chemistry. We present line profiles and maps of H2O using data from two guaranteed-time key programs “Water In Star-forming regions with Herschel” and “Herschel observations of EXtra-Ordinary Sources”. We analyze the temperature and density structures using LTE and non-LTE methods. We also estimate turbulent and expansion velocities, and abundance of water in the inner and outer envelopes using the 1D radiative transfer code. Around high-mass protostars we find H2O abundances of ~10-8-10-9 for the outer envelope and ~10-4-10-5 for the inner envelope, and expansion and turbulent velocities range from 1.0 km s-1 to 2.0 km s-1. The abundances and kinematic parameters of the sources do not show clear trends with evolutionary indicators. The Herschel/HIFI mapping observations of H2O toward the Orion Bar PDR show that H2O emission peaks between the shielded dense gas and the radicals position, in agreement with the theoretical and the observational PDR structure. The derived H2O abundance is ~10-7 and peaks at the depth of AV ~8 mag from the ionization front. Together with the low ortho-to-para ratio of H2O (~1) presented by Choi et al. (2014), our results show that the chemistry of water in the Orion Bar is dominated by photodesorption and photodissociation.

## 관측자료

### [구 AT-01] IGRINS : 1st Year Operation & Future Plan

Jae-Joon Lee (이재준), Hwihyun Kim (김휘현), Narae Hwange (황나래), Chan Park (박찬), Byeong-Gon Park (박병곤)
*Korea Astronomy and Space Science Institute (한국천문연구원)*

After successful commissioning observations in 2014, Immersion Grating Infrared Spectrograph (IGRINS) has been conducting its normal scientific operations on the 2.7m Harlan J. Smith telescope at the McDonald Observatory and has been producing high spectral resolution near-infrared spectroscopic data in excellent quality. We will present the current status of the instrument and its software packages, and highlight initial scientific results. In particular, we will discuss possibilities of having IGRINS on larger telescopes.

### [구 AT-02] Photometric Transformation from RGB Bayer Filter System to Johnson-Cousins BVR Filter System

Woojin Park[1], Soojong Pak[1], Hyunjin Shim[2], Huynh Anh N. Le[1], Myungshin Im[3], Seunghyuk Chang[4], Joonkyu Yu[5]
*[1]School of Space Research and Institute of Natural Sciences, Kyung Hee University, Yongin, Gyeonggi 446-701, Korea, [2]Department of Earth Science Education, Kyungpook National University, Buk-gu, Daegu 702-701, Korea,*
*[3]CEOU, Astronomy Program, Department of Physics & Astronomy, Seoul National University, Gwanak-gu, Seoul, Korea, [4]Center for Integrated Smart Sensors, Korea Advanced Institute of Science and Technology (KAIST), Gangnam-gu, Seoul 135-854, Korea, [5]Hwasangdae Observatory, Hongcheon-gun, Gangwon-do 250-862, Korea*

The RGB Bayer filter system consists of a mosaic of R, G, and B filters on the grid of the photo sensors which typical commercial DSLR (Digital Single Lens Reflex) cameras and CCD cameras are equipped with. Lot of unique astronomical data obtained using an RGB Bayer filter system are available, including transient objects, e.g. supernovae, variable stars, and solar system bodies. The utilization of such data in scientific research requires that reliable photometric transformation methods are available between the systems. In this work, we develop a series of equations to convert the observed magnitudes in the RGB Bayer filter system (RB, GB, and BB) into the Johnson-Cousins BVR filter system (BJ, VJ, and RC). The new transformation equations derive the calculated magnitudes in the Johnson-Cousins filters (BJcal, VJcal, and RCcal) as functions of RGB magnitudes and colors. The mean differences between the transformed magnitudes and original magnitudes, i.e. the residuals, are (BJ - BJcal) = 0.064 mag, (VJ - VJcal) = 0.041 mag, and (RC - RCcal) = 0.039 mag. The calculated Johnson-Cousins magnitudes from the transformation equations show a good linear correlation with the observed Johnson-Cousins magnitudes.

### [구 AT-03] Measuring AGN Core-shift Effect by Extended KVN with Global Baselines

Taehyun Jung[1,2], Richard Dodson[3], Seog-Tae Han[1], Do-Young Byun[1], Bong Won Sohn[1,2], Maria J. Rioja[3,4,7], Mareki Honma[5], Jamie Stevens[6], Pablo de Vincente[7]
*[1]Korea Astronomy & Space Science Institute, Korea,*