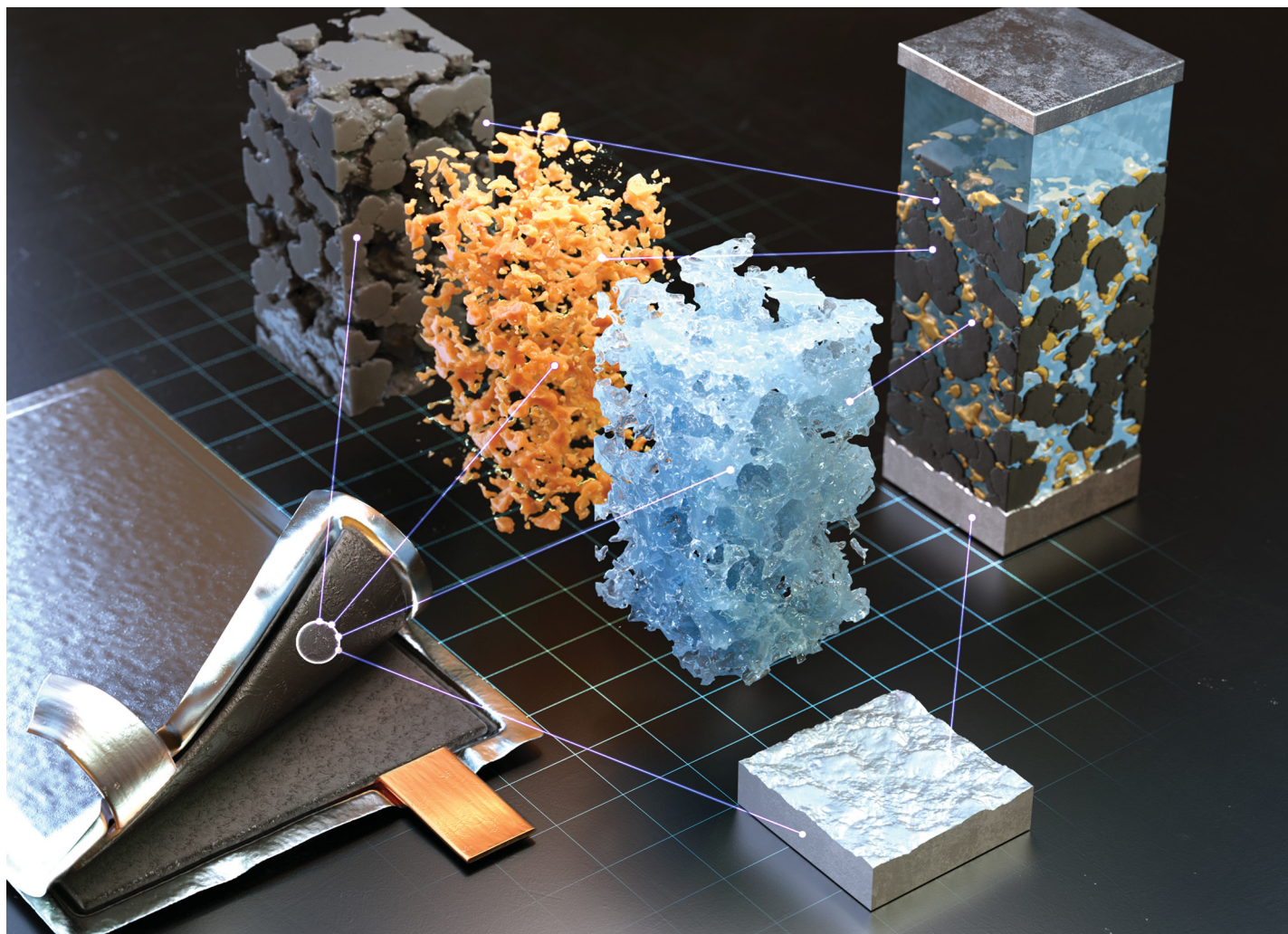




Showcasing research from Professor Juner Zhu's laboratory, Department of Mechanical and Industrial Engineering, Northeastern University, Boston, USA and Professor Yong Min Lee's laboratory, Department of Chemical and Biomolecular Engineering, Yonsei University, Seoul, Republic of Korea.

A microstructural electrochemo-mechanical model of high-nickel composite electrodes towards digital twins to bridge the particle and electrode-level characterizations

A microelectrode modeling framework analyzes electrochemical and mechanical interactions in composite electrodes, identifying reduced reaction area, increased diffusion length, and insufficient electrolyte volume as key performance factors. A design with excess electrolyte improves rate capability and stability. Simulations reveal degradation mechanisms, highlighting conductive and binder roles and polymer binder viscoplasticity.

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