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### **Hidden In Plain Sight**

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Endeavors in electrochemical energy storage are industrial masochism for the same reason they are academic hedonism: a working, rechargeable battery represents a tight coupling of multiphase phenomena across the chemical, electrical, thermal and mechanical domains. Despite these couplings, most treatments of batteries in literature emphasize the material challenges and opportunities as opposed to the system level dynamics. There good reasons for this: 1) to date, tools for examining the structure of “real” cells in operando are largely limited to synchrotron x-ray and neutron methods, 2) full cells are products engineered for application demands and not platonic ideals and 3) material improvements can have enormous impact on battery performance.