



## Cryogenic specimens for nanoscale characterization of solid–liquid interfaces

MRS Bulletin, Volume 44, Issue 12

DOI: 10.1557/mrs.2019.289

Published online: 10 December 2019, pp. 949-955

Print publication: December 2019

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### Summary

New cryogenic characterization techniques for exploring the nanoscale structure and chemistry of intact solid–liquid interfaces have recently been developed. These techniques provide high-resolution information about buried interfaces from large samples or devices that cannot be obtained by other means. These advancements were enabled by the development of instrumentation for cryogenic focused ion beam liftout, which allows intact solid–liquid interfaces to be extracted from large samples and thinned to electron-transparent thicknesses for characterization by cryogenic scanning transmission electron microscopy or atom probe tomography. Future implementation of these techniques will complement current strides in imaging of materials in fluid environments by *in situ* liquid-phase electron microscopy, providing a more complete understanding of the morphology, surface chemistry, and dynamic processes that occur at solid–liquid interfaces.

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