

The **Vienna School of Mathematics (VSM)** is a joint graduate school of the mathematics faculties of the **University of Vienna** and the **TU Wien**. The VSM is devoted to top-level PhD education in all branches of mathematics. It fosters intra- and interdisciplinary scientific cooperation and networking among students and advisors and aims at increasing the international visibility of the Vienna area as a center for mathematics.

The VSM currently announces a PhD position in the area of

**Analysis of Neural Network Quantum States
(University of Vienna, Supervisor: P. Grohs and S. Lanthaler)**

In recent work methods from deep learning have been extremely successful in computing approximate ground states of molecules and solids, see [<https://arxiv.org/abs/2504.06087>] or [<https://arxiv.org/abs/2405.07599>]. However, the mathematical analysis to these algorithms is still at its infancy. In this project we thus contribute towards a better mathematical understanding of deep learning for computing quantum states. Concrete topics include the development of a posteriori error estimates, the analysis of variational monte carlo optimization methods with heavy tailed data, or the development and analysis of novel neural network architectures and training paradigms.

The advertised position is associated with the Faculty of Mathematics of the **University of Vienna**. The successful candidate will become a member of the Vienna School of Mathematics and is expected to actively contribute to its activities. The extent of employment is 30 hours per week. The position is planned to start on September 1, 2025.

Application Requirements and Procedure

The candidates must have a master degree (or equivalent) in Mathematics at the moment the PhD position starts. The application documents should contain a letter of motivation; the scientific CV with publications list; higher education certificates/diplomas; and letter(s) of recommendation. Applications have to be sent via the Job Portal of the University of Vienna at these links (pos. [4198](#) + [4199](#)). The deadline for application is **July 4, 2025**.