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## The visible arm of the GAPS 2.0 atmospheric characterization programme

*Wednesday, 23 October 2019 09:30 (25 minutes)*

I will present results obtained within the GAPS 2.0 long term programme for atmospheric characterization of hot giant planets using the Telescopio Nazionale Galileo (TNG) in the simultaneous GIARPS (GIANO-B + HARPS-N) observing mode. I will focus in particular on our ongoing efforts to probe exoplanetary atmospheres through transmission and emission spectroscopy using the visible light (380-690 nm) arm of GIARPS: the high-resolution ( $R \sim 116\,000$ ) spectrograph HARPS-N.

The vast majority of exoplanetary systems are completely different from our Solar System, and their orbital configurations challenge our traditional formation and migration theories. Crucial information about the environment where planets formed, their subsequent migration, and their interaction with the host star is somehow encoded in the present physical state and chemical composition of their atmospheres.

We are exploiting different tracers and analysis techniques in the GIARPS-VIS region to probe different atmospheric layers and physical mechanisms. This includes the study of metallic lines (such as the neutral Sodium doublet) and of the Balmer series to investigate evaporation processes and the dynamics of the upper atmosphere, and strong sources of optical opacities that regulate the whole energy balance of very hot Jupiters, such as TiO or atomic metals, that are found in their transmission and emission spectrum. I will review some of our preliminary results also in a wider context, since the refinement and development of our analysis techniques (including, for instance, telluric-correction algorithms) will be crucial for an optimal exploitation of forthcoming facilities such as E-ELT, able to probe smaller and more temperate planets.

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