

The 32nd Umbrella Symposium on Energy Conversion and Energy Storage

Scientific Program

Monday, April 23			
Wolfson Faculty of Chemical Engineering, Hall 1			
8:30 – 8:45	Gathering		
8:45 – 9:05	Welcome Greetings and Introduction to Topics		Wayne D. Kaplan - Technion Elke Müller - RWTH Aachen Sebastian Schmidt - FZ Jülich Yoed Tsur - Technion
9:05 – 9:15	Umbrella Award Ceremony		Awardees: Stefanie Elgeti - RWTH Aachen - Spline-Based Finite Element Methods for Coupled Fluid-Flow Problems in Energy Conversion
9:15 – 10:30	Presentations by the awardees		Yasin Emre Durmus - FZ Jülich - Recent Developments in a Resource Efficient Si-Air Battery Matthew Suss – Technion - Towards Devices which Combine Energy Storage and Water Desalination
10:30 – 10:45	Coffee Break		
Session 1	Chairs: Yair Ein-Eli and Dina Fattakhova-Rohlfing		
10:45 – 12:00	Topic: Energy Storage and Conservation	Batteries	Isidora Cekic-Laskovic - FZ Jülich - Electrolyte Additives: How Do They Work and Why Are They Effective? Rüdiger-A. Eichel - FZ Jülich - All Solid-State Batteries – Strategies to Enable High Power and Energy Densities Yair Ein-Eli – Technion - Advanced Materials for High Energy Density Li-ion Batteries
12:00 – 12:10	Coffee Break		
12:10 – 13:25	Topic: Energy Storage and Conservation	Batteries	Dina Fattakhova-Rohlfing - FZ Jülich - Ceramic Materials and Technologies for the Development of Solid-State Batteries Egbert Figgemeier - RWTH Aachen - Implications of Cycle Stability of Silicon Alloy Anodes on Driving Range, Costs and Business Models of Electric Vehicles Moritz Teuber - RWTH Aachen - Aging of Lithium-Ion Batteries – Implications and Effect Mechanisms

Wolfson Faculty of Chemical Engineering, Meeting Room (across the Dean's Office)			
Session 2	Chairs: Yaron Amouyal and Stefanie Elgeti		
14:45 – 16:25	Topic: Energy Storage and Conservation	Fuel Cells Technologies	Joachim Mayer - <i>RWTH Aachen</i> - Atomic Scale Analysis of Proton- and Oxygen-conducting Membranes Lorenz Singheiser - <i>FZ Jülich</i> - Cr- and Sr- Related Degradation Mechanisms in SOFCs Yoed Tsur – <i>Technion</i> - Impedance Spectroscopy Analysis Using Genetic Programming (ISGP): a Short Tutorial
		Thermoelectrics	Yaron Amouyal – <i>Technion</i> - Novel Approaches in Development of Thermoelectric Materials for Energy Harvesting: PbTe and Beyond
16:25 – 16:35	Coffee Break		
16:35 – 17:50		Fuel Cells Technologies	Ghaleb Natour - <i>FZ Jülich</i> - Development Status of Solid Oxide Cells at Forschungszentrum Juelich and Engineering Contributions David Eisenberg – <i>Technion</i> - Nano-Structuring of Carbon Electrocatalysts for Optimized Flow Uri Ash - <i>Technion</i> - TEEM Lab Latest Development in Anion Exchange Membrane Fuel Cells

Tuesday, April 24			
Wolfson Faculty of Chemical Engineering, Meeting Room (across the Dean's Office)			
Session 3	Chairs: Yachin Ivry and Ghaleb Natour		
8:30 – 10:35	Topic: Alternative Fuels	Hydrogen Technologies; Water Splitting; H ₂ Generation	Serhiy Cherevko - <i>FZ Jülich</i> - Current Challenges in Acidic Water Splitting: a View from Electrocatalyst Stability Studies Felix Gunkel - <i>RWTH Aachen</i> - Electrolysis of Water at Atomically Tailored Epitaxial Cobaltite Surfaces Avner Rothschild – <i>Technion</i> - The “Rust” Challenge: Iron Oxide Photoelectrodes for Solar Water Splitting Leonid Tartakovsky – <i>Technion</i> - High-Pressure Thermo-Chemical Recuperation – a Novel Method of Onboard Hydrogen Production for Propulsion Systems Avigail Landman – <i>Technion</i> - Membrane-Free Hydrogen Generation from Water
10:35 – 10:50	Coffee Break		
Session 4	Chair: Felix Gunkel		
10:50 – 12:30		Biomass Based Fuels	Michael Müller - <i>FZ Jülich</i> - Development of Models and Databases for Predicting Properties and Behavior of Biomass Ashes and Slags Oz Gazit – <i>Technion</i> - Promoting C-C Coupling by Multifunctional Hybrid Catalysts
		Power-to-X	Katharina Thenert - <i>RWTH Aachen</i> - Power-to-X: Redesigning the Energy/Chemistry-Interface
		DeNOx	Peter Dittmann - <i>RWTH Aachen</i> - DeNOx – New Ways in Exhaust Aftertreatment
Session 5	Chair: Avner Rothschild		
13:30 – 14:45	Topic: Managing Energy in a Smart World	Cross-cutting: Materials Computation	Robert Spatschek - <i>FZ Jülich</i> - Materials Modeling Across the Scales Georg J. Schmitz - <i>RWTH Aachen</i> - Towards an ICME Methodology- Current Activities in Europe and at the RWTH Aachen

			Maytal Caspary Toroker – <i>Technion</i> - Proton Transfer through the Bulk and Near Surface Catalysis in Nickel Oxides
14:45 – 14:55	Coffee Break		
Session 6	Chair: Robert Spatschek		
14:55 – 16:10	Topic: Renewable Energy	Wind	Björn Roscher - <i>RWTH Aachen</i> - Research at Center for Wind Power Drives – From Wind Turbine Components till Wind Farm Planning Yeshayahou Levy - <i>Technion</i> - On the Implementation of Low Cost Control System in Small Wind Turbines David Greenblatt - <i>Technion</i> - Breakthrough Technologies for Wind-Powered Desalination

Wednesday, April 25			
Wolfson Faculty of Chemical Engineering, Meeting Room (across the Dean's Office)			
Session 7	Chair: Lior Kornblum		
9:00 – 9:50	Topic: Renewable Energy	Photovoltaics Light Manipulation	Joachim Knoch - <i>RWTH Aachen</i> - Storage of Solar Power - All-Silicon Multi-Junction Solar Cells for Direct Water Splitting Carmel Rotschild – <i>Technion</i> - CPV & CSP on a Single Photoluminescent Crystal
9:50 – 10:15		Grids, Energy Systems, Managing Demand and Storage	Dov Dori - <i>Technion</i> - Conceptual Modeling for Model-Based Systems Engineering of Energy Systems
10:15 – 10:30	Coffee Break		
10:30 – 11:00	Closing Remarks		

