VolkswagenStiftung

STARDISK - Simulating Dense Star-Gas Systems in Galactic Nuclei using Special Hardware

Initiative: Zwischen Europa und Orient - Mittelasien/Kaukasus im Fokus der Wissenschaft

Bewilligung: 21.12.2006

Laufzeit: 3 Jahre

Supermassive black holes are located in most if not all centres of galaxies, including our own. Their growth due to interaction with and accretion of surrounding gas and stars is one of the most interesting and important fields in astrophysics nowadays. New space and ground based telescopes of present (Hubble Space Telescope, VLT, Chandra, XMM Newton) and future generations (Next Generation Space Telescope) provide a large amount of new high-resolution data on morphology and kinematics of stellar and gaseous systems near black holes. Since the underlying equations are very complex, theory consists of computer simulations in which the evolution of stars (gravitating mass points) with a central potential (black hole) and a gaseous disk is followed by direct modelling of stellar orbits. The project examines a special topic in this area, namely the interplay between stellar dynamical two-body relaxation and star-gas interactions due to a central accretion disk. The proposed computing facility in Almaty is supposed to be included in the world wide MODEST network and will take part in the forefront of a newly planned grid network of such facilities.

Projektbeteiligte

Prof. Dr. Rainer Spurzem
Universität Heidelberg
Zentrum für Astronomie
Astronomisches Rechen-Institut
Heidelberg

Prof. Dr. Emmanuil Vilkoviskij
Fessenkov Astrophysical Institute
Laboratory on Active Processes in Space
Almaty
Kasachstan

Dr. Chingis Omarov
Fessenkov Astrophysical Institute
Almaty
Kasachstan