DISLOCATIONS
2025

UNIVERSITY OF MIAMI

November 10-14, Coral Gables, FL, USA

This is the short version of the conference booklet for print use.
The full version, including abstracts, will soon be available on the conference website.

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https://github.com/maximelucas/AMCOS_booklet

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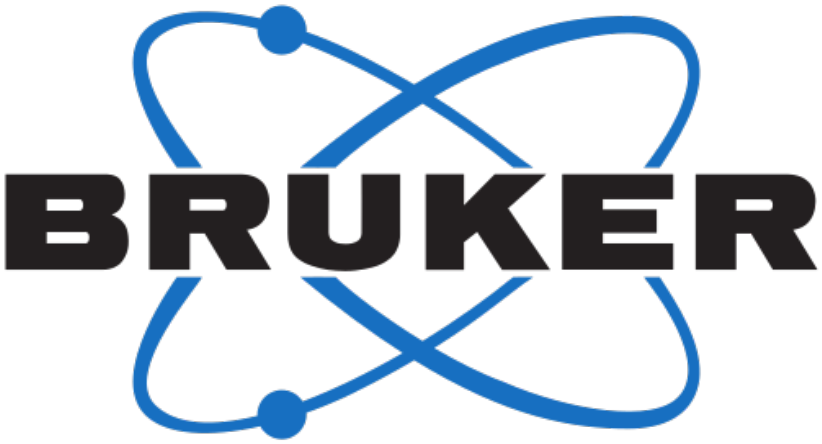
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Welcome

Dear Participants,

On behalf of the Organizing Committee, it is our great pleasure to welcome you to **Dislocations 2025**, the seventh edition of the Dislocations conference series. While temporarily disrupted by the global COVID-19 pandemic, the Dislocations conference series has established itself as one of the leading international scientific meetings dedicated to the mechanics and physics of crystal dislocations and related phenomena.

Recent progress in experimental characterization techniques and modeling methodologies—particularly those enhanced by machine learning—has opened new avenues for exploring dislocation processes across multiple length and time scales. These advances enable deeper insights into the physical properties of dislocations, their interactions with other crystal defects, and their collective dynamics.

The program of Dislocations 2025 includes a series of mini-symposia addressing a broad range of topics, such as dislocations in non-metallic materials, dislocations at interfaces, dislocations in complex alloys, environmental effects on dislocations, data-driven plasticity and machine learning, as well as various aspects of dislocation physics and mechanics across scales.

The primary objective of the conference is to bring together the community of researchers engaged in both experimental and theoretical studies of dislocations, connecting universities, national laboratories, and industry. By fostering the exchange of ideas and promoting collaboration, the conference aims to advance the fundamental understanding of dislocation behavior and to accelerate the development of novel and advanced materials.

We extend our sincere appreciation to all contributors—invited speakers, participants, and sponsors—for their valuable contributions. A special thank you goes to our local staff and administrators, whose dedication and hard work have made this conference possible.

We wish you a productive and enjoyable conference.

Giacomo Po
Dislocations 2025 Conference Chair
University of Miami

Committees

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Program at a Glance

	Mon 10	Tues 11	Wed 12	Thurs 13	Fri 14
8:00-9:00	**Breakfast, Registration, & Welcome**	**Breakfast & Registration**	**Breakfast & Registration**	**Breakfast & Registration**	**Breakfast & Registration**
AM	**Dislocations in non-metallic materials** J. Alcala, R. Madec	**Dislocations and Interfaces** E. Martinez, H. Sehitoglu	**Dislocations in Complex Alloys** I. Ryu, A. El-Azab	**Data-driven Plasticity and ML** W. Cai, E. Cluet	**Modeling Dislocations Across Scales II** G. Po, J. Amodeo
9:00-9:30	Oliver Preuss	Josh Kacher	William Curtin	Thomas Swinburne	Dan Mordehai
9:30-10:00	Michael Demkowicz	Jason Trelewicz	Daryl Chrzan	Sean Agnew	Istvan Groma
10:00-10:20	Philippe Carrez	Nikhil Admal	Atsuo Hirano	Jaafar El-Awady	Jan Ocenasek
10:20-10:50	**Coffee Break**	**Coffee Break**	**Coffee Break**	**Coffee Break**	**Coffee Break**
10:50-11:20	Shen Dillon	Tim Rupert	Satish Rao	Henning Poulsen	Vasily Bulatov
11:20-11:40	Jonathan Amodeo	Spencer Thomas	Thomas Leveau	Liming Xiong	Ghiath Monnet
11:40-12:00	Roman Gröger	Ryan Sills	Felix Frankus	Nithin Mathew	Giacomo Po
12:00-12:20	Etienne Martin	Paul Lafourcade	Douglas Stauffer	Yifan Wang	
12:20-13:50	**Lunch Break**	**Lunch Break**	**Lunch Break**	**Lunch & Learn** Austin Wade	
PM	**Dislocations and Plasticity** P. Carrez, R. Gröger	**Physics and Mechanics of Dislocations** N. Admal, R. Sills	**Environmental Effects and Dislocations** S. Rao, W. Curtin	**Modeling Dislocations Across Scales I** N. Mathew, T. Swinburne	
13:50-14:20	Javier Llorca	Maryam Ghazisaeidi	Jaime Marian	Irene Beyerlein	
14:20-14:50	Jorge Alcala	Huseyin Sehitoglu	Anter El-Azab	Emmanuel Clouet	
14:50-15:10	Ronan Madec	Enrique Martinez	Ilya Svetlizky	Alexander Umantsev	
15:10-15:40	**Coffee Break**	**Coffee Break**	**Coffee Break**	**Coffee Break**	
15:40-16:10	Erik Bitzek	Dallas Trinkle	. Ill Ryu	Wei Cai	
16:10-16:30	Thao Nguyen	Aitor Cruzado	Daniel N. Blaschke	Nicolas Bertin	
		16:30-19:30 Posters Session charcuteries & open bar		**19:30-22:30 Banquet** & open bar	

Invited Talks, Session Chairs

General Information

Conference Venue. The conference will be held at the **Lakeside Village** on the campus of the University of Miami (UM).

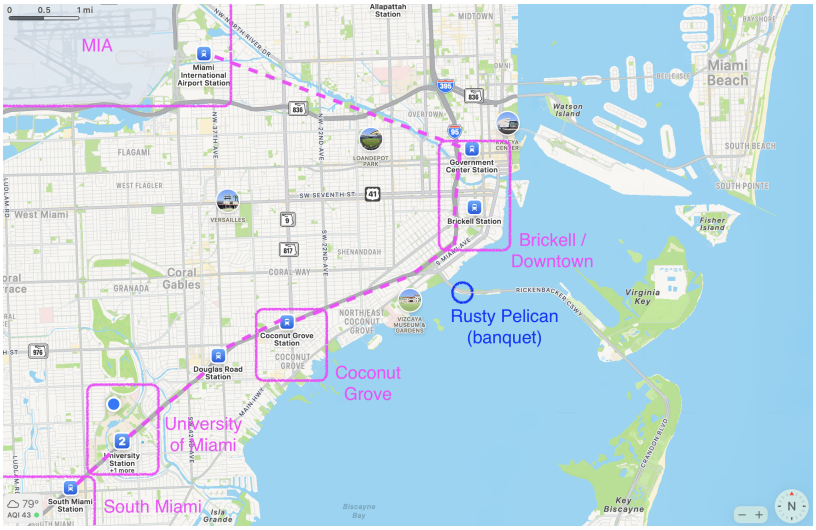
Venue address:
1280 Stanford Drive, Coral Gables, FL 33146

All lectures will take place in the **Lakeside Auditorium**, with food and beverages served in the adjacent **Lakeside Pavilion** and **Lakeside Expo Center**.

Getting there. The conference venue is easily accessible via the **Metrorail**, Miami's elevated, dual-track rapid transit system connecting Downtown/Brickell, Coconut Grove, the University of Miami, and South Miami. The Orange Line also provides a direct connection to Miami International Airport.

Disembark at the "University" Metrorail Station, which is within walking distance of UM's Lakeside Village. From the station, cross Ponce de Leon Boulevard, walk around the adjacent parking lot, and continue toward the Lakeside Village complex. The Auditorium, Pavilion, and Expo Center are located in the northern courtyard of Lakeside Village, near Lake Osceola.

Alternatively, the conference venue can also be reached by **ridesharing services**.



Registration Desk. The registration desk is located in the lobby of the Lakeside Auditorium, where you can pick up your badge and other conference materials.

Breakfast & Lunch. An assorted breakfast will be served daily from 8:00 to 9:00 AM throughout the conference. Lunch will be provided Monday through Thursday and will include vegan and vegetarian options.

Internet and Wi-Fi. Internet access is available throughout the Lakeside Village complex via the **CaneGuest** Wi-Fi network.

Oral Presentations and A/V Information. Contributed oral presentations are 20 minutes, and invited talks are 30 minutes, including time for questions and answers.

Presenters may either connect their own laptops to the A/V system or transfer their presentation to the conference computer via USB drive.

If using a USB drive, please ensure your presentation is copied to the conference computer before the start of your session.

The Lakeside Auditorium A/V system features a wired HDMI connection, a USB-C wireless dongle connection, and a video Wi-Fi connection. Apple laptops are compatible with the USB-C and Wi-Fi connections only.

Posters session. The Poster Session will be held on **Tuesday, November 11, from 4:30 to 7:30 PM** at the Lakeside Pavilion. Please set up your poster after the lunch break and collect it at the end of the session.

Poster boards measuring **36 × 48 in** will be provided. Posters may be displayed in either portrait or landscape orientation.

Charcuteries & an **open bar** will be available during the poster session.

Conference Banquet. The conference **Banquet** will take place off-campus on **Thursday, November 13, from 7:30 to 10:30 PM**, at the iconic **Rusty Pelican restaurant**—where we'll enjoy great food, drinks, and an unforgettable view of the Miami skyline from the Key Biscayne waterfront.

Rusty Pelican address:
3201 Rickenbacker Cwy, Key Biscayne, FL 33149

An **open bar** will be available during the conference banquet.

Conference Program

Monday, November 10

Food and beverages will be served at the Lakeside Pavilion.

8:00-8:40		**Breakfast & Registration**
8:40-9:00	**Giacomo Po**	**Welcome to Dislocations 2025**
		Dislocations in non-metallic materials J. Alcala, R. Madec
9:00-9:30	Oliver Preuss	Room-Temperature Dislocations In Ceramics: From Engineering To Application
9:30-10:00	Michael Demkowicz	Basal Dislocations In Proton-Ordered Hexagonal Ice
10:00-10:20	Philippe Carrez	The Core Structure Of Charge-Neutral Edge Dislocations In Strontium Titanate
10:20-10:50		**Coffee Break**
10:50-11:20	Shen Dillon	Line Defect Nucleation During Creep And Plasticity
11:20-11:40	Jonathan Amodeo	Mobility And Cross-Slip Of The ½<110> Screw Dislocation In UO_2
11:40-12:00	Roman Gröger	Charged Dislocations In Gallium Nitride Semiconductors
12:00-12:20	Etienne Martin	High Temperature Anomalous Fatigue Behavior Of High Gamma Prime (γ') PM Ni-Base Superalloys
12:20-13:50		**Lunch Break**
		Dislocations and Plasticity P. Carrez, R. Gröger
13:50-14:20	Javier Llorca	Dislocations In Zinc
14:20-14:50	Jorge Alcala	Atomistic Insights Into High-Pressure Twinning Pathways And Twin-Dislocation Interactions In BCC Nanocrystals
14:50-15:10	Ronan Madec	Effect Of Dislocation Cross-Slip On Interactions Between Slip Systems In Copper Single Crystal
15:10-15:40		**Coffee Break**
15:40-16:10	Erik Bitzek	Atomistic Modeling Of Interacting Strengthening Mechanisms In Metallic Alloys
16:10-16:30	Thao Nguyen	Dynamic Strain Aging In Single Crystal Vanadium: Material Characterization And Dislocation-Based Crystal Plasticity Framework

Invited Talks, Session Chairs

Tuesday, November 11

Food and beverages will be served at the Lakeside Pavilion.

8:00-9:00		**Breakfast & Registration**
		Dislocations and Interfaces E. Martinez, H. Sehitoglu
9:00-9:30	Josh Kacher	Deconvolving Dislocation And Grain Boundary-Mediated Deformation In Ultrafine Grained Thin Films Using In Situ TEM
9:30-10:00	Jason Trelewicz	Grain Boundary Migration And Shear Accommodation Controlled By Disconnection Mobility
10:00-10:20	Nikhil Admal	Equilibrium Statistical Mechanics Of Grain Boundaries
10:20-10:50		**Coffee Break**
10:50-11:20	Tim Rupert	Dislocation Defect Phases For The Control Of Higher Order Mechanical Properties
11:20-11:40	Spencer Thomas	Finite-Size Effects In Atomistic Simulations Of Grain Boundary Migration
11:40-12:00	Ryan Sills	Interfaces As Playgrounds For Dislocation Theory
12:00-12:20	Paul Lafourcade	S2TXA – Slip Systems and Twinning eXtraction Algorithm: extension to arbitrary reference orientation and application to nanorcystalline samples compressed at high strain rate
12:20-13:50		**Lunch Break**
		Physics and Mechanics of Dislocations N. Admal, R. Sills
13:50-14:20	Maryam Ghazisaeidi	Functional Dislocations
14:20-14:50	Huseyin Sehitoglu	Atomistics Informed Continuum Strain Field Of Dislocations
14:50-15:10	Enrique Martinez	Effect Of Entropy And Langevin Friction On The Rates Of Dislocation Obstacle Bypass
15:10-15:40		**Coffee Break**
15:40-16:10	Dallas Trinkle	Core Energies Of Isolated Dislocations From First-Principles Energy Density Method
16:10-16:30	Aitor Cruzado	A Line-Free Discrete Dislocation Dynamics Analysis Of The Elastic Gap Effect In Bending
16:30-19:30		**Posters Session with charcuteries & open bar**

Invited Talks, Session Chairs

Poster Session

1	Myung Chul Kim	Internal Stress Distribution Of Dislocation Networks
2	Himanshu Joshi	The Energetics Of Grain Boundary Migration And Their Interaction With Dislocation In Symmetric Tilt Grain Boundaries
3	Juan Carlos Ramirez	Fracture Modeling Using Somigliana Dislocations
4	Matthew Maron	Coupled Cluster And Dislocation Dynamics Modeling Of Microstructure Evolution In Irradiated Materials
5	Hyunsoo Lee	Effect Of The Stacking Fault Fluctuations And Solid Solution Noise On The Dislocation Glide Behavior In Al-Mg Random Alloys
6	Liam Myhill	Calibration Of Dislocation Drag Parameters Utilizing Molecular Dynamics Experiments And Gaussian Process Modelling
7	Eliott T. Dubois	Atomistic Tools For Deformations And Defect Analysis In Molecular Dynamics Simulations
8	Harsh Dudhatra	Dislocation Hardening Modeling Of Irradiated Tungsten
9	Abdulmohssen Abaalkhail	A Microstructure-Based Viscoplastic Model Of First Wall & Blanket Fusion Materials
10	Balduin Katzer	Characterization And Continuum Modeling Of Dislocation Networks In FCC Single Crystals Based On Discrete Dislocation Dynamics
11	Yang Li (Rutgers U.)	Gaussian Random Friction Fields For Dislocation Modeling In Solid Solutions
12	Dayeeta Pal	Imaging The Effect Of Hydrogen On Dislocations In Steel With Dark-Field X-Ray Microscopy
13	Gaurav Lathiya	Graph Representations Of Dislocation Networks
14	Benjamin Udofia	Identification Of Dislocation Structures In Experimental Laue Microdiffraction Patterns
15	Hanfeng Zhai	Link Statistics Of Dislocation Network During Strain Hardening
16	Thomas Leveau	Impact Of Hydrogen On Screw Dislocation Glide In BCC Tungsten
17	Yang Li (Shanghai U.)	Temperature-activated dislocation avalanches signaling brittle-to-ductile transition in BCC micropillars
18	Giacomo Po	Unprecedented High-Temperature Strength Of a Multiprincipal Element Refractory Superalloy
19	Michael J. Demkowicz	Excitation Of Resonant Modes Dictates Dislocation Mobility Relations Beyond Subsonic Velocities
20	Ruben Escobar	Plasticity enabled by $\langle 100 \rangle$ dislocations in BCC Tungsten
21	Marta Pozuelo	Dislocations Mediated Deformation Mechanisms In The BCC NbMotTW Refractory Multi-Principal Element Alloy

Wednesday, November 12

Food and beverages will be served at the Lakeside Expo Center.

8:00-9:00		**Breakfast & Registration**
		Dislocations In Complex Alloys I. Ryu, A. El-Azab
9:00-9:30	William Curtin	Screw Strengthening In Complex BCC Alloys
9:30-10:00	Daryl Chrzan	Influence Of Interstitial Solutes On The Structures Of $\langle a \rangle$-Type Screw Dislocations In α-Titanium
10:00-10:20	Atsuo Hirano	Dislocation Dynamics Analysis In 4H-SiC To Elucidate The Behavior Of Basal Plane Dislocations
10:20-10:50		**Coffee Break**
10:50-11:20	Satish Rao	Simulations And Modelling Of The Mechanical Behavior Of Compositionally Complex Concentrated BCC Alloys
11:20-11:40	Thomas Leveau	Impact Of Hydrogen On Screw Dislocation Glide In BCC Tungsten
11:40-12:00	Felix Frankus	Benchmarking Discrete Dislocation Dynamics Using Dark-Field X-Ray Microscopy Movies
12:00-12:20	Douglas Stauffer	Nanomechanical Insights Into Dislocations In Silicon
12:20-13:50		**Lunch Break**
		Environmental Effects And Dislocations S. Rao, W. Curtin
13:50-14:20	Jaime Marian	Coupling Crystal Plasticity, Irradiation Damage Theory, And Vertex Dynamics Models In Recrystallization Simulations Of BCC Metals
14:20-14:50	Anter El-Azab	Interfacing Continuum Dislocation Dynamics And Crystal Plasticity
14:50-15:10	Ilya Svetlizky	Work Hardening In Colloidal Crystals
15:10-15:40		**Coffee Break**
15:40-16:10	Ill Ryu	The Role Of Dislocation-Plasticity In Nano-Architectured Metals
16:10-16:30	Daniel N. Blaschke	Dislocation Mobility In Metals Undergoing High-Rate Plastic Deformation

Invited Talks, Session Chairs

Thursday, November 13

Food and beverages will be served at the Lakeside Pavilion.

8:00-9:00		**Breakfast & Registration**
		Data-driven Plasticity and Machine Learning W. Cai, E. Cluet
9:00-9:30	Thomas Swinburne	Data-Driven Dislocation Simulations Of Solute Depinning And Network Evolution
9:30-10:00	Sean Agnew	Extending The Phenomenological Theory Of Martensite Crystallography (PTMC) To Rationalize The Microstructures And Determine The Properties Of Nanoscale Building Blocks Of Shape Memory Alloys: Application To U-Nb
10:00-10:20	Jaafar El-Awady	Advancing Data-Driven Uncertainties And Predictions Of The Stress-Strain Response Of Polycrystalline Alloys
10:20-10:50		**Coffee Break**
10:50-11:20	Henning Poulsen	Dislocation Dynamics Observed By Dark-Field X-Ray Microscopy
11:20-11:40	Liming Xiong	Atomistic Roughening Of Micrometer-Long Dislocation Lines Under Multi-Physical Stimuli
11:40-12:00	Nithin Mathew	Data-Driven Modeling Of Dislocations For Multi-Scale Simulations
12:00-12:20	Yifan Wang	Room-Temperature Vacancy Emission From The Jog On Edge Dislocation In FCC Nickel Under Glide Force
12:20-13:50	Austin Wade	**Lunch & Learn:** Redefining Accessibility And Performance In Advanced Electron Microscopy
		Modeling Dislocations Across Scales I N. Mathew, T. Swinburne
13:50-14:20	Irene Beyerlein	Dislocation Dynamics In Nanolaminates With Thick Interfaces
14:20-14:50	Emmanuel Clouet	Mobility Of <100> Dislocations In Body-Centered Cubic Transition Metals
14:50-15:10	Alexander Umantsev	Thermodynamic Theory Of Dislocation-Mediated Plasticity
15:10-15:40		**Coffee Break**
15:40-16:10	Wei Cai	Prediction Of Yield Surface Of Single Crystal Copper In The Full Stress Space From Discrete Dislocation Dynamics
16:10-16:30	Nicolas Bertin	Predicting Metal Plasticity Through Cross-Scale Modeling
19:30-22:30		**Banquet & open bar at the Rusty Pelican**

Invited Talks, Session Chairs

Friday, November 14

Food and beverages will be served at the Lakeside Expo Center.

8:00-9:00		**Breakfast & Registration**
		Modeling Dislocations Across Scales II G. Po, J. Amodeo
9:00-9:30	Dan Mordehai	Dislocations In Nanoporous Au Nanoparticles – The Locality Of The Plastic Zone
9:30-10:00	Istvan Groma	Dislocation In Large Deformation Framework
10:00-10:20	Jan Ocenasek	Revisiting Dislocation Junction Formation And Destruction In FCC Metals And Alloys
10:20-10:50		**Coffee Break**
10:50-11:20	Vasily Bulatov	Asymptotic Crystal Plasticity
11:20-11:40	Ghiath Monnet	Characterization And Constitutive Analysis Of Shear Localization
11:40-12:00	**Giacomo Po**	**Closing Remarks**

Invited Talks, Session Chairs