

## Microsymposium

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*Materials for energy storage and conversion: Probing functionality with PDF*

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In the last decade, the potential of the pair distribution function (PDF) method as a versatile tool for materials characterization has expanded enormously, driven by accelerated data acquisition (from hours to sub-second) and the advent of dedicated PDF instruments, such as 11-ID-B at the Advanced Photon Source. New time-resolved, in-situ/operando, parametric, and combined experimental capabilities coupled with innovative model-independent approaches to data analysis are being developed to harness the growing potential of this methodology. For example, while the complex multicomponent architecture of batteries and their coupled electronic, chemical and structural transformations complicate investigations of functionality, through the development of new in situ PDF measurement capabilities and analytical approaches, we have been able to gain insight into the structure and reactivity of these electrochemical energy storage systems.[1] This presentation will describe recent studies of electrode reactions during cycling and the atomic structure of electrolytes.[2]

[1] O. J. Borkiewicz, B. Shyam, K. M. Wiaderek, et al., *J. Appl. Crystallogr.*, 2012, 45, 1261-1269., [2] K. M. Wiaderek, O. J. Borkiewicz, E. Castillo-Martínez, et al., *J. Am. Chem. Soc.*, 2013, 135, 4070-4078.

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