

# MIDWEST MECHANICS SEMINAR SERIES



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Updates:



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## AI/Computing: Alloys for Flow Modeling and Control

### Abstract

Over the last last thirty years we have experienced more than a billion-fold increase in hardware capabilities and a dizzying pace of acquiring and transmitting massive amounts of data. Artificial Intelligence (AI) has been the beneficiaries of these advances and today it is increasingly embedded in technologies that touch every aspect of humanity. However along with the abundance of promise there is an ever increasing amount of hype, in particular regarding the capabilities of learning algorithms to model, predict and control complex fluid mechanics problems.

In this talk I would offer a perspective on forming alloys of AI and simulations for the prediction and control of complex flow systems. I will present novel algorithms for learning the Effective Dynamics (LED) of complex flows and a fusion of multi-agent reinforcement learning and scientific computing (SciMARL) for modeling and control of complex flow-structure interactions. I will juxtapose successes and failures and argue that the proper fusion of fluid mechanics knowledge and AI expertise are essential to advance scientific frontiers.

(In Person Only)

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