Valeria Simoncini (University of Bologna, Italy)

"Matrix oriented methods for dynamical systems and optimization problems"

Matrix equations have arisen as the natural setting for various PDE discretization methods such as finite differences, isogeometric analysis, spectral and finite elements. Thanks to major recent computational advances, solving certain classes of linear matrix equations is a competitive alternative to dealing with the large (vector) linear systems classically stemming from the aforementioned discretizations. During this seminar we present an introduction to the solution of matrix equations, and support the considerations above with examples from the numerical treatment of possibly time-dependent PDE problems.