

SALZBURG MATHEMATICS COLLOQUIUM

Winter 2017/2018

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„Inverse problems for adaptive systems of extremely large telescopes“

February 1, 2018

Abstract:

Currently there is a new generation of large astronomical telescopes under construction. The operation of those huge telescopes require new mathematical methods in particular for the Adaptive Optics systems of the telescopes. The image quality of ground based astronomical telescopes suffers from turbulences in the atmosphere. Adaptive Optics (AO) systems use wavefront sensor measurements of incoming light from guide stars to determine an optimal shape of deformable mirrors (DM) such that the image of the scientific object is corrected after reflection on the DM(s). The solution of this task involves several inverse problems. In the talk we introduce mathematical models for the elements of different Adaptive Optic systems. In particular, we consider the reconstruction of the incoming wavefront from Shack-Hartmann and Pyramid sensor data and present different reconstruction approaches for the atmospheric tomography problem. The numerical results for each of the sub-tasks confirm that the methods achieve the accuracy and speed required for the operation on ELTs.

Thursday, **15:00-15:45**

Hörsaal 414, 1. Stock