disk galaxies having formed ~1.5 Gyr before our own solar system. Finally, we expect that ~ 1.4×10^9 planets similar to present-day Earth have existed so far in our galaxy.

성간물질

[포 IM-01] Looking for Direct Evidence of Triggered Star Formation: Gas Kinematics

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Stellar wind and radiation pressure from massive stars can trigger the formation of new generation of stars. The sequential age distribution of stars, the morphology of cometary globules, and bright-rimmed clouds have been accepted as evidence of triggered star formation. However, these characteristics do not necessarily suggest that new generation of stars are formed by the feedback of massive stars. In order to search for any physical connection between star forming events, we have initiated a study of gas and stellar kinematics in NGC 1893, where two prominent cometary nebulae are facing toward O-type stars. The spectra of gas and stars in optical and near-infrared (NIR) wavelength are obtained with Hectochelle on the 6.5m MMT and Immersion GRating INfrared Spectrograph on the 2.7m Harlan J. Smith Telescope at McDonald observatory. In this study, the radial velocity field of gas across the cluster is investigated using Hα and [N II] λ 6584 emission lines, and that of the cometary nebula Sim 130 is also probed using 1-0 S(1) transition line of H_2. We report a distinctive velocity field of the cometary nebulae and many ro-vibrational transitions of H_2 even at high energy levels in the NIR spectra. These properties indicate the interaction between the cometary nebulae and O-type stars, and this fact can be a clue to triggered star formation in NGC 1893.

[포 IM-02] Machine Learning Approach to Estimation of Stellar Atmospheric Parameters

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We present a machine learning approach to estimating stellar atmospheric parameters, effective temperature (Teff), surface gravity (log g), and metallicity ([Fe/H]) for stars observed during the course of the Sloan Digital Sky Survey (SDSS). For training a neural network, we randomly sampled the SDSS data with stellar parameters available from SEGUE Stellar Parameter Pipeline (SSPP) to cover the parameter space as wide as possible. We selected stars that are not included in the training sample as validation sample to determine the accuracy and precision of each parameter. We also divided the training and validation samples into four groups that cover signal-to-noise ratio (S/N) of 10-20, 20-30, 30-50, and over 50 to assess the effect of S/N on the parameter estimation. We find from the comparison of the network-driven parameters with the SSPP ones the range of the uncertainties of 73~123 K in Teff, 0.18~0.42 dex in log g, and 0.12~0.25 dex in [Fe/H], respectively, depending on the S/N range adopted. We conclude that these precisions are high enough to study the chemical and kinematic properties of the Galactic disk and halo stars, and we will attempt to apply this technique to Large Sky Area Multi-Object Fiber Spectroscopic Telescope (LAMOST), which plans to obtain about 8 million stellar spectra, in order to estimate stellar parameters.

[포 IM-03] SED modeling of the Class 0 protostar L1527 IRS

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We model the spectral energy distribution (SED) of the Class 0 protostar L1527 IRS using a dust continuum radiative transfer code RADMC-3D to study the initial condition of gravitational collapse. To constrain the envelope structure, we use the data obtained by Herschel /PACS, which covers the far-infrared regime (55 – 190 μm) where the SED of L1527 IRS peaks. According to our modeling, a more flattened density profile fits the far-infrared SED of L1527 IRS better than the density profile of a rotating and infalling envelope. Thus, we employ the density structure of a Bonnor-Ebert sphere, which consists of the inner flat-topped and the outer power-law regions and is