

Abstract Talk HD95086, SF2A 2022

Title: In-depth direct imaging and spectroscopic characterization of the young, Solar System-analog HD 95086

Abstract:

HD 95086 is a young (~ 13 Myr), nearby Solar-System analog hosting a 4—5 MJup, directly-imaged exoplanet: HD 95086 b. The planet orbits at 57 au from the star between an inner and an outer debris belt located at 7—10 au and 106—320 au, respectively. Previous studies have suggested that the size of the broad cavity between the two belts requires the presence of one or more additional planets at a closer separation (< 30 au).

In this talk, we present the results of a long-term, in-depth follow-up monitoring of the HD 95086 planetary system with direct imaging observations from the VLT/SPHERE instrument combined with archival data from the VLT/NACO and Gemini/GPI instruments. Our work aims to explore the orbital and atmospheric properties of HD 95086 b, and look for the presence of additional planet(s).

For the first time, we extract the JH low-resolution spectrum of HD 95086 b, and confirm its very red spectral energy distribution. Our analysis indicates that it could be explained by the presence of a circumplanetary debris disk around the planet b or a super-solar metallicity atmosphere. In addition, direct imaging enables to accurately determine the orbital properties of HD 95086 b, and to confirm a low-eccentric, coplanar orbit within the outer belt leaving room for additional closer-in planets. We do not find any robust candidate for the planet c between 10 and 30 au, but we give updated constraints on its potential mass and location.