



Wir laden recht herzlich zu einem Vortrag im Rahmen des

Oberseminars Numerische Optimierung

ein:

Prof. Dr. Martin J. Gander

(University of Geneva)

On the Beauty of Coarse Space Components

Donnerstag, 9. Juli 2020

Beginn: **16:00 Uhr**

Raum: **BigBlueButton Room: <https://bbb.uni-konstanz.de/b/gab-nez-v4u>**

Interessenten sind herzlich willkommen!

G. Ciaramella

Abstract:

The field of domain decomposition methods has reached a certain maturity, and for many of the classical domain decomposition methods like Additive Schwarz, FETI and Neumann-Neumann, there are condition number estimates for coercive problems that show that these two level methods are optimal in the sense that their convergence when used with a Krylov method does not (or only very weakly) depend on the mesh size and the number of subdomains.

Over the past years, a large effort has gone into developing coarse spaces for these methods which make them robust also for problems with large contrast in the coefficients, which led to several new coarse spaces, like GenEO, SLEM and ACMS. In contrast to coarse corrections in multigrid which are based on a coarse grid, these coarse spaces consist of coarse space components, i.e. coarse functions which span the coarse space.

The focus of this presentation is to visualize how such coarse space components look like for the different domain decomposition methods. In order to discover them, we take the Laplace equation and look for each domain decomposition method at which error components are not converging well. We then study how these depend on the geometry of the decomposition and the number of subdomains, and investigate if one can find an analytical representation for them.