

IAS Summer School

# Advances in Battery Technologies: Past, Present and Future

July 21-26, 2025

**Venue: Kaisa Group Lecture Theater (IAS LT), G/F, Lo Ka Chung Building, Lee Shau Kee Campus, HKUST**

***July 21, 2025 (Mon)*** |

Time	Event
09:00 - 09:30	Registration
Class Mon-01	
09:30 - 10:45	<b>The Li-ion Battery Technology: Working Principle and Electrode Materials</b> <i>Jean Marie Tarascon (Collège de France; IAS Senior Visiting Fellow)</i>
10:45 - 11:00	Group photo taking & Short Break
11:00 - 12:15	<b>How It Works, Where It Comes From and Where We Are</b> <i>Jean Marie Tarascon (Collège de France; IAS Senior Visiting Fellow)</i>
12:15 - 12:30	Q & A Session
12:30 - 14:00	Lunch Break
Seminar #01	
14:00 - 15:00	<b>Thermodynamics and Kinetics in Battery Materials</b> <i>Biao LI (Peking University)</i>
15:00 - 15:15	Short Break
Class Mon-02	
15:15 - 16:30	<b>From Layered to Polyanionic Compounds and Anionic Redox Materials</b> <i>Jean Marie Tarascon (Collège de France; IAS Senior Visiting Fellow)</i>

Time	Event
Class Tue-01	
09:30 - 10:45	<b>The Na-ion Battery: How It Differs from Li-ion and Its Road to Commercialization</b> <i>Jean Marie Tarascon (Collège de France; IAS Senior Visiting Fellow)</i>
10:45 - 11:00	Short Break
11:00 - 12:15	<b>Basics Principles and Various Na-ion Chemistries</b> <i>Jean Marie Tarascon (Collège de France; IAS Senior Visiting Fellow)</i>
12:15 - 12:30	Q & A Session
12:30 - 14:00	Lunch Break
Seminar #02	
14:00 - 15:00	<b>Advancing Redox Flow Batteries: Molecular Insights to Grid-Scale Solutions</b> <i>Yi-Chun Lu (The Chinese University of Hong Kong)</i>
15:00 - 15:15	Short Break
Class Tue-02	
15:15 - 16:30	<b>Hard Carbon vs. Graphite and Alloys</b> <i>Jean Marie Tarascon (Collège de France; IAS Senior Visiting Fellow)</i>

Time	Event
Class Wed-01	
09:30 - 10:45	<b>Electrolyte Design for Batteries</b> <i>Jean Marie Tarascon (Collège de France; IAS Senior Visiting Fellow)</i>
10:45 - 11:00	<b>Short Break</b>
11:00 - 12:15	<b>What You Need to Know (Basics and Figure of Merits) for Designing New Electrolytes</b> <i>Jean Marie Tarascon (Collège de France; IAS Senior Visiting Fellow)</i>
12:15 - 12:30	<b>Q &amp; A Session</b>
12:30 - 14:00	<b>Lunch Break</b>
Seminar #03	
14:00 - 15:00	<b>Mechanical Properties of Interfaces</b> <i>Biao ZHANG (The Hong Kong Polytechnic University)</i>
15:00 - 15:15	<b>Short Break</b>
Class Wed-02	
15:15 - 16:30	<b>Electrolyte Additives and Interfaces</b> <i>Jean Marie Tarascon (Collège de France; IAS Senior Visiting Fellow)</i>
17:00 - 20:00	<b>Reception</b>

Time	Event
Class Thu-01	
09:30 - 10:45	<b>Battery Diagnostic: From Electrochemical to Optical Methods</b> <i>Jean Marie Tarascon (Collège de France; IAS Senior Visiting Fellow)</i>
10:45 - 11:00	Short Break
11:00 - 12:15	<b>FBGs, TFBGs and Optical IR Sensors for Spying the Dynamic Chemistry of Batteries</b> <i>Jean Marie Tarascon (Collège de France; IAS Senior Visiting Fellow)</i>
12:15 - 12:30	Q & A Session
12:30 - 14:00	Lunch Break
Seminar #04	
14:00 - 15:00	<b>Machine Learning for Exploiting Sensing Data</b> <i>Jiaqiang HUANG (HKUST (Guangzhou))</i>
15:00 - 15:15	Short Break
Class Thu-02	
15:15 - 16:30	<b>From Merging Electrochemical and Optical Sensing to Acoustic Sensing</b> <i>Jean Marie Tarascon (Collège de France; IAS Senior Visiting Fellow)</i>

Time	Event
Class Fri-01	
09:30 - 10:45	<b>Li(Na) Solid State Batteries: Basic Principles and Challenges</b> <i>Jean Marie Tarascon (Collège de France; IAS Senior Visiting Fellow)</i>
10:45 - 11:00	<b>Short Break</b>
11:00 - 12:15	<b>The Long Journey Towards New Inorganic Ionic Conductors</b> <i>Jean Marie Tarascon (Collège de France; IAS Senior Visiting Fellow)</i>
12:15 - 12:30	<b>Q &amp; A Session</b>
12:30 - 14:00	<b>Lunch Break</b>
Seminar #05	
14:00 - 15:00	<b>Covalent Organic Frameworks for the Next-generation Batteries: Design and Applications,</b> <i>Yoonseob KIM (HKUST (Clear Water Bay))</i>
15:00 - 15:15	<b>Short Break</b>
Class Fri-02	
15:15 - 16:30	<b>Problematic of Interfaces and New Trends in Assembling Process</b> <i>Jean Marie Tarascon (Collège de France; IAS Senior Visiting Fellow)</i>

Time	Event
Class Sat-01	
09:30 - 10:45	<b>Batteries Technologies Based on Divalent Elements Cations</b> <i>Jean Marie Tarascon (Collège de France; IAS Senior Visiting Fellow)</i>
10:45 - 11:00	<b>Short Break</b>
11:00 - 12:15	<b>Status of Mg(Ca)-ion Chemistries, Plus Recent Advances on Aqueous Zn-MnO<sub>2</sub> Batteries</b> <i>Jean Marie Tarascon (Collège de France; IAS Senior Visiting Fellow)</i>
12:15 - 12:30	<b>Q &amp; A Session</b>