



# Computational Methods for Quantitative Finance: PDE Methods

**Lecturer:** Prof. Dr. Christoph Schwab

**Credits (ECTS):** 6.0

## Course contents:

- Review of option pricing. Wiener and Levy price process models. Deterministic, local and stochastic volatility models.
- Finite Difference Methods for option pricing. Relation to bi- and multinomial trees. European contracts.
- Finite Difference methods for Asian, American and Barrier type contracts.
- Finite element methods for European and American style contracts.
- Pricing under local and stochastic volatility in Black-Scholes Markets.
- Finite Element Methods for option pricing under Levy processes. Treatment of integrodifferential operators.
- Stochastic volatility models for Levy processes.
- Techniques for multidimensional problems. Baskets in a Black-Scholes setting and stochastic volatility models in Black Scholes and Levy markets.
- Introduction to sparse grid option pricing techniques.