**THE UNIVERSITY**     **OF HONG KONG**

*Institute of Mathematical Research*
*Department of Mathematics*

# Numerical Analysis Seminar

## Numerical homogenization of Hamilton-Jacobi-Bellman equations

### Dr. Timo Sprekeler
National University of Singapore

**Abstract**

In the first part of the talk, we propose and rigorously analyze a mixed finite element method for the approximation of the periodic strong solution to the fully nonlinear second-order Hamilton-Jacobi-Bellman (HJB) equation with coefficients satisfying the Cordes condition. These problems arise as the corrector problems in the periodic homogenization of HJB equations. The second part of the talk focuses on the numerical homogenization of such equations, more precisely on the numerical approximation of the effective Hamiltonian. Numerical experiments demonstrate the approximation scheme for the effective Hamiltonian and the numerical solution of the homogenized problem. This is joint work with Dietmar Gallistl (Jena) and Endre Süli (Oxford).

|        |                                          |
|-------:|------------------------------------------|
| Date:  | April 19, 2023 (Wednesday)               |
| Time:  | 10:00am – 11:00am                        |
| Venue: | ZOOM: https://hku.zoom.us/j/             |
|        | Meeting ID: 913 6532 3891                |
|        | Password: 310656                         |

*All are welcome*