A U S H A N G

FREIE UNIVERSITÄT BERLIN
Fachbereich Mathematik und Informatik

Promotionsbüro, Arnimallee 14, 14195 Berlin

D I S P U T A T I O N

Freitag, 6. Januar 2023, 14:15 Uhr

Ort: Seminarraum 108
(Fachbereich Mathematik und Informatik, Arnimallee 6, 14195 Berlin)

Disputation über die Doktorarbeit von

Herrn Jes Lasse Hinrichsen-Bischoff

Thema der Dissertation:
Adaptive Discontinuous Galerkin Methods for Variational Inequalities with Applications to Phase Field Models

Thema der Disputation:
Virtual Element Methods

Die Arbeit wurde unter der Betreuung von **Prof. Dr. C. Gräser** durchgeführt.

Abstract: Solutions to partial differential equations can be numerically approximated by a wide variety of methods. Very prominent among these are finite element methods which solve the problem in a discrete space consisting of (typically) polynomial functions defined on elements of a triangulation of the domain. In two space dimensions, these grid elements are usually triangles or rectangles.
Subject of this talk will be "Virtual Element Methods" which enrich the discrete space by using additional non-polynomial functions to allow for more general polygonal grid elements and hanging nodes. While these VEM originated in the so called mimetic finite differences approach, the final method is framed as a particular kind of finite element method.
In contrast to similar approaches, VEM do not require to compute or approximate the non-polynomial functions explicitly, turning them indeed into "virtual" quantities. All of this is achieved while preserving the asymptotic accuracy of a polynomial discretization of the same degree on simplexes.
In this talk, we will focus on the crucial ideas to give a understanding of the fundamentals of the method using a simple model problem. Finally, we will give an outlook how the Virtual Element Method is applied to more challenging problems.

Die Disputation besteht aus dem o. g. Vortrag, danach der Vorstellung der Dissertation einschließlich jeweils anschließenden Aussprachen.

Interessierte werden hiermit herzlich eingeladen

Der Vorsitzende der Promotionskommission
Prof. Dr. C. Gräser