Discrete Element Methods (DEM) '07

Sunday August 26th			
17.00	Registration		
18.00-19.30	Welcome Event and "Gallery of DEM"		
Monday August 27th			
08.00	Registration and coffee		
09.00	Conference Opening		
09.15	**Keynote Lecture:** Dr. Colin Thornton, University of Birmingham, UK, "DEM yesterday, DEM today and DEM tomorrow" Chairman: Dr P. Cleary		
10.15	Coffee		
11.00	*Technical Session 1a* *Numerical methods, Validation and Novel Applications – Computer Methods* Chairman: Prof A. Munjiza and Dr M. Sinnott		*Technical Session 1b* *Mining, Geomechanics and Geophysics- Applications* Chairman: Dr M. Hopkins and Dr G. Chitombo
11.00	**Quaternion-based approach for integrating finite rotational motion** S. Johnson (Lawrence Livermore National Laboratory, USA), J. Williams (Massachusetts Institute of Technology, USA) and B. Cook (Sandia National Laboratories, USA)		**Rockslide runout prediction from distinct element analysis** L.J. Lorig (Itasca S.A., Chile), A.D. Watson (BCHydro, Canada) and C.D. Martin (University of Alberta, Canada)
11.15	**Large-scale parallel discrete element simulations of granular flow** J.H. Walther (Technical University of Denmark, Denmark) and I.F. Sbalzarini (Institute of Computational Science, Switzerland)		**Simulation of concrete armour unit breakage under wave loads using coupled FEM/DEM and CFD** J.-P. Latham et al (Imperial College, UK) and A. Munjiza (Queen Mary London University, UK)
11.30	**New algorithm to treat particle rotation and parameter calibration in 3D bonded DEM model** Y. Wang and P. Mora (University of Queensland, Australia)		**Simulations of fracture and fragmentation of geologic materials using combined FEM/DEM/SPH analysis** J.P. Morris and S.M. Johnson (Lawrence Livermore National Laboratory, USA)
11.45	**Advanced visualization of large datasets for discrete element method simulations** M.L. Sawley (Granulair Technologies, Switzerland), J. Biddiscombe and J.M. Favre (Swiss National Supercomputing Centre, Switzerland)		**Diffuse failure in a numerical granular material** L. Sibille, F-V. Donzé, F. Darve and F. Nicot (Universite Joseph Fourier-Grenoble, France)
12.00	**Hierarchical search method** J.F. Peters and R. Kala (US Army Engineer Research & Development Center, USA)		**The state-of-the-art on distinct element method in Institute of Mechanics, Chinese Academy of Sciences** Shihai Li, Xiaoyu Liu, Zhennong Tian and Bingshan Liu (Chinese Academy of Sciences, China)
12.15	**Calibration procedure for spherical discrete elements using a local moment law** J.-P. Plassiard and F.-V. Donzé (Université Joseph Fourier - Grenoble, France)		**Quasi-static fall of planar granular columns: laboratory experiments and discrete element modelling** P.W. Cleary, C. Mériaux and P.J. Owen (CSIRO Mathematical & Information Sciences, Australia)

12.30	Lunch		
13.30	**Highlight Presentation:** **Modeling the Impact of Cohesion and Flow Perturbations on Segregation** Prof. Joe McCarthy (University of Pittsburgh) Chairman: Prof J. Williams		
14.00	**Highlight Presentation:** **The largest fracture mechanics problem on earth: deformation and plate formation in Arctic sea ice** Dr. Mark Hopkins (ERDC-CRREL, USA) and A.S. Thorndike (University of Puget Sound, USA) Chairman: Dr C. Thornton		
14.30	Mining, Geomechanics and Geophysics: Round Table Discussion/Workshop - Challenges in Modelling Mining Chairman: Gideon Chitombo		
15.30	Coffee		
16.00	*Technical Session 2a* *Mineral and Physical Processing- Non-Breakage* Chairman: Dr R. Morrison and Dr D. Curry		*Technical Session 2b* *Powder Technology, Process Engineering and Industrial Applications – Heat and Multiphase* Chairman: Prof A. Yu and Prof J. Curtis
16.00	**DEM 3D model of the magnetic roll separator** V. Murariu (De Beers Group Services, South Africa)		**A numerical study of heat transfer and mixing on grates by the discrete element method (DEM)** E. Simsek, S. Wirtz and V. Scherer (Ruhr-University Bochum, Germany)
16.15	**Simulation of the capacity of coal flow through industrial scale transfer chutes** J.G. Loughran (James Cook University, Australia), P.F. Britton and S.I. Anderson (Rockfield Technologies Australia Pty Ltd, Australia)		**The DEM simulations including natural and forced convection heat transfer and conduction heat transfer** Y. Shimizu (Itasca Japan, Japan)
16.30	**Prediction of the burden properties and flow in the cohesive zone of the ironmaking blast furnace** A. Adema, Y. Yang and R. Boom (Delft University of Technology, The Netherlands)		**Comparison of heat transfer approaches at the particle scale in fluidized beds** F.P. Di Maio, A. Di Renzo and D. Trevisan (Universita della Calabria, Italy)
16.45	**Highly resolved particle shapes for FEM/DEM simulation** J.-P. Latham et al (Imperial College, UK) and A. Munjiza (Queen Mary London University, UK)		**Numerical study of gas-solid flow in cyclone separator** K.W. Chu B. Wang, A.B. Yu (University of New South Wales, Australia) and D.L. Xu (Xi'an University, China)
17.00	**An investigation and optimization of the 'OLDS' elevator using discrete element modeling** W. McBride (University of Newcastle, Australia) and P. Cleary (CSIRO Mathematical & Information Sciences, Australia)		**Industrial application of DEM: opportunities and challenges** J. Favier (DEM Solutions Ltd, UK)
17.15	**Simulation of filter cake porosity** T. Neesse and J. Dueck (University Erlangen-Nuremberg, Germany)		**Discrete thermal element modelling of heat conduction in particulate systems** Y.T. Feng, K. Han and D.R.J. Owen (University of Wales Swansea, UK)
17.30	**Meeting of the Scientific Advisory Committee**		

Tuesday 28th August			
08.30	Registration and coffee		
09.15	**Keynote Lecture:** Dr. Paul Cleary, CSIRO, Australia, "Industrial Particle flow modelling using DEM" Chairman: Dr Rob Morrison		
10.15	Coffee		
10.45	Poster Viewing Session 1		
12.00	*Technical Session 3a* *Numerical methods, Validation and Novel Applications – Coupled methods* Chairman: Prof J. McCarthy and Prof J.P. Latham		*Technical Session 3b* *Mineral and Physical Processing- General* Chairman: Dr. I. Govender and Prof R. Rajamani
12.00	**Validation of FEM/DEM and DEM models in 2D and 3D** J. Xiang et al (Imperial College, UK) and A. Munjiza (Queen Mary London University, UK)		**Simulation of liquid-solid flow in a coal distributor** K.J. Dong, B.Y. Guo, K.W. Chu, A.B. Yu (University of New South Wales, Australia) and I. Brake (BHP Billiton Mitsubishi Alliance, Australia)
12.15	**3D combined FEM-DEM simulation of Ridge Keel punch-through tests** A. Polojarvi and J. Tuhkuri (Helsinki University of Technology, Finland)		**Stress field of solid flow in a model blast furnace** H.P. Zhu, Z.Y. Zhou, A.B. Yu (University of New South Wales, Australia) and P. Zulli (Bluescope Steel Research, Australia)
12.30	**Exploring DEM model development for the simulation of thermal effects on ore breakage** G. Wang, P. Radziszewski and J. Ouellet (McGill University, Canada)		**Modeling of solid particle flow in iron making process by large-scale discrete element method** H. Mio (Kyoto Fine Particle Technology, Japan), S. Miyazaki et (Doshisha University, Japan) and K. Kuniyomo (Nippon Steel Corp., Japan)
12.45	Lunch		
14.00	*Technical Session 4a* *Numerical methods, Validation and Novel Applications – Shape* Chairman: Prof J. Williams and Dr M. Sawley		*Technical Session 4b* *Mineral and Physical Processing- Breakage* Chairman: Mr S. Green and Prof M. Powell
14.00	**Contact resolution between axially-asymmetric ellipsoidal bodies** S. Johnson (Lawrence Livermore National Laboratory, USA), J. Williams (Massachusetts Institute of Technology, USA) and B. Cook (Sandia National Laboratories, USA)		**Modeling of diamond liberation and damage for Debswana kimberlitic ores** J.A. Herbst, A. Potapov (Metso Minerals Optimization Services, USA), G. Hambidge and J. Rademan (Debswana Diamond Co., Botswana)
14.15	**Validating rigid body simulation of real particle shapes using pose estimation from high-speed video** M. Price (University of Cape Town, South Africa) and G. Morrison (De Beers Group Services, South Africa)		**DEM study of scale up of abrasion in small scale tumbling mill environment** M. Khanal, R. Morrison and N. Djordjevic
14.30	**Comparison of sphere-clump and real particle trajectories** V. Murariu, G. Morrison (De Beers Group Services, South Africa) and M. Price (University of Cape Town, South Africa)		**Simulation of charge transport in the pulp lifters of a semi autogeous grinding mill** R.K. Rajamani (Milltech Engineering Company, USA)
14.45	**The effect of particle shape on particle-phase stress** B. James and J. Curtis (University of Florida, USA)		**Applying DEM outputs to the unified comminution model – the SAG mill** M.S. Powell, I. Govender, C. Kulya and A.T McBride (University of Cape Town, South Africa)

15.00	**The upscaling of discrete elements** Y.T. Feng, K. Han, D.R.J. Owen and J. Loughran (Swansea University, UK)		**The fast breakage model for simulation of particle breakage** A.V. Potapov, J.A. Herbst, M. Song and W.T. Pate (Metso Minerals Optimization Services, USA)
15.15			**Towards a virtual comminution machine** R.D. Morrison (JKMRC, Australia) and P.W. Cleary (CSIRO Mathematical & Information Sciences, Australia)
15.30	Coffee		
16.00	*Technical Session 5a* *Numerical methods, Validation and Novel Applications – Applications* Chairman: Prof J. Loughran and Dr S. Johnson		*Technical Session 5b* *Powder Technology, Process Engineering and Industrial Applications – Flow, Packing and Shape* Chairman: Dr C. Thornton and Dr Y. Feng
16.00	**Discrete element simulations of vibration-induced arching in a deep granular bed** M.D. Sinnott and P.W. Cleary (CSIRO Mathematical & Information Science, Australia)		**Combined finite-discrete element simulation of particle packing in 2D** R. Guises et al (Imperial College, UK) and A. Munjiza (Queen Mary London University, UK)
16.15	**Particle scale study of heat transfer in packed beds** Z.Y. Zhou, A.B. Yu (University of New South Wales, Australia) and P. Zulli (Bluescope Steel Research, Australia)		**The influence of air presence on flow, mixing and segregation of powders during die filling** Yu Guo, David Kafui, Chuan-Yu Wu, Colin Thornton (University of Birmingham, UK)
16.30	**The importance of co-ordination number in the discrete element method to produce Weibullian crushable particles** W.L. Lim and G.R. McDowell (University of Nottingham, UK)		**Prediction of screw-feeder performance using the Discrete Element Method** P.J. Owen, P.W. Cleary and H. Busch (CSIRO Mathematical & Information Sciences, Australia)
16.45	**A numerical framework for simulation of undrained behavior of granular soils using the discrete element method** M. Lamei and A.A. Mirghasemi (University of Tehran, Iran)		**DEM simulation and experiment of granule flow in silo with equal spheres** Li Yanjie, Xu Yong and Yu Lianying (China Agricultural University, China)
18.00	Ferry Boat Departs for Conference Dinner		

Wednesday 29th August			
08.30	Registration and Coffee		
09.15	**Keynote Lecture:** Prof. John Williams, MIT, USA, "Programming DEM in a Multi-Core Multi-Processor Environment" Chairman: Prof J. McCarthy		
10.15	Coffee		
10.45	Poster Session 2		
11.45	Mineral and Physical Processing: Round Table Discussion/Workshop- Challenges in Modelling Mineral Processing and Bulk Materials Chairman: Dr. Rob Morrison		
12.30	Lunch		
13.30	*Technical Session 6a* *Mining, Geomechanics and Geophysics- Modelling* Chairman: Dr L. Lorig and Dr D. Potyondy		*Technical Session 6b* *Powder Technology, Process Engineering & Industrial Applications – Cohesion and industrial flows* Chairman: Dr J. Favier and Prof F-V. Donze
13.30	**A DEM simulation of the critical state behavior of granular media and micromechanical analysis** S.V. Dinesh (Siddaganga Institute of Technology, India), T.G. Sitahram (Indian Institute of Science, India) and M. Hyodo (Yamaguchi University, Japan)		**Tracking liquid transfer in DEM Simulations: a coating study** D. Shi and J.J. McCarthy (University of Pittsburgh, USA)
13.45	**Unjamming transitions in dense granular assemblies under biaxial compression: role of force chain buckling quantified via DEM** A. Tordesillas (University of Melbourne, Australia)		**A modeling approach for cohesive powder processing** S. Johnson (Lawrence Livermore National Laboratory, USA), J. Williams (Massachusetts Institute of Technology, USA) and B. Cook (Sandia National Laboratories, USA)
14.00	**An approach to local element refinement in 3-D block discrete element method and numerical simulation of blasting effect in rock mass** Tian Zhennong Li Shihai and Liu Xiaoyu (Chinese Academy Sciences, China)		**Collision detection and administration methods for many particles with different sizes** B. Muth, P. Eberhard (University of Stuttgart, Germany), M.-K. Muller and S. Luding (Technical University Delft, The Netherlands)
14.15	**Simulation of fluid/structure coupling in multi-fracturing rock and particulate media** D.R.J. Owen, Y.T. Feng, M. Labao, C.R. Leonardi (University of Wales Swansea, UK) and S.Y. Zhao (Rockfield Technology Centre, UK)		**Industrial application of discrete particle simulation at BlueScope Steel** D. Pinson and B. Wright (BlueScope Steel Research, Australia)
14.30	**The effect of void shape on the mechanical properties of rock** D.O. Potyondy (Itasca Consulting Group, Inc., USA)		**Experimental validation of the Discrete Element Method (DEM)** W. Wu (The University of Queensland, Australia) and D. Morrison (Sinclair Knight Merz, Australia)
14.45	**Characterization of damage anisotropy from 3D discrete element model** A. Delaplace and R. Desmorat (Universite P. et M. Curie, France)		**DEM simulation and analysis of mixing and segregation of particles in a bladed mixer** R. Chandratilleke, A.B. Yu (University of New South Wales, Australia) and J. Bridgwater (University of Cambridge, UK)
15.00	Coffee		
15.30	*Technical Session 7a* *Numerical methods, Validation and Novel Applications*		*Technical Session 7b* *Mining, Geomechanics and Geophysics/*

	– Contact Models Chairman: Prof S. Luding and Dr H. Mio		*Mineral and Physical Processing* Chairman: Dr A. Potapov and Dr J. Peters
15.30	**Friction through DEM simulations: the necessity of a multi-scale approach** N. Fillot, D. Richard and M. Renouf (LaMCoS - INSA Lyon, France)		**Putting a new spin on technology development – IsaMill DEM modelling** D. Curry (Xstrata Technology, Australia), C. Jayasundara, R. Yang and A. Yu (University of New South Wales, Australia)
15.45	**Coupling DEM simulations and physical tests to study the load – unload response of an ideal granular material** Liang Cui (University College Dublin, Ireland), C. O'Sullivan (Imperial College, UK) and S. O'Neill (University College Dublin, Ireland)		**Application of DEM for assessment for rock slope stability** S. Kuraoka and T.Makino (Nippon Koei Co., Ltd., Japan)
16.00	**A comparison and validation of normal and tangential force models for the use within discrete element simulations** H. Kruggel-Emden, S. Wirtz and V. Scherer (Ruhr-University Bochum, Germany)		**Numerical study of particle flow on a vibrating screen** K.J. Dong, B Wang, A.B. Yu (University of New South Wales, Australia) and I. Brake (BHP Billiton Mitsubishi Alliance, Australia)
16.15	**Thermo-mechanical coupling in particle compaction** W.L. Vargas and J.J. McCarthy (University of Pittsburgh, USA)		**Positron emission particle tracking of charge particles in a scaled industrial tumbling mill** I. Govender, M.S. Powell, R. Chandramohan (University of Cape Town, South Africa), D.J. Parker et al (University of Birmingham, UK)
16.30	Conference Closes		

POSTER SESSIONS

Poster Session 1

The following posters will be on display from the morning of Monday 27th August to mid-day on Tuesday 28th August

Spatial reasoning algorithms for discrete element analysis
J.R. Williams (Massachusetts Institute of Technology, USA), S. Johnson (Lawrence Livermore National Laboratory, USA) and B. Cook (Sandia National Laboratories, USA)

DEM analysis of the flow of granular materials into a moving confined space
Chuan-Yu Wu (University of Birmingham, UK)

Soil dynamics prediction with bulldozer using the FE/ DE method
Yanjie Li, Yong Xu (China Agricultural University, China), Y.T. Feng and D.R.J. Owen (University of Wales Swansea, UK)

Coupling techniques for discrete element models
S. Gavoille, A. Delaplace, C. Rey (Universite P. et M. Curie, France) and C. Mariotti (LSEG/CEADAM, France)

Stochastic discrete element modelling
Y.T Feng, J. Kato and D.R.J. Owen (Swansea University, UK)

Ancient columns and colonnades under strong earthquake excitations
L. Papaloizou, P. Polycarpou and P. Komodromos (University of Cyprus, Greece)

Using EDEM to simulate a direct shear box experiment
A.D. Orlando, H. Shen (Clarkson University, USA), S. Ji (Dalian University of Technology, China), and J. Favier (DEM Solutions Ltd, UK)

Numerical investigation of granular flow in a cylindrical hopper
H.P. Zhu and A.B. Yu (University of New South Wales, Australia)

Modelling of the multiphase flow in dense medium cyclone
K.W. Chu, B. Wang, A.B. Yu and A. Vince (University of New South Wales, Australia)

An improved point-locating algorithm for discrete particle simulation of particle-fluid flow under polyhedral meshes
S.B. Kuang, A.B. Yu (University of New South Wales, Australia) and Z.S. Zou (Northeastern University, China)

A 3D X-ray vision system for studying discrete particulate behaviour
I. Govender and M.S. Powell (University of Cape Town, South Africa)

Investigating the validity of DEM simulations of experimental tumbling mills
A.T. McBride and M.S Powell (University of Cape Town, South Africa)

Using DEM to inform experimental design
A.T. McBride and M.S Powell (University of Cape Town, South Africa)

A DEM study of red blood cells, white blood cells and platelets flowing in a plasma fluid
Wenbin Zhang and C. Thornton (University of Birmingham. UK)

The discrete element method in linear elastic fracture mechanics
N. Raje and F. Sadeghi (Purdue University, USA)

Modeling realistic particle shape in granular materials
F. Alonso-Marroquin and P. Mora (University of Queensland, Australia)

A polly-ellipsoid particle for non-spherical DEM
J.F. Peters, M.A. Hopkins, R.E. Wahl and R. Kala (US Army Engineer Research & Development Center, USA)

DEM analysis of fibre-reinforced granular soils
K. Maeda, T. Matsumoto, H. Hirabayashi (Nagoya Institute of Technology, Japan), E. Ibraim and D. Muir Wood (University of Bristol, UK)

Simulation of triaxial testing using rigid and flexible walls
M. Hopkins (ERDC-CRREL, USA) and L. Uthus (NTNU, Norway)

Application of DEM to virtual experiments on granular packs
G. Delaney, S. Inagaki, T. Di Matteo and T. Aste (The Australian National University, Australia)

DEM: an essential tool for thermo-micro-mechanical continuum theories of shear banding and comminution phenomena
A. Tordesillas (University of Melbourne, Australia), A. Ord (CSIRO Exploration & Mining, Australia) and I. Einav (University of Sydney, Australia)

2D discrete element method for modelling multi-fracturing of beam structures
J. Paavilainen and J. Tuhkuri (Helsinki University of Technology, Finland)

3D combined FEM-DEM simulation of Ridge Keel punch-through tests
A. Polojarvi and J. Tuhkuri (Helsinki University of Technology, Finland)

Reproduction of 3-D brittle rock failure under uni-axial compression using Lattice Solid Model with particle rotation
Yucang Wang and P. Mora (University of Queensland, Australia)

Poster Session 2

The following posters will be on display from mid-day on Tuesday 28th August until the close of the conference:

Modeling of solid particle flow in iron making process by large-scale discrete element method
H. Mio (Kyoto Fine Particle Technology, Japan), S. Miyazaki et (Doshisha University, Japan) and K. Kuniyomo (Nippon Steel Corp., Japan)

DEM simulations of a pulse of gas-solid two-phase mixture flowing through a packed bed
Wei Yang, Yurong He and Yulong Ding (University of Leeds, UK)

Efficient contact detection algorithm between ellipsoids and its use in discrete element simulation of flowing granular materials
B. Trabelsi, M. Moakher (National Engineering School at Tunis, Tunisia), C. Gatumel and H. Berthiaux (Ecole des Mines d'Albi, France)

Mixing dynamics in two-component fluidized beds of solids differing by density
F. Cello, F.P. Di Maio and A. Di Renzo (Universita della Calabria, Italy)

DEM simulations of a HMA drum mixer
A. Hobbs (Astec, Inc, USA)

DEM simulation of particle percolation in a packed bed
M. Rahman, H.P. Zhu, A.B. Yu (University of New South Wales, Australia) and J. Bridgwater (University of Cambridge, UK)

Post liquefaction undrained monotonic strength of granular materials
J.S. Vinod, T.G. Sitharam (Indian Institute of Science, India) and B.V. Ravishankar (B.M.S. College of Engineering, India)

Experimental and DEM simulation of cyclic behaviour of granular soils
T.G. Sitharam, J.S. Vinod (Indian Institute of Science, India) and B.V. Ravishankar (B.M.S. College of Engineering, India)

Modeling of rockfall protection structure by discrete analysis
D. Bertrand et al (Cemagref, France), P. Gotteland (LIRIGM, UJF/RNVO Group, France), V. Gras (LIRIGM, UJF, France) and F. Nicot (Cemagref/RNVO Group, France)

New way of microparameter determination in 2D bonded particle model generation for uniaxial compression simulations
Jeoungseok Yoon, Heekwang Lee and Seokwon Jeon (Seoul National University, Korea)

Simulation of particle flow in IsaMill
C.T. Jayasundara, R.Y. Yang, A.B. Yu (University of New South Wales, Australia) and D. Curry (Xstrata Technology, Australia)

Numerical study of coke collapse by discrete element method
S.M. Wu, H.P. Zhu, A.B. Yu (University of New South Wales, Australia) and P. Zulli (Bluescope Steel Research Laboratories, Australia)

Concepts of applying DEM outputs to a mill model
M.S. Powell (University of Cape Town, South Africa)

Particle modeling of material comminution process study
G. Wang, P. Radziszewski (McGill University, Canada), M. Ostoja-Starzewski (University of Illinois at Urbana-Champaign, USA) and S. Caron (COREM, Canada)

Validating iBall outputs with simple trajectories
S. Martins, W. Li, P. Radziszewski and S. Caron (McGill University, Canada)

Exploring the feasibility of using a commercial hardware and software physics engine for milling system simulation
S. Martins, P. Radziszewski, M. Brochu and U. Seminari (McGill University, Canada)

Application of DGB (Discrete Grain Breakage) model to breakage and liberation behavior of recycled aggregates from crushing of concrete waste
Hoon Lee, Ji Hoe Kwon and Heechan Cho (Seoul National University, Korea)

On the boundary conditions of virtual triaxial test using DEM
M. Alsaleh (Caterpillar Inc., USA)

3D DEM simulations of a shallow fine powder bed
K D Kafui, C Thornton and J P K Seville, (University of Birmingham, UK)