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PHYSICS-INFORMED MACHINE LEARNING FOR NUMERICAL MODELLING IN ENGINEERING AND SCIENCE

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MINISYMPOSIUM

Machine learning has gained increasing attention in the field of numerical modelling. Fuelled by data, it provides researchers with powerful computing tools and has already led to significant innovations. However, in many real-world engineering and science applications, data scarcity can pose significant challenges for machine-learning-driven numerical modelling, hindering its practical implementation. Recent advancements in '*physics-informed machine learning*' have enabled incorporation of guidance from '*physics*', such as governing equations and boundary conditions, into machine learning inspiring a transition away from sole reliance on data. Physics-informed machine learning methods have demonstrated the ability to use '*physics*' as a remedy to insufficient data, resulting in superior performances in terms of accuracy and robustness, specifically for applications with increased complexity and non-linearity. In such a context, this mini-symposium aims to foster a rich and comprehensive dialogue at WCCM 2024 about latest advancements in physics-informed machine learning for numerical methods in engineering and science.