Paper ID: 56796
student

IAF SYMPOSIUM ON FUTURE SPACE ASTRONOMY AND SPACE PHYSICS MISSIONS (A7)
Science Goals and Drivers for Future Exoplanet, Space Astronomy and Space Physics (2)

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# OPENING NEW PERSPECTIVES IN EXOPLANET SCIENCE WITH JAMES WEBB SPACE TELESCOPE

**Abstract**

Since 1995 and the discovery of the first exoplanet around a star, we turned from a science focused on detection of new planets to an era of characterization. These performances are allowed by increased performances of new instruments and renewed computing capabilities. The launch and commissioning of the James Webb Space Telescope (JWST) in 2021 will provide game-changing astronomical observations, in particular for exoplanets. The Mid-InfraRed Instrument (MIRI) with its Low-Resolution Spectrometer (LRS) will carry out transit spectroscopy of the exoplanet atmospheres with unprecedented precision. These observations will unravel information about exoplanets that were not accessible until then. The treatment of these data is challenging, as atmosphere signals are small, and there is few model precise enough to compare it. How is the science community answering to these challenges? Deeper astrophysical and instrumental models are being developed. New data reduction, data treatment techniques are being designed, from machine learning to physically accurate fits. Astronomy as a whole, and exoplanet science in particular, is more and more demanding of computing capability, not only for modelling but now for data processing as well. In that frame, it is critical to identify the circumstances that require sophisticated modelling. Here, also I present a way to predict the bias on the measure of the planet's atmospheric absorption, due to hypothesis made to alleviate computing demand. Studies preparing the JWST are also paving the way for the upcoming telescopes like Ariel (ESA), with new observations strategies. We can now go more and more in detail in the knowledge of exoplanets, as well as starting statistical analysis on the exoplanet populations.