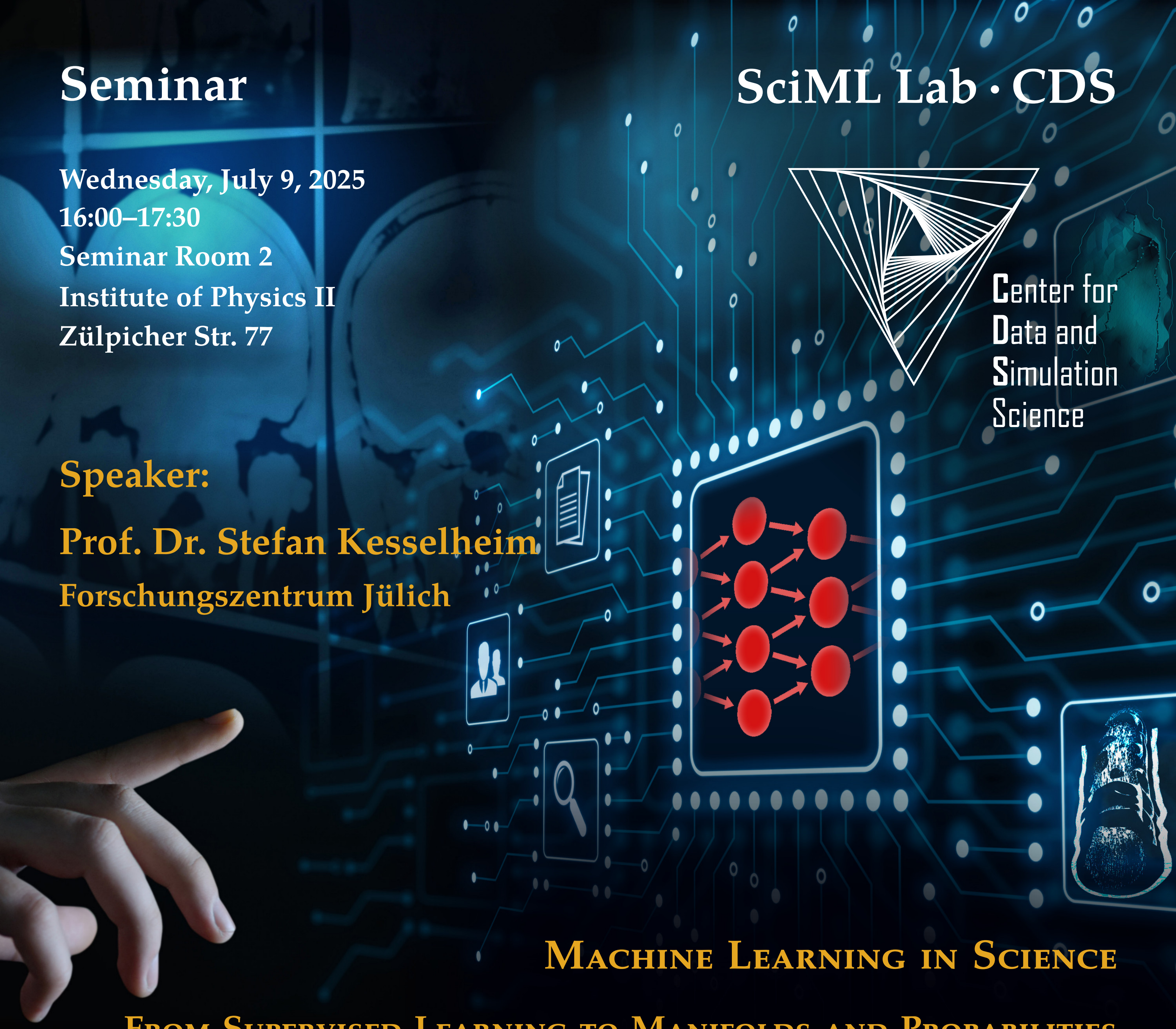
Seminar

SciML Lab · CDS

Center for Data and Simulation Science

Wednesday, July 9, 2025
16:00–17:30
Seminar Room 2
Institute of Physics II
Zülpicher Str. 77



Speaker:

Prof. Dr. Stefan Kesselheim

Forschungszentrum Jülich

Machine Learning in Science

From Supervised Learning to Manifolds and Probabilities

Machine Learning has proven to be very successful in solving supervised tasks – telling cats from dogs or analyzing galaxy morphology based on supervised training with labeled examples. But Machine Learning can be more: For example, it can learn complex data manifolds such as the output space of (deterministic) simulations. We can train models that identify low dimensional continuous manifolds that reveal the structure of complex high-dimensional data, and build effective surrogate models – based on physical intuition and data. We can also train classes of models to represent probability distributions – either as generative models to sample high-dimensional probabilistic datasets or to model uncertainty. This talk gives a compressed overview over non-mainstream applications of Machine Learning in science, stimulating new ideas for applications.

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