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Wednesday, March 28, 2007

8:00-8:30 AM **Registration; Optional breakfast**

8:30-8:45 AM **Welcome and opening remarks**

8:45 AM **Keynote**

Coalescence of Voids and Formation of Shear Bands in Porous Ductile Solids – Theoretical Models and Numerical Studies: J.B. Leblond¹, G. Mottet²;

¹ Institut Jean Le Rond d'Alembert, Université Pierre et Marie Curie, France, ² ESI Group, France.

9:30 AM

Numerical Modeling of Microstructural Phenomena in Polycrystalline Metals:

Kaan Inal¹, Raja K. Mishra²;

¹Department of Mechanical and Mechatronics Engineering, University of Waterloo, Waterloo, Canada; ²General Motors Research and Development Center, Warren, U.S.A.

10:00 AM

Mesoscale Modeling of the Recrystallization of Superalloys:

J.P. Thomas^{1,2}, F. Montheillet³ and S.L. Semiatin¹;

¹Air Force Research Laboratory, Materials and Manufacturing Directorate, AFRL/MLLMP, Wright-Patterson Air Force Base, U.S.A.; ²Universal Technology Corporation, Dayton, U.S.A.; ³Ecole Nationale Supérieure des Mines de Saint-Etienne, Centre SMS, CNRS UMR 5146, Saint-Etienne, France.

10:30 AM **Break**

10:40 AM **Keynote**

A Multiscale Modelling of Dynamic Damage by Micro-Voiding with Application to Spalling: A Molinari¹, C. Czarnota¹, S. Mercier¹, N. Jacques²

¹Université Paul Verlaine-Metz, France; ²Ensieta, Brest, France.

11:25 AM

Failure and Plastic Strains in Granular Materials- A Multiscale Approach:

F. Nicot¹, and F. Darve²

¹Cemagref, Unité de Recherche Erosion Torrentielle Neige et Avalanches, Grenoble, France ; ²Laboratoire Sols Solides Structures, UJF-INPG-CNRS, Grenoble, France.

12:05 AM **Lunch**

1:00 PM Keynote

Constitutive Modeling and Forming Simulations from an Industrial Perspective

F. Barlat, J.W. Yoon, Alloy Technology and Materials Research Division, Alcoa
Technical Center, USA

1:30 PM

Multi-scale stochastic analysis of heterogeneous materials

A. Ibrahimegovic, Ecole Normale Supérieure de Cachan, Cachan, France.

2:00 PM

Some general properties of Eshelby's tensor fields in conduction and anti-plane elasticity: H. Le Quang¹, **Q.-C. He**¹, Q-Z. Zheng²,

¹Laboratoire de Mécanique, Université de Marne-la-Vallée, Marne-la-Vallée, France

²Department of Engineering Mechanics, Tsinghua University, Beijing, China.

2:30 PM Break

2:45 PM Keynote

Modelling Subgrain Texture Evolution with Experimental Validation Using Direct

Input From Microstructure Images: **R. A. Lebensohn**¹, R. Brenner² and O. Castelnau³

LPMTM, CNRS, Université Paris 13, Villetaneuse, France ; (3) Los Alamos National

Laboratory, MST-8, Los Alamos, USA

3:30 PM

Discussions

4:30-6:00 PM

WELCOME RECEPTION

Thursday, March 29, 2007

7:30-8:00 AM **Optional breakfast**

8:15 AM **Keynote**

A Parallel Code for Phenomenological Mesoscale Field Dislocation Mechanics: A. J. Beaudoin¹, S. Varadhan¹, S. Puri,² A. Acharya²

¹University of Illinois at Urbana-Champaign, USA

²Carnegie-Mellon University, USA.

9:00 AM

What Have We Learned From Discrete Dislocation Dynamics? A Review of Recent Studies: M. Fivel, SIMAP-GPM2, CNRS/INPG, Grenoble, France

9:30 AM

Micromechanical Modeling of the Viscoplastic Behaviour of Earth Mantle Olivine:

O. Castelnau^{1,2}, R. Lebensohn³, D. Blackman¹

(1) IGPP, UCSD, 9500 Gilman drive, La Jolla, CA, USA ;(2) LPMTM, CNRS, Université Paris 13, Villetaneuse, France ; (3) Los Alamos National Laboratory, MST-8, Los Alamos, USA.

10 :00 AM **Break**

10:10 AM **Keynote**

Multiscale Methods for the Failure of Heterogeneous Materials: T. Belytschko and S. Lohner, Department of Mechanical Engineering, Northwestern University, USA

10:55 AM

Modeling of Elastoplastic Damage in Cohesive Geomaterial Using Non Linear Homogenization Technique: J.F. Shao^{1,*} A-C Guéry^{1,2}, T. Jia¹, F. Cormery¹ and D.

Kondo¹

¹Laboratoire de Mécanique de Lille, UMR 8107 CNRS, Villeneuve d'Ascq, France;

²Agence Nationale de Gestion des Déchets Radioactifs (ANDRA), France.

11:25 AM **Lunch**

12:30 PM **Keynote**

Dislocation dynamics and size effects in the torsion of ice single crystals:

¹V. Taupin,²S. Varadhan,³J. Chevy,¹C. Fressengeas,²A.J. Beaudoin,³M. Montagnat and³P. Duval

¹ Laboratoire de Physique et Mécanique des Matériaux, Université P. Verlaine - Metz / CNRS, Ile du Saulcy, Metz, France ; ² Department of Mechanical Sciences and Engineering University of Illinois at Urbana – Champaign, USA ; ³ Laboratoire de Glaciologie et Géophysique de l'Environnement – CNRS, Grenoble, France.

1:15 PM

Mesoscopic Size-Effects in Athermal Microcrystal Deformation: Dennis M.

Dimiduk, C. Woodward, M. D. Uchic, S. I. Rao,* T. A. Parthasarathy, and E. M. Nadgorny**

Air Force Research Laboratory, Materials and Manufacturing Directorate, Wright-Patterson AFB, OH 45433-7817;*UES, Inc., Dayton, USA; **Department of Physics, Michigan Technological University, Houghton, MI, USA.

1:45 PM

Multiscale Modeling of Alloy Solidification: N. Zabaras, Materials Process Design and Control Laboratory, Sibley School of Mechanical and Aerospace Engineering, Cornell University, Ithaca, NY, USA.

2:15 PM Break

2:30 PM Keynote

Bifurcations and Instabilities in Granular Media: From Micro to Macro Scales: F.

Darve, F. Nicot, L. Sibille, F. Prunier, S. Lignon, J. Duriez, F. Donze, B. Chareyre, Laboratoire Sols, Solides, Structures – INPG, UJF, CNRS, Grenoble, France.

3:15 PM

Shock compression in concrete under 20 GPa-Experimental and Modeling

Investigations: E Buzaud, P-L Hereil, Delegation Generale pour l'Armement, Centre d'Etudes de Gramat, Gramat, France.

3:45-4:30 PM Discussions

6:30-9:00 PM Conference Banquet

Friday, March 30, 2007

7:30-8:00 AM **Optional breakfast**

8:15 AM **Keynote**

Damage and Permeability in Quasi-Brittle Materials: from Diffuse to Localized Properties: G. Pijaudier-Cabot, M. Choinska and F. Dufour, Ecole Centrale de Nantes, Nantes, France.

9:00 AM

A Constitutive Model for Granular Materials with Surface Energy Forces:

P.-Y. Hicher¹ and C.S. Chang²

¹Research Institute in Civil and Mechanical Engineering UMR CNRS 6183, Ecole Centrale Nantes-University of Nantes, France ; ²Department of Civil and Environmental Engineering, University of Massachusetts, Amherst, USA.

9:30 AM

Gravity Flow of a Model Granular Material: J. Rajchenbach, Laboratoire de Physique de la Matière Condensée (CNRS UMR 6622), Université de Nice-Sophia Antipolis, Nice, France.

10:00 AM **Break**

10:10 AM **Keynote**

Direct Scale Transition Approach for Viscohyperelastic Particulate Composites:

A. Dragon¹; M. Touboul¹; C. Nadot¹; A. Fanget²

¹ Laboratoire de Mécanique et de Physique des Matériaux (UMR CNRS 6617), ENSMA, B.P. 40109, 86961 Futuroscope-Chasseneuil, France

² CEG, 46000 Gramat, France

10:55 AM

Length scales in mechanics of granular solids from DEM simulations: F. Radjai, Laboratoire de Mécanique et Genie Civil, Université Montpellier 2, France

11:25 AM **Lunch**

12:30 PM Investigation of Three-Dimensional Stress Fields and Slip Systems for FCC Single Crystal Superalloy Notched Specimens: N. Arakere¹; F. Ebrahimi ²; S. Siddiqui³

¹Department of Mechanical & Aerospace Engineering, University of Florida, Gainesville, FL, USA; ² Department of Materials Science and Engineering, University of Florida, Gainesville, FL, USA; Siemens-Westinghouse, Orlando, FL, USA.

1:00 pm Keynote

A Microstructure-Based Plastic Potential For Polycrystalline Metallic Aggregates
P. Franciosi, LPMTM, CNRS, Université Paris 13, Villetaneuse, France.

1:45 pm Break

2:00 PM Keynote

Some Aspects of the Nonlinear Behavior of Microcracked Materials:
D. Kondo, V. Monchiet, Q. Zhu, Laboratoire de Mecanique de Lille, UMR8107 CNRS, USTL, Lille, France

2:45 PM

Initial Yielding and Anisotropic Hardening of Hexagonal Metals:

B. Plunkett^a, O. Cazacu^b, R. Lebensohn^c, F. Barlat^d,

^aAir Force Research Laboratory, Eglin Air Force Base, FL, USA; ^b Department of Mechanical and Aerospace Engineering, University of Florida/REEF, Shalimar, FL, USA
^cLos Alamos National Laboratory, MST-8, Los Alamos, USA; ^d Alloy Technology and Materials Research Division, Alcoa Technical Center, USA

3:15 PM Keynote

Modeling and Simulation of Shear Bands in Metals and Impact Damage of Steel Plates by Deformable Projectiles: G. Z. Voyiadjis¹ and R.K. Abu Al-Rub², ¹Department of Civil and Environmental Engineering, Louisiana State University, Baton Rouge;
²Department of Civil and Environmental Engineering, Catholic University of America, Washington, DC

4:00 PM Discussions and Concluding Remarks