



Contribution ID: 56

Type: **Contributed**

## The surprising range of characteristics found in Neptune-sized Exoplanets

*Thursday, 16 May 2024 09:30 (20 minutes)*

Sub-Neptune and Neptune-sized Exoplanets exhibit a more and more surprising wide diversity of masses and bulk density. Determining their internal composition is, actually, a key parameter that can provide insights into whether these planets are predominantly composed of volatile materials or if they have significant amounts of denser substances such as water or rocky materials. Such information is, therefore, fundamental for understanding their formation and evolution, especially for those that lie in the hot-Neptune “desert” where the vicinity with their parent stars can induce atmospheric escape processes. Also in the context of possible planetary atmosphere characterization with the JWST, it is very important to measure the mass of these planets with a precision of  $\sim 5\sigma$ . Such precision requires a long RV monitoring of the parent stars and the use of very high-resolution spectrographs. The TESS space telescope is providing many transiting-planet candidates, orbiting bright stars, that are excellent targets for high-precision spectroscopic follow-up observations, which allow us to physically characterize these planets and explore their parameter space. In this context, we will present an update on our project concerning the high-cadence RV monitoring of a list of Neptune-sized TESS planet candidates. This project is currently split into two observational programs: the first is performed by using HARPS-N at the TNG and is focussed on hot-Neptune TESS candidates, while the second involves the use of HARPS at the ESO 3.6m telescope and a list of warmer Neptunes has been selected.

**Primary author:** MANCINI, Luigi (Dipartimento di Fisica, Università di Roma “Tor Vergata”)

**Presenter:** MANCINI, Luigi (Dipartimento di Fisica, Università di Roma “Tor Vergata”)

**Session Classification:** Exoplanets Evolution