

Einladung zum  
ICP-Kolloquium (ICP Seminarraum + Hybrid via Zoom)  
**Bitte geänderte Uhrzeit beachten - 14:00 Uhr**

**Dr. Miriam Klopotek**  
**Stuttgart Center for Simulation Science (SC SimTech)**  
**Cluster of Excellence “Data-Integrated Simulation Science“**  
**University of Stuttgart**

hält am

**Donnerstag, 19.05.2022, 14:00 Uhr**  
**ICP Seminarraum 1.079, Allmandring 3**

und via zoom

<https://us06web.zoom.us/j/85187598463?pwd=MlILTUZpYmR3dkNONlJ2S2YyTUy5QT09>

Meeting-ID: 851 8759 8463

Kenncode: 106393

einen Vortrag über das Thema:

**“From many-body model systems towards physics-inspired machine learning”**

Abstract:

Simple model systems from statistical mechanics like that of Ising have played a central role for fundamental understanding of emergent phenomena in condensed-matter and soft-matter physics. They have enabled us to find ways of categorizing critical behavior, for example, and still serve as important "playground" or reference models for current research. We argue that the usefulness of these simple models goes beyond "just" for physics: They can be used to interpret, scrutinize, improve, and develop new, sophisticated machine learning (ML) algorithms. Using a well-characterized, simple-most model system of hard rods on lattices, we show how confronting ML with data from these systems renders deep insight into the nature of the learning problem from the point-of-view of physics. It also reveals basic issues with the algorithms in the implicit (or explicit) assumptions they make about the world, which we need to be especially aware of if we use ML in the sciences. ML algorithms are generally not designed to abide to physical laws, phenomenology, or dynamics. We argue for physics-inspired and -interpretable machine learning, and present ideas on how complex, many-body dynamics could be exploited for learning purposes.

Interessenten sind herzlich eingeladen.

Prof. Dr. C. Holm  
Apl. Prof. Dr. R. Hilfer