

# A U S H A N G

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**FREIE UNIVERSITÄT BERLIN**

**Fachbereich Mathematik und Informatik**

Promotionsbüro, Arnimallee 14, 14195 Berlin

## **D I S P U T A T I O N**

**Mittwoch, 26. Oktober 2022, 14:30 Uhr**

**Ort: Seminarraum 031**

(Fachbereich Mathematik und Informatik, Arnimallee 6, 14195 Berlin)

**Disputation über die Doktorarbeit von**

**Herrn Abbas Gholami Poshtehani**

**Thema der Dissertation:**

**Coupling boundary conditions in continuum-particle approach for open systems: theoretical analysis and computational implementation**

**Thema der Disputation:**

**Electrolyte flows and the governing mathematical models and numerical approach for the modelling**

Die Arbeit wurde unter der Betreuung von **Prof. Dr. L. Delle Site** durchgeführt.

Abstract: Liquid electrolytes contain electrically charged ions and act as a transport environment in many applications including fuel cells, batteries, cell membranes, and water purification technologies. Due to the complex nature of these types of flow, it is required to develop mathematical modelling for them, and in many cases, numerical modellings are useful to obtain a reliable understanding of the flow behaviour. Here, a comprehensive mathematical aspect of the governing equations including the Nernst-Planck-Poisson equation set, its coupling to Navier-Stokes equations, and numerical schemes for solving these equations would be presented. Later, some examples of the electrolyte flows and their transport characteristics would confirm the presented mathematical model and numerical approach

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. L. Delle Site