

Type Bachelor or Master Thesis

Title **Implementation of Novel Discretizations in Radiative Transfer**

Advisor PROF. PHILIPP GROHS

**Description.** This project is concerned with the implementation of discretization schemes for the radiative transfer equation which, in its original interpretation, describes the transport of the stationary radiation intensity across a finite domain. Applications range from high energy physics and molecular biology to socio-economic modelling. For several reasons the numerical solution of this equation is challenging: First, it is posed on a moderately high-dimensional state space (typically 5-7 D). Furthermore, it is a hyperbolic transport equation which requires specific, non-standard, discretization concepts in order to yield well-conditioned linear systems. In (Grohs and Schwab 2011) we found such a discretization and the goal of this project is to implement this construction. A successful completion of the project may result in a journal publication.

**Prerequisites.** Numerical analysis, Finite Element Methods, programming skills (MATLAB and/or C++).

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## References

P. Grohs and C. Schwab (2011), Sparse twisted tensor frame discretization of parametric transport operators, Technical Report 2011/41, Seminar for Applied Mathematics, ETH Zürich.