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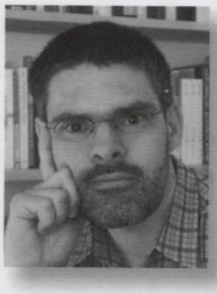
A comprehensive overview of X-ray scattering using nano-focused beams for probing matter at the nanoscale is presented. The monograph includes guidance on the design of nano-beam experiments and discusses various sources, including free electron lasers, synchrotron radiation and special laboratory sources.

The rapid progress of this research area was initiated by the availability of brilliant well-collimated synchrotron X-ray sources and is strongly linked to the recent development of state-of-the art devices now capable to focus hard X-rays. Accordingly, several experimental methods have developed, such as nano-beam based scanning diffraction microscopy and spectroscopy, coherent diffraction imaging, etc. They are used in a broad range of applications in material science, from semiconductor nanostructures to biological specimen.

It therefore seems a good time to give a first résumé on the achievements made, an overview on techniques and applications currently available, and based on that, an outlook on the potential of this approach.

From the contents:



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Dina Carbone *works on the exploitation of small (coherent) x-ray beams for the investigation of strain in complex materials, and its effect on their physical properties and functionality. As beamline scientist at the European Synchrotron Radiation Facility in Grenoble, France, she is also contributing to the technical and methodological developments of nano-beam diffraction.*

ISBN 978-3-527-41077-4

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