



**IAUS-REG-NUMBER:** IAUS-51

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**TITLE:** Integral Field Spectroscopy of NGC 3242 and the puzzling nature of its LISs

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**ABSTRACT:**

We know that UV radiation from the central star of a planetary nebula ionizes the gas, leading to a homogeneous ionization structure. However, in some planetary nebulae (PNe), distinct small-scale structures characterized by a reduced degree of ionization level, are observed. The objective of my study is the spectroscopic analysis in 2D of the PN NGC 3242, which contains a pair of low-ionization structures (LISs). MUSE data are used in conjunction with the SATELLITE code for the spatial analysis. Here, I present the preliminary results of my work. Firstly, the electron temperature calculated from [S III] is decreasing from the inner to the outer parts of the nebula. As for the electron density, it is slightly higher at the inner parts of the nebula. My analysis also verifies that there is no significant chemical variation. Moreover, the emission line ratios of NGC3242 imply a very low-ionization PN. In addition, the detailed examination of MUSE data has led to identifying the far-red [C I]  $\lambda 8727$  emission line emitted only from the LISs. This finding in conjunction with the enhanced low-ionization lines such as [N II], [S II], [O I] implies a partially ionized gas which may surround a dense molecular gas.