ABERRATION CORRECTED TRANSMISSION ELECTRON MICROSCOPY

This focus issue of the Journal of Materials Research contains peer reviewed articles that were accepted in response to a call for manuscripts.

Introduction

Guest Editors:

Thomas Walther
University of Sheffield, United Kingdom

Rafal E. Dunin-Borkowski
Research Centre Jülich, Germany

Jean-Luc Rouvière
CEA Grenoble, France

Eric A. Stach
Brookhaven National Laboratory, USA

With the commercial availability of correctors for the spherical and chromatic aberrations of the imaging lenses in transmission and scanning transmission electron microscopes in the last 17 years, during which the focus has been mainly on installation, characterization, and testing, the focus now shifts towards new areas of science that can be addressed with this novel equipment.

This Focus Issue presents research from different fields where better resolved, faster, and more controlled experimental materials studies by aberration corrected (scanning) transmission electron microscopy are needed. This includes imaging, spectroscopy, and diffraction based applications to materials science problems with planar and focused illumination.

The papers collected in this issue have been written by a number of experts in the field. David J. Smith presents his work on semiconductor hetero-interfaces and semiconductor-perovskite interfaces and Ritesh Sachan et al., their overview of 3D ion track imaging in irradiated pyrochlore. Other topics discussed include recent progress made in measuring materials properties, such as crystallographic polarity (Roshko et al.), ionic displacement fields (Liu et al.), polarization (Tang et al.), segregation (Peter et al., Walther et al.) and strain within nano-scale regions (Norouzpour and Herring), with improved lateral resolution and precision.

We hope the readers will find this volume to be a useful collection of methodological papers representing the rapid advancement in this field. Finally, we are very grateful to both the authors and reviewers of the many high-quality manuscripts submitted to this *JMR* Focus Issue on *Aberration corrected Transmission Electron Microscopy.*

ON THE COVER:

MBE grown GaN nanowire (NW) exhibiting a core-shell inversion domain boundary. The dark lines are AlN markers to understand how the NW grew during the MBE process. Imaged with probe-corrected Titan^3 Ultimate at 300 kV with 24 mrad convergence angle, 70 pA beam current, 2048^2 pixels with 11.8pm sampling, leading to 24.2x24.2 nm^2 field of view on an annular detector detecting from 55 mrad to around 200 mrad. (Image courtesy of Benedikt Haas, CEA Grenoble)

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