BLACK HOLES IN DENSE STAR CLUSTERS
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TITLE: Large-scale Kinematics and Dynamical Modeling of the Milky Way Nuclear Star Cluster

SPEAKER: Anja Feldmeier (ESO)

Within the central 10 pc of our Galaxy lies a dense cluster of stars, the nuclear star cluster. This cluster forms a distinct component of our Galaxy, and hosts a supermassive black hole. Because the Milky Way nuclear star cluster is at a distance of only 8 kpc, we can spatially resolve its kinematics much better than in external galaxies. This makes the Milky Way nuclear star cluster the perfect reference objects for studying the dynamics of nuclear star clusters.

We have obtained an unprecedented data set using the near-infrared long-slit spectrograph ISAAC (VLT) in a drift-scan to construct an integral-field spectroscopic map of the central ~10x8 pc of our Galaxy.

From this data set we extract a stellar kinematic map using the CO bandheads in integrated light. Using the stellar kinematics and photometry from Spitzer, we set up a kinematic model for the Milky Way nuclear star cluster to derive its mass and constrain the central Galactic potential. Because the black hole mass in the Milky Way is precisely known from measuring stellar orbits, this kinematic data set will also serve as a benchmark for testing black hole mass modeling techniques used in external galaxies.