

PRISMS Center Annual Workshop

August 3-6, 2021

VIRTUAL (all times Eastern Time)

Program

NOTE: Times include discussion times. All speakers should allow time for Q+A at the end of their talks!

Tuesday August 3

10:00am Welcome and PRISMS Center Overview
John Allison

Measuring and Modeling Microstructural Effects on Fatigue in Mg Alloys

Session Chair: Mohamadreza Yaghoobi

10:20am PRISMS-Fatigue: Overview and Case Studies
Guest Speaker: Kris Stopka (Purdue University), Mohammadreza Yaghoobi, Aaditya Lakshmanan, Veera Sundararaghavan, John Allison and David McDowell (Georgia Tech)

10:50am HEDM Characterization of Fatigue Crack Paths in WE 43 Mg
Duncan Greeley, Jake Adams, Peter Kenesei, Wayne Jones, Ashley Spear, John Allison,

11:10am Graph Theory Model for Fatigue Crack Path Modeling
Siddhartha Srivastava, and Veera Sundararaghavan

11:35am Finite Element Based Modeling of Geometrically Explicit Cracks in 3D Microstructures
Guest Speaker: Brian Phung and Ashley Spear, University of Utah

12:00 pm Break (20 min)

12:20 pm High-throughput feature extraction for measuring attributes of deforming open-cell foams
Guest Speaker: Attila Gyulassy and Ashley Spear, University of Utah

12:45 Open Discussion

Wednesday August 4

Predicting and Measuring Twinning and Detwinning in Mg Alloys

Session Chair: Amit Misra

9:55-10am Convene/Welcome

10:00am Interaction of twin boundaries and precipitates at the atomic scale
Guest Speaker: Teresa Perez Prado (IMDEA)

10:40am PRISMS-Plasticity: Advances in Modeling of Twinning During Monotonic and Cyclic Deformation in Mg and Mg alloys
Mohammadreza Yaghoobi, Aaditya Lakshmanan, Zhe Chen, John Allison and Veera Sundararaghavan

11:10pm Using HEDM and PRISMS-Plasticity to Quantify and Model Twinning and Detwinning in Mg Alloys
Duncan Greeley, Mohammadreza Yaghoobi, Darren Pagan and John Allison

11:35pm Quantifying Twin Behavior by In-Situ SEM Measurements During Monotonic and Cyclic Loading in Mg and Mg alloys
Zhe Chen and John Allison

12:00pm Break 30 min

Capturing and Using Materials Information

Session Chair: Brian Puchala

12:30pm Materials Commons 2.0 Overview
Glenn Tarcea, Brian Puchala, Tracy Berman and John Allison

12:55pm Added value and increased organization: Capturing experimental data provenance in Materials Commons 2.0
Tracy Berman

1:20pm Open Discussion

Thursday August 5

Grain Strengthening Use Case

Session Chair: Veera Sundararaghavan

9:55-10am Convene/Welcome

10:00am PRISMS Grain Strengthening Use Case Overview
Veera Sundararaghavan

10:05am Formation of $\{11\}$ stacking fault by deformation defect evolutions from grain boundaries in Mg
Yong-Jie Hu, Vaidehi Menon and Liang Qi

10:35am Estimation of Micro-Hall-Petch Coefficients in Mg-4Al as a Function of Grain Boundary Parameters
Moshen Tahari, Aaditya Lakshmanan, Yung Suk Yoo, Veera Sundararaghavan, John Allison, Amit Misra

11:00 am TEM study of Dislocation Interactions with Grain Boundaries in Mg Alloys
Yung Suk (Jeremy) Yoo and Amit Misra

11:20am Incorporating Grain Size Effects into PRISMS-Plasticity
Aaditya Lakshmanan, Mohammedreza Yaghoobi and Veera Sundararaghavan

11:45 am Break 30 min

12:15 pm Characterizing Precipitation and Grain Boundary Segregation in Mg Alloys
Qianying Shi, Anirudh Natarajan, Alexander Pielack, Anton Van der Ven and John Allison

12:40 pm DFE-FE 1.0 Overview
Sambit Das, Phani Motamarri and Vikram Gavini

1:10 pm Open Discussion

Friday August 6

Texture Evolution Use Case

Session Chair: Katsuyo Thornton

9:55-10am Convene/Welcome

10:00am PRISMS Texture Evolution Use Case Overview

John Allison

10:05am Texture Evolution in Mg-Zn-Ca Alloys

Tracy Berman and John Allison

10:30am HEDM studies of Recrystallization in Mg alloys

Sangwon Lee, Reza Roumina, Kate Shanks, Can Yildirim, Tracy Berman, John Allison and Ashley Bucsek

11:00am PRISMS-PF Overview

David Montiel and Katsuyo Thornton

11:30 am Break 30 min

12:00pm CASM 1.0 Overview

Brian Puchala and Anton Van der Ven

12:30pm Using PRISMS-PF to Characterize Microsegregation during Solidification in Al-Cu Alloys

Guest Speaker: Zhenjie Yao (UM), David Montiel, Mei Li (Ford), Katsuyo Thornton and John Allison

12:55pm Concluding Remarks

John Allison