

## Press Release

6th October 2021

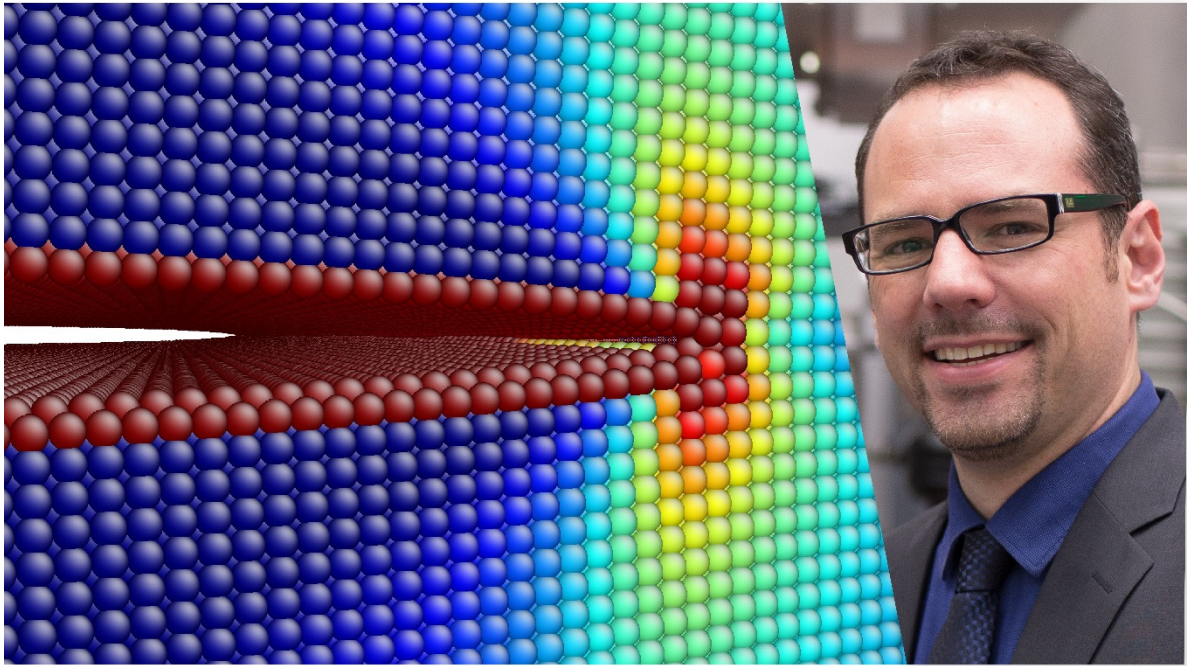
### How will materials fail? Basic simulations on experimental data

New research group on “Microstructure and Mechanics” starts at the MPIE

The Max-Planck-Institut für Eisenforschung (MPIE) welcomes Prof. Erik Bitzek as new group head in the department “Computational Materials Design” (CM). Bitzek just started his research at the MPIE in September 2021. His research group “Microstructure and Mechanics” unravels the relation between a material’s mechanical properties and its crystal defects by using large-scale atomistic simulations.

“Most computational studies of defects have so far been performed on idealized structures like perfectly planar interfaces, infinite straight crack fronts or dislocations that did not contain any additional defects. Our approach to creating more realistic samples for atomistic simulations is the direct use of experimental information for example from electron microscopy or atom probe tomography”, explains Bitzek. “The MPIE is a perfect match as I’m able to use both, the computational expertise in the CM department and the experimental data provided by the colleagues of the other MPIE units.” The group aims to improve the understanding and interpretation of experimental results, whilst simultaneously helping in the development of robust and reliable models for the prediction of deformation and failure of materials.

Erik Bitzek was full professor at the Department of Materials Science and Engineering of the Friedrich-Alexander Universität Erlangen-Nürnberg, where he is still affiliated to. He holds a Consolidator Grant of the European Research Council and develops models to understand the relation between the physical, crystallographic and microstructural properties on the one hand and the failure resistance of materials on the other hand. Moreover, he is co-speaker of the consortium [NFDI-MatWerk](#), a research project with strong MPIE participation aiming to build up a common research data infrastructure for Germany. He is author and co-author of more than 50 publications in international peer-reviewed journals, of one patent application and has given invited presentations at more than 50 international conferences, workshops and seminars.



Prof. Erik Bitzek is head of the newly established group “Microstructure and Mechanics” at the Max-Planck-Institut für Eisenforschung. Copyright: Erik Bitzek

The international team of the Max-Planck-Institut für Eisenforschung conducts advanced basic materials research for the fields of mobility, energy, infrastructure, medicine and digitalisation. The focus lies on nanostructured metallic materials as well as semiconductors, which are analysed down to their atomic and electronic scales. This enables the MPIE team to develop new, tailor-made structural and functional materials embracing their synthesis and processing, characterization and properties, as well as their response in engineering components exposed to real operating environments.

Stay up to date and follow us on [LinkedIn](#), [Twitter](#) and [YouTube](#).

**Contact:**

Yasmin Ahmed Salem, M.A.  
Press and Public Relations Officer  
E-Mail: [y.ahmedsalem@mpie.de](mailto:y.ahmedsalem@mpie.de)  
Tel.: +49 (0) 211 6792 722  
[www.mpie.de](http://www.mpie.de)

