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(G*) The galactic white-dwarf population from the CLAUDS deep fields

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The Canada-France-Hawaii Telescope (CFHT) Large Area U-band Deep Survey (CLAUDS) produces images to a median depth of $U = 27.1$ AB. These U-band images are the deepest ever assembled over such a large area. The catalogue resulting from this survey contains a little more than 10,000,000 objects. Our goal is to identify white dwarfs from the CLAUDS deep fields and to study their physical properties and spatial distribution, in the Milky Way. Considering the size of the catalogue, we conduct our search via machine learning. We use the end-to-end open-source platform for machine learning, TensorFlow. Via TensorFlow, we perform a binary classification using deep learning methods. After filtering the white-dwarf candidates, to limit contamination by other objects such as main-sequence stars, we find over 600 white dwarfs. We then determine the physical properties of the white dwarfs, such as surface temperature, distance modulus and age, using cooling models. We then fit for the thin and thick disc scale heights of the white-dwarf space distribution, and we derive the white-dwarf luminosity function. Thanks to the properties of the CLAUDS fields, we provide one of the deepest catalogues of galactic white dwarfs.

Authors: Mr RIPOCHE, Paul; HEYL, Jeremy (UBC)

Presenter: Mr RIPOCHE, Paul

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