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# The GAPS 2.0 project for the characterization of exoplanetary atmospheres

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## Abstract

We will describe the ongoing efforts of the GAPS 2.0 project for atmospheric characterization of highly irradiated planets using the simultaneous GIANO-B + HARPS-N (GIARPS) observing mode of the Telescopio Nazionale Galileo (TNG). We will focus in particular on the results and prospects for detection of the individual contributions of atomic (Helium) and molecular (e.g., water, methane, carbon dioxide, hydrogen cyanide) species for constraining the planet C/O ratio and for studying extended atmospheres at high spectral resolution with the GIARPS near-infrared arm. Thanks to its high spectral resolution (R ~ 50 000) and its wide spectral coverage (0.95-2.45) μm, GIANO-B is indeed one of the best suited current spectrographs to perform studies of exoplanetary atmospheres.