In the AEI Space Interferometry group, we designed numerous laser interferometer prototypes as well as the laser interferometry of LISA Pathfinder and GRACE Follow-On and investigate first prototype setups for the LISA interferometry. For each interferometer setup, optical simulations are performed for optimization of the system prior to setting up the experiment. Once the experimental setup is fully implemented, additional simulations are performed to support data analysis and allow interpretation of the measurement results. We do these optical simulations with our in-house software library IfoCAD, which we are continuously developing since about 2009.
IfoCAD does not perform frequency analyses (unlike e.g. Finesse)- nor does it work in time domain. Instead, the main functionality of IfoCAD is to compute standard interferometer readout signals (e.g. phases, differential wavefront sensing, differential power sensing, contrasts) which can then be monitored as functions of certain changes in the optical setup.
In this talk, I will show what simulation tasks we are addressing within our working group. Thereby, I will give an overview of IfoCADs functionality, standard applications, its limitations and the current work in progress, and will also inform about the availability of IfoCAD.