

計算材料力學實驗室



陳志鴻副教授

台灣大學應用力學研究所

學歷：德州大學奧斯汀分校物理博士

研究介紹：實驗室主要研究工程學及材料科學中的界面移動穩定性議題，涵蓋仿生材料增韌機制、電極表面電化學穩定性，以及流固耦合在生物物理中的應用。我們針對這些複雜系統，建立理論模型並開發數值計算方法，並利用圖形處理器（GPU）的平行運算來高效模擬與實驗尺度相當的系統。歡迎對以下領域有興趣的同學加入實驗室。

- Linux 系統
- 程式撰寫 (Python, C/C++, Cuda)
- High performance computing
- 數值模型推導與分析

研究方向：

- 仿生複合材料增韌機制
- 鋰電池電極表面電化學穩定性

代表著作：

- C.-H. Chen* and C.-W. Pao. Phase-field study of dendritic morphology in lithium metal batteries. Journal of Power Sources, 2021.
- H.-C. Tsai, C.-H. Chen*, Y.-C. Shu, Crack behavior in nacre-like composites: a phase-field method, Proc. SPIE 11586, Bioinspiration, Biomimetics, and Bioreplication XI, 2021.
- C.-H. Chen*, A. M. Tabrizi, P.-A. Geslin, and A. Karma. Dendritic needle network modeling of the Columnar-to-Equiaxed transition. Part II: three dimensional formulation, implementation and comparison with experiments. Acta Materialia, 2021.
- P.-A. Geslin, C.-H. Chen, A. M. Tabrizi, and A. Karma. Dendritic needle network modeling of the Columnar-to-Equiaxed transition. Part I: two dimensional formulation and comparison with theory. Acta Materialia, 2021
- S.-J. Chang, C.-H. Chen*, and K.-C. Chen. Assessment of the mechanical suppression of nonuniform electrodeposition in lithium metal batteries. Physical Chemistry Chemical Physics, 2022.
- H.-C. Lin, K.-C. Chen, and C.-H. Chen. "Electrochemical Change Induced by Spherical Indentation in Lithium-Ion Batteries." Batteries, 2022
- P.-C. Hsu, Y.-C. Lin, W.-H. Wu, C.-W. Pao, and C.-H. Chen*. Atomistic Investigation of Solid Electrolyte Interphase: Nanostructure, Chemical Composition, and Mechanical Properties. Journal of The Electrochemical Society, 2022
- C.-J. Ko, C.-H. Chen*, and K.-C. Chen. Influence of Inhomogeneity of Lithium-Ion Transport within the Anode/Electrolyte Interface on Mossy Lithium Formation. Journal of Power Sources, 2023
- C.-J. Ko, C.-N. Tai, C.-H. Chen*, and K.-C. Chen. Influence of concentration-dependent diffusivity on lithium plating: Polarization, stability, and dendrite formation in phase-field simulations. Journal of Energy Storage, 2024
- C.-J. Ko, K.-C. Chen*, and C.-H. Chen. Using partial discharge data to identify highly sensitive electrochemical parameters of aged lithium-ion batteries. Energy Storage Materials, 2024
- C.-H. Chen, K.-Y. Chen, and Y.-C. Shu*. Data-driven bio-mimetic composite design: direct prediction of stress-strain curves from structures using cGANs. Journal of the Mechanics and Physics of Solids, 2024