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Modelling the Milky Way nuclear star cluster

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The Galactic center region has a mass of $\sim 10^9 M_{\odot}$. It consists of the nuclear stellar disk (NSD), a flat, rotating stellar structure, and the nuclear star cluster (NSC), the densest concentration of stars in the Galaxy. The NSC and NSD are distinct structures of the Milky Way, but also connected to the larger Milky Way structures, e.g. via the inflow and outflow of gas, and the infall of star clusters. Our knowledge of the larger Milky Way structures, Galactic disc, bulge and halo, has expanded in recent years through surveys and dedicated missions. Hidden behind large amounts of interstellar dust, the Galactic centre structures, NSC and NSD, are inaccessible for these surveys, and they miss an important piece for our understanding of the Milky Way's formation and evolution, leaving us with many unanswered questions, such as:

How did the NSC assemble within the NSD and the other larger structures of the MW? What is NSC's history of mass accretion and star formation, can we identify distinct events?

In this talk I will present spectroscopic observations of the NSC and inner NSD, resulting in $>2,500$ stellar spectra, and measurements of their line-of-sight velocity and overall metallicity. These data can constrain dynamical models of the Galactic centre, which inform us about the mass distribution, dynamical structure and evolution of the NSC.

Affiliation

University of Vienna

Current Position

Postdoc

Primary author: FELDMEIERS-KRAUSE, Anja (University of Vienna)

Presenter: FELDMEIERS-KRAUSE, Anja (University of Vienna)

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