Donghyeon Jeff Khim

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◇ Google Scholar ◇ SciX (ADS) ◇ ResearchGate

Education

University of Arizona, Tucson, Arizona, United States of America

Ph.D. in Astronomy and Astrophysics **2021–May 2027 (expected)**
- Thesis title *The Diversity and Evolution of Low-Surface-Brightness Galaxies: Insights from Star Clusters and Internal Dynamics*
- Advisor Prof. Dennis Zaritsky

M.S. in Astronomy and Astrophysics **Aug. 2025**

M.S. in Optical Sciences **2025–May 2027 (expected)**
- Thesis title *Optical Alignment and Metrology from Day to Night: Heliostat Metrology and Image-Based Active Optics*
- Advisor Prof. Daewook Kim

Yonsei University, Seoul, Republic of Korea

Ph.D. Studies in Astronomy – qualifying examination completed **2018–2021**
- Research Star-gas misalignment in the Horizon-AGN cosmological simulation
- Advisor Prof. Sukyoung Yi

Bachelor of Science in Astronomy and Physics, double major **2011–2018**
- *Graduated Magna Cum Laude*

Research Interests

- Low-surface-brightness and ultra-diffuse galaxies; dark matter and kinematics in diffuse galaxies; nuclear star clusters, globular clusters, and compact stellar systems; integral-field spectroscopy; environmental effects on dwarf galaxies; observation–simulation comparisons of galaxy formation and evolution

Awards & Fellowships

University of Arizona
- Korean Honor Scholarship, Consulate General of the Republic of Korea 2026
- College of Science Graduate Fellowship (full tuition) 2021–2022

Yonsei University, Graduate
- Yonsei Honors Scholarship Program – Graduate Fellowship (three-year full tuition) 2018–2020
- Brain Korea 21 Plus Fellowship, Brain Korea 21 Project 2018–2021
- Yonsei Merit Academic Paper Award Dec. 2020
- 2019 Korea Astronomical Society Spring Meeting, Poster Award (Khim & Yi) Apr. 2019
- 2019 The 2nd Yonsei Astro Poster Jamboree, Best Poster Award Feb. 2019

Yonsei University, Undergraduate
- Korea Presidential Science Scholarship (four-year full tuition) 2011–2018
- Yonsei Honor's Scholarship Program (four-year full tuition) 2011–2018
- Awarded the Highest Honors, three semesters Aug. 2011, Feb. 2014, Feb. 2018
- Awarded High Honors Feb. 2012
- Awarded Honors, three semesters Aug. 2012, Aug. 2014, Aug. 2017

Korea Science Academy
- The 3rd International Olympiad on Astronomy and Astrophysics (IOAA), Silver Medal Oct. 2009

Publications

18 refereed journal papers (published) and 3 submitted manuscripts
6 of these are first-author papers (5 published, 1 submitted)
6 additional SPIE conference proceedings papers on Optics (2 first-author papers)

Journal Papers

[21] *SEAMLESS Survey: A Closer Look at Seven Local Volume Dwarf Galaxies in Diverse Environments*
Mutlu-Pakdil, B., Jones, M. G., Sand, D. J., Crnojević, D., Hunter, L. C., Spekkens, K., Zaritsky, D., Bennett, P. N., Carlin, J. L., Donnerstein, R., Hazarika, D., **Khim, D. J.**, Prabhu, D. S., et al. 2026, *submitted to ApJ,* arXiv:2610.40765.

[20] *SMUDGes Below the Surface: Clusters Confirm the Diversity of Low-Surface-Brightness Galaxies*
Khim, D. J., Zaritsky, D., Sandoval Ascencio, L., Cooper, M. C., & Donnerstein, R. 2026, *submitted to ApJ*, arXiv:2608.24991.

[19] *Systematically Measuring Ultra-Diffuse Galaxies. IX. A Gyr in the Life of Nearby Low Surface Brightness Galaxies*
Zaritsky, D., Donnerstein, R., Sandoval Ascencio, L., Cooper, M. C., **Khim, D. J.**, & Spekkens, K. 2026, ApJ, 1006, 48.

[18] *ID-MAGE II: The Star Forming Satellites of Low-Mass Hosts*
Hunter, L. C., Mutlu-Pakdil, B., Farnell, M. B., Sand, D. J., Bennet, P., Campana, S. N., Carlin, J. L., Crnojević, D., Doliva-Dolinsky, A., Durodola, E., Jones, M. G., **Khim, D. J.**, Marin, L., Mendez, R. J., et al. 2026, ApJ, 1009, 241.

[17] *Blobs and Blurs: A Citizen Science-Identified Catalog of Diffuse Galaxies in the Fornax Cluster*
Mazziotti, N., Jones, M. G., **Khim, D. J.**, Sand, D. J., & Bennet, P. 2026, ApJ, 1005, 207.

[16] *SEAMLESS Survey: Four Faint Dwarf Galaxies Tracing Low-Mass Galaxy Evolution Across Environments*
Fielder, C. E., Jones, M. G., Sand, D. J., Crnojević, D., Mutlu-Pakdil, B., Bennet, P., Doliva-Dolinsky, A., Donnerstein, R., Hunter, L. C., Karunakaran, A., **Khim, D. J.**, Prabhu, D. S., Spekkens, K., & Zaritsky, D. 2025, *submitted to ApJ*, arXiv:2512.02118.

[15] *Caught in the Act of Quenching: A Population of Post-Starburst Ultra-Diffuse Galaxies*
Sandoval Ascencio, L., Cooper, M. C., Zaritsky, D., Donnerstein, R., **Khim, D. J.**, & Baxter, D. C. 2025, OJA, 8, 110.

[14] *A Closer Look at an Unusual Ultra-Diffuse Galaxy*
Khim, D. J., Zaritsky, D., Sandoval Ascencio, L., Cooper, M. C., & Donnerstein, R. 2025, ApJ, 989, 154.

[13] *Systematically Measuring Ultra-Diffuse Galaxies. VIII. Misfits, Miscasts, and Miscreants*
Zaritsky, D., Donnerstein, R., & **Khim, D. J.** 2025, OJA, 8, 90.

[12] *Identifying Dwarfs of MC Analog GalaxiEs (ID-MAGE): The Search for Satellites around Low-mass Hosts*
Hunter, L., Mutlu-Pakdil, B., Bennet, P., Sand, D., **Khim, D.**, et al. 2025, ApJ, 989, 58.

[11] *Properties of Nuclear Star Clusters in Low Surface Brightness Galaxies*
Khim, D. J., Zaritsky, D., Lambert, M., & Donnerstein, R. 2024, AJ, 168, 45.

[10] *Systematically Measuring Ultra-diffuse Galaxies (SMUDGes). VI. Nuclear Star Clusters*
Lambert, M., **Khim, D. J.**, Zaritsky, D., & Donnerstein, R. 2024, AJ, 167, 61.

[9] *An enigmatic 380 kpc long linear collimated galactic tail*
Zaritsky, D., Crossett, J. P., Jaffé, Y. L., Donnerstein, R., Karunakaran, A., **Khim, D. J.**, et al. 2023, MNRAS, 524, 1431–1437.

[8] *Systematically Measuring Ultra-diffuse Galaxies (SMUDGes). V. The Complete SMUDGes Catalog and the Nature of Ultradiffuse Galaxies*
Zaritsky, D., Donnerstein, R., Dey, A., Karunakaran, A., Kadowaki, J., **Khim, D. J.**, Spekkens, K., & Zhang, H. 2023, ApJS, 267, 27.

[7] *The MAGPI Survey - mapping galaxy transformation with MUSE: science goals, design, observing strategy and early results*
Foster, C., Mendel, J. T., Lagos, C. D. P., Wisnioski, E., Yuan, T., D'Eugenio, F., Barone, T. M., Harborne, K. E., Vaughan, S. P., Schulze, F., Remus, R.-S., Gupta, A., Collacchioni, F., **Khim, D. J.**, Taylor, P., Bassett, R., et al. 2021, PASA, 38, e031.

[6] *Star-Gas Misalignment in Galaxies. II. Origins Found from the Horizon-AGN Simulation*
Khim, D. J., Yi, S. K., Pichon, C., Dubois, Y., Devriendt, J., Choi, H., Bryant, J. J., & Croom, S. M. 2021, ApJS, 254, 27.

[5] *Star-Gas Misalignment in Galaxies. I. The Properties of Galaxies from the Horizon-AGN Simulation and Comparisons to SAMI*
Khim, D. J., Yi, S. K., Dubois, Y., Bryant, J. J., Pichon, C., Croom, S. M., Bland-Hawthorn, J., et al. 2020, ApJ, 894, 106.

[4] *Variable Stars in the Region of the Open Cluster NGC 1039 (M34)*
Jeon, Y.-B., Park, Y.-H., Lee, S.-M., Lee, U., **Kim, D.**, Jang, H., & Cho, S. 2015, PKAS, 30, 821–832.

[3] *Variable Stars in the Region of CYG OB3 Association Centered on the Open Cluster NGC 6871 II*
Jeon, Y.-B., Park, Y.-H., Lee, U., **Kim, D.**, Jang, H., & Cho, S. 2013, PKAS, 28, 83–93.

[2] *Variable Stars in the Region of CYG OB3 Association Centered on the Open Cluster NGC 6871 I: δ Scuti Type Stars*
Jeon, Y.-B., Lee, U., Park, Y.-H., **Kim, D.**, Jang, H., & Cho, S. 2012, PKAS, 27, 399–409.

[1] *CCD photometry of new variable stars and BX Dra*
Kim, D., Jeon, Y.-B., Lee, U., Jang, H.-E., Cho, S., & Park, Y.-H. 2009, Information Bulletin on Variable Stars, 5872, 1.

SPIE Proceedings Papers

[6] *Development of a multi-camera metrology system for closed-loop heliostat surface control*
Khim, D. J., Choi, H., Angel, J. R., Huang, Y., Hernandez, M., Negi, V. S., & Kim, D. 2026, Proc. SPIE, Paper 14215-28.

[5] *Single-shot metrology of multiple heliostats using the sun and a camera array*
Huang, Y., Angel, R., Choi, H., **Khim, D. J.**, Hernandez, M., Mayera, L., Negi, V. S., & Kim, D. 2026, Proc. SPIE, Paper 14212-27.

[4] *Optomechanical design for a prototype heliostat*
Hernandez, M., Kim, C., Choi, H., Kim, D., Huang, Y., **Khim, D. J.**, et al. 2026, *submitted to Proc. SPIE*, Paper 14215-42.

[3] *Active optics alignment using field-dependent point spread functions from the Large Binocular Camera's science images*
Khim, D. J., Kim, D., & Choi, H. 2025, Proc. SPIE, Paper 13624-11.

[2] *Twisting heliostat technology enabling high temperature industrial processes and solar electric power generation*
Kim, D., Angel, R., Hissataka, L. K., Nash, L., Hernandez, M., **Khim, D. J.**, et al. 2025, Proc. SPIE, Paper 13600-15.

[1] *In-situ slope measurement system for heliostat daytime operation*
Choi, H., Angel, R., Huang, Y., Hernandez, M., **Khim, D. J.**, Hissataka, L., Nash, L., et al. 2025, Proc. SPIE, 13600-22.

Research Software & Technical Development

MC2fit **2022–present**
- A multi-component, multi-configuration GALFIT-based pipeline for structural modeling of faint dwarf galaxies
- Optimized the pipeline for systems with multiple components, including nuclear star clusters
- Used in four peer-reviewed studies: Lambert et al. 2024, Khim et al. 2024, Hunter et al. 2025, Mazziotti et al. 2026

Surveillance Assistance Program for the Joint Security Area **2015–2016**
- Developed software to calculate target coordinates, ground speed, and elevation, and to automatically classify surveillance events

Telescope Operating System for Yonsei University's Ilsan Observatory **2011–2013**
- Developed software for telescope pointing, coordinate calculation, and observatory operation support

Talks & Presentations

[25]	**Talk**	Invited seminar - Department of Physics and Astronomy, University of California, Riverside	Oct. 2026
[24]	**Talk**	Invited seminar - Department of Physics and Astronomy, University of California, Irvine	Oct. 2026
[23]	**Talk**	NOIRLab FLASH Talk Series	Sep. 2026
[22]	**Talk**	2026 SPIE Optics + Photonics	Aug. 2026
[21]	**Talk**	247th American Astronomical Society Meeting – Splinter Session Talk	Jan. 2026
[20]	**Poster**	247th American Astronomical Society Meeting – iPoster	Jan. 2026
[19]	**Talk**	NOIRLab FLASH Talk Series	Sep. 2025
[18]	**Talk**	10 Years of Ultra-Diffuse Galaxies: Past Perspectives and Future Prospects	Aug. 2025
[17]	**Talk**	2025 SPIE Optics + Photonics	Aug. 2025
[16]	**Talk**	Steward Observatory Spring 2025 Internal Symposium	May 2025
[15]	**Talk**	Steward Observatory Spring 2024 Internal Symposium	Apr. 2024
[14]	**Talk**	Steward Observatory Spring 2023 Internal Symposium	Apr. 2023
[13]	**Talk**	Wide-Field Spectroscopy vs Galaxy Formation Theory	Mar. 2023
[12]	**Talk**	2022 CGER kick-off meeting	Aug. 2022
[11]	**Talk**	2021 Korea Astronomical Society Spring Meeting	Apr. 2021
[10]	**Talk**	Galaxy Evolution Workshop 2020	Feb. 2021
[9]	**Talk**	Numerical Galaxy Formation Mini-Workshop	Jan. 2021
[8]	**Talk**	2020 Korea Astronomical Society Fall Meeting	Oct. 2020
[7]	**Talk**	2019 RAMSES Users Conference	Sep. 2019
[6]	**Talk**	Mini-workshop on Numerical Modeling of Galaxy Formation and Evolution	May 2019
[5]	**Poster**	2019 Korea Astronomical Society Spring Meeting **(Poster Award)**	Apr. 2019
[4]	**Talk**	SAMI Busy Week	Feb. 2019
[3]	**Poster**	2019 The 2nd Yonsei Astro Poster Jamboree **(Best Poster Award)**	Feb. 2019
[2]	**Talk**	Galaxy Formation Workshop	Jan. 2019
[1]	**Talk**	Mini-workshop on Galaxy Evolution	Nov. 2018

Teaching & Mentoring Experience

[8] Teaching Assistant, Observational Astronomy, University of Arizona — Spring 2025
[7] Teaching Assistant, Radiative Processes and the Interstellar Medium, University of Arizona — Spring 2024
- Delivered more than 10 course lectures

[6] Guest Lecturer, Yonsei Astronomy RC101 "Conversation with Alumni," Yonsei University — Spring 2023
[5] Research Mentor, University of Arizona — 2022–2025
- Mentored undergraduate students in identifying and modeling nuclear star clusters in low-surface-brightness galaxies; projects resulted in three peer-reviewed publications
- Mentored undergraduate students in identifying tidal disruption events in galaxies

[4] Mentor, Korean International Team, 1st Global e-Competition on Astronomy and Astrophysics (GeCAA) — Fall 2020
[3] Teaching Assistant, Understanding of Space, Yonsei University — Fall 2019
[2] Military Squad Counselor — 2016
[1] Teaching Assistant (seasonal) for "Korea Astronomy Olympiad Summer/Winter Schools" — 2012–2018

Science Outreach Programs

[6] Public Lecture: Splendido Retirement Community's Astronomy Lecture Series — Feb. 2026

[5] Public Lecture Series, *"Universe Express"* — 2020–2021
- Participated in a Korean-language astronomy outreach program on YouTube
- Served as the student project director

[4] KBS Documentary Film, *"Kiss the Universe"* — 2020–2021
- Contributed to script development and scientific content review for a 2021 astronomy documentary produced by KBS, South Korea's national public broadcaster.

[3] Science Educator (seasonal), Songam Space Center (http://www.starsvalley.com) — 2012–2018

[2] Printed Astronomy Outreach Magazine, *"Would You Like"* (http://wouldyoulike.org) — 2012–2017
- Co-founder and Editor-in-Chief
- Produced and distributed a printed astronomy outreach magazine to universities and high schools across Korea

[1] Education Outreach, *"Beol-A-Rum"* — 2011–2017
- Developed educational materials and served as a science educator for an astronomy observation club

Leadership & Service

[6] University of Arizona Korean Graduate Student Association — 2021–present
- President, 2022–2026

[5] 75th Anniversary of the Korean War Memorial Event & 72nd Anniversary of ROK-US Alliance — Jun. 28, 2025
- Served as the representative of Korean students at the University of Arizona in the Korean War Veterans Roll Call Ceremony honoring Arizona service members

[4] Steward Observatory International Scholars Task Force — 2021–present
- Organizer/Chair, 2026–present

[3] Astro Graduates General Meeting — 2019–2021
- Executive Committee Member, Primary Assembly of the Astronomy Graduate Student Association

[2] Yonsei University Student Council — 2012–2013
- Executive Committee Member, Office of Education Support

[1] Yonsei University Student Club Council — 2012
- Director, Office of Sports

Awarded Observing Programs

25 awarded programs: 13 as PI and 12 as Co-I
Total awarded time: 37.59 nights with 173 HST orbits
Facilities: LBT, MMT, Gemini North & South, Magellan Clay, Keck II, and HST

[25]	**Co-I**	MMT / Binospec-IFU, UAO-S137-26B	1.5 nights	2026B
[24]	**Co-I**	MMT / Binospec-IFU, UAO-S121-26B	2 nights	2026B
[23]	**Co-I**	Keck II / KCWI, 2026B_U227	1 night	2026B
[22]	**Co-I**	Keck II / KCWI, 2026B_U226	1 night	2026B
[21]	**PI**	LBT / LBC, AZ-2026A-014	2 nights	2026A
[20]	**Co-I**	MMT / Binospec-IFU, UAO-S334-26A	2 nights	2026A
[19]	**Co-I**	MMT / Blue Channel, UAO-S348-26A	1 night	2026A
[18]	**PI**	MMT / Binospec-IFU, UAO-S152-25B	2 nights	2025B
[17]	**Co-I**	Keck II / KCWI, 2025B_U217	1 night	2025B
[16]	**PI**	MMT / Binospec-IFU, UAO-S140-25A	2 nights	2025A
[15]	**PI**	MMT / Binospec-IFU, UAO-S141-25A	1 night	2025A
[14]	**Co-I**	MMT / Binospec-IFU, UAO-S193-25A	1.5 nights	2025A
[13]	**Co-I**	*HST,* Cycle 33, ID. #18062	24 orbits	Jul. 2025
[12]	**Co-I**	*HST,* Cycle 33, ID. #18061	149 orbits	Jul. 2025
[11]	**PI**	Gemini-S / GMOS-S, GS-2024B-Q-119	1.44 nights	2024B
[10]	**PI**	Gemini-N / GMOS-N, GN-2024A-Q-119	1.35 nights	2024A
[9]	**Co-I**	MMT / Binospec-IFU, DIR	3 hours	2024A
[8]	**PI**	MMT / Binospec-IFU, UAO-S155-24A	3 nights	2024A
[7]	**PI**	MMT / Binospec-IFU, UAO-S188-24A	1 night	2024A
[6]	**PI**	MMT / Binospec, UAO-S142-23B	3 nights	2023B
[5]	**PI**	Magellan Clay 6.5-m / LDSS-3	1 night	Jul. 2023
[4]	**PI**	MMT / Binospec, UAO-S107-23A	1.5 nights	2023A
[3]	**PI**	MMT / Binospec, UAO-S134-22B	3 nights	2022B
[2]	**Co-I**	MMT / Binospec, UAO-S171-22A	2.5 nights	2022A
[1]	**PI**	MMT / Binospec, UAO-S138-22A	1.5 nights	2022A

Military Service: UNCSB-JSA https://8tharmy.korea.army.mil/uncsb

- United Nations Command Security Battalion – Joint Security Area, Panmunjom 2014–2016
- Sergeant and Surveillance Squad Leader; honorably discharged after conducting 180+ VIP protection missions, including protection for the U.S. Secretary of Defense; recipient of three commendations

Skills & Activities

Languages	Korean (Native), English (Proficient)
Programming	Python, C++, C, Cython, MATLAB, Fortran
Astronomical Software	GALFIT, pPXF, DOLPHOT, IRAF/PyRAF, RAMSES, Prospector
High-performance computing	Traced galaxy evolution in large-scale cosmological simulations; developed and managed automated workflows for structural fitting of galaxies on HPC clusters
Sports	**Yonsei Skin Scuba Diving Team**, Club President (2012–2013); 250+ logged dives; NAUI Master Scuba Diver (certified 2013); PADI Enriched Air Diver (certified 2019) **Taekwondo** Third-degree black belt, 3rd Dan

References

Prof. Dennis Zaritsky (Ph.D. Advisor)
Deputy Director, Steward Observatory
Regents Professor of Astronomy, University of Arizona
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Prof. Ann Zabludoff
Astronomer, Steward Observatory
Professor of Astronomy, University of Arizona
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Prof. David Sand
Astronomer, Steward Observatory
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