Heeyoung Oh

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EDUCATION

Ph. D., Astronomy & Space Science
Korea University of Science Technology, Daejeon, Korea — August 2016
THESIS - Optical & Near-Infrared Spectroscopy of Jets from Young Stellar Objects

M. S., Space Research
Kyung Hee University, Suwon, Korea — August 2010
THESIS - Calibration System for IGRINS, a High Resolution Near-IR Spectrograph

B. S., Astronomy & Space Science
Kyung Hee University, Suwon, Korea — August 2008

ACADEMIC EXPERIENCE

Korea Astronomy & Space Science Institute, Senior Researcher	2019 Dec. – Present
Korea Astronomy & Space Science Institute, Postdoctoral Researcher	2017 – 2019
Seoul National University, Postdoctoral Researcher	2016 – 2017
Korea Astronomy & Space Science Institute, Research Assistant	2009 – 2010

PROFESSIONAL SOCIETIES

American Astronomical Society	2010
Korean Astronomical Society	2009 – Present
Korean Space Science Society	2009 – Present

ASTRONOMICAL INSTRUMENTATION

Immersion GRating INfrared Spectrograph (IGRINS)

- Opto-mechanical mounts of slit-viewing camera system: cryogenic mount design, 3D drawing, structure analysis, fabrication, parts inspection, assemble.
- Wavelength calibration system: selection/purchase/install of calibration sources, mechanical design, drawing, fabrication, assemble, and test.

Giant Magellan Telescope Near-InfraRed Spectrograph (GMTNIRS)

- Design of opto-mechanical mounts of input-relay, slit mirror, filter, dichroic lenses in Conceptual Design Review (CoDR) in 2011.

SCIENTIFIC RESEARCH

:Study of Jets & Outflows from Young Stellar Objects with Optical & Near-infrared Spectroscopy

Multiple-outflows around Herbig Ae/Be star

- High-resolution near-infrared spectroscopy (molecular hydrogen & forbidden iron emission lines)
- Bow-shock kinematics and excitation condition

- Revealing of new infrared jet and identification of driving source

Explosive Outflows in Massive star Forming Region (Orion KL)
- Construction of datacubes with slit-scannig of near-infrared spectrograph
- Shock condition, Kinematics of finger-shaped outflows and their distributions in 3D space
- Internal extinction in dense molecular cloud

Parsec-scale Jets from T-Tauri & Intermediate-mass Stars
- Optical spectroscopy of Hα, forbidden emission lines (oxygen, nitrogen, sulfur)
- Kinematics, launching mechanism
- Physical parameters along the jet (ionization fraction, electron density, temperatures)
- Characteristics depend on the mass of driving source

OBSERVATION & DATA REDUCTION

Observation
- Immersion GRating INfrared Spectrograph (IGRINS), McDonald 2.7-m HJS Telescope
- Bohyun Mountain Observatory Echelle spectrographs (BOES, optical long-slit & fiber spectrograph), BOAO 1.8-m Telescope
- KASI Near Infrared Camera System (KASINICS), BOAO 1.8-m Telescope
- The Infrared Camera and Spectrograph (IRCS), Subaru Telescope, observing assistant
- Electronic Spectrograph No. 2 (ES2), McDonald 2.1-m Otto Struve Telescope, observing assistant

Data Reduction
- High-resolution near-infrared echelle spectra (IGRINS, IRCS)
- Optical long-slit spectra (Bohyun Mountain long-slit spectrograph, Magellan LDSS3)

COMPUTER SKILLS

Astronomical Data Reduction and Coding Tools
- Image Reduction and Analysis Facility (IRAF)
- Interactive Data Language (IDL)
- Python scripts

Image & TeX Editors
- Adobe Illustrator, Photoshop, Flash, Mac Inkscape
- TeXShop, WinEdit

3D Modeling & Optical Design Tools
- Solidworks: Advanced use for astronomical instruments design & structure analysis
- Autodesk Inventor, CAD
- ZEMAX: Design & optimization of simple optics

Operating Systems
- Mac OS X, Linux, Microsoft Windows

HONORS

Oversea training program, UST	May – July 2015
Excellent poster presentation, KAS Meeting	April 2014
The best presentation, K-GMT Summer School	August 2013

PUBLICATIONS

In Refereed Journals

- López-Valdivia, R., Mace, G. N., Sokal, K. R., et al. 2019, "Effective Temperatures of Low-mass Stars from High-resolution H-band Spectroscopy", ApJ, 879, 105 ADS
- Lim, B., Sung, H., Bessell, M. S., et al. 2018, "Kinematic evidence for feedback-driven star formation in NGC 1893", MNRAS, 477, 1993 ADS
- **Oh, H.**, Pyo, T.-S., Koo, B.-C., et al. 2018, "High-resolution Near-IR Spectral Mapping with H_2 and [Fe II] Lines of Multiple Outflows around LkHα 234", ApJ, 858, 23 ADS
- Sokal, K. R., Deen, C. P., Mace, G. N., et al. 2018, "Characterizing TW Hydra", ApJ, 853, 120 ADS
- Lyo, A.-R., Kim, J., Lee, J.-J., et al. 2017, "Inner Warm Disk of ESO Hα 279a Revealed by NA I and CO Overtone Emission Lines", ApJ, 844, 4 ADS
- Le, H. A. N., Pak, S., Kaplan, K., et al. 2017,"Fluorescent H_2 Emission Lines from the Reflection Nebula NGC 7023 Observed with IGRINS", ApJ, 841, 13 ADS
- Kaplan, K. F., Dinerstein, H. L., **Oh, H.**, et al. 2017, "Excitation of Molecular Hydrogen in the Orion Bar Photodissociation Region from a Deep Near-infrared IGRINS Spectrum", ApJ, 838, 152 ADS
- **Oh, H.**, Pyo, T.-S., Kaplan, K., et al. 2016, "Three-dimensional Shock Structure of Orion KL Outflow with IGRINS", ApJ, 833, 275 ADS
- Afşar, M., Sneden, C., Frebel, A., et al. 2016, "The Chemical Compositions of Very Metal-poor Stars HD 122563 and HD 140283: A View from the Infrared", ApJ, 819, 103 ADS
- **Oh, H.**, Pyo, T.-S., Yuk, I.-S., et al. 2016, "IGRINS Near-IR High-resolution Spectroscopy of Multiple Jets around LkHα 234", ApJ, 817, 148 ADS
- **Oh, H.**, Pyo, T.-S., Yuk, I.-S., & Park, B.-G. 2015, "Long-Slit Spectroscopy of Parsec-Scale Jets from DG Tauri", JKAS, 48, 113 ADS
- Oh, J. S., Park, C., Kim, K.-M., et al. 2015, "Igrins Mirror Mount Design for Five Flat Mirrors", PKAS, 30, 17 ADS
- Oh, J. S., Park, C., Cha, S.-M., et al. 2014, "Detector Mount Design for IGRINS", JASS, 31, 177 ADS
- Ko, K., Han, J.-Y., Nah, J., et al. 2013, "Precise Prediction of Optical Performance for Near Infrared Instrument Using Adaptive Fitting Line", JASS, 30, 307 ADS
- Rukdee, S., Park, C., Kim, K.-M., et al. 2012, "IGRINS Mirror Mount Design for Three Off-Axis Collimators and One Slit-Viewer Fold Mirror", JASS, 29, 233 ADS

Conference Proceedings, Presentations, and Telegrams

- Mace, G., Sokal, K., Lee, J.-J., et al. 2018, "IGRINS at the Discovery Channel Telescope and Gemini South", Proc. SPIE, 107020Q ADS
- Pyo, T.-S., **Oh, H.**, Yuk, I.-S., Kim, H., & Davis, C. J. 2015, "IGRINS K-band High-Resolution Spectroscopy of the FU Ori Type Object 2MASS J06593158-0405277", ATel, 6901 ADS
- Szentgyorgyi, A., Barnes, S., Bean, J., et al. 2014, "A preliminary design for the GMT-Consortium Large Earth Finder (G-CLEF)", SPIE, 9147, 914726 ADS
- Jeong, U., Chun, M.-Y., Oh, J. S., et al. 2014, "Characterization and optimization for detector systems of IGRINS", SPIE, 9154, 91541X ADS
- Park, C., Jaffe, D. T., Yuk, I.-S., et al. 2014, "Design and early performance of IGRINS (Immersion Grating Infrared Spectrometer)", SPIE, 9147, 91471D ADS
- **Oh, H.**, Pyo, T.-S., Yuk, I.-S., & Park, B.-G. 2014, "Optical Long-slit Spectroscopy of Parsec-scale Jets from DG Tau", BKAS, 39, 2, 75
- **Oh, H.**, Pyo, T.-S., Yuk, I.-S., et al. 2013, "Optical Long-slit Spectroscopy of Parsec-scale Jets", BKAS, 38, 1, 55

- **Oh, H.**, Yuk, I.-S., Park, C., et al. 2011, "Opto-Mechanical Design of IGRINS Slit-viewing Camera Barrel", Bulletin of the Korean Space Science Society, 20, 1, 31
- Lee, S., Yuk, I.-S., Lee, H., et al. 2010, "GMTNIRS (Giant Magellan Telescope near-infrared spectrograph): design concept", SPIE, 7735, 77352K ADS
- Yuk, I.-S., Jaffe, D. T., Barnes, S., et al. 2010, "Preliminary design of IGRINS (Immersion GRating INfrared Spectrograph)", SPIE, 7735, 77351M ADS
- **Oh, H.**, Pak, S., Yuk, I., et al. 2010, "The Calibration System for IGRINS, a High Resolution Near-IR Spectrograph", AAS, 216, 415.10 ADS
- Kim, E., Park, W., Lim, J., et al. 2010, "Camera for Quasars in the Early Universe (CQUEAN)", AAS, 216, 415.09 ADS