CV

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Professional Experience

Postdoctoral Researcher, ifA, Hawai'i, USA (2025.01-2027)

- Supporting Pan-STARRS Image Processing Pipeline, conducting independent research on transient science

Postdoctoral Researcher, Seoul, South Korea (2024.09-12)

- Research focused on GW follow-up observations, transient classification, and pipeline development for 7-Dimensional Telescope and Sky Survey (7DT/7DS)

Research Interests

Observational Astronomer looking for the transient in Gravitational-wave Multi-messenger era

- Gravitational-wave Optical Follow-up Observation Strategy and Development of Data Reduction Pipeline
- The Diversity and Physics of Kilonova as an Optical Counterpart of Gravitational Wave and Gamma-ray Burst
- Deep Learning in Transient Search: Real/Bogus Classification, Kilonova classification with Photometric SED

Awards

- **Winner of poster prizes at GWPAW Melbourne ($1,000 AUD) - OzGrav 2022.12.09 (Webpage)**

Participation of Observation Proposal as CI

- Im, M., ..., Paek, G. S. H., et al. 2018B, 2020A, 2022B, 2023A, 2023B, Gemini (Flamingos2, GNIRS, NIRI, GMOS South/North), Queue + Rapid ToO: *Optical/NIR Follow-up Observational Study of Gravitational Wave Sources, and Long-term Optical/NIR Monitoring of Gravitational-wave Sources*
- Im, M., ..., Paek, G. S. H., et al. 2020-10-01 to 2023-09-30, 2024-01-01 to 2026-12-31, KMTNet, ToO: *Multi-Messenger Astronomy with KMTNet*
- Im, M., ..., Paek, G. S. H., et al. 2020-10-01 to 2023-09-30, Wide-Field Survey: *KMTNet Synoptic Survey of Southern Sky (KS4)*
- Im, M., ..., Paek, G. S. H., et al. 2020B, BOAO ToO: *Gamma-Ray Burst Optical Afterglows, and Follow-up observation of energetic transients*
- Im, M., ..., Paek, G. S. H., et al. 2019A, UKIRT ToO: *Follow-up Observation of Energetic Transients and UKIRT Multi-Messenger Astronomy*

Observational Experience

- **Over 70 nights of observational experience in optical/NIR astronomy**
- Commission Observation of 7-Dimensional Telescope (7DT)
  - 0.5m Telescope (Moravian C3-61000, optical imager) @ObsTech (Chile, USA) - 2 nights in 2023B (remote)
- Monitoring and Following up **SNe**, and **other transients** (GRB, FBOT, ...)
  - 0.36m Telescope (SBIC STX16803, optical imager) @DeepSkyChile (Chile, USA) – 2 nights in 2020B (remote)
  - 1.0m Telescope (SBIC STX16803, optical imager) @Seoul National University Astronomical Observatory (Seoul, South Korea) - 3 nights in 2019, and 10 nights in 2018
  - 1.5m Telescope (SNUCAMII, optical/NIR imager) @Maidanak Observatory (Tashkent, Uzbekistan) – 6 nights in 2018A
  - 30inch Telescope (Loral Fairchild CCD, optical imager) @McDonald Observatory (Texas, USA) – **38 nights** in 2016B-2020A (Remote and on-site observation)
- Confirmation **Quasar** Candidates
  - 1.8m Telescope (BOES, spectroscopy) @Bohyunsan Optical Astronomy Observatory (Yeongcheon, South Korea) – 4 nights in 2022B
  - 2.1m Telescope (SQUEAN, optical/NIR imager) @McDonald Observatory (Texas, USA) – 10 nights in 2019A

Conferences and Workshops

- "GECKO and 7DT: Gravitational-Wave Optical Follow-up Observation Campaign in Korea" (Invited talk) 69th Workshop on Gravitational Waves and Numerical Relativity; Pohang, South Korea – 2023.06.14
- "GW EM Counterpart Korean Observatories (GECKO) with 7DT and prospects in LVK O4 run" (Invited talk) The 9th KAGRA International Workshop (KIW9); Remote – 2022.06.08
- 6 oral talks and 3 posters in international conferences: Rubin Community Workshop 2024, GWPAW, Is-Ko-Space 2023 and IAUS 363
- 12 oral talks and 3 posters in Korean Astronomical Society Meeting, and 8 talks in domestic conferences

Outreach Experience

- Public Lecture: "The Gravitational Wave Hunter and the Secret of Gold Mine of the Galaxy", Seoul National University, 2024.09.14
- 2 Panel Discussions as a Student Research Representative; Ministry of Science and ICT, and The National Science Challenges Support & Network, 2022 (Webpage and YouTube link)
- "Data Reduction for Astronomical image" (Invited talk) – 2022 KAO Summer Camp; Korea Astronomy Olympiad (KAO), 2022.07.19, 25
- "The Space Miner, Astronomer, looking for the gold!" (Public Talk) – 2021 Science Culture Program Business Matching Day; Ministry of Science and ICT, 2021.11.28
- Student Teaching Assistant at Seoul National University
  - Course: Extraterrestrial Planets and Life (Graduate) 2017B, 2018A, 2020A
- Special Lecture on Academic Presentations, 2023.11.22
  - aimed at graduate students and postdoctoral researchers within the university.

Skills and Certifications

- **Programing**: Python (expert)
- **Development of pipeline**
  - Automatic pipeline for the optical/NIR data reduction, photometry, and transient search (gpPy)
  - Same function with a gpPy, but utilizing the GPU for faster processing of 7 Dimensional Telescope (gpPy+GPU)
  - Automatic real-time GW alert receiver for GW optical follow-up (GeckoDigestor)
- **Software**
  - Image Process: **SExtractor**, **HOTPANTs**, Astrometry.net, SCAMP, MissFITS, SWarp, WCSremap, astroscrappy, IRAF, and PyRAF
  - Others: scikit-learn (ML), ligo.skymap (GW), healpy (GW), astropy, astroplan, ds9, sklearn (ML), EAZY (phot-z)
- Managers for CentOS, and Ubuntu Research Servers (2022-)
- National Certification: **Engineer Big Data Analysis** (link), and Advanced Data Analytics Semi-Professional (link), and the Advanced Science Convergence Lecture Course (link)
- Driving License: Class 2 Regular (South Korea), with experience in driving 4WD vehicles

Publications

1. **Paek, G. S. J.**, Im, M.,et al. 2024, submitted in ApJ: GECKO Follow-up Observation of the Binary Neutron Star-Black Hole Merger Candidate S230518h
2. **Paek, G. S. H.**, Im, M., Kim, J., et al. 2024, ApJ, 960, 113: Gravitational-wave Electromagnetic Counterpart Korean Observatory (GECKO): GECKO Follow-up Observation of GW190425 (**ApJ**)

Other Refereed Papers

(Link to ADS Link)

3. Gu, Lim, Changsu Choi, Myungshin Im, Sung-Chul Yoon, **Paek, G. S. H.**, et al. submitted in JKAS: *High-cadence Optical Observations of a Normal Type Ia Supernova 2018kp from its Early Phase*
4. Taak, Donggeun, Uhm Z. Lucas, **Paek, G. S. H.**, and Im, M., et al. accepted in ApJ: *Multi-wavelength analysis on the early afterglow of the extremely bright GRB 221009A*
5. Gu, Lim, Im, M., **Paek, G. S. H.**, et al. *2024 submitted in ApJ: The Early Light Curve of a Type Ia Supernova 2021hpr in NGC 3147: Progenitor Constraints with the Companion Interaction Model*
6. Kann, D. A., White, N. E., Ghirlanda, G., Oates, S. R., Melandri, A., Jelínek, M., de Ugarte Postigo, A., Levan, A. J., Martin-Carrillo, A., **Paek, G. S.-H.**, *et al. 2024, A&A, 686, A56: Fires in the deep: The luminosity distribution of early-time gamma-ray-burst afterglows in light of the Gamow Explorer sensitivity requirements*
7. Yang, Y., ..., **Paek, G. S. H.**, et al., *2024, Nature, 626, 742-745: A Lanthanide-rich Kilonova in the Aftermath of a Long Gamma-ray Burst*

8. Becerra, R. L., ..., **Paek, G. S. H.**, *et al. 2023, MNRAS, 522, 5204-5216: Deciphering the Unusual Stellar Progenitor of GRB 210704A*
9. Gu, Lim, Im, M., **Paek, G. S. H.**, et al. 2023, ApJ, 949, 33: *The Early Light Curve of a Type Ia Supernova 2021hpr in NGC 3147: Progenitor Constraints with the Companion Interaction Model*
10. Masterson, Megan, ..., **Paek, G. S. H.**, et al. 2023, ApJL, 945, 34: *Unusual Hard X-Ray Flares Caught in NICER Monitoring of the Binary Supermassive Black Hole Candidate AT2019cuk/Tick Tock/SDSS J1430+2303*
11. Kim, Joonho, Im, M., **Paek, G. S. H.**, et al. 2021, ApJ, 916, 47K: *GECKO Optical Follow-up Observation of Three Binary Black Hole Merger Events: GW190408_181802, GW190412, and GW190503_185404*
12. Im, M., ..., **Paek, G. S. H.**, et al. 2021, JKAS, 54, 89I: *SomangNet: Small Telescope Network of Korea*
13. Kim, Y., ..., **Paek, G. S. H.**, et al. 2020, ApJ, 904, 111K: *The Infrared Medium-deep Survey. VIII. Quasar Luminosity Function at $z \sim 5$*
14. Shin, S., ..., **Paek, G. S. H.**, et al. 2020, ApJ, 893, 45S: *The Infrared Medium-deep Survey. VII. Faint Quasars at $z \sim 5$ in the ELAIS-N1 Field*
15. Im, M., ..., **Paek, G. S. H.**, et al. 2019, JKAS, 52, 11I: *Intensive Monitoring Survey of Nearby Galaxies (IMSNG)*

Others

Transient Reports (Link to ADS Library)

- The Gamma-ray Coordinates Network (GCN) Circulars Archive, 55 in total (25 as first author)

Medical Field (Link to ADS Library)

- Woo, Soo Jin, et al. 2025, *Correction of Congenital Syndactyly of the Hand with Minimal Full-Thickness Skin Graft from the Weight-Bearing Midline Plantar Area - participated in imaging analysis and statistics*