

# Kolokvij Matematičkog odsjeka PMF-a Sveučilišta u Zagrebu

**"SIBE MARDEŠIĆ"**

poziva na predavanje



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**Koopman Operator Theory, Dynamical Systems  
and Learning**

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## Abstract

The Koopman operator, invented in 1931, initially provided a rich framework for ergodic theory, a part of dynamical systems that aims to describe their statistical properties. Its connections with nonequilibrium statistical mechanics made it a useful tool in physics and chemistry. In recent years, its use in machine learning is becoming widespread. I will discuss its mathematical underpinnings with an emphasis on functional space constructions. The interplay of spectral reduction theory and geometrical dynamical systems theory yields a fascinating merger of concepts from two seemingly disparate mathematical fields that will be described. I will also present the associated applications and extensions that made Koopman operator theory an essential tool in modern AI.

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