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M-dwarf flares and their impact on exoplanet habitability

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M dwarfs are the smallest and coolest stars on the main sequence. They are the most common stars in the Galaxy and are known to show the highest rocky planets occurrence. As a result, they may host most of the Universe's Earth-sized planets orbiting in the Habitable Zones of main sequence stars. Among several parameters to determine if an exoplanet could possibly host life, one of them is the flaring capacity of its host star. A flaring host star is a double-edged sword in regard of exoplanet habitability. On one hand, the increased flux during flare events can trigger chemical reactions that are necessary to build the basis of prebiotic chemistry. On the other hand, sufficiently strong flares may erode exoplanets'ozone layers and reduce their UV protection. M dwarfs stellar flares are particularly interesting to study in the UV range since they can display peak amplitudes of x14.000 with respect to the quiescent flux compared to x90 in the optical. CubeSats are small, cheap, and accessible satellites allowing to perform astrophysical measurements. Thanks to them, the study of M dwarf flares is now feasible on small scale and time frame. Thus, the main objective of this PhD will be to study data on stellar flares from M dwarfs, collected with a dual-band (UV and optical) camera onboard of a CubeSat.

Primary author: POYATOS, Julien (ICCUB)

Presenter: POYATOS, Julien (ICCUB)