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Recent Advances in Neural Network-based Methods for Partial Differential Equations and Eigenvalue Problems

In this talk, I will provide an overview of recent algorithms and mathematical advances in scientific machine learning, focusing on the computation of eigenvalues and eigenfunctions of operators, as well as on the solution of partial differential equations. I will illustrate these methods with examples and highlight current research challenges in this rapidly evolving field. While the presentation will emphasize general mathematical frameworks, many of the techniques discussed have direct applications to problems arising in mathematical biology.