Contribution ID: **494** Type: **Invited talk in a parallel session**

Update on Dusty Sources and Candidate Young Stellar Objects in the S-cluster

Friday, 12 July 2024 15:00 (25 minutes)

The Galactic Center provides a unique opportunity to observe galactic cores, objects in the close proximity to a supermassive black hole (SMBH), and star formation channels that exhibit imprints of this peculiar environment. This habitat hosts, in addition to the SMBH Sgr A * , a surprisingly young cluster with the so-called S-stars. These stars orbit the SMBH on timescales of a few years with thousands of km/s. While the presence of high-velocity stars in the S-cluster already imposes a variety of scientific questions, the observation of several bright L-band emission sources has resulted in a rich discussion of their nature. The detection of a prominent Doppler-shifted Brγ line accompanies most of these sources that seem to be embedded in a dusty envelope. With the radiative-transfer model HYPERION, we find strong indications of the presence of a stellar low-mass population embedded in the S-cluster. We revisit this intriguing cluster and its dusty members that orbit the supermassive black hole Sgr A* on bound Keplerian trajectories. Among these cluster members, there is one source that initiated the studies of this analysis: G1.We find that the flux density of G1 in the NIR and MIR resembles a spectral energy distribution of a Class I YSO, which contributes to the “Paradox of Youth”.

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Session Classification: Latest results from Galactic center observations

Track Classification: High-precision astrometry (HP): Latest results from Galactic center observations