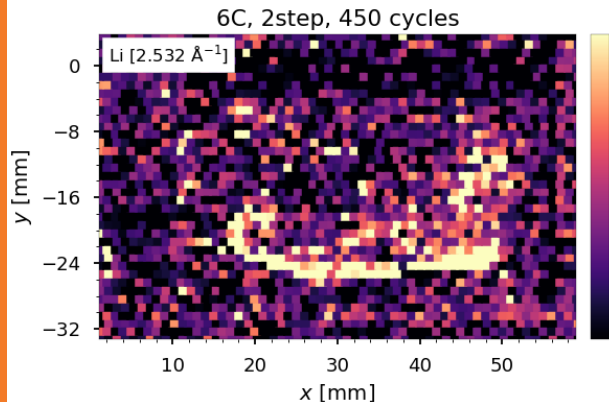


BAT386



eXtreme Fast Charge Cell Evaluation
of Lithium-ion Batteries

EXTREME FAST CHARGING CELL DEVELOPMENT SUMMARY AND FUTURE



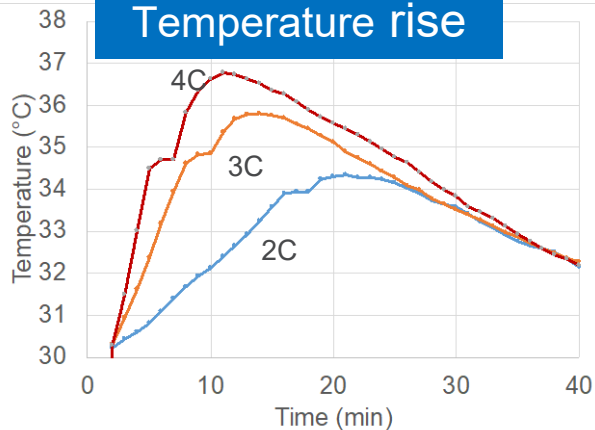
VENKAT SRINIVASAN
Argonne National Lab

SAMUEL GILLARD
Department of Energy

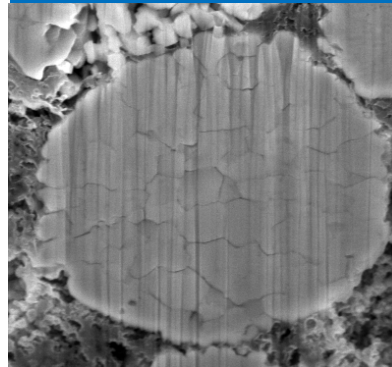
This presentation does not contain any proprietary,
confidential, or otherwise restricted information

RELEVANCE: WHAT LIMITS FAST CHARGE?

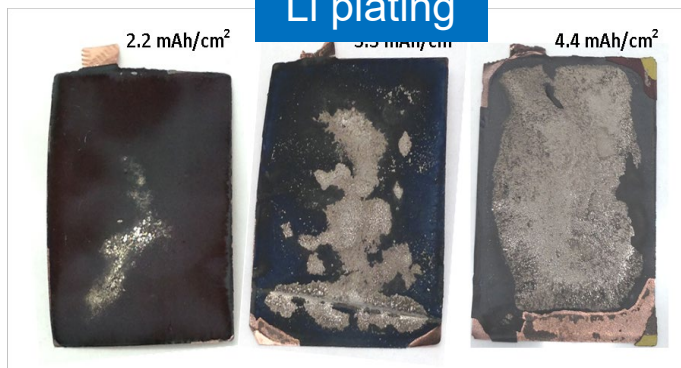
Temperature rise



Particle breakup

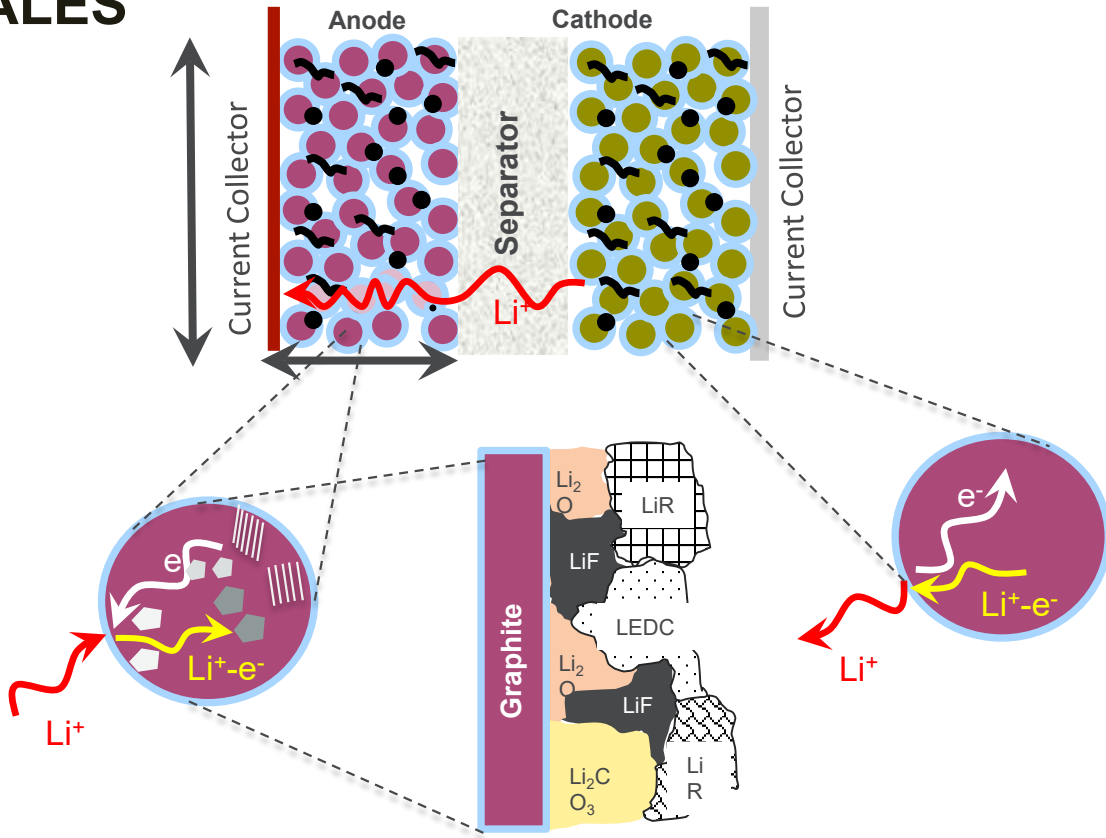


Li plating



Li plating remains a critical issue

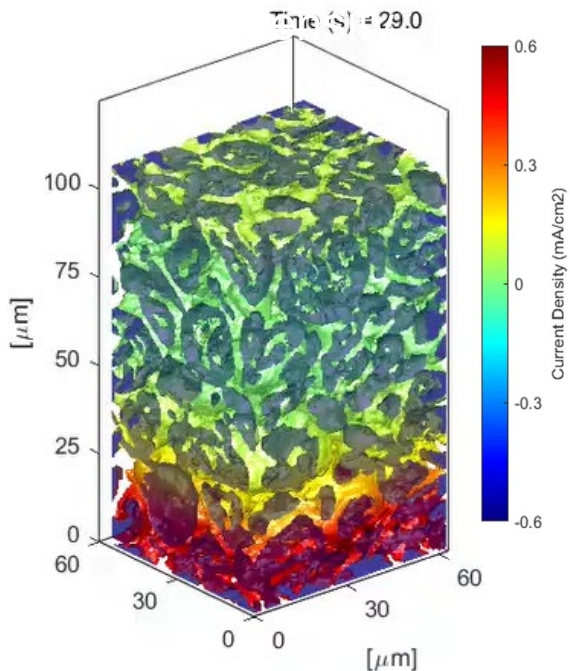
RELEVANCE: CHALLENGES AT MULTIPLE SCALES



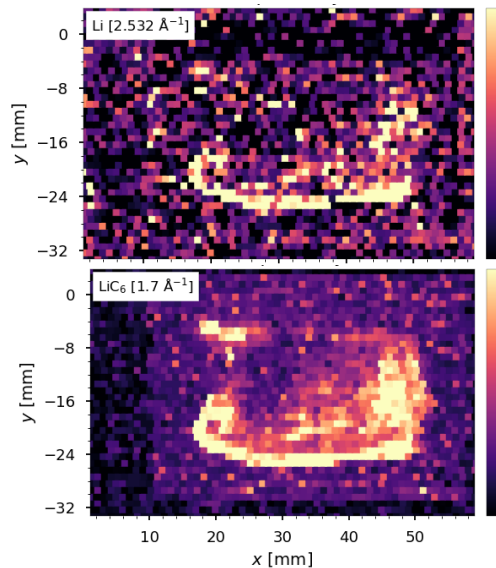
WHERE ARE WE GOING?

1. MORE *IN SITU* MAPPING

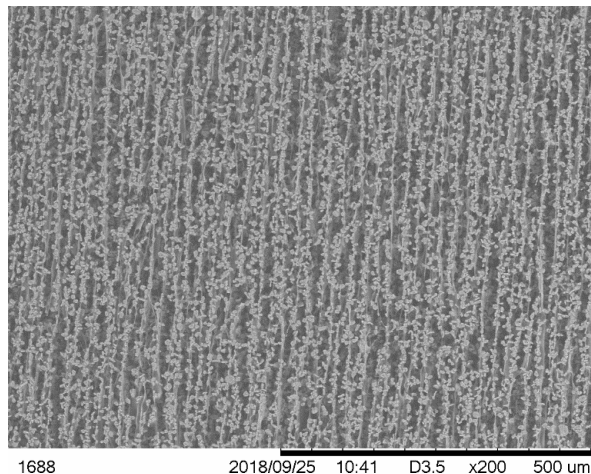
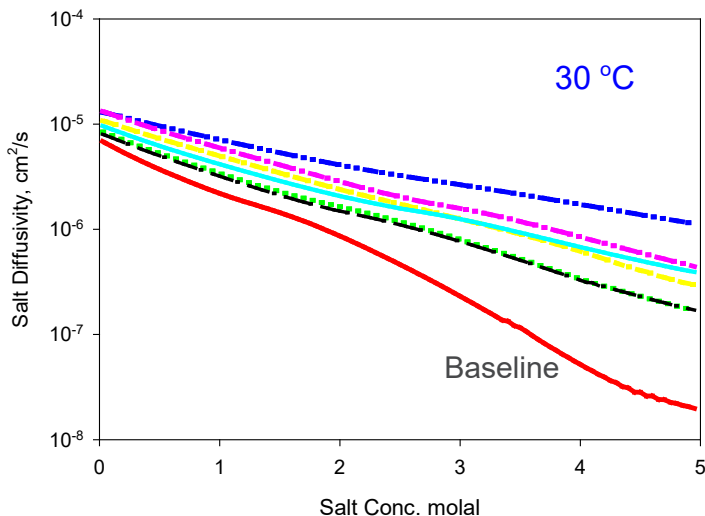
Estimated current



Detecting Li plating



2. MORE EFFORT AROUND FINDING SOLUTIONS

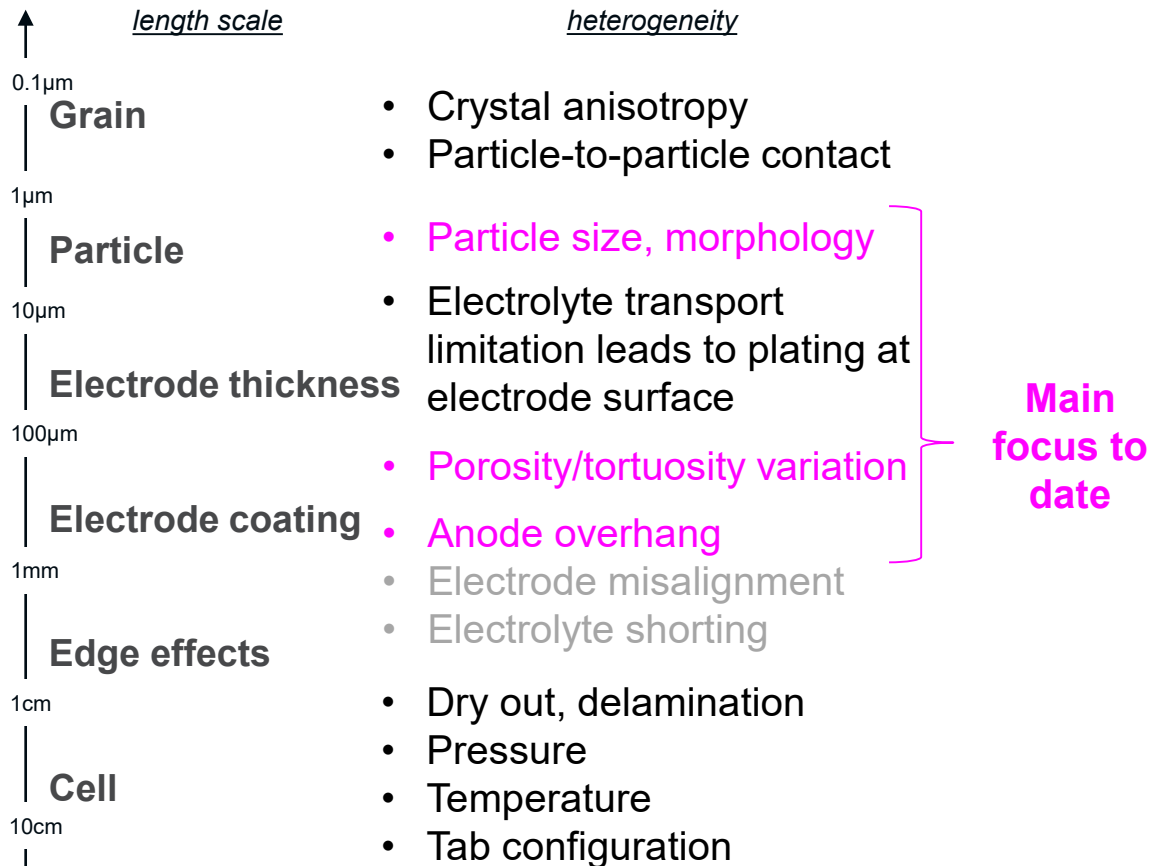


Higher transport property
electrolytes

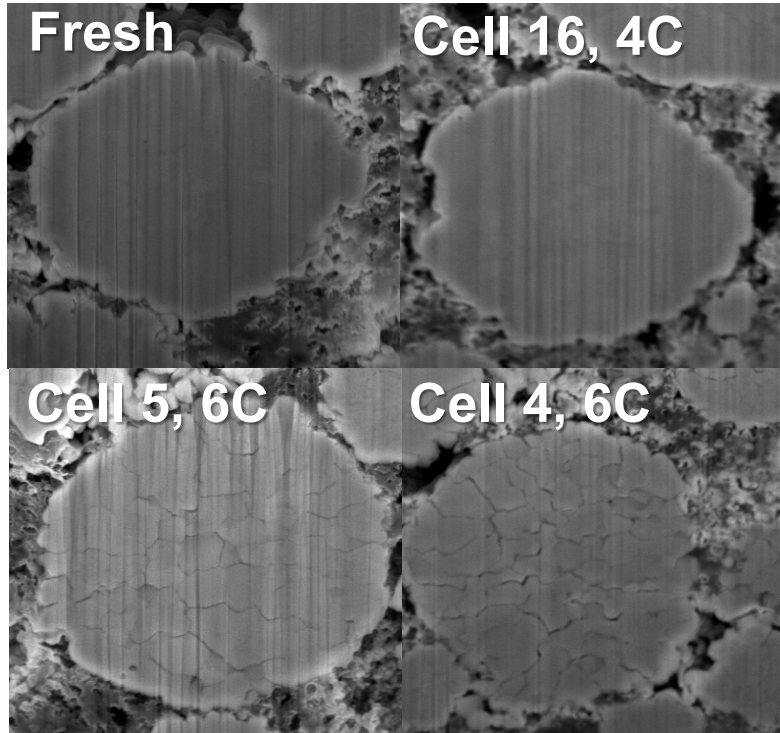
Reducing tortuosity in the
anode

3. FOCUS ON HETEROGENEITIES WILL INCREASE

Heterogeneities at all length scales cause early onset of Li plating



4. CATHODE CRACKING REQUIRES FURTHER EXPLORATION



LEVERAGING CORE CAPABILITY ACROSS THE LAB COMPLEX



Cell and electrode design and building, performance characterization, post-test, cell and atomistic modeling, cost modeling



Li detection, electrode architecture, diagnostics



Performance characterization, Li detection, failure analysis, electrolyte modeling and characterization, acoustic detection (with Princeton)



Thermal characterization, life modeling, micro and macro scale modeling, electrolyte modeling and characterization



Li detection, novel separators, diagnostics



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