context of the stellar light illumination through a porous envelope with postulated longer-term variations for a period of 10 years.

[구 IS-02] Role of Mass Inflow and Supernova Feedback on Nuclear Ring Star Formation

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Observations suggest the star formation in nuclear rings of barred galaxies proceeds episodically in time and sometimes asymmetrically in space. Existing theories and numerical simulations suggest that the episodic star formation is perhaps due to either supernova feedback combined with fluid instabilities or time-varying mass inflow rate. However, it has been challenging to discern what dominates in shaping the star formation history because the effects of the inflow and feedback are blended in global simulations of nuclear rings. To understand their effects separately, we construct semi-global models of nuclear rings, which treat the mass inflow rate as a model parameter. By running simulations with the inflow rates kept constant or oscillating in time, we find that the star formation rate (SFR) of the rings varies coherently with the inflow rate, while the feedback is responsible only for stochastic fluctuations of the SFR within a factor of two. The feedback instead plays an important role in maintaining the vertical dynamical equilibrium and setting the depletion time. While the asymmetry in the inflow does not necessarily lead to the asymmetry in the star formation, we find that the rings undergo a transient period of lopsided star formation when the inflow rate of only one dust lane is suddenly increased.

[박 IS-03] TRAO-TIMES: Investigating Turbulence and Chemistry in Two Star-forming Molecular clouds

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Turbulence produces the density and velocity fluctuations in molecular clouds, and dense regions within the density fluctuation are the birthplace of stars. Also, turbulence can produce non-thermal pressure against gravity. Thus, turbulence plays a crucial roles in controlling star formation. However, despite many years of study, the detailed relation between turbulence and star formation remain poorly understood. As part of the Taeduk Radio Astronomy Observatory (TRAO) Key Science Program (KSP), "mapping Turbulent properties In star-forming MolEcular clouds down to the Sonic scale (TIMES; PI: Jeong-Eun Lee)", we mapped two star-forming molecular clouds, the Orion A and the ρ Ophiuchus molecular clouds, in six molecular lines (^{13}CO 1-0/$C^{18}O$ 1-0, HCN 1-0/HCO^+ 1-0, and CS 2-1/N_2H^+ 1-0) using the TRAO 14-m telescope. We applied the Principal Component Analysis (PCA) to the observed data in two different ways. The first method is analyzing the variation of line intensities in velocity space to evaluate the velocity power spectrum of underlying turbulence. We investigated the relation between the star formation activities and properties of turbulence. The other method is analyzing the variation of the integrated intensities between the molecular lines to find the characteristic correlation between them. We found that the HCN, HCO^+, and CS lines well correlate with each other in the integral shaped filament in the Orion A cloud, while the HCO^+ line is anti-correlate with the HCN and CS lines in L1688 of the Ophiuchus cloud.

[구 IS-04] Complex organic molecules detected in twelve high mass star forming regions with ALMA

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