

Challenging Scanning Probe Microscopy by Resolving Complex Surface Structures

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The difficulty to reveal the atomic structure of bulk amorphous materials can be overcome by using a thin film approach. The development of an amorphous two dimensional (2D) silica bilayer has allowed deriving the atomic positions by using scanning tunneling microscopy (STM), atomic force microscopy (AFM) [1] and transmission electron microscopy (TEM) [2]. In order to establish a general understanding of amorphous networks, structural characterization of glass-forming materials as well as their mixtures is of great interest.

Furthermore, these thin film glass systems have gained impact as a new 2D material class with interesting material properties [3, 4]. Besides the recent success, their applicability for applications like atom trapping or electrochemical reactions will be rendered.

[1] L. Lichtenstein, et al., *Angew. Chem., Int. Ed.* 51 (2012) 404

[2] P. Y. Huang, et al., *Nano Letters* 12 (2012) 1081

[3] C. Büchner, et al., *ACS Nano* 10 (2016) 7982

[4] C. Büchner, et al., *Phys. Rev. Lett.* 120 (2018) 226101