

國立清華大學新進人員研究獎得獎人簡介

葉哲寧博士自 2021 年起任職於國立清華大學材料科學工程學系。她於清華大學材料系取得學士與碩士學位，並於美國西北大學取得材料科學與工程博士學位，之後於史丹佛大學從事博士後研究。從二維材料、界面科學到電化學能源材料，她的研究歷程持續聚焦於「材料結構與界面如何影響其功能與反應機制」這一核心問題。



博士期間，葉博士主要研究氧化石墨烯 (graphene oxide, GO) 的層間作用力、薄膜穩定性與三維結構設計，相關成果發表於 *Nature Chemistry*、*Nature Communications* 與 *Advanced Materials* 等國際重要期刊，並獲 *Science*、*C&EN*、*Materials Today* 等國際媒體報導。博士後期間，她將研究進一步拓展至電化學界面，探討鋰離子電池中固態電解質界面 (SEI) 的生成以及石墨負極上的鋰沉積行為，逐步建立其在電池界面機制與 operando 電化學分析方面的研究專長。

回到清華大學後，葉博士建立以電化學儲能材料設計與機制解析為核心的獨立研究團隊，研究涵蓋快速充電鋰離子電池、鋰金屬與鋰硫電池、鋅電池及固態電解質，並結合材料設計、電化學分析與原位／臨場 (in-situ/operando) 鑑定技術，從材料結構、界面演變到元件表現建立完整的研究鏈結。近年以獨立通訊作者身分於 *Journal of Energy Storage*、*Electrochimica Acta*、*Applied Surface Science* 等期刊發表多項研究成果，並透過跨領域合作於 *Nature Communications*、*Advanced Functional Materials*、*Advanced Science*、*Chemical Engineering Journal* 等高影響力國際期刊發表研究，展現其獨立研究與跨領域整合能力。同時，她亦成功爭取校內競爭型研究經費，建置先進 AFM-SECM 分析平台，用於即時探究電極表面形貌、局部電化學反應與界面機制，進一步強化清華大學在電化學 operando 研究與界面分析方面的研究能量。

葉博士的研究、教學與人才培育表現獲得多項肯定，包括國立清華大學新進人員研究獎、校傑出導師獎、校傑出教學獎、中國材料科學學會優秀年輕學者獎、國科會「2030 跨世代年輕學者計畫—新秀學者」以及教育部玉山青年學者等。除持續拓展國內外研究合作外，她也十分重視學生培育，希望學生能從自己的好奇心出發，真正參與研究問題的形成，並在探索與討論的過程中建立獨立思考、解決問題及團隊合作的能力。未來，她將持續透過材料創新與深入的界面機制解析，推進高能量密度、快速充電與高安全性儲能技術，同時培養具備研究熱情、誠信與獨立思考能力的下一代材料科學人才。

Dr. Che-Ning Yeh has been an Assistant Professor in the Department of Materials Science and Engineering at National Tsing Hua University (NTHU) since 2021. She received her B.S. and M.S. degrees in Materials Science and Engineering from NTHU and her Ph.D. in Materials Science and Engineering from Northwestern University, followed by postdoctoral training at Stanford University. Across her research journey from two-dimensional materials and interface science to electrochemical energy storage, her work has consistently centered on understanding how material structures and interfaces govern functional properties and reaction mechanisms.

During her doctoral studies, Dr. Yeh investigated the interlayer interactions, stability, and structural transformation of graphene oxide (GO). Her research was published in leading journals including *Nature Chemistry*, *Nature Communications*, and *Advanced Materials*, and was highlighted by international scientific media such as *Science*, *C&EN*, and *Materials Today*. During her postdoctoral research, she extended her expertise to electrochemical interfaces, investigating solid-electrolyte interphase formation and lithium plating on graphite electrodes. This experience established a strong foundation for her research in battery interfacial mechanisms and operando electrochemical characterization.

Since returning to NTHU, Dr. Yeh has established an independent research program centered on electrochemical energy-storage materials design and mechanistic understanding, with research spanning fast-charging lithium-ion batteries, lithium-metal and lithium-sulfur batteries, zinc-based batteries, and solid-state electrolytes. Her group integrates materials design, electrochemical analysis, and in-situ/operando characterization to understand the interplay between material structure, interfacial evolution, and electrochemical performance. As an independent corresponding author, she has published in journals including *Journal of Energy Storage*, *Electrochimica Acta*, *Applied Surface Science*, etc. Her interdisciplinary collaborations have also led to publications in high-impact journals such as *Nature Communications*, *Advanced Functional Materials*, *Advanced Science*, and *Chemical Engineering Journal*, highlighting both her independent research capability and collaborative strength. She has also established an advanced AFM-SECM platform at NTHU for real-time investigation of electrode morphology, localized electrochemical reactions, and interfacial processes, further strengthening the university's capabilities in operando electrochemical research.

Dr. Yeh has received several honors recognizing her contributions to research, teaching, and mentorship, including the NTHU New Faculty Research Award, NTHU Outstanding Mentor Award, NTHU Outstanding Teaching Award, Outstanding Young Scholar Award from the Materials Research Society–Taiwan, the NSTC 2030 Next Generation Young Scholar Program–Emerging Scholar Award, and the Yushan Young Scholar Award from Taiwan's Ministry of Education. In addition to promoting interdisciplinary and international collaborations, she is deeply committed to student development. She encourages students to formulate research questions from their own curiosity, take ownership of their projects, and develop independence, integrity, and confidence in addressing challenging scientific problems. Through fundamental understanding of electrochemical interfaces and innovative materials design, her group aims to advance high-energy-density, fast-charging, and safer energy-storage technologies while cultivating the next generation of materials scientists.