

# Jongho Park | Curriculum Vitae

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## Personal Details

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Date of birth: 1990 December 08

Place of birth: Seoul, Republic of Korea

Nationality: Korean

Languages: Korean (native), English (fluent), Mandarin (fragmentary)

ORCID: 0000-0001-6558-9053

## Education

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**Seoul National University**

**Seoul, Korea**

*Ph.D. in Astronomy*

08/2019

*Advisor:* Prof. Sascha Trippe

*Thesis:* A multiscale view of AGN jets:

from the formation and acceleration to high energy outbursts

*B.Sc. in Physics & Astronomy, cum laude*

02/2013

## Employment

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**Kyung Hee University (KHU)**

**Yongin, Korea**

*Assistant professor*

09/2023 – present

**Korea Astronomy and Space Science Institute (KASI)**

**Daejeon, Korea**

*Tenure-track senior researcher*

07/2022 – 08/2023

**East Asia Core Observatories Association (EACOA) @ ASIAA**

**Taipei, Taiwan**

*EACOA Fellow*

09/2020 – 07/2022

*Advisor:* Dr. Keiichi Asada, Dr. Masanori Nakamura, Dr. Geoffrey Bower

**Academia Sinica Institute of Astronomy & Astrophysics (ASIAA)**

**Taipei, Taiwan**

*Academia Sinica (Regular) Postdoctoral Fellow*

01/2020 – 08/2020

*ASIAA Postdoctoral Fellow*

09/2019 – 12/2019

*Advisor:* Dr. Keiichi Asada, Dr. Masanori Nakamura, Dr. Geoffrey Bower

## Honors and Awards

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**2021 EHT Early Career Award** ([website](#))

*The Event Horizon Telescope Collaboration*

10/2021

**EACOA Fellowship** (Grants: \$80,000/yr, [certificate](#))

*East Asia Core Observatories Association (EACOA)*

09/2020–Present

**Academia Sinica Postdoctoral Fellowship** (Grants: \$35,000/yr, [certificate](#))

*Academia Sinica*

01/2020–08/2020

## Publications ([ADS Link](#))

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### Refereed Journal Articles – First Authorships

15. *Observational Evidence for a Dense Ambient Medium Shaping the Jet in 3C 84*  
**Park, J.**; Kino, M.; & Nagai, H.; et al. 2023, *A&A*, in press
14. *Calibrating VLBI Polarization Data Using GPCAL. II. Time-dependent Calibration*  
**Park, J.**; Asada, K.; & Byun, D.-Y. 2023, *ApJ*, 958, 28
13. *Calibrating VLBI Polarization Data Using GPCAL. I. Frequency-dependent Calibration*  
**Park, J.**; Asada, K.; & Byun, D.-Y. 2023, *ApJ*, 958, 27
12. *Polarization Observations of AGN Jets: Past and Future*  
**Park, J.**; Algaba, J. C. 2022, *Galaxies*, 10(5), 102
11. *A revised view of the linear polarization in the subparsec core of M87 at 7 mm*  
**Park, J.**; Asada, K.; Nakamura, M.; et al. 2021, *ApJ*, 922, 180
10. *Jet collimation and acceleration in the giant radio galaxy NGC 315*  
**Park, J.**; Hada, K.; Nakamura, M.; et al. 2021, *ApJ*, 909, 76
9. *GPCAL: a generalized calibration pipeline for instrumental polarization in VLBI data*  
**Park, J.**; Byun, D.-Y.; Asada, K.; & Yun, Y. 2021, *ApJ*, 906, 85
8. *Kinematics of the M87 Jet in the Collimation Zone: Gradual Acceleration and Velocity Stratification*  
**Park, J.**; Hada, K.; Kino, M.; et al. 2019, *ApJ*, 887, 147
7. *Ejection of Double knots from the radio core of PKS 1510–089 during the strong  $\gamma$ -ray flares in 2015*  
**Park, J.**; Lee, S.-S.; Kim, J.-Y.; et al. 2019, *ApJ*, 877, 106
6. *Faraday Rotation in the Jet of M87 Inside the Bondi Radius: Indication of Winds from Hot Accretion Flows Confining the Relativistic Jet*  
**Park, J.**; Hada, K.; Kino, M.; et al. 2019, *ApJ*, 871, 257
5. *Revealing the Nature of Blazar Radio Cores through Multifrequency Polarization Observations with the Korean VLBI Network*  
**Park, J.**; Kam, M.; Trippe, S.; et al. 2018, *ApJ*, 860, 112
4. *The Long-Term Centimeter Variability of Active Galactic Nuclei: a New Relation between Variability Timescale and Accretion Rate*  
**Park, J.** & Trippe, S. 2017, *ApJ*, 834, 157
3. *No asymmetric outflows from Sagittarius A\* during the pericenter passage of the gas cloud G2*  
**Park, J.**; Trippe, S.; Krichbaum, T. P.; et al. 2015, *A&A*, 576, L16
2. *Radio Variability and Random Walk Noise Properties of Four Blazars*  
**Park, J.** & Trippe, S. 2014, *ApJ*, 785, 76
1. *Multiple Emission States in Active Galactic Nuclei*  
**Park, J.** & Trippe, S. 2012, *JKAS*, 45, 147

## Refereed Journal Articles – Co-Authorships.....

63. *A search for pulsars around Sgr A\* in the first Event Horizon Telescope dataset*  
Torre, Pablo; Liu, Kuo; Eatough, Ralph P.; ...; **Event Horizon Telescope Collaboration**; et al; 2023, *ApJ*, in press
62. *Polarimetric Geometric Modeling for mm-VLBI Observations of Black Holes*  
Roelofs, Freek; Johnson, Michael D.; Chael, Andrew; ...; **Event Horizon Telescope Collaboration**; et al; 2023, *ApJL*, 957, 21
61. *First M87 Event Horizon Telescope Results. IX. Detection of Near-horizon Circular Polarization*  
**Event Horizon Telescope Collaboration**; et al; 2023, *ApJL*, 957, 20
60. *The Greenland Telescope-Construction, Commissioning, and Operations in Pituffik*  
Chen, Ming-Tang; Asada, Keiichi; Matsushita, Satoki; ...; **Park, J.**; et al; 2023, *PASP*, 135, 5001
59. *Precessing jet nozzle connecting to a spinning black hole in M87*  
Cui, Yuzhu; Hada, Kazuhiro; Kawashima, Tomohisa; ...; **Park, J.**; et al; 2023, *Nature*, 621, 711
58. *Double SSA spectrum and magnetic field strength of the FSRQ 3C 454.3*  
Jeong, Hyeon-Woo; Lee, Sang-Sung; Cheong, Whee Yeon; ...; **Park, J.**; et al; 2023, *MNRAS*, 523, 5703
57. *Probing the Heart of Active Narrow-line Seyfert 1 Galaxies with VERA Wideband Polarimetry*  
Takamura, Mieko; Hada, Kazuhiro; Honma, Mareki; ...; **Park, J.**; et al; 2023, *ApJ*, 952, 47
56. *Comparison of Polarized Radiative Transfer Codes Used by the EHT Collaboration*  
Prather, Ben S.; Dexter, Jason; Moscibrodzka, Monika; ...; **Event Horizon Telescope Collaboration**; et al; 2023, *ApJ*, 950, 35
55. *Surveying Flux Density in Galaxies with Apparent Large Black Holes at Millimeter/Submillimeter Wavelengths*  
Lo, Wen-Ping; Asada, Keiichi; Matsushita, Satoki; ...; **Park, J.**; et al; 2023, *ApJ*, 950, 10
54. *Spectral analysis of a parsec-scale jet in M87: Observational constraint on the magnetic field strengths in the jet*  
Ro, Hyunwook; Kino, Motoki; Sohn, Bong Won; Hada, Kazuhiro; **Park, J.**; et al; 2023, *A&A*, 673, 159
53. *a Ring-like Accretion Structure in M87 Connecting its Black Hole and Jet*  
Lu, Ru-sen; Asada, Keiichi; Krichbaum, Thomas P.; **Park, J.**; et al; 2023, *Nature*, 616, 686
52. *Comparison of Polarized Radiative Transfer Codes used by the EHT Collaboration*  
Prather, Ben S.; Dexter, Jason; Moscibrodzka, Monika; ...; **Event Horizon Telescope Collaboration**; et al. 2023, *ApJ*, 943, 170
51. *The Event Horizon Telescope Image of the Quasar NRAO 530*  
Jorstad, Svetlana; Wielgus, Maciek; Lico, Rocco; ...; **Event Horizon Telescope Collaboration**; et al. 2023, *ApJ*, 943, 170
50. *Using the Crab Nebula as Polarization Angle Calibrator for the Korean VLBI Network*  
Kam, Minchul; Trippe, Sascha; Byun, Do-Young; **Park, J.**; et al. 2023, *JKAS*, 56, 1
49. *Overview of the Observing System and Initial Scientific Accomplishments of the East Asian VLBI Network (EAVN)*  
Akiyama, Kazunori; Algaba, Juan-Carlos; An, Tao; ...; **Park, J.**; et al. 2022, *Galaxies*, 10, 113

48. *Implications from the Velocity Profile of the M87 Jet: A Possibility of a Slowly Rotating Black Hole Magnetosphere*  
Kino, Motoki; Takahashi, Masaaki; Kawashima, Tomohisa; **Park, J.**; et al. [2022, ApJ, 939, 83](#)
47. *The Photon Ring in M87\**  
Broderick, Avery E.; Pesce, Dominic W.; Gold, Roman; ...; **Event Horizon Telescope Collaboration**; et al. [2022, ApJ, 935, 61](#)
46. *Resolving the Inner Parsec of the Blazar J1924-2914 with the Event Horizon Telescope*  
Issaoun, Sara; Wielgus, Maciek; Jorstad, Svetlana; ...; **Event Horizon Telescope Collaboration**; et al. [2022, ApJ, 934, 145](#)
45. *Unraveling the Innermost Jet Structure of OJ 287 with the First GMVA + ALMA Observations*  
Zhao, Guang-Yao; Gómez, José L.; Fuentes, Antonio; ...; **Event Horizon Telescope Collaboration**; et al. [2022, ApJ, 932, 72](#)
44. *Characterizing and Mitigating Intraday Variability: Reconstructing Source Structure in Accreting Black Holes with mm-VLBI*  
Broderick, Avery E.; Gold, Roman; Georgiev, Boris; ...; **Event Horizon Telescope Collaboration**; et al. [2022, ApJ, 930, 21](#)
43. *A Universal Power-law Prescription for Variability from Synthetic Images of Black Hole Accretion Flows*  
Georgiev, Boris; Pesce, Dominic W.; Broderick, Avery E.; ...; **Event Horizon Telescope Collaboration**; et al. [2022, ApJ, 930, 20](#)
42. *Millimeter Light Curves of Sagittarius A\* Observed during the 2017 Event Horizon Telescope Campaign*  
Wielgus, Maciek; Marchili, Nicola; Martí-Vidal, Iván; ...; **Event Horizon Telescope Collaboration**; et al. [2022, ApJ, 930, 19](#)
41. *Selective Dynamical Imaging of Interferometric Data*  
Farah, Joseph; Galison, Peter; Akiyama, Kazunori; ...; **Event Horizon Telescope Collaboration**; et al. [2022, ApJ, 930, 18](#)
40. *First Sagittarius A\* Event Horizon Telescope Results. VI. Testing the Black Hole Metric*  
**Event Horizon Telescope Collaboration**; et al. [2022, ApJ, 930L, 17](#)
39. *First Sagittarius A\* Event Horizon Telescope Results. V. Testing Astrophysical Models of the Galactic Center Black Hole*  
**Event Horizon Telescope Collaboration**; et al. [2022, ApJ, 930L, 16](#)
38. *First Sagittarius A\* Event Horizon Telescope Results. IV. Variability, Morphology, and Black Hole Mass*  
**Event Horizon Telescope Collaboration**; et al. [2022, ApJ, 930L, 15](#)
37. *First Sagittarius A\* Event Horizon Telescope Results. III. Imaging of the Galactic Center Supermassive Black Hole*  
**Event Horizon Telescope Collaboration**; et al. [2022, ApJ, 930L, 14](#)
36. *First Sagittarius A\* Event Horizon Telescope Results. II. EHT and Multiwavelength Observations, Data Processing, and Calibration*  
**Event Horizon Telescope Collaboration**; et al. [2022, ApJ, 930L, 13](#)

35. *First Sagittarius A\* Event Horizon Telescope Results. I. The Shadow of the Supermassive Black Hole in the Center of the Milky Way*  
**Event Horizon Telescope Collaboration**; et al. [2022, ApJ, 930L, 12](#)
34. *The Intrinsic Structure of Sagittarius A\* at 1.3 cm and 7 mm*  
Cho, Ilje; Zhao, Guang-Yao; Kawashima, Tomohisai; ...; **Park, J.**; et al. [2022, ApJ, 926, 108](#)
33. *The Variability of the Black Hole Image in M87 at the Dynamical Timescale*  
Satapathy, Kaushik; Psaltis, Dimitrios; Özel, Feryal; ...; **Event Horizon Telescope Collaboration**; et al. [2021, RAA, 21, 205](#)
32. *East Asian VLBI Network observations of active galactic nuclei jets: imaging with KaVA+Tianma+Nanshan*  
Cui, Yu-Zhu; Hada, Kazuhiro; Kino, Motoki; ...; **Park, J.**; et al. [2021, RAA, 21, 205](#)
31. *Event Horizon Telescope observations of the jet launching and collimation in Centaurus A*  
Janssen, Michael; Falcke, Heino; Kadler, Matthias; ...; **Event Horizon Telescope Collaboration**; et al. [2021, Nature Astronomy, 5, 1017](#)
30. *A Detailed Kinematic Study of 3C 84 and Its Connection to Gamma-Rays*  
Hodgson, Jeffrey A.; Rani, Bindu; Oh, Junghwan; ...; **Park, J.**; et al. [2021, ApJ, 914, 43](#)
29. *Interferometric Monitoring of Gamma-ray Bright AGNs: Measuring the Magnetic Field Strength of 4C +29.45*  
Kang, S.; Lee, S. -S.; Hodgson, J.; ...; **Park, J.**; et al. [2021, A&A, 651, A74](#)
28. *Constraints on Black-hole Charges with the 2017 EHT Observations of M87\**  
Kocherlakota, Prashant; Rezzolla, Luciano; Falcke, Heino; ...; **Event Horizon Telescope Collaboration**; et al. [2021, PhRvD, 103, 4047](#)
27. *The Polarized Image of a Synchrotron-emitting Ring of Gas Orbiting a Black Hole*  
Narayan, Ramesh; Palumbo, Daniel C. M.; Johnson, Michael D.; ...; **Event Horizon Telescope Collaboration**; et al. [2021, ApJ, 912, 35](#)
26. *East Asian VLBI Network Observations of Active Galactic Nuclei Jets: Imaging with KaVA+Tianma+Nanshan*  
Cui, Yuzhu; Hada, Kazuhiro; Kino, Motoki; ...; **Park, J.**; et al. [2021, RAA, 21, 205](#)
25. *Broadband Multi-wavelength Properties of M87 during the 2017 Event Horizon Telescope Campaign*  
**EHT MWL Science Working Group**; et al. [2021, ApJ, 911, 11](#)
24. *Polarimetric Properties of Event Horizon Telescope Targets from ALMA*  
Goddi, Ciriaco; Marti-Vidal, Ivan; Messias, H.; ...; **Event Horizon Telescope Collaboration**; et al. [2021, ApJ, 910, 14](#)
23. *First M87 Event Horizon Telescope Results. VIII. Magnetic Field Structure near the Event Horizon*  
**Event Horizon Telescope Collaboration**; et al. [2021, ApJ, 910, 13](#)
22. *First M87 Event Horizon Telescope Results. VII. Polarization of the Ring*  
**Event Horizon Telescope Collaboration**; et al. [2021, ApJ, 910, 12](#)
21. *Gravitational Test beyond the First Post-Newtonian Order with the Shadow of the M87 Black Hole*  
Psaltis, Dimitrios; Medeiros, Lia; Christian, Pierre; ...; **Event Horizon Telescope Collaboration**; et al. [2020, PhRvL, 125, 1104](#)
20. *Interferometric Monitoring of Gamma-Ray Bright AGNs: OJ 287*  
Lee, Jee Won; Lee, Sang-Sung; Algaba, Juan-Carlos; ...; **Park, J.**; et al. [2020, ApJ, 902, 104](#)

19. *Monitoring the Morphology of M87\* in 2009-2017 with the Event Horizon Telescope*  
Wielgus, Maciek; Akiyama, Kazunori; Blackburn, Lindy; ...; **Event Horizon Telescope Collaboration**; et al. 2020, *ApJ*, 901, 67
18. *Event Horizon Telescope imaging of the archetypal blazar 3C 279 at an extreme 20 microarcsecond resolution*  
Kim, Jae-Young; Krichbaum, Thomas P.; Broderick, Avery E.; ...; **Event Horizon Telescope Collaboration**; et al. 2020, *A&A*, 640, 69
17. *Verification of Radiative Transfer Schemes for the EHT*  
Gold, Roman; Broderick, Avery E.; Younsi, Ziri; ...; **Event Horizon Telescope Collaboration**; et al. 2020, *ApJ*, 897, 148
16. *THEMIS: A Parameter Estimation Framework for the Event Horizon Telescope*  
Broderick, Avery E.; Gold, Roman; Karami, Mansour; ...; **Event Horizon Telescope Collaboration**; et al. 2020, *ApJ*, 897, 139
15. *Linear Polarization in the Nucleus of M87 at 7 mm and 1.3 cm*  
Kravchenko, E.; Giroletti, M.; Hada, K.; Meier, D. L.; Nakamura, M.; **Park, J.**; Walker, R. C. 2020, *A&A*, 637, 6
14. *Exploring the Morphology and Origins of the 4C 38.41 Jet*  
Algaba, J. C.; Rani, B.; Lee, S.-S.; Kino, M.; **Park, J.**; Kim, J.-Y. 2019, *ApJ*, 886, 85
13. *Jet Kinematics of the Quasar 4C+21.35 from Observations with the KaVA Very Long Baseline Interferometry Array*  
Lee, T.; Trippe, S.; Kino, M.; ...; **Park, J.**; et al. 2019, *MNRAS*, 486, 2412
12. *Source-Frequency Phase-Referencing Observation of AGNs with KaVA using Simultaneous Dual-Frequency Receiving*  
Zhao, G.-Y.; Jung, T.; Sohn, B. W.; ...; **Park, J.**; et al. 2019, *JKAS*, 52, 23
11. *Exploring the Nature of the 2016  $\gamma$ -ray Emission in the Blazar 1749+096*  
Kim, D.; Trippe, S.; Lee, S.-S.; ...; **Park, J.**; et al. 2018, *MNRAS*, 480, 2324
10. *Exploring the Variability of the Flat-spectrum Radio Source 1633+382. II. Physical Properties*  
Algaba, J.-C.; Lee, S.-S.; Rani, B.; ...; **Park, J.**; et al. 2018, *ApJ*, 859, 128
9. *KVN Observations Reveal Multiple  $\gamma$ -ray Emission Regions in 3C 84?*  
Hodgson, J. A.; Rani, B.; Lee, S.-S.; ...; **Park, J.**; et al. 2018, *MNRAS*, 475, 368
8. *Exploring the Variability of the Flat-spectrum Radio Source 1633+382. I. Phenomenology of the Light Curves*  
Algaba, J.-C.; Lee, S.-S.; Kim, D.; ...; **Park, J.**; et al. 2018, *ApJ*, 852, 30
7. *The Power of Simultaneous Multi-frequency Observations for mm-VLBI: Beyond Frequency Phase Transfer*  
Zhao, G.-Y.; Algaba, J.-C.; Lee, S.-S.; ...; **Park, J.**; et al. 2018, *AJ*, 155, 26
6. *The Millimeter-Radio Emission of BL Lacertae during Two  $\gamma$ -ray Outbursts*  
Kim, D.; Trippe, S.; Lee, S.-S.; **Park, J.**; et al. 2017, *JKAS*, 50, 167
5. *Pilot KaVA monitoring on the M 87 jet: Confirming the inner jet structure and superluminal motions at sub-pc scales*  
Hada, K.; **Park, J.**; Kino, M.; et al. 2017, *PASJ*, 69, 71

4. *Interferometric Monitoring of  $\gamma$ -ray Bright AGNs. I. The Results of Single-epoch Multifrequency Observations*  
Lee, S.-S.; Wajima, K.; Algaba, J.-C.; ...; **Park, J.**; et al. 2016, *ApJS*, 227, 8
3. *PAGaN II: The Evolution of AGN Jets on Sub-Parsec Scales*  
Oh, J.; Trippe, S.; Kang, S.; ...; **Park, J.**; et al. 2015, *JKAS*, 48, 299
2. *PAGaN I: Multi-Frequency Polarimetry of AGN Jets with KVN*  
Kim, J.; Trippe, S.; Sohn, B. W.; ...; **Park, J.**; et al. 2015, *JKAS*, 48, 285
1. *Interferometric Monitoring of  $\gamma$ -ray Bright Active Galactic Nuclei II: Frequency Phase Transfer*  
Algaba, J.-C.; Zhao, G.-Y.; Lee, S.-S.; ...; **Park, J.**; et al. 2015, *JKAS*, 48, 237

### Non-Refereed Journal Articles – Co-Authorships.....

1. *White Paper on East Asian Vision for mm/submm VLBI: Toward Black Hole Astrophysics down to Angular Resolution of  $1R_S$*   
Asada, K., Kino, M., Honma, M., ...; **Park, J.**, et al. 2017, [arXiv:1705.04776](https://arxiv.org/abs/1705.04776)

### Observation Experience

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GLT Observations participating in the 2021 GMVA Observations, Apr 22–27, 2021

GLT Observations participating in the 2021 EHT Observations, Apr 09–20, 2021

GLT Observations participating in the 2021 EHT Dress Rehearsal Campaign, Mar 21, 2021

### Successful Observing Proposals as a PI

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GMVA Semester 2023B Proposal [GMVA/23B-067](#) for **28 hours**  
: Peering into M87's black hole in multiple colors

VLBA Semester 2023A Proposal [VLBA/23A-118](#) for **30 hours**  
: Probing the Jet Base of M87 in the Time Domain

VLBA Semester 2023A Proposal [VLBA/23A-119](#) for **37.5 hours**  
: Probing the Faraday Rotation and Magnetic Field in the Core and Inner Jet of M87

ALMA Cycle 9 Proposal [ALMA/2022.1.00750.V](#) for **16 hours**  
: A Multicolor View of the Black Hole Environment in M87

GMVA Semester 2022B Proposal [GMVA/22B-100](#) for **28 hours**  
: A Multicolor View of the Black Hole Environment in M87

GMVA Semester 2022B Proposal [GMVA/22B-097](#) for **15 hours**  
: Investigating the origin of the Fanaroff-Riley dichotomy with mm-VLBI

HSA Semester 2022B Proposal [VLBA/22B-079](#) for **12 hours**  
: Jet Collimation in Fanaroff-Riley type II Radio Galaxies - a Pilot Study

HSA Semester 2022A Proposal [VLBA/22A-148](#) for **30 hours**  
: Probing the Jet Base of M87 in the Time Domain

VLBA Semester 2022A Proposal [VLBA/22A-150](#) for **37.5 hours**  
: Probing Faraday Rotation and Magnetic Field in the Core and Inner Jet of M87

**GMVA Semester 2021B Proposal [VLBA/21B-078](#) for 12 hours**  
: Is shear acceleration at work in the jets of NGC 315?

**HSA/VLBA Semester 2021B Proposal [VLBA/21B-075](#) for 57.5 hours**  
: Testing the MHD model of AGN jet acceleration

**VLBA Semester 2020B Proposal [VLBA/20B-116](#) for 64 hours**  
: Towards a complete understanding of jet acceleration & energy dissipation in M87

**EAVN Semester 2020A Proposal [EAVN20A-143](#) for 54 hours**  
: Investigating the peculiar jet collimator NGC 315

**KVN Semester 2020A Proposal [KVN20A-VLBI-144](#) for 75 hours**  
: The Global VLBI Polarimetry Campaign for M87 in 2020

**VLBA Semester 19B Proposal [VLBA/19B-143](#) for 12 hours**  
: Investigating the peculiar jet collimator NGC 315

**HSA Semester 19B Proposal [VLBA/19B-108](#) for 36 hours**  
: Mapping the Faraday rotation and the magnetic field of the M87 jet

**EAVN Semester 2019B Proposal [EAVN19B-094](#) for 36 hours**  
: Investigating the peculiar jet collimator NGC 315

**KVN Semester 2019B Proposal [KVN19B-VLBI-095](#) for 68 hours**  
: Probing the Faraday rotation near the jet base of M87

**KaVA Semester 2018A Proposal [KaVA18A-01](#) for 48 hours**  
: Solving the puzzling kinematics of the flat spectrum radio quasar 1928+738

**KVN Semester 2018A Proposal [KVN18A-VN-01](#) for 96 hours**  
: Unveiling the hidden core polarization in 3C 273

**KaVA Semester 2017B Proposal [KaVA17A-01](#) for 36 hours**  
: Solving the puzzling kinematics of the flat spectrum radio quasar 1928+738

**KVN Semester 2017B Proposal [KVN17B-VN-01](#) for 48 hours**  
: Revealing the Nature of Blazar Radio Cores through Multi-frequency Polarization Observations with ALMA and KVN

**KaVA Semester 2017A Proposal [KaVA17A-01](#) for 40 hours**  
: Solving the puzzling kinematics of the flat spectrum radio quasar 1928+738

**ALMA Cycle 4 Proposal 2016.1.00112.S for 3 hours**  
: Probing the magnetic fields in the jet base of the gamma-ray bright blazar PKS 1510-08

## **Selected Conferences and Seminars**

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### **Press Conferences**.....

1. Press Conference Presentation: "First M87 Event Horizon Telescope Results: Polarization of the Ring & Magnetic Field Structure near the Event Horizon",



Academia Sinica Institute of Astronomy and Astrophysics (ASIAA), Taipei, Taiwan, Mar 25, 2021, [website](#)

### Invited Talks.....

15. Invited Colloquium, "Observing the Supermassive Black Hole at the Center of M87 using EHT and GMVA+ALMA",  
Yonsei University, Seoul, Republic of Korea, Nov 3, 2023, [website](#)
14. Invited Lecture, "Active Galactic Nuclei & Supermassive Black Holes",  
Seoul National University, Siheung, Republic of Korea, Aug 22, 2023, [website](#)
13. Invited Colloquium, "Observing the Supermassive Black Hole at the Center of M87 using EHT and GMVA+ALMA",  
KyungHee University, Yongin, Republic of Korea, Jun 1, 2023, [website](#)
12. Invited Colloquium, "Observing the Supermassive Black Hole at the Center of M87 using EHT and GMVA+ALMA",  
Korea Astronomy & Space Science Institute (KASI), Daejeon, Republic of Korea, May 17, 2023, [website](#)
11. Invited Talk, "Observing the Supermassive Black Hole at the Center of M87 using EHT and GMVA+ALMA",  
2023 107th KAS Spring Meeting, Lahan Hotel JeonJu, JeonJu, Republic of Korea, Apr 12, 2023, [website](#)
10. Invited Talk, "The Magnetic Field Structure in the Jet Acceleration and Collimation Zone of M87",  
Black Hole Astrophysics with VLBI 2023, NAOJ, Mitaka, Tokyo, Japan, Feb 6, 2023, [website](#)
9. Invited Talk, "Collimation and Acceleration of AGN jets",  
Focus Meeting 1 "Physics of Relativistic Jets on All Scales" at the IAUGA 2022, BEXCO, Busan, Republic of Korea, Aug 4, 2022, [website](#)
8. Invited Talk, "Polarization of the photon ring of M87\*" (cancelled),  
The 239th meeting of the Americal Astronomical Society, Salt Lake City, Utah, USA, Jan 9–13, 2022, [website](#) (in the special session "New Views of Extragalactic Supermassive Black Holes with the Event Horizon Telescope")
7. Invited Colloquium, "Magnetic field structure near the event horizon of the M87 black hole",  
Seoul National University, Seoul, South Korea, May 13, 2021, [website](#)
6. Invited Talk, "Prospect of Polarization Observations of M87 with the EHT & Jet Collimation and Acceleration in the Giant Radio Galaxy NGC 315",  
Black Hole Astrophysics with VLBI: Multi-Wavelength and Multi-Messenger Era, Institute for Cosmic Ray Research, the University of Tokyo, Tokyo, Japan (online), Jan 18–20, 2021, [website](#)
5. Invited Colloquium, "Collimation and Acceleration of the M87 jet (and more)",  
National Tsing-Hua University (NTHU), Hsinchu, Taiwan, Dec 11, 2020, [website](#)
4. Invited Talk, "Faraday Rotation in the Jet of M87 Inside the Bondi Radius: Indication of Winds from Hot Accretion Flows Confining the Relativistic Jet"  
EATING VLBI Workshop 2019, CNS Research Area, Bologna, Italy, Apr 15–17, 2019, [website](#)

3. Invited Seminar, "Faraday Rotation in the Jet of M87 Inside the Bondi Radius: Indication of Winds from Hot Accretion Flows Confining the Relativistic Jet"  
Academia Sinica Institute of Astronomy and Astrophysics (ASIAA), Taipei, Taiwan, Jan 17, 2019, [website](#)
2. Invited Talk, "Substantial Outflows from Hot Accretion flows Confining the Relativistic Jet of M87"  
Dawn of a New Era for Black Hole Jets in Active Galaxies, Tohoku University, Sendai, Japan, Jan 25–27, 2018, [website](#) (terminated)
1. Invited Talk, "Probing the Velocity Field in the Inner Region of M87 Jets with a KaVA Large Program: Early Science Results"  
Challenges of AGN Jets, National Astronomical Observatory of Japan (NAOJ), Mitaka, Tokyo, Japan, Jan 17–20, 2017, [website](#) (terminated)

### Contributed Talks.....

22. Contributed Talk, "Observational Evidence for a Dense Ambient Medium Shaping the Jet in 3C 84",  
14th East Asian VLBI Workshop, Shanghai, China, Nov 29, 2023, [website](#)
21. Contributed Talk, "Observational Evidence for a Dense Ambient Medium Shaping the Jet in 3C 84",  
2023 108th KAS Fall Meeting, Ramada Plaza Jeju, Jeju, Korea, Jun 22, 2023, [website](#)
20. Contributed Talk, "Searching for New Targets for the EHT & Faraday Synthesis of the M87 Jet",  
the extended KVN KSP workshop, Korea Astronomy and Space Science Institute (KASI), Daejeon, Korea, Jun 22, 2023, [website](#)
19. Contributed Talk, "Collimation and Acceleration of AGN jets",  
2022 106th KAS Fall Meeting, Lahan Select Kyung, Gyeongju, Republic of Korea, Oct 12, 2022, [website](#)
18. Contributed Talk, "Collimation and Acceleration of AGN jets",  
2nd Malaysia VLBI Workshop, Universiti Malaya, Kuala Lumpur, Malaysia, Sep 7, 2022, [website](#)
17. Contributed Talk, "GPCAL: a new calibration pipeline for instrumental polarization in VLBI data"  
13th East Asian VLBI Workshop 2021, Chiang Mai, Thailand (online), Mar 2–5, 2021, [website](#)
16. Contributed Talk, "Kinematics of the M87 Jet in the Collimation Zone: Gradual Acceleration and Velocity Stratification"  
COSPAR 2021, 43rd COSPAR Scientific Assembly, Sydney, Australia (online), Jan 28–Feb 4, 2021, [website](#)
15. Contributed Talk, "Preliminary reduction of the 2018-Rev0 data"  
The Event Horizon Telescope Collaboration Meeting 2020, online, Dec 4–14, 2020, [website](#) (invitation-only)
14. Colloquium, "Acceleration and Collimation of the M87 Jet"  
Academia Sinica Institute of Astronomy and Astrophysics (ASIAA), Taipei, Taiwan, Jan 15, 2020, [website](#)

13. Contributed Talk, "Kinematics of the M87 jet in the collimation zone: gradual acceleration and velocity stratification"  
The Event Horizon Telescope Collaboration Meeting 2019, Naniiloa Hotel, Hilo, Hawaii, USA, Dec 2–6, 2019, [website](#) (invitation-only)
12. Contributed Talk, "M87 Polarization and RM at low frequencies"  
The Event Horizon Telescope Collaboration Meeting 2019, Naniiloa Hotel, Hilo, Hawaii, USA, Dec 2–6, 2019, [website](#) (invitation-only)
11. Contributed Talk, "A new strategy for polarization calibration of VLBI data and an improved view of linear polarization of AGN jets at millimeter wavelengths"  
12th East Asian VLBI Workshop, Ibaraki University, Mito, Ibaraki, Japan, Sep 23–27, 2019, [website](#)
10. Contributed Talk, "Substantial Winds from the accreting supermassive black hole in M87 revealed by Faraday rotation observations"  
14th European VLBI Network Symposium & Users Meeting, Granada, Spain, Oct 8–11, 2018, [website](#)
9. Contributed Talk, "Detection of a Moving Spine-Sheath Jet Structure after a VHE  $\gamma$ -ray Flare in PKS 1510-089 in 2015"  
East Asian VLBI Workshop 2018, YongPyong Resort, PyeongChang, Korea, Sep 04–07, 2018, [website](#)
8. Contributed Talk, "Substantial Winds from Hot Accretion flows Confining the Relativistic Jet of M87"  
IAU Symposium 342 – Perseus in Sicily: from Black Hole to Cluster Outskirts, Noto, Sicily, Italy, May 13–18, 2018, [website](#)
7. Contributed Talk, "Revealing the Nature of Blazar Radio Cores through Multi-Frequency Polarization Observations with KVN"  
East Asia To Italy: Nearly Global (EATING) VLBI Workshop 2017, Hotel Bareve, Jeju, Korea, Oct 30–Nov 1, 2017, [website](#)
6. Colloquim, "Revealing the Nature of Blazar Radio Cores through Multi-Frequency Polarization Observations with KVN and ALMA"  
Korea Astronomy and Space Science Institute (KASI), Daejeon, Korea, Aug 31, 2017, [website](#) (terminated)
5. Contributed Talk, "Revealing the Nature of Blazar Radio Cores through Multi-Frequency Polarization Observations with KVN"  
When Brandeis met Jansky: Astrophysics and beyond, Brandeis University, Boston, USA, Jun 28–30, 2017, [website](#)
4. Contributed Talk, "Probing the Velocity Field in the Inner Region of M87 Jets with a KaVA Large Program: Early Science Results"  
9th East Asian VLBI Workshop, Forest Moon Hotel, Guiyang, Guizhou, China, Nov 07–11, 2016, [website](#) (terminated)
3. Contributed Talk, "Probing the Velocity Field in the Inner Region of M87 Jets with a KaVA Large Program: Early Science Results"  
East-Asia AGN Workshop 2016, Seoul National University, Seoul, Korea, Sep 22–24, 2016, [website](#)

2. Contributed Talk, "The plasma physics of Active Galactic Nuclei (PAGaN) : Polarimetry with KVN"  
8th East Asian VLBI Workshop, Hokkaido University, Sapporo, Hokkaido, Japan, July 6–10, 2015, [website](#)
1. Contributed Talk, "Radio Variability and Random Walk Noise Properties of Four Blazars"  
12th Asia-Pacific Regional IAU Meeting (APRIM), DCC, Daejeon, Korea, Aug 18–22, 2014, [website](#) (terminated)

## Computer Skills

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**Programming Language:** Python, IDL, AIPS, Difmap, CASA

## Development of Astronomical Software Packages

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**GPCAL:** An Open-source instrumental polarization calibration pipeline for VLBI data ([github](#))

## Teaching Experience

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- *Man and the Universe*, Teaching Assistant for Prof. Sascha Trippe, Spring 2014
- *Man and the Universe*, Teaching Assistant for Prof. Hyung-Mok Lee, Fall 2013
- *Astronomical Lab Experiments*, Teaching Assistant for Prof. Woong-Tae Kim, Spring 2013

## Academic Service

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### Conferences and Workshops:

- EHT Imaging Workshop 2020, a remote workshop, May 11–15, 2020 (SOC)
- The 4th KVN-VERA Science Working Group Meeting, Seoul National University, Seoul, Korea, Jan 29–30, 2013 (LOC)

### Collaborations:

- EHT Data Access, Analysis, and Publication Policy (DAAPP) Task Force committee

### Reviews:

- The National Radio Astronomy Observatory (NRAO) 2022A, 2022B, 2023A proposal review panelist
- Monthly Notices of the Royal Astronomical Society, 2022
- The Astrophysical Journal Letters, 2021

## Mentoring

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- Ph. D. student Kunwoo Lee at Seoul National University for his project "Jet collimation and acceleration in the flat spectrum radio quasar 1928+738" since 2017

## Other Experience

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**Military Service:** Served as a Technical Research Personnel in the Republic of Korea Army, 2016-2019

**Departmental Service:**

- Lecturer for a short course on *VLBI Polarization Data Reduction*, SNU, Nov 17, 2017
- Full-time lecturer for a short course on *Unveiling the Finest Details of Supermassive Black Holes and AGN Jets through ALMA-VLBI Imaging*, SNU, Mar 15, 2023
- President of Graduate Students in the SNU Astronomy Department, 2016
- SNU Astronomy Journal Club Participants, 2013–2016
- President of the club “Amateur Astronomy Association (AAA)” in SNU (~100 new members every year), 2010–2011

**Outreach:**

- Volunteered for 2019 Academia Sinica Open House, Oct 26, 2019
- Volunteered multiple times (>50 times) for Astronomy Open House at SNU, 2009–2018

## Academic References

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| ◦ <b>Prof. Sascha Trippe</b><br><a href="mailto:trippe@astro.snu.ac.kr">trippe@astro.snu.ac.kr</a><br>Department of Physics and Astronomy<br>Seoul National University<br>+82-2-880-6611 | ◦ <b>Dr. Kazuhiro Hada</b><br><a href="mailto:kazuhiro.hada@nao.ac.jp">kazuhiro.hada@nao.ac.jp</a><br>Mizusawa VLBI Observatory<br>National Astronomical Observatory of Japan                    |
| ◦ <b>Dr. Masanori Nakamura</b><br><a href="mailto:nakamura@asiaa.sinica.edu.tw">nakamura@asiaa.sinica.edu.tw</a><br>National Institute of Technology, Hachinohe<br>College               | ◦ <b>Dr. Motoki Kino</b><br><a href="mailto:motoki.kino@nao.ac.jp">motoki.kino@nao.ac.jp</a><br>Kogakuin University<br>National Astronomical Observatory of Japan                                |
| ◦ <b>Prof. Mareki Honma</b><br><a href="mailto:mareki.honma@nao.ac.jp">mareki.honma@nao.ac.jp</a><br>Mizusawa VLBI Observatory<br>National Astronomical Observatory of Japan             | ◦ <b>Dr. Geoffrey Bower</b><br><a href="mailto:gbower@asiaa.sinica.edu.tw">gbower@asiaa.sinica.edu.tw</a><br>Academia Sinica Institute of Astronomy and<br>Astrophysics<br>EHT Project Scientist |
| ◦ <b>Dr. Keiichi Asada</b><br><a href="mailto:asada@asiaa.sinica.edu.tw">asada@asiaa.sinica.edu.tw</a><br>Academia Sinica Institute of Astronomy and<br>Astrophysics                     |  |