Título/Title:

Titan atmosphere's studies using VLT/UVES and Cassini space mission data

Orientador/Supervisor:

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Local do Estágio/Host Place:

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Descrição/Description:

Saturn's moon Titan has an atmosphere in hydrostatic equilibrium. This atmosphere, more dense than the Earth's atmosphere, is rich in hydrocarbons such as methane and ethane (among others) which makes it a preferred study target of Astrobiology. Our team observed Titan with the VLT telescope and the UVES high resolution spectroscope. The work here proposed is focused in producing high-resolution spectra from Titan's atmosphere in order to allow us to yield a dynamical and chemical study of this Solar System body atmosphere. On the other hand, cloud tracking techniques upon Cassini's data will be used to retrieve a Titan's wind map.

The data for this work come from the Huygens-Cassini (NASA-ESA) mission and observations from ground-based telescopes (VLT-UVES).

Workplan:

The candidate will learn how to use the Cassini space mission archive in order to obtain pairs of Titans' images that can be used with our cloud tracking method, and then learn how to process the images to optimize the definition of atmospheric patterns.

The next procedure will consist in learning how to use the PLIA and PICV2 tool to obtain wind velocity maps. In a second phase, the successful candidate will learn Doppler techniques in order to study the dynamics of this atmosphere using the high resolution spectra obtained with the VLT (ESO) telescope and the UVES instrument.

Requisitos/Requirements:

The project is based on the use of MATLAB and IDL routines. Therefore, the candidate should be willing to program in these programming environments and possibly have a basic knowledge of MATLAB.

Typo/Type

This is a closed project. Only the student: Constança Freire can apply.