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Probing SFR of nearby galaxies with SOFIA/FIFI-LS [CII] observations

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The observation of the far-IR 158 μm line of singly ionised carbon [CII] plays an important role in the study of star-forming regions of the interstellar medium (ISM) in galaxies. The connection between the [CII] fine-structure line and ionised phases of the ISM, could make [CII] emission a useful alternative star-formation rate (SFR) measure. However, due to the ambiguity of the origin of [CII] line (e.g. tracing both regions of active star formation and neutral gas), full disc observations in nearby galaxies are first required to determine the fraction of [CII] that originates from different phases of the ISM. The aim of this project is to test the above assumptions using SOFIA/FIFI-LS [CII] observations of 3 nearby galaxies (NGC 3627, NGC 4321, NGC 6946). I will present our results showing that the use of [CII] as a tracer for star formation is much more complex than previously suggested within the extragalactic literature, which focused on small regions of galaxies and/or used large apertures containing many environments.

Presenter: KOVAČIĆ, Inja (Ghent University)

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