



Wintersemester 2022/23

Dresdner Mathematisches Seminar

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University of Warwick, Mathematics Institute

Elastic far-field development around lattice defects

A zoo of different kinds of defects are found in crystals, from point defects, to dislocations, to grain boundaries and beyond. Very often, the presence and motion of such defects are crucial in determining the real-world electrical and mechanical properties of such materials. As such, methods to compute the properties of such defects are key to predictive materials science, but the accuracy of these methods is hampered by long-range elastic fields generated by defects. In this talk, I will present joint work with Dr Julian Braun and Prof Christoph Ortner in which we study infinite systems of discrete non-linear force balance equations describing some examples of such defects. We show it is possible to accurately describe the algebraic decay of the discrete elastic fields generated, and moreover, derive a computable hierarchy of far-field predictors based on the solution to a sequence of PDEs. These predictors allow us to pass information between discrete and continuum theories of defects and can be used in boundary conditions to speed-up and improve the accuracy of defect simulations.

Freitag, 25.11.2022, 13:00 Uhr – Willers-Bau, Raum C 129

Leitung: Prof. Dr. Axel Voigt

Nach dem Vortrag findet **ab ca. 14:00 Uhr** ein gemeinsames **Kaffee-/Teetinken** vor Hörsaal **WIL C 307 (!)** statt.

Bereich Mathematik und Naturwissenschaften

Fakultät Mathematik