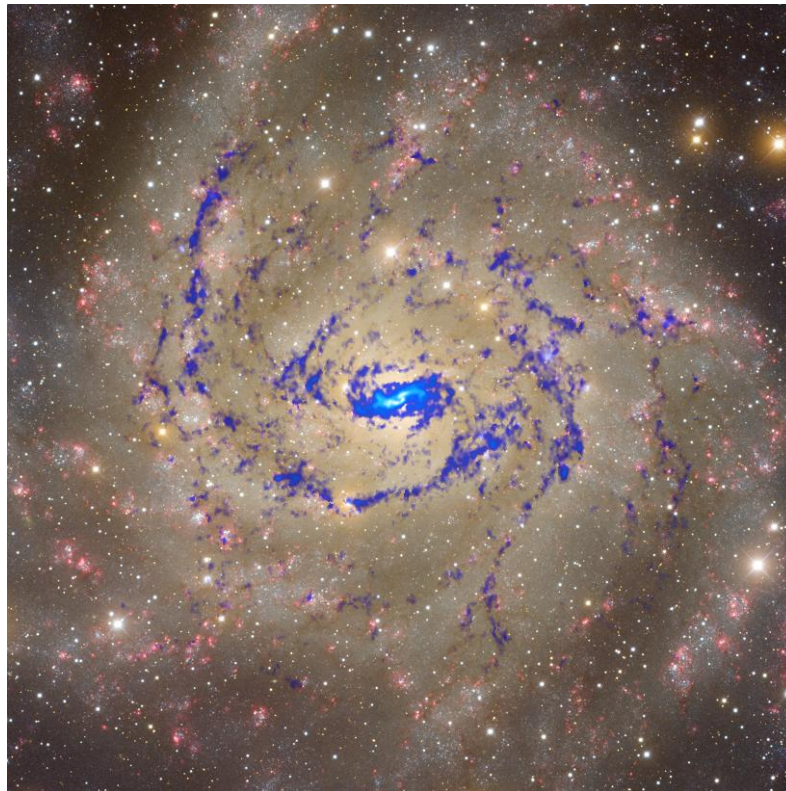


A Wide-area, Cloud-Scale ISM Survey of IC 342

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I will present a new wide-area, high resolution survey of molecular gas in the nearby spiral galaxy IC 342. We have used NOEMA, together with the IRAM 30-m, to perform today's largest interferometric mosaic consisting of 1000 pointings and covering the central 11 arcmin ~ 10 kpc of the galaxy disk. The high resolution (3.5 arcsec ~ 60 pc) and high sensitivity allow us to study the properties of 1,200 GMCs with mass $\sim 10^5 - 10^7$ Msun. The NOEMA survey is supplemented by an ongoing survey with MaNGA (PI: K. Kreckel) to cover a similarly large field of view. We use these data to determine local ionized gas properties, gas-phase metallicity, and extinction-corrected star formation rates. By combining these two surveys, we can study the star formation process at the scale of individual molecular clouds with unprecedented statistics. In particular, we correlate molecular cloud properties and the local star formation rate to determine what ISM properties control the star formation process and how feedback from recent star formation shapes the local ISM. We contrast these observations to analytical star formation theories to identify the physics regulating the star formation process and determine the efficiency of various feedback mechanisms. Finally, we place these observations into the context of the local galaxy population currently studied by the PHANGS collaboration.



New NOEMA and MaNGA observations of the nearby spiral IC 342 provide novel insight on the physics of star formation ($H\alpha$ in red) of 1,200 individual molecular clouds (CO in blue).