Seho Kim

Hawai'i Institute of Geophysics and Planetology
University of Hawai'i at Mānoa
sehokim@hawaii.edu

Last Update: November 2026
kimlab.space
ORCID: 0000-0001-9227-062X, Google Scholar

EMPLOYMENT

Hawai'i Institute of Geophysics and Planetology, University of Hawai'i at Mānoa, Honolulu, HI
Assistant Professor Jan 2026 - Present
Faculty Member, Hawai'i Space Flight Laboratory
Cooperating Graduate Faculty, Department of Earth Sciences

Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA
Postdoctoral Fellow in Radio Science and Solar System Radar Group Aug 2023 - Dec 2025

Korea Aerospace University, Goyang, South Korea
Research Assistant in Unmanned Systems Control Laboratory 2018

EDUCATION

Purdue University, West Lafayette, IN
Ph.D. in Aeronautics and Astronautics (Astrodynamics and Space Applications) 2023
Dissertation: *Multiple Signals of Opportunity for Land Remote Sensing*

Korea Aerospace University, Goyang, South Korea
M.S. in Electronic and Information Engineering 2018
B.S. in Electronics and Avionics Engineering, *magna cum laude* 2016

RESEARCH FIELDS

Radio Remote Sensing, Signals of Opportunity, GNSS-Reflectometry, Radio Occultation, Space Mission Design and Analysis, Spacecraft Systems

GRANTS AND FUNDING

Total funding awarded: **$138.09K** (external $90K; internal $48.09K)

Funded

Science-PI, "Developing a Radio Occultation Tool for Magnetic Field Observations at Jupiter," Innovative Spontaneous Concepts Program (internal), JPL. **$48.09K** 2025

Future Investigator (PI: J. L. Garrison), "Assessing the Impact of Root Zone Soil Moisture Observations Using Multi-Frequency Signals of Opportunity on Agricultural Drought Risk Estimation," ROSES Future Investigators in NASA Earth and Space Science and Technology (NNH20ZDA001N-FINESST, 20-EARTH20-274), NASA. **$90K** over 2 years 2021 – 2023

PROJECTS

Advisor, HITechSat-1 (HTS-1) CubeSat Mission, Hawai'i Space Flight Laboratory, UH Mānoa	2026 – Present
Member, "SmallSat Snow and Ice Thickness Sensing (SITS)," ROSES Commercial Smallsat Data Scientific Analysis (NNH22ZDA001N-CSDSA), NASA	2024 – 2025
Member, "Planetary Seismology in the Outer Solar System," President's and Director's Research and Development Fund, JPL	2024 – 2025
Member, SMAP-Reflectometry Team, NASA	2024 – 2025
Member, New Horizons Phase-E Radio Science Team, NASA	2023 – 2024
Member, "Probing the Small-scale Atmospheric Features of Saturn by Using Slepian Functions to Interpret Cassini Gravity Science Data," ROSES Cassini Data Analysis Program (NNH21ZDA001N-CDAP), NASA	2023 – 2024
Member, "SNOOPI: SigNals-Of-Opportunity P-band Investigation," ROSES In-Space Validation of Earth Science Technologies (InVEST) Program (NNH17ZDA001N), NASA	2018 – 2021
Team Lead, Korea Aerospace University CubeSat (VisionCube) Team, National Research Foundation of Korea	2015 – 2018

PUBLICATIONS

1. **S. Kim**, D. Buccino, N. Rodriguez-Alvarez, M. Parisi, W. Majid, and K. Oudrhiri, "Faraday Rotation as a Probe of Jupiter's Magnetic Field: Error Modeling and Sensitivity Analysis," *The Planetary Science Journal*, 7(8), 2026. doi: 10.3847/PSJ/ae939c
2. **S. Kim**, N. Rodriguez-Alvarez, and K. Oudrhiri, "Sea-Ice Thickness Retrieval Using Integrated Grazing-Angle and Near-Nadir GNSS-R Reflectivity from the Spire Constellation," *IEEE Transactions on Geoscience and Remote Sensing*, vol. 64, 2026. doi: 10.1109/TGRS.2026.3714677
3. M. Parisi, **S. Kim**, C. Mankovich, J. Fuller, A. J. Friedson, and S. Markham, "A Multiarc Approach to Detecting Uranus's Normal Modes via Doppler Tracking of a Planetary Orbiter," *The Planetary Science Journal*, 6(12), 2025. doi: 10.3847/PSJ/ae271e
4. **S. Kim**, M. Parisi, C. Mankovich, D. Buccino, and O. Yang, "Saturn's small-scale winds revealed by its high-degree gravity field," *Geophysical Research Letters*, 52(5), e2024GL113236, 2025. doi: 10.1029/2024GL113236
5. J. L. Garrison et al., "SNOOPI: Demonstrating Earth remote sensing using P-band signals of opportunity (SoOp) on a CubeSat," *Advances in Space Research*, vol. 73, issue 6, pp 2855-2879, 2024. doi: 10.1016/j.asr.2023.10.050
6. **S. Kim**, J. L. Garrison, and M. Kurum, "Retrieval of Subsurface Soil Moisture and Vegetation Water Content from Multi-frequency SoOp-Reflectometry: Sensitivity Analysis," *IEEE Transactions on Geoscience and Remote Sensing*, vol. 61, 2023. doi: 10.1109/TGRS.2023.3284800
7. T. Nam, **S. Kim**, and D. Jung, "Hardware Implementation of KLT Tracker for Real-time Intruder Detection and Tracking using On-board Camera," *International Journal of Aeronautical and Space Sciences*, 20(1):300-314, 2019. doi: 10.1007/s42405-018-0131-2

8. **S. Kim**, T. Nam, and D. Jung, "Experimental Validation of the Onboard Transient Luminous Events Observation System for VisionCube via Ground Simulation Environment," *Aerospace*, 5(4):100, 2018. doi: 10.3390/aerospace5040100

CONFERENCE PAPERS

1. **S. Kim** et al., "HITechSat-1: A Rapidly Integrable 3U Platform for University CubeSat Missions," *Proceedings of the AIAA/USU Conference on Small Satellites*, 2026, SSC26-P4-87-2.
2. **S. Kim** and J. L. Garrison, "A mission design tool for satellite constellations using multi-frequency signals of opportunity," *2023 IEEE International Geoscience and Remote Sensing Symposium (IGARSS)*, 2023, pp. 4218-4221. doi: 10.1109/IGARSS52108.2023.10281817
3. J. L. Garrison et al., "Instrument Science Experiments on the SNOOPI P-Band Reflectometry Mission," *2022 IEEE International Geoscience and Remote Sensing Symposium (IGARSS)*, 2022, pp. 7146-7149. doi: 10.1109/IGARSS46834.2022.9883233
4. **S. Kim**, E. P. Smith, B. R. Nold, A. S. Choudhari and J. L. Garrison, "Multi-Frequency Signals of Opportunity Soil Moisture Retrievals for Agricultural Applications," *2022 IEEE International Geoscience and Remote Sensing Symposium (IGARSS)*, 2022, pp. 4204-4207. doi: 10.1109/IGARSS 46834.2022.9883090
5. J. Mansell, E. Rivera, **S. Kim** et al., "Snooping Around: Observation Planning for the Signals of Opportunity P-Band Investigation (SNOOPI)." *Proceedings of the AIAA/USU Conference on Small Satellites*, 2022, SSC22-WKVIII-04.
6. J. L. Garrison et al., "SNOOPI: Demonstrating P-band reflectometry from orbit," *2021 IEEE International Geoscience and Remote Sensing Symposium (IGARSS)*, 2021, pp. 164-167. doi: 10 .1109/IGARSS47720.2021.9554546
7. **S. Kim** and J. L. Garrison, "Retrieval of root-zone soil moisture profiles from multi-frequency signals of opportunity: A simulation study," *2021 IEEE International Geoscience and Remote Sensing Symposium (IGARSS)*, 2021, pp. 155-158. doi: 10.1109/IGARSS47720.2021.9554561
8. J. L. Garrison, R. Shah, **S. Kim** et al., "Analyses Supporting SNOOPI: a P-Band Reflectometry Demonstration," *2020 IEEE International Geoscience and Remote Sensing Symposium (IGARSS)*, 2020, pp. 3349-3352. doi: 10.1109/IGARSS39084.2020.9323547
9. **S. Kim** and J. L. Garrison, "Development of an End-to-End Mission Simulator for Land Remote Sensing with Signals of Opportunity," *2020 IEEE International Geoscience and Remote Sensing Symposium (IGARSS)*, 2020, pp. 5933-5936. doi: 10.1109/IGARSS39084.2020.9323710

CONFERENCE ABSTRACTS AND PRESENTATIONS

1. **S. Kim**, M. Parisi, C. Mankovich, D. Buccino, and O. Yang, "Unveiling Saturn's Small-scale Winds from Its High-degree Gravity Field based on Slepian Functions," *2024 AGU Fall Meeting*, 2024
2. M. Parisi et al., "Gravitational Seismology with the Uranus Orbiter and Probe mission," *2024 AGU Fall Meeting*, 2024
3. **S. Kim**, M. Parisi, D. R. Buccino, O. Yang, C. R. Mankovich, E. Galanti, Y. Kaspi, "Estimating the High-Degree Gravity Field of Saturn Using Slepian Functions," *55th Lunar and Planetary Science Conference*, 2024
4. J. L. Garrison et al., "Toward Spaceborne P-band Remote Sensing of the Water Cycle using Signals of Opportunity (SoOp)," *Chapman Conference on Remote Sensing of the Water Cycle*, AGU, 2024

5. E. Smith, B. Nold, **S. Kim** et al., "Algorithm Development and Calibration Activities for the SNOOPI Mission," *Chapman Conference on Remote Sensing of the Water Cycle*, AGU, 2024
6. J. L. Garrison et al., "Development and validation of a physics-based root-zone soil moisture retrieval algorithm for multi-frequency dual-polarization (MFDP) signals of opportunity (SoOp) observations," *104th American Meteorological Society (AMS) Annual Meeting*, 2024
7. J. L. Garrison, B. Nold, **S. Kim** et al., "Signals of Opportunity Reflectometry at Multiple Frequencies and Polarizations: Simulation Studies and Instrument Validation," *2023 International Conference on Electromagnetics in Advanced Applications (ICEAA)*, 2023, pp. 470. doi: 10.1109/ICEAA57318.2023.10297637
8. **S. Kim**, J. L. Garrison, and M. Kurum, "Sensitivity of Root-zone Soil Moisture Retrieval to Observation Parameters in Signals of Opportunity Reflectometry," *2022 AGU Fall Meeting*, 2022
9. J. L. Garrison et al., "Remote Sensing of the water cycle using Signals of Opportunity: challenges and opportunities," *Frontiers in Hydrology 2022*, 2022, 527-04. doi: 10.1002/essoar.10511772.1
10. J. L. Garrison et al., "Hydrology Remote Sensing using P-band Signals of Opportunity (SoOp), the SNOOPI Demonstration Mission," *2021 AGU Fall Meeting*, 2021
11. J. L. Garrison et al., "Sub-surface Soil Moisture Profile Retrieval using Multi-frequency Signals of Opportunity," *2021 AGU Fall Meeting*, 2021

SCHOLARSHIPS AND AWARDS

Future Investigators in NASA Earth and Space Science and Technology (FINESST), NASA	2021
Award for successfully developing and launching CubeSat, Korea Aerospace Research Institute	2019
Ross Fellowship, Purdue University	2018
Graduate scholarships for outstanding academic performance, Korea Aerospace University	2016, 2017
Winner of CubeSat Competition, National Research Foundation of Korea	2015
Awards for 2nd rank GPA in the Department, Korea Aerospace University	2015
Hanjin Group Scholarship for 1st rank GPA in the Department, Korea Aerospace University	2015

INVITED TALKS

Brain Korea 21 Seminar, Korea Aerospace University	May 2026
Space Challenge Technology Seminar, Korea Aerospace University	Jan 2023, May 2025

TEACHING EXPERIENCE

Lecturer, EPET/ME 401 Capstone Project: Producing a Science Satellite, UH Mānoa	Fall 2026
Lecturer, EPET/ME 400 Space Mission Design, UH Mānoa	Spring 2026
Invited Lecturer, AAE 450 Spacecraft Design, Purdue University	Fall 2022, 2023, 2024
Mentor, AAE 497 Earth Observation Mission Design, Purdue University	Spring 2021
Mentor, AAE 597 Earth Observation Mission Design, Purdue University	Fall 2020
Mentor, AAE 450 Spacecraft Design, Purdue University	Fall 2020
TA, Electric Circuits II, Korea Aerospace University	Fall 2017
TA, Introduction to Avionics, Korea Aerospace University	Spring 2016, 2017
Lab Instructor, Introduction to Engineering Design, Korea Aerospace University	Fall 2015

PROFESSIONAL SERVICE

Reviewer, Earth Science Informatics, Springer Nature	Since 2026
Reviewer, AGU Earth and Space Science	Since 2025
Reviewer, IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing	Since 2024
Reviewer, IEEE Transactions on Geoscience and Remote Sensing	Since 2022
Reviewer, IEEE International Geoscience and Remote Sensing Symposium (IGARSS)	Since 2022
Session Manager, IEEE IGARSS 2023 Session "Advanced Concepts for Signals of Opportunity"	Jul, 2023
Vice-President, Purdue Korean Association of Aerospace Engineers	2019 – 2020

PROFESSIONAL MEMBERSHIPS

Member, IEEE Geoscience and Remote Sensing Society (GRSS)	2020 – Present
Member, American Geophysical Union (AGU)	2022 – Present

LANGUAGE AND SKILLS

Language: English (fluent), Korean (native)
Theories: Remote Sensing, Astrodynamics, GNSS, Spacecraft Attitude Dynamics, Spacecraft Engineering and Mission Design, Control Systems, Electromagnetics, Optimization, Estimation, Signal Processing
Technical skills: MONTE, C/C++, Python, MATLAB, Git, Linux, STK, GMAT, SPICE, Verilog-HDL, VHDL, Altium, Inventor, LaTeX

PATENT

D. Jung and **S. Kim**, "Apparatus and Method for Observing Optical Events," South Korea Patent No. 10-2018-0067438, Jun 2018