Universität Hamburg
DER FORSCHUNG | DER LEHRE | DER BILDUNG

Fakultät für
Mathematik, Informatik
und Naturwissenschaften

Kolloquium über Reine Mathematik

Einladung zu einem Vortrag

Dienstag, 14.07.2026

17 Uhr, Geom H6

Prof. Sebastian Heller
(BIMSA)

Integrability and monodromy in Geometry: From Classical minimal surfaces to Hitchin Moduli spaces

Abstract:

Many familiar geometric objects, such as minimal surfaces and metrics of constant curvature on surfaces, are defined by partial differential equations with an underlying integrable structure. In this talk, I will explain how global topological information associated with solutions of integrable PDEs interacts with the geometry and leads to concrete geometric consequences. The talk will begin with classical examples, including hyperbolic metrics on closed surfaces, their relation to Fuchsian representations and Liouville's equation, and constant mean curvature surfaces. These examples motivate the general picture: a nonlinear integrable geometric PDE can be encoded by a family of flat connections, and the desired geometric solutions are selected by a reality condition on the associated monodromy data. I will then describe two recent applications of this point of view. The first explains how hyperpolygon spaces arise as natural models for the hyperkähler geometry of Hitchin's moduli space in a semiclassical limit. The second concerns the construction of embedded special Legendrian surfaces in the five-sphere.

Vor dem Vortrag (ab 16.30 Uhr) stehen im Foyer vor Hörsaal H6 Kaffee und Tee bereit.