percentage of Free Hydrogen After the Placement of Cemented Fly Ash Grout <u>Thomas Bunn</u> , <u>Shaun Reid</u> , <u>Tim Gilroy</u> , <u>Marta De Sousa Felix</u>
<b>13:55 - 14:20</b>	Generalized Conveyor Design for In-Pit Crushing and Conveying (IPCC) <u>Nicholas S. Russell</u>		Investigations into Optimal Pulse Cleaning of Dust Filter Media <u>Richard Farnish</u> , <u>Michael Bradley</u> , <u>Vivek Garg</u>
<b>14:20 - 14:45</b>	Pipe Belt Conveyor Systems: An Update on Operational Performance <u>Gabriel Lodewijks</u> and <u>Yusong Pang</u>		On the Performance of an Open Channel in the Settling of Coal Tailings <u>Ognjen Orozovic</u> , <u>Peter Robinson</u> , <u>Thomas Bunn</u> , <u>Kevin Rowe</u> , <u>Peter Shumack</u> , <u>Craig Wheeler</u> , <u>Michael Carr</u> and <u>Tiago Cousseau</u>

<b>14:45 - 15:20</b>	<b>Afternoon tea</b>
----------------------	----------------------

<b>SESSION 3</b>	<b>SESSION 3A - GRAND PACIFIC BALLROOM</b> Belt Conveying Session Chair:	<b>SESSION 3B - ESCARPMENT ROOM</b> Simulation Session Chair:	<b>SESSION 3C - FORESHORE ROOM</b> Segregation Session Chair:
<b>15:20 - 15:45</b>	Identification of Conveyor Drive Pulley Lagging Friction <u>Jason T. Willis</u> , <u>Peter W. Robinson</u> , <u>Michael J. Carr</u> , <u>Jayne O'Shea</u> , <u>Ashleigh Kirkland</u> , <u>Craig A. Wheeler</u> and <u>Mariana Ballestrin</u>	A Review of Simulation Methods for Belt Conveyors <u>Jingye Tian</u> , <u>David B. Hastie</u> , <u>Jon M. Roberts</u> , <u>Peter W. Wypych</u> and <u>Renhu Pan</u>	Cross Flow Turbine to Reduce Size Segregation Effects in Storage Processes <u>Michael Prenner</u> , <u>Michael Denzel</u> and <u>Nikolaus A. Sifferlinger</u>
<b>15:45 - 16:10</b>	Analysing Impact Forces & Overcoming Speed, Heat and Pressure Issues in High Capacity Belt Support Applications <u>Cameron Portelli</u>	A Coupled Length Scale Parameter Study for SPH Simulations of a Fluid Flow Inside a Rotating Drum <u>Nam Tran</u> , <u>Jon M. Roberts</u> , <u>David B. Hastie</u>	Calibration of DEM Parameters for Multi-Component Segregation <u>Ahmed Hadi</u> , <u>Yusong Pang</u> and <u>Dingena L. Schott</u>

Wednesday 12-7-2023

9:00 - 9:05	Welcome and Notices		
9:05 - 9:40	<b>KEYNOTE 2 - GRAND PACIFIC BALLROOM</b> Advances in Pneumatic Conveying Technology – an Australian Perspective Prof Peter W. Wypych		
<b>SESSION 4</b>	<b>SESSION 4A - GRAND PACIFIC BALLROOM</b> Flow Properties Session Chair:	<b>SESSION 4B - ESCARPMENT ROOM</b> Segregation Session Chair:	<b>SESSION 4C - FORESHORE ROOM</b> Belt Conveying Session Chair: Dr Jayne O'Shea
	9:45 - 10:10 The Influence of Drying Techniques on Bulk Material Flow Properties Michael J. Carr, Alan W. Roberts, Craig A. Wheeler, Peter W. Robinson and Ognjen Orozovic	Frequency Domain Analysis to Identify Main Segregation Contributors in a Chain of Material Handling Processes Susantha Dissanayake, Michael Bradley, Hamid Salehi, Stefan Zigan, Tong Deng	<b>WORKSHOP</b>  Discussion on updates and additions to AS1333 - Conveyor Belting of Elastomeric and Steel Cord Construction
	10:10 - 10:35 Determination of Cohesive Arching Characteristics in Ore Passes Shaun C. Reid, Alan W. Roberts, Jens Plinke	Application of a Cellular Automata Modelling to Dynamic Simulation of Industrial Stockpiles and Bins Marko Hilden, Ziming Ye, Mohsen Yahyaei	
10:35 - 11:10 Morning tea			
<b>SESSION 5</b>	<b>SESSION 5A - GRAND PACIFIC BALLROOM</b> Belt Conveying Session Chair:	<b>SESSION 5B - ESCARPMENT ROOM</b> Wear Session Chair:	
	11:10 - 11:35 Improving Energy Efficiency of Belt Conveying System by Controlling Transient Operation Sequence Yusong Pang, Tiezhu Qiao, Gaowei Yan, Gabriel Lodewijks	Evaluation and Calibration of Wood Pellets Degradation Using a Rotary Impact Tester against Single-Bend Attrition Tester Gulab Singh, Tong Deng, Mike Bradley, Richard Ellis	
	11:35 - 12:00 Considerations of Large Diameter Idler Rollers on the Indentation Rolling Resistance for Designers of Belt Conveying Systems Shawn Ryan, Jayne O'Shea, Tiago Cosseau	Improvements in Wear Liner Technology David Molesworth, Mariana Ballestrin, Justin Minto, Cameron Dodd	
	12:00 - 12:25 Analysis and Validation of Data-driven Dimensional Analysis Method for Pouch Belt Conveyors Resistance Prediction Jingye Tian, David B. Hastie, Jon M. Roberts, Peter W. Wypych and Renhu Pan	Calibrated and Validated Wear Prediction for Bulk Material Handling Equipment using DEM Simulations Thomas Roessler and André Katterfeld	
12:30 - 14:00 Lunch			
<b>SESSION 6</b>	<b>SESSION 6A - GRAND PACIFIC BALLROOM</b> Simulation Session Chair:	<b>SESSION 6B - ESCARPMENT ROOM</b> Belt Conveying Session Chair:	
	13:45 - 14:10 A Dual Mode Bench-Scaled Calibration Study for Fluid – Particulate Flows Using SPH – DEM Coupling Nam Tran, Jon M. Roberts, David B. Hastie	Use of Composite Rollers to Improve Belt Conveyor Performance Peter Copley, Ahmad Fleyfel and Anna Lisboa	
	14:10-14:35 Predicting Gate Loads from Hopper with Insert(s) Using Discrete Element Method (DEM) Modelling Bin Chen, Alan Roberts, Tim Donohue, Shaun Reid	Pulley Lagging Selection and Performance Optimisation Tarun Srivastava, Mariana Ballestrin, Bradley Lawson, Peter Robinson, Jason Willis	
	14:35- 15:00 Predicting the Dust Suppression Efficiency of Spray Systems using CFD-DPM Approach Rongfu Liao, Jon M. Roberts, Peter W. Wypych, Renhu Pan	Study on Coal/Ash Two way Transportation Technology of Belt Conveyor from Open pit Mine to Power Plant Liang Cao, Huimin Shen, Guanting Song, Weigang Song	
15:00 - 15:30 Afternoon Tea			
<b>SESSION 7</b>	<b>SESSION 7A - GRAND PACIFIC BALLROOM</b> Session Chair: Em/Prof Mark Jones		
	15:30 - 16:30 Australian Society for Bulk Solids Handling Meeting		
17:15	Courtesy Bus Transportation from Sage Hotel, Wollongong		
18:00 - 22:00	Conference Dinner - Panorama House, 811 Princes Highway, Maddens Plains		

Thursday 13-7-2023

9:00 - 9:05	Welcome and Notices		
9:05 - 9:40	<b>KEYNOTE 3 - GRAND PACIFIC BALLROOM</b> Flow of Bulk Solids; Sixty Years of Progress (?) and Where Has it Got Us? Prof Michael S.A. Bradley		
<b>SESSION 8</b>	<b>SESSION 8A - GRAND PACIFIC BALLROOM</b> Belt Conveying Session Chair:	<b>SESSION 8B - FORESHORE ROOM</b> Pneumatic Conveying Session Chair:	
9:45 - 10:10	Monitoring System for Belt Conveyors  Michael Prenner, Jakob Müller, Michael Denzel	Application of Recurrence Quantification Analysis to Electrostatic Measurements of Horizontal Gas-solid Flow in Pneumatic Conveying of Plastic Pellets  Osamh S. Alshahed, Baldeep Kaur, Michael S.A. Bradley	
10:10 - 10:35	Polymeric Idler Roll Abrasion Resistance Evaluation Tiago Cousseau, Daniel E. Pacholok, Fernanda Kouketsu, Carlos H. da Silva, Peter W. Robinson and Craig Wheeler	Investigations into Development of AI Technology for Prediction of Pneumatic Conveying Performance  Nan Dang, Peter W. Wypych, Jon M. Roberts and Renhu Pan	
10:35 - 11:10	Morning tea		
<b>SESSION 9</b>	<b>SESSION 9A - GRAND PACIFIC BALLROOM</b> Pneumatic Conveying Session Chair:	<b>SESSION 9B - ESCARPMENT ROOM</b> Ports Session Chair:	<b>SESSION 9C - FORESHORE ROOM</b> Bin Loads Session Chair:
11:10 - 11:35	System Identification and Stability Analysis of a Pneumatic Conveying Pipeline Based on Blower Input Voltage and Particle Velocity: Preliminary Study Chanaka Prasad Premarathna, Baldeep Kaur, Hamid Salehi Kahrizsanghi, Richard Ellis, Michael S.A. Bradley	Towards Hydrogen-Fuelled Marine Vessels using Solid Hydrogen Carriers  M.C. van Benten, J.T. Padding, D.L. Schott	<b>WORKSHOP</b>
11:35 - 12:00	A Review of Energy-Saving Technologies for Pneumatic Conveying Nan Dang, Peter W. Wypych, Jon M. Roberts and Renhu Pan	Failure of Shiploader Trimmer Flap due to Thermal Loads Kannon Ford, Michael Carr, Peter Robinson and David Bradney	Discussion on AS3774 - Loads on Bulk Solids Containers (Standard currently withdrawn)
12:00 - 12:25	Application of Chaos Analysis to Electrostatic Measurements of Horizontal Gas-solid Flow in Pneumatic Conveying of Plastic Pellets Osamh S. Alshahed, Baldeep Kaur, and Michael S.A. Bradley		
12:30 - 14:00	Lunch		
<b>SESSION 10</b>	<b>SESSION 10A - GRAND PACIFIC BALLROOM</b> Belt Conveying Session Chair:	<b>SESSION 10B - ESCARPMENT ROOM</b> Bins and Hoppers Session Chair:	
14:00 - 14:25	Analyzing Conveyor Idler Replacement Causes: Insights From Idler Type And Position I.E.E. Loureiro, D.E. Pacholok, C.H. da Silva, T. Cousseau, Peter W. Robinson, Craig Wheeler and Felipe Fraga	Handling Dewatered Tailings: The Three Root Causes of Poor Material Discharge and Bin Hang-ups  Jamil Bundalli and Jake Knowles	
14:25 - 14:50	Research on the Modeling and Drawing Method of Belt Conveyor Truss Yong Gao, Hailiang Hu, Kunpeng Xu, Weigang Song	Structural Failure of Silos: Learning Lessons from Failure Prof Mike Bradley	
14:50-15:10	Conference Close		
15:10-15:50	Afternoon Tea and Goodbyes		