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Rogue planets with Euclid: Messier 78 and Lynds 1641

Tuesday, December 16, 2025 2:20 PM (20 minutes)

Primarily designed to explore the dark universe, the Euclid space telescope also opens exciting new opportunities for substellar science. Its Early Release Observations and Quick Data Release include several young star-forming regions in Orion. In this talk, I will present results from Messier 78 (M78) and Lynds 1641 (LDN1641). The M78 data are representative of the Euclid Wide Survey, which will map one-third of the sky down to J(AB)=24.5, while the LDN1641 observations reach two magnitudes deeper, offering a preview of the Euclid Deep Fields at the end of the mission. Both regions are strongly affected by extinction, so we combined Euclid's Y, J, and H photometry with ground-based K-band and Spitzer/IRAC data to build high-resolution extinction maps and isolate the most likely young members. Their masses cover the ultracool dwarf regime and extend down to planetary-mass objects, demonstrating Euclid's unique ability to detect free-floating planets in Orion. Finally, I will show how Euclid spectroscopy, together with ESO's KMOS follow-up, confirms the substellar nature of these candidates.

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