

Program for June 19, 2000

Registration: 8:00 – 9:00

Welcoming Remarks: 9:00 – 9:15

Introductory Session

- 9:15 – 9:55 **Owen Richmond (Plenary Speaker)**, “The Essential Role of Dislocation Theory for the Holistic Design of Structural Metal Products and Their Manufacturing Processes”
- 9:55 – 10:35 **Alan Needleman (Plenary Speaker)**, “A Comparison of Discrete Dislocation and Continuum Predictions of Plastic Flow”
- 10:35 – 11:15 **Ali Argon (Plenary Speaker)**, “Production of Dislocations and Source Limited Plasticity in Crystalline Solids”
- 11:15 – 11:35 Break

Session 1: Experimental Techniques and Observations

- 11:35 – 12:15 **Tamas Ungár (Plenary Speaker)**, “Dislocation Densities, Arrangements, and Character from X-ray Diffraction Experiments”
- 12:15 – 12:35 **E. Zolotoyabko, D. Shilo, and E. Lakin**, “X-ray Imaging of Acoustic Wave Interaction with Dislocations”
- Lunch** 12:35 – 1:35
- 1:35 – 1:55 **Gabrielle Long and Lyle E. Levine**, “X-ray Scattering and Imaging from Dislocation Structures”
- 1:55 – 2:15 **E. Cadel, A. Fraczkiewicz, and D. Blavette**, “Atomic Scale Observation of Cottrell Atmospheres in B-doped FeAl (B2) by 3D Atom Probe Field Ion Microscopy”
- 2:15 – 2:35 **Patrick Cordier**, “Plastic Deformation of Minerals Under Extreme Pressure”
- 2:35 – 2:55 **Patrick Veyssi  re**, “Flow Stress Anomalies in Ordered Alloys: A Review of Microstructural Findings and Related Models”
- 2:55 – 3:15 Break

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Session 2: Atomic Scale

- 3:15 – 3:55 **Vasily Bulatov (Plenary Speaker)**, “Core Aspect of Dislocation Behavior: Where the Atoms Matter”
- 3:55 – 4:15 **Sohrab Ismail-Beigi and T. A. Arias**, “*Ab Initio* Study of Screw Dislocations in Mo and Ta: A New View of Plasticity in BCC Transition Metals”
- 4:15 – 4:35 **Lin H. Yang, Per Söderlind, and John A. Moriarty**, “Atomistic Simulation of Stress-Dependent Screw Dislocation Properties in BCC Tantalum”
- 4:35 – 4:55 **T. J. Balk, O. N. Mryasov, Yu. N. Gornostyrev, P. Panfilov, A. J. Freeman, K. J. Hemker**, “Theoretical Predictions and Experimental Observations of Dislocation Core Structures in Single Crystalline Au and Ir”

Poster Session I.

4:55 – 6:10 (Experimental and Atomic I)

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Session 2: Atomic Scale

- 8:30 – 8:50 **T. Vegge, O. B. Pedersen, T. Leffers, and K. W. Jacobsen**, “Atomic Scale Simulations of Jogged Screw Dislocation Cross Slip, Jog Migration, and Dipole Annihilation Rates Using Direct MD”
- 8:50 – 9:10 **Hirokazu Koizumi, Helmut O. K. Kirchner, and Takayoshi Suzuki**, “Emission of Elastic Waves From a Dislocation in a Discrete Lattice”
- 9:10 – 9:30 **J. W. Morris, C. R. Krenn, D. Roundy, and M. L. Cohen**, “Deformation at the Limit of Elastic Stability”

Discussion Period I

9:30 – 10:15 (**Discussion Leader: Frank Nabarro**)

Poster Session II.

10:15 – 12:15 (**Atomic II, Mesoscopic, and Statistical**)

Bus Trip to Washington D. C

1:00 – 5:00 (**Lunch included, see enclosed description**)

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Session 3: Mesoscopic and Multiscale

- 9:00 – 9:40 **Benoit Devincre (Plenary Speaker)**, “Mesoscopic Simulations of Plastic Deformation”
- 9:40 – 10:00 **Darcy A. Hughes, Hussein M. Zbib, and Andrew Godfrey**, “Internal Structures of Deformation Induced Planar Dislocation Boundaries”
- 10:00 – 10:20 **N. M. Ghoniem, S-H Tong, H. Trinkaus, and B. N. Singh**, “A Computational Method for 3-D Parametric Dislocation Dynamics and its Application to Flow Localization”
- 10:20 – 10:40 **F. R. N. Nabarro**, “The Time Constant of Logarithmic Creep”
- 10:40 – 11:00 Break
- 11:00 – 11:20 **K. W. Schwarz, D. Chidambarao, and X. H. Liu**, “Dislocation Modeling for the Silicon World”
- 11:20 – 11:40 **A. George, A. Jacques, and M. Legros**, “Fatigue Testing of Single Crystalline Silicon”

Session 4: Nonlinear and Statistical

- 11:40 – 12:20 **Michael Zaiser (Plenary Speaker)**, “Non-Equilibrium Statistical Mechanics of Dislocation Systems”

Lunch 12:20 – 1:20

- 1:20 – 1:40 **G. Ananthakrishna, S. J. Noronha, C. Fressengeas, and L. P. Kubin**, “From Chaos to SOC in Jerky Flow of Single Crystals”
- 1:40 – 2:00 **Robb Thomson and Lyle E. Levine**, “Strain Percolation: Physical Considerations”
- 2:00 – 2:20 **M.-Carmen Miguel, Jérôme Weiss, Jean-Robert Grasso, Alessandro Vespignani, and Stefano Zapperi**, “Complexity in Dislocation Dynamics: Experiments and Model”
- 2:20 – 2:40 **Chandra S. Pande**, “Work hardening behavior of face-centered cubic single crystals”

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2:40 – 3:00 **J. Kratochvíl, J. Škrobánek, and J. Zatloukal**, “Self-Organization Model of Localization of Cyclic Strain into PSBs and Formation of Dislocation Wall Structure”

3:00 – 3:20 Break

Discussion Period II

3:20 – 4:05 **(Discussion Leader: Ladislás Kubík)**

Session 5: Size Effects and Strain Gradients

4:05 – 4:45 **Javier Gil Sevillano (Plenary Speaker)**, “Size Effects in Plasticity by Dislocation Glide”

Banquet Dinner

6:00 Buses leave from Conference Hotel

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Session 5: Size Effects and Strain Gradients

- 9:00 – 9:20 **Douglas J. Bammann**, “Incorporation of a Natural Length Scale into a Crystal Plasticity Model”
- 9:20 – 9:25 **Mini-Discussion (Frank Nabarro)**
- 9:25 – 9:45 **A. J. Beaudoin and A. Acharya**, “Consideration of Grain-size Effect and Kinetics in the Plastic Deformation of Metal Polycrystals”

Session 6: Dislocation-Interface Interactions

- 9:45 – 10:25 **Louisette Priester (Plenary Speaker)**, “Dislocation-Interface Interactions: Stress Accommodation Processes at Interfaces”
- 10:25 – 10:45 Break
- 10:45 – 11:05 **H. Van Swygenhoven, A. Caro, and D. Farkas**, “A Molecular Dynamics Study of Polycrystalline FCC Metals at the Nanoscale: Grain Boundary Structure and its Influence on Plastic Deformation”
- 11:05 – 11:25 **B. W. Lagow, M. Jouiad, I. M. Robertson, and D. H. Lassila**, “Observation of Dislocation Dynamics in the Electron Microscope”
- 11:25 – 11:45 **Masao Doyama and Y. Kogure**, “Computer Simulation of Creation and Motion of Dislocations During Plastic Deformation in Copper”
- 11:45 – 12:05 **J. Grilhé, S. Brochard, and P. Beauchamp**, “Stress Concentration Near a Surface Step and Non-Linear Coupling with an Applied Stress”
- 12:05 – 12:25 **P. Pirouz and L. P. Kubin**, “On Partial/Perfect Dislocations and Transitions in Yield and Fracture Properties of Semiconductors”
- Lunch** 12:25 – 1:25

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Poster Session III.

1:25 – 2:55 **(Strain Gradients, Interfaces, and Non-Crystalline)**

Session 7: Non-Crystalline Dislocations

2:55 – 3:35 **Keiichi Edagawa (Plenary Speaker)**, “Dislocations in Quasicrystals”

3:35 – 3:55 **M. Feuerbacher, H. Klein, and K. Urban**, “Dislocations in ξ' -Al-Pd-Mn Quasicrystal Approximants”

3:55 – 4:15 **Christian G'SELL**, “Dislocations in Glassy Polymers: Do They Exist? Are They Useful?”

Discussion Period

4:15 – 5:00 **(Discussion Leader: Robb Thomson)**

Closing Remarks

4:55 Lyle Levine