

## 20th Israel Materials Engineering Conference (IMEC20)

Plenary	Small Dimensions Sessions	Soft Matter Sessions	Structural Materials Sessions	Computational MS Sessions
Reduced Dimensionality Sessions	Charge Transfer Sessions	Materials in Archeology Session	Additive Manufacturing Session	Functional Materials Session
Materials Characterization Session	Networking	Breaks		

### Tuesday, February 25, 2025

8:00 – 9:00	<i>Registration Area, Poster Area, Exhibition Area</i>
<b>Registration, Coffee Break, Poster Mounting</b>	

9:00 – 9:10	<i>Hall A</i>
<b>Opening Ceremony</b>	

9:10 – 9:55	<i>Hall A</i>
<b>Plenary 1: Grain Growth is Not Curvature Flow: Why? Consequences?</b>	

Chair: TBA

#### **Grain Growth is Not Curvature Flow: Why? Consequences?**

David J. Srolovitz, *Hong Kong University*

9:55 – 10:40	<i>Hall A</i>
<b>Plenary 2: Magnesium Technologies for Aviation and Aerospace Applications</b>	

Chair: TBA

#### **Magnesium Technologies for Aviation and Aerospace Applications**

Dan Shechtman, *Technion - Israel Institute of Technology*

10:40 – 11:10	<i>Poster Area, Exhibition Area</i>
<b>Coffee Break, Poster Viewing</b>	

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11:10 – 13:10	<i>Hall A</i>
<b>Nanomaterials</b>	

Chairs: TBA

**When Nature Meets Nanotechnology: Bio-assisted Synthesis of Nanomaterials Using Renewable Resources**

Shachar Richter, *Tel Aviv University*

**New Approach for "Dry" Colloidal Lithography, and its Applications in Advanced Optics and Nanomedicine**

Mark Schwartzman, *Ben-Gurion University of the Negev*

**Presentation 3**

Shlomi Polani, *Ariel University*

11:10 – 13:10	<i>Hall B</i>
<b>Polymers &amp; Colloids</b>	

Chair: TBA

**Monitoring the Kinetics of Crystal Growth for Self-Healing and Structural Control of Anisotropic Theophylline Crystals**

Angelika Elkan, *Tel Aviv University*

**Space Durable 3D Printed High-Performance Polymers Based on Cyanate Ester/Extended-Bismaleimide**

Yuval Vidavsky, *MAMAG*

**Multi-Stimuli Responsivity of Single-Layer Magnetic Polymer**

Amos Bardea, *Holon Institute of Technology*

11:10 – 13:10	<i>Hall C</i>
<b>2D Materials</b>	

Chair: TBA

**Presentation 1**

Doron Naveh, *BIU*

**Layered Ferroelectricity: From Geometric Measures to First-Principles Calculations**

Oded Hod, *Tel Aviv University*

**Presentation 3**

Ariel Ismach, *Tel Aviv University*

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11:10 – 13:10	<i>Hall D</i>
<b>Materials in Archeology</b>	

Chair: TBA

**On Ingots and Men: East Mediterranean Copper Trade during the Bronze and Iron Ages**

Naama Yahalom-Mack, *Hebrew University of Jerusalem*

**Presentation 2**

Adi Eliyahu, *Ariel University*

**The Nature of the Pumiceous Ash and Tuff used for the Construction of the Sebastos Harbor**

Yotam Asscher, *University of Haifa & Israel Antiquities Authority*

11:10 – 12:55	<i>Hall E</i>
<b>E. Gutmanas Symposium</b>	

Chair: TBA

**Paper-Derived Ceramic-Based Materials**

Nahum Travitzky, *University of Erlangen–Nuremberg, Germany*

**Manipulating the Growth and Form of Biogenic Glass**

Igor Zlotnikov, *Dresden University of Technology, Germany*

**Advancing the Knowledge of Dislocation Dynamics: A Simulation Perspective**

Dan Mordehai, *Technion - Israel Institute of Technology*

**Cold Sintering Processes: A Historical Perspective on Biomaterials Applications**

Aliya Sharipova, *Fraunhofer Institute for Ceramic Technologies and Systems IKTS*

**Reactive Infiltration Synthesis of Additively Manufactured Metal/Ceramic Composites**

Alexander Katz-Demyanetz, *Israel Institute of Materials Manufacturing Technologies*

13:10 – 14:40	<i>Poster Area, Exhibition Area</i>
<b>LUNCH BREAK</b>	

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14:40 – 16:40	<i>Hall A</i>
<b>Materials for Energy</b>	

Chairs: TBA

### **Porosity and Energy: From Fuel Cells to Fracking**

David Eisenberg, *Technion - Israel Institute of Technology*

### **High Entropy Oxides as Materials for Energy Storage and Conversion**

Ronen Gottesman, *Hebrew University of Jerusalem*

### **Mixed Conductivity in the TiO<sub>2</sub>-SrF<sub>2</sub> and LaOxFy Systems for Energy Applications**

Yatir Sadia, *KAMAG*

14:40 – 16:40	<i>Hall B</i>
<b>Bio- &amp; Soft Materials I</b>	

Chair: TBA

### **Inorganic Condensates in Biomaterial Synthesis**

Assaf Gal, *Weizmann Institute of Science*

### **Presentation 2**

Dganit Danino, *Technion - Israel Institute of Technology*

14:40 – 16:40	<i>Hall C</i>
<b>Ceramics and Composites</b>	

Chair: TBA

### **Self-compensation in Metal Oxides with Application on (Fast) Sintering of MgO**

Yoed Tsur, *Technion - Israel Institute of Technology*

### **Challenges and Opportunities Utilizing Multilayer MXene as Precursors for Oriented TiC<sub>x</sub> in Ceramic Composites**

Barak Ratzker, *Max-Planck-Institut for Sustainable Materials, Germany*

### **Beyond Thin Films: ALD`s Role in Next-Generation Ceramic Materials**

Amnon Rothman, *Ben-Gurion University of the Negev*

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14:40 – 16:40	<i>Hall D</i>
<b>Quantum Materials</b>	

Chair: TBA

### **Exploring Fast and Ultrafast Dynamics of Matter with Electrons and Photons**

Ido Kaminer, *Technion - Israel Institute of Technology*

### **Coherent Control of Phonon Anharmonicity**

Alon Ron, *Tel Aviv University*

### **Features of Uniform and Non-Uniform Strain in Transition-Metal Dichalcogenides Mono-layers**

Moshe Harats, *Ben-Gurion University of the Negev*

14:40 – 16:40	<i>Hall E</i>
<b>Mechanical Properties &amp; Failure</b>	

Chair: TBA

### **Presentation 1**

Jay Fineberg, *Hebrew University of Jerusalem*

### **Dynamics of Deformation Twinning in Magnesium**

Eilon Faran, *Technion - Israel Institute of Technology*

### **Structural Motifs in Soft Fibrous Tissues: Unraveling Structure-Mechanics Relationships to Inspire Biomimetic Material Design**

Mirit Sharabi, *Ariel University*

16:40 – 18:10	<i>Poster Area, Exhibition Area</i>
<b>Welcome Reception &amp; Posters</b>	

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### Wednesday, February 26, 2025

8:00 – 9:00	<i>Registration Area, Poster Area, Exhibition Area</i>
<b>Registration, Coffee Break, Poster Mounting</b>	

9:00 – 9:45	<i>Hall A</i>
<b>Plenary 3: Unveiling the Art of Self-Assembly in the Creation of Diverse Biomaterials</b>	

Chair: TBA

#### **Unveiling the Art of Self-Assembly in the Creation of Diverse Biomaterials**

*Ulyana Shimanovich, Weizmann Institute of Science*

9:45 – 10:30	<i>Hall A</i>
<b>Plenary 4: Materials Science Challenges in Developing High Energy, Safe and Durable Rechargeable Batteries</b>	

Chair: TBA

#### **Materials Science Challenges in Developing High Energy, Safe and Durable Rechargeable Batteries**

*Doron Aurbach, Bar-Ilan University*

10:30 – 11:00	<i>Poster Area, Exhibition Area</i>
<b>Coffee Break, Poster Viewing</b>	

11:00 – 13:00	<i>Hall A</i>
<b>Computational MS I</b>	

Chair: TBA

#### **Thermodynamic Theory of Dislocation-Mediated Plasticity**

*Alex Umantsev, North Carolina State University, USA*

#### **Presentation 2**

*Lee Burton, Tel Aviv University*

#### **Towards Fully Automated and Universal Metallographic Image Analysis Using AI Methods**

*Ofer Beerli, KAMAG*

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11:00 – 13:00	<i>Hall B</i>
<b>Surfaces &amp; Interfaces</b>	

Chair: TBA

### **Quantitative Surface Optical Imaging and Spectroscopy**

Adi Salomon, *Bar-Ilan University*

### **High Purity Nanoporous Metallic Films: Direct Synthesis and Catalytic Applications**

Hannah-Noa Barad, *Bar-Ilan University*

### **Surface Engineering on Gold: From Atomic Steps to Nanoporous Structures and Directed Nanowire Growth**

Boaz Pokroy, *Technion - Israel Institute of Technology*

11:00 – 13:00	<i>Hall C</i>
<b>Additive Manufacturing I</b>	

Chair: TBA

### **Presentation 1**

Shulamit Levenberg, *Technion - Israel Institute of Technology*

### **Overview of Mechanical, Metallurgical, and Physical Properties of PBF Ti-6Al-4V**

Amnon Shirizli, *RAFAEL*

### **Presentation 3**

Aslan Miriyev, *Ben-Gurion University of the Negev*

11:00 – 13:00	<i>Hall D</i>
<b>Functional Materials</b>	

Chair: TBA

### **Presentation 1**

Elena Meirzadeh, *Weizmann Institute of Science*

### **On the Role of Twinning in Phase Transitions of Ferroelectric Perovskites**

Semën Gorfman, *Tel Aviv University*

### **Non-Ergodic-Induced Negative Differential Piezoresponse in Relaxor Ferroelectrics**

Yachin Ivry, *Technion - Israel Institute of Technology*

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11:00 – 13:00	<i>Hall E</i>
<b>Physical Metallurgy</b>	

Chair: TBA

### **Heusler Alloys for Spintronics and Magnetocaloric Applications: Understanding through the Lens of Diffraction Techniques**

Pnina Ari-Gur, *West Michigan University, USA*

### **Local Electrical Properties of Grain Boundary Complexions in Alloys**

Hanna Bishara, *Tel Aviv University*

### **Structural Materials for Nuclear Fusion Energy: Knowledge Gaps and Opportunities in Metallic Materials Innovation**

Aleksandra Baron-Wiechec, *GTIIT*

11:00 – 12:30	<i>Hall F</i>
<b>Bio- &amp; Soft Materials II</b>	

Chair: TBA

### **Presentation 1**

Lihi Adler-Abramovich, *Tel Aviv University*

13:00 – 14:30	<i>Poster Area, Exhibition Area</i>
<b>Lunch Break &amp; Poster Session</b>	

14:30 – 16:30	<i>Hall A</i>
<b>Computational MS II</b>	

Chair: TBA

### **Computational Thermodynamics: Principles and New Applications to Electrodeposition of Reactive Metals from Molten Salts**

Eli Brosh, *KAMAG*

### **Presentation 2**

Sivan Refaely-Abramson, *Weizmann Institute of Science*

### **Charge Transport through Catalytic Materials**

Maytal Caspary Toroker, *Technion - Israel Institute of Technology*



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14:30 – 16:30	<i>Hall B</i>
<b>Materials for Extreme Conditions</b>	

Chair: TBA

### **The Influence of Solutes and Fields on Anisotropic Grain Growth of Alumina**

Wayne Kaplan, *Technion - Israel Institute of Technology*

#### **Presentation 2**

Noam Eliaz, *Tel Aviv University*

### **Ceramic Matrix Composites – Challenges and Development Approach for Military Applications**

Amit Schleyer, *RAFAEL*

14:30 – 16:35	<i>Hall C</i>
<b>Materials Physics</b>	

Chair: TBA

### **Charge Transport in Calcium-Manganate Oxides for Thermoelectric Applications**

Yaron Amouyal, *Technion - Israel Institute of Technology*

### **Chalcogenides for Extreme Light-matter Interactions**

Tomer Lewi, *Bar-Ilan University*

### **Designing Nickelates for High-temperature Superconductivity**

Muntaser Naamneh, *Ben-Gurion University*

### **Probing Phase Transitions and Stability within Molecular Ices by the Discharge of Weakly Bound Electrons and Ions**

Roy Sagi, *KAMAG*

### **Metasurfaces: From science to Applications**

Uriel Levy, *Hebrew University of Jerusalem*

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14:30 – 16:30	<i>Hall D</i>
<b>Materials Characterization</b>	

Chair: TBA

### Presentation 1

Yevgeny Rakita, *Ben-Gurion University of the Negev*

**Elucidating the Structure and Composition of Buried Interfaces with New Solid State NMR**

#### Methods

Michal Leskes, *Weizmann Institute of Science*

### Presentation 3

Yoav Shechtman, *Technion - Israel Institute of Technology*

14:30 – 16:30	<i>Hall E</i>
<b>Corrosion &amp; Electrochemistry</b>	

Chair: TBA

### Synthesis of Functional Coatings Using the Molten Salt Plasma Electrolytic Oxidation

Konstantin Borodianskiy, *Ariel University*

**Enhancing the Efficiency and Stability of Reversible Zinc and Iron Electrodeposition in Mildly**

#### Acidic Electrolyte Solutions

Daniel Sharon, *Hebrew University of Jerusalem*

**Corrosion Performance of Biomaterials in Physiological Environments**

Galit Katarivas Levy, *Ben-Gurion University of the Negev*

14:30 – 16:15	<i>Hall F</i>
<b>Additive Manufacturing</b>	

Chair: TBA

16:30 – 17:00	<i>Poster Area, Exhibition Area</i>
<b>Coffee Break, Poster Viewing</b>	

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17:00 – 17:45	<i>Hall A</i>
<b>Plenary 5: Underwater Technologies for Cultural Heritage in the Eastern Mediterranean: Data Capture, Curation, Analyses and Dissemination</b>	

Chair: TBA

**Underwater Technologies for Cultural Heritage in the Eastern Mediterranean: Data Capture, Curation, Analyses and Dissemination**

Thomas Levy, *University of California San Diego, USA*

17:45 – 18:15	<i>Hall A</i>
<b>Best Poster Prize Announcement &amp; Closing Remarks</b>	