

Physics & Astronomy Colloquium -
Spring 2020

Tuesday, Jan 21st at 3:30 pm in SC 234

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**Stellar feedback and galaxy evolution in the era of
integral field spectroscopy**

Feedback from massive stars plays a central role in shaping the evolution of entire galaxies. Despite a solid qualitative understanding of feedback, our quantitative knowledge remains poor. Currently, only a small number of HII regions have adequate observational information on both gas and stars needed for detailed feedback studies. However, the growing availability of integral field unit (IFU) instruments and the novel analysis techniques we've developed for them, now allow the study of stellar feedback in orders-of-magnitude more HII regions than previously possible, i.e. the numbers needed to fully quantify the effects of feedback over a large dynamic range of stellar and interstellar medium properties, and to connect the results to state-of-the-art star formation and galaxy evolution models.

I will discuss the first results of resolved stellar feedback studies from a MUSE IFU legacy dataset covering the nearby Sculptor galaxy NGC 300, as well as results from MUSE observations of HII regions in the Magellanic Clouds and the Milky Way. By merging the MUSE NGC 300 data with HST resolved stellar photometry, I demonstrate that ground-based IFU data of nearby galaxies is ideally suited to quantify feedback from massive stars over entire galaxies all the way down to individual cloud scales. Moreover, I will discuss the MUSE observations in terms of a pathfinder to ongoing and next-generation IFU nearby galaxy surveys, instruments, and facilities such as the Local Volume Mapper, JWST, and 30m-class telescopes. Finally, I will highlight serendipitous discoveries only possible thanks to the 3D nature of IFU data.

Refreshments at 3:00 pm in SC 103