

Jinmi Yoon, Ph.D.

✉ Department of Physics
University of Notre Dame, IN 46556 USA

Curriculum Vitae

jinmi.yoon@gmail.com
🌐 jinmiyoon.github.io/
ORCID: 0000-0002-4168-239X

Education

- 2002 – 2008 **Ph.D. Physics (Astrophysics)**
Department of Physics and Astronomy, Stony Brook University, NY, USA
Dissertation title: *Rotation and Evolution of A and F stars*
Advisor: Prof. Deane M. Peterson
- 1999 – 2002 **M.Sc. Physics**
School of Physics, Seoul National University, Seoul, Republic of Korea
Thesis title: *Closed string dynamics in tensor fields*
- 1995 – 1999 **B.Sc. Physics**
Department of Physics, University of Seoul, Seoul, Republic of Korea
(graduated with a top honor and Dean's award for academic excellence)

Employment/Appointment

- 2021 – **Senior Staff Astronomical Data Scientist**
Space Telescope Science Institute, MD USA
- 2017 – 2020 **JINA-CEE Postdoctoral Fellow**
Department of Physics and Joint Institute for Nuclear Astrophysics-Center for the evolution of the elements, University of Notre Dame, IN USA
- 2015 – 2017 **Postdoctoral Research Associate**
Department of Physics and Joint Institute for Nuclear Astrophysics-Center for the evolution of the elements, University of Notre Dame, IN USA
- 2002–2008 **Graduate Research and Teaching Assistant** Department of Physics and Astronomy, Stony Brook University, NY USA
- 2001–2002 **Adjunct faculty (lecturer and lab instructor)**
Department of Physics, University of Seoul, Seoul, Republic of Korea
- 1999–2001 **Graduate Research and Teaching Assistant** School of Physics, Seoul National University, Seoul, Republic of Korea

Awards/Honors/Achievements

- 2017–present **JINA-CEE Postdoctoral Fellowship**, University of Notre Dame
- 2016–present **AAS Astronomy Ambassador program cohort**, Astronomical Society of the Pacific (ASP) & American Astronomical Society (AAS)
- 2000 – 2001 **Brain Korea 21 scholarship**, School of Physics, Seoul National University
- 1999 **Dean's award** (from the College of Liberal Arts and Sciences) for academic excellence, University of Seoul
- Graduated with a top honor**, the department of Physics, The University of Seoul

Awards/Honors/Achievements (continued)

- 1995 – 1998 ■ Scholarship for academic excellence/top 3 highest class rank, the department of Physics, University of Seoul

Research Interests

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|-----------------------------|--|
| Galactic archaeology | ■ The nature of the first-generation of stars through chemodynamical analysis of the most metal-poor stars, in particular, carbon-enhanced metal-poor (CEMP) stars in the Galactic halo and the ultra-faint dwarf galaxies |
| Near-field cosmology | ■ Formation and evolution of galaxies in the early Universe |
| Galactic chemical evolution | ■ Evolution of chemical elements throughout the Galactic assembly history, in particular, its early enrichment history |
| Nuclear astrophysics | ■ Origin and evolution of elements and first-star nucleosynthesis (quiescent stellar burning processes and neutron-capture processes such as s-process, i-process, and r-process) |
| Stellar Astrophysics | ■ Stellar evolution and (rapid) rotation of intermediate-mass and massive stars |

Research Publications

An inactive publication gap during 2011–2014 is due to an extended family leave.

Each article with citations can be also found at [my ADS library](#) and [my ORCID link](#).

* Students I have mentored.

First- and Second-Authored Peer Reviewed Journal Articles

1. Dietz*, S. E., Yoon, J., Beers, T. C. & Placco, V. M. *The Metallicity Gradient and Complex Formation History of the Outermost Halo of the Milky Way* May 2020. doi:[10.3847/1538-4357/ab7fa4](#). arXiv: [1911.11140 \[astro-ph.GA\]](#).
2. Yoon, J., Whitten*, D. D., Beers, T. C., Lee, Y. S., Masseron, T. & Placco, V. M. *Identification of a Group III CEMP-no Star in the Dwarf Spheroidal Galaxy Canes Venatici I* May 2020. doi:[10.3847/1538-4357/ab7daf](#). arXiv: [1910.10038 \[astro-ph.SR\]](#).
3. Yoon, J., Beers, T. C., Tian*, D. & Whitten*, D. D. *Origin of the CEMP-no Group Morphology in the Milky Way*, *The Astrophysical Journal*, 878, 97 June 2019. doi:[10.3847/1538-4357/ab1ead](#). arXiv: [1904.02758 \[astro-ph.SR\]](#).
4. Yoon, J., Beers, T. C., Dietz*, S., Lee, Y. S., Placco, V. M., Da Costa, G., Keller, S., Owen, C. I. & Sharma, M. *Galactic Archeology with the AEGIS Survey: The Evolution of Carbon and Iron in the Galactic Halo*, *The Astrophysical Journal*, 861, 146, July 2018. doi:[10.3847/1538-4357/aaccea](#). arXiv: [1806.04738 \[astro-ph.SR\]](#).
5. Yoon, J., Beers, T. C., Placco, V. M., Rasmussen*, K. C., Carollo, D., He, S., Hansen, T. T., Roederer, I. U. & Zeanah, J. *Observational Constraints on First-star Nucleosynthesis. I. Evidence for Multiple Progenitors of CEMP-No Stars*, *The Astrophysical Journal*, 833, 20, Dec. 2016. doi:[10.3847/0004-637X/833/1/20](#). arXiv: [1607.06336 \[astro-ph.SR\]](#).
6. Yoon, J., Peterson, D. M., Kurucz, R. L. & Zagarelio, R. J. *A New View of Vega's Composition, Mass, and Age*, *The Astrophysical Journal*, 708, 71, Jan. 2010. doi:[10.1088/0004-637X/708/1/71](#).

7. **Yoon, J.**, Peterson, D. M., Zagarelo, R. J., Armstrong, J. T. & Pauls, T. *The Effect of Rotation on the Spectrum of Vega*, *The Astrophysical Journal*, 681, 570, July 2008. doi:[10.1086/588550](https://doi.org/10.1086/588550). arXiv: [0803.3145](https://arxiv.org/abs/0803.3145) [astro-ph].
8. **Yoon, J.**, Peterson, D. M., Armstrong, J. T., Clark James H., I., Gilbreath, G. C., Pauls, T., Schmitt, H. R. & Zagarelo, R. J. *The Effect of Rotation on Calibrators for Ground-based Interferometry*, *Publications of the Astronomical Society of the Pacific*, 119, 437, Apr. 2007. doi:[10.1086/518270](https://doi.org/10.1086/518270).

Co-Authoring Peer Reviewed Journal Articles

9. Jeon, M., Bromm, V., Besla, G., **Yoon, J.** & Choi, Y. *The role of faint population III supernovae in forming CEMP stars in ultra-faint dwarf galaxies* Dec. 2020. arXiv: [2012.10012](https://arxiv.org/abs/2012.10012) [astro-ph.GA].
10. Lee, Y. S., Beers, T. C., Kim, Y. K., Placco, V., **Yoon, J.**, Carollo, D., Masseron, T. & Jung, J. *Chemical Cartography. I. A Carbonicity Map of the Galactic Halo* Feb. 2017. doi:[10.3847/1538-4357/836/1/91](https://doi.org/10.3847/1538-4357/836/1/91). arXiv: [1702.00195](https://arxiv.org/abs/1702.00195) [astro-ph.GA].
11. Placco, V. M., Frebel, A., Beers, T. C., **Yoon, J.**, Chiti, A., Heger, A., Chan, C., Casey, A. R. & Christlieb, N. *Observational Constraints on First-Star Nucleosynthesis. II. Spectroscopy of an Ultra metal-poor CEMP-no Star* Dec. 2016. doi:[10.3847/0004-637X/833/1/21](https://doi.org/10.3847/0004-637X/833/1/21). arXiv: [1609.02134](https://arxiv.org/abs/1609.02134) [astro-ph.SR].
12. Hansen, T. T., Andersen, J., Nordström, B., Beers, T. C., Placco, V. M., **Yoon, J.** & Buchhave, L. A. *The role of binaries in the enrichment of the early Galactic halo. III. Carbon-enhanced metal-poor stars - CEMP-s stars* Apr. 2016. doi:[10.1051/0004-6361/201527409](https://doi.org/10.1051/0004-6361/201527409). arXiv: [1601.03385](https://arxiv.org/abs/1601.03385) [astro-ph.SR].
13. Hansen, T. T., Andersen, J., Nordström, B., Beers, T. C., Placco, V. M., **Yoon, J.** & Buchhave, L. A. *The role of binaries in the enrichment of the early Galactic halo. II. Carbon-enhanced metal-poor stars: CEMP-no stars* Feb. 2016. doi:[10.1051/0004-6361/201527235](https://doi.org/10.1051/0004-6361/201527235). arXiv: [1511.08197](https://arxiv.org/abs/1511.08197) [astro-ph.SR].
14. Hansen, T. T., Andersen, J., Nordström, B., Beers, T. C., **Yoon, J.** & Buchhave, L. A. *The role of binaries in the enrichment of the early Galactic halo. I. r-process-enhanced metal-poor stars* Nov. 2015. doi:[10.1051/0004-6361/201526812](https://doi.org/10.1051/0004-6361/201526812). arXiv: [1509.05344](https://arxiv.org/abs/1509.05344) [astro-ph.SR].

Pre-prints

15. Aprahamian, A., Surman, R., Frebel, A., McLaughlin, G. C., Arcones, A., Balantekin, A. B., Barnes, J., Beers, T. C., Holmbeck, E. M., **Yoon, J.**, Brodeur, M., Sprouse, T. M., Vassh, N., Cizewski, J. A., Clark, J. A., Cote, B., Couch, S. M., Eichler, M., Engel, J., Ezzeddine, R., Fuller, G. M., Giuliani, S. A., Grzywacz, R., Han, S., Horowitz, C. J., Kankainen, A., Korobkin, O., Kwiatkowski, A. A., Lawler, J. E., Lippuner, J., Litvinova, E., Mathews, G. J., Mumpower, M. R., Naimi, S., Nazarewicz, W., O'Connor, E., O'Shea, B. W., Perego, A., Perdakis, G., Radice, D., Richers, S., Roberts, L. F., Robin, C., Roederer, I. U., Siegel, D. M., Schunck, N., Spyrou, A. & Zhu, Y.-L. *FRIB and the GW170817 Kilonova* Sept. 2018. arXiv: [1809.00703](https://arxiv.org/abs/1809.00703) [astro-ph.HE].

Conference Proceedings

16. Dietz*, S., Beers, T. C., Placco, V. M., **Yoon, J.** & AEGIS Collaboration. *Kinematic and Chemical Analysis of AEGIS Survey Stars in IAUS 334 Rediscovering Our Galaxy* (eds Chiappini, C., Minchev, I., Starkenburg, E. & Valentini, M.) 334 (Aug. 2018), 283–284. doi:[10.1017/S1743921317006895](https://doi.org/10.1017/S1743921317006895).
17. Lee, Y. S., Beers, T. C., **Yoon, J.**, Kim, Y. K. & Jeong, J. *Assembly of the Galactic Halo System Based on Carbon-Enhanced Metal-Poor Stars in IAUS 334 Rediscovering Our Galaxy* (eds Chiappini, C., Minchev, I., Starkenburg, E. & Valentini, M.) 334 (Aug. 2018), 327–328. doi:[10.1017/S1743921317007529](https://doi.org/10.1017/S1743921317007529).
18. Rasmussen*, K. C., Beers, T. C., Placco, V. M., **Yoon, J.** & Dietz*, S. *Measurement of [Fe/H] and [C/Fe] for Metal-Poor Stars from the RAVE Survey in IAUS 334 Rediscovering Our Galaxy* (eds Chiappini, C., Minchev, I., Starkenburg, E. & Valentini, M.) 334 (Aug. 2018), 353–354. doi:[10.1017/S1743921317007001](https://doi.org/10.1017/S1743921317007001).

19. **Yoon, J.**, Whitten*, D. D., Beers, T. C., Placco, V. M., Lee, Y. S., Dietz*, S., Gudin*, D. & Rasmussen*, K. C. *Lifting the Veil on Ultra Metal-Poor Stars in the Outermost Halo* in *IAUS 334 Rediscovering Our Galaxy* (eds Chiappini, C., Minchev, I., Starkenburg, E. & Valentini, M.) **334** (Aug. 2018), 389–390. doi:[10.1017/S174392131700792X](https://doi.org/10.1017/S174392131700792X).
20. **Yoon, J.**, Peterson, D. M., Armstrong, T., Clark James H., I., Gilbreath, C., Pauls, T. & Schmitt, H. R. *Early type stars as calibrators for ground-based interferometry* in *Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series* **6268** (June 2006), 626848. doi:[10.1117/12.670309](https://doi.org/10.1117/12.670309).

Journal Articles Under Review

21. Whitten, D. W., Placco, V. M., Beers, T. C., ..., **Yoon, J.** & ... *The Photometric Metallicity and Carbon Distributions of the Milky Way's Halo and Solar Neighborhood from S-PLUS Observations of SDSS Stripe 82*, submitted to *The Astrophysical Journal*
22. Dietz, S. E., **Yoon, J.**, Beers, T. C., Placco, V. & Lee, Y. S. *Two Populations of Carbon-Enhanced Metal-Poor Stars in the Disk System of the Milky Way* Dec. 2020. arXiv: [2012.03463](https://arxiv.org/abs/2012.03463) [astro-ph.GA].

Presentations

Invited Talks and Seminars

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| Dec 2020 | ■ "First-Star Nucleosynthesis", JINA Horizons Working Group 2: Stellar Burning (virtual meeting) |
| Dec 2019 | ■ "Understanding cosmic origins with the relics of the first stars", Colloquium at Carnegie Observatories, CA |
| Jun 2019 | ■ "We are Star Stuff: Galactic Archaeology and the Origin of the Elements", REU seminar talk, University of Notre Dame, IN |
| May 2019 | ■ "First-star nucleosynthetic imprints in the Milky Way and its satellite dwarf galaxies", 2019 JINA-CEE Frontiers meeting, East Lansing, MI |
| Dec 2018 | ■ "Decoding the Stellar Fossils of the First Stars", Astronomy colloquium talk, Astronomy program at Seoul National University, Seoul, Korea |
| | ■ "Unraveling the Assembly History of the Galactic halo with CEMP-no Stars", Colloquium talk, Korea Astronomy and Space Science Institute, Daejeon, Korea |
| Oct 2017 | ■ "Galactic Archeology: Study of the Early Universe with Ancient Stars", the department of Physics and Astronomy at Indiana University at South Bend, South Bend, IN |
| Jul 2017 | ■ "Galactic Archeology: Study of the Early Universe with Metal-Poor Stars", Astronomy seminar at Department of Astronomy & Space Science, Chungnam National University, Daejeon, Korea |
| Sep 2016 | ■ "Near-Field Cosmology with Carbon-Enhanced Metal-Poor stars", Astrophysics seminar, at Department of Physics, University of Notre Dame, IN |

Contributed Talks

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| Mar 2020 | ■ "Stochastic Galactic Chemical Evolution" at JINA Galactic Chemical Evolution workshop, MIT, USA |
| Sep 2019 | ■ "Origin of CEMP-no morphology in the Milky Way halo" at CEMP stars as Probes of First-Star Nucleosynthesis, the IMF, and Galactic Assembly, University of Geneva, Switzerland |

Presentations (continued)

- Dec 2018 ■ "The Origin of CEMP-no: Connection to the Satellite Dwarf Galaxies" at Stellar Archeology as a Time Machine to the First Stars, Kavli IPMU, Japan
- May 2018 ■ "Near Field Cosmology with most metal-poor stars" at Enzo Workshop 2018, Atlanta, GA
- Nov 2017 ■ "Lifting the Veil of Ultra Metal-Poor stars in the Outermost Galactic Halo" at A Celebration of CEMP & Gala of GALAH workshop, Melbourne, Australia
- Aug 2017 ■ "Lifting the Veil of Ultra Metal-Poor stars in the Outermost Galactic Halo" at Giant Magellan Telescope Community meeting, Tarrytown, NY
- Feb 2017 ■ "Best and Farthest: Searching for Ultra Metal-Poor stars in the Outermost Galactic Halo" at JINA-CEE Frontiers meeting, Lansing, MI
- Jan 2017 ■ "Best and Farthest: Searching for Ultra Metal-Poor stars in the Outermost Galactic Halo" at the 229th American Astronomical Society Meeting, Grapevine, TX
- Sep 2016 ■ "Evidence for Multiple Progenitors of CEMP-no Stars" at Precision Spectroscopy 2016 workshop, Porto Alegre, Brazil
- Oct 2008 ■ "Updating Vega's mass, age, and evolutionary status" at the Astronomical Society of New York, New York, IN
- Apr 2007 ■ "The effects of rotation on early type stars as ground-based interferometry calibrators" at the Astronomical Society of New York, Albany, NY

Posters

- Jan 2020 ■ "Origin and evolution of the CEMP-no stars in the Galaxy and its satellite dwarf galaxies" at the 235th American Astronomical Society meeting, Honolulu, HI
- Jul 2017 ■ "Lifting the Veil of Ultra Metal-Poor stars in the Outermost Galactic Halo" at 334 IAU symposia, Potsdam, Germany
- Apr 2017 ■ "Searching for Ultra Metal-Poor stars in the Outermost Galactic Halo" at JINA-CEE NSF review site visit, Michigan State University, East Lansing, MI
- Aug 2016 ■ "Absolute Carbon Abundance Distribution of Carbon-Enhanced Metal-Poor stars" at The First Stars conference, Heidelberg, Germany
- Mar 2016 ■ "Carbon Plateaus among Carbon-Enhanced Metal-Poor stars" at 2016 JINA-CEE frontiers meeting, South Bend, IN
- Jan 2016 ■ "Carbon Plateaus among Carbon-Enhanced Metal-Poor stars" at the 227th American Astronomical Society meeting, Kissimmee, FL
- Jun 2015 ■ "Tracing Ultra Faint Dwarf galaxies with CEMP-no stars" at Local Group Astrostatistics conference, University of Michigan at Ann Arbor, MI
- Mar 2015 ■ "Searching for Ultra Faint Dwarf galaxies using CEMP-no stars" at JINA-CEE frontiers in Nuclear Astrophysics, Michigan State University, East Lansing, MI
- May 2006 ■ "Early type stars as calibrators for ground-based interferometry" at the International Society for Optical Engineering, Orlando, FL

Observations/Proposals

- 2016 – Present ■ **Large Binocular Telescope (LBT)**
 – LUCI (as PI) 2020B (4 hours)
 – PEPSI (as Co-I, PI: Timothy Beers) 2017B (5 hours)
 – MODS (as PI): 2016B (2.8 hours), 2017A (12 hours), 2017B (4 hours), 2018A (4 hours), 2018B (4 hours), 2019A (2 hours), 2019B (2 hours)
- 2017 – Present ■ **Gemini Telescope**
 – GMOS Gemini Fast turnaround program 2017A (Co-I, 5.5 hours granted, PI: Vinicius Placco)
 – GMOS Gemini Fast turnaround program 2017B (PI, 6.3 hours granted)
 – GRACES K-GMT Science Program 2018B (Co-I, 10 hours granted, PI: Young Sun Lee)
- 2020– Present ■ **Subaru Telescope**
 – IRD (InfraRed Doppler) 2020A observation (Co-I, one night granted, PI: Wako Aoki)

Research Experience

- 2018–Present ■ **Galactic chemical evolution**
 Collaboration with Dr. Benoit Côte
- Developing stochastic Galactic chemical evolution code (Python) using NuGrid [NuPyCEE](#) pipeline to study the effect of stochastic star formation on Galactic chemical evolution
- 2015–Present ■ **Galactic archaeology and near-field cosmology**
 JINA-CEE Postdoctoral Fellow (2017–present) and Postdoctoral Associate (2015–2017) at the department of Physics and JINA-CEE, University of Notre Dame
- Project leading and development of a stellar parameter pipeline (Python) ([CASPER](#)) for cool carbon stars
 - *Best and Farthest Survey*: Searching for ultra metal-poor stars in the outermost Galactic halo using both Large Binocular Telescopes, Gemini telescopes
 - Kinematical analyses using [galpy](#) of the Galactic halo stars
 - Use of various data such as SDSS, AEGIS, Gaia, and literature database
- 2004–2008 ■ **Stellar Rapid Rotation and Evolution of A and F stars with Prof. Deane M. Peterson**
 Graduate Research Assistant at the department of Physics and Astronomy, Stony Brook University
- Ph. D. Dissertation titled “Rotation and Evolution of A and F stars”
 - Stellar rotation modeling (C programming)
 - High-resolution spectroscopy (ELODIE archival data) and spectral synthesis for 2D rotating stellar models
 - High angular resolution long baseline interferometry (Navy Precision Optical Interferometer)

Research Experience (continued)

- Summer 2004 ■ **Stellar Imager Design Reference Mission with Prof. Fred Walter**
Graduate Research Assistant at the department of Physics and Astronomy, Stony Brook University
• Developed the observation scheduling code using IDL language
- Summer 2003 ■ **Photometry Reduction with Prof. Michal Simon**
Graduate Research Assistant at the department of Physics and Astronomy, Stony Brook University
- 2000–2001 ■ **High Energy Physics with Prof. Soo-Jong Rey**
Graduate Research Assistant at the School of Physics, Seoul National University
Master of Science thesis titled "Closed string dynamics in tensor fields"

External Funding/Travel Grants

- Feb 2020 ■ Travel grant from International Research Network for Nuclear Astrophysics (iReNA) to visit Konkoly Observatory for collaboration, Hungary
- Jan 2020 ■ Travel grants from the Department of Physics and the College of Science at University of Notre Dame, the AAS 235 meeting, Honolulu HI
- Dec 2018 ■ Travel grant from a conference, Stellar Archaeology as a Time Machine to the First Stars, IMPU, Japan
- AAS 2018B International travel grant for a travel to a conference, Stellar Archaeology as a Time Machine to the First Stars, Kavli IPMU, Japan
- Jul 2018 ■ Full travel grant from a workshop, FRIB Theory Alliance r-process meeting
- May 2018 ■ Full travel grant from ENZO user tutorial workshop
- Nov 2017 ■ AAS 2017B International travel grant for a trip to a conference, A celebration of CEMP and gala of GALAH, Melbourne, Australia
- Jul 2017 ■ IAU travel grant, Rediscovering the Galaxy, IAU symposium 334 at Potsdam, Germany
- Jan 2017 ■ Travel grant from Astronomical Society of Pacific & AAS to participate AAS Astronomy Ambassador Program
- Jun 2006 ■ Partial travel grant from Astronomical Society of New York to attend Michelson Summer Workshop in Pasadena, Caltech
- Partial Travel Grant from Michelson Summer Workshop, in Pasadena, California Institute of Technology
- Research Travel Award from Stony Brook University Graduate Student Organization to attend Michelson Summer Workshop, in Pasadena, California Institute of Technology
- 2000–2001 ■ Brain Korea 21 scholarship, School of Physics, Seoul National University
- 1996–1998 ■ Full Scholarship (full tuition waived for 3 years) for 3 highest class rank, Department of Physics, University of Seoul
- 1995 ■ Scholarship (tuition partially waived for a semester), Department of Physics, University of Seoul

Grant Review Experience and Workshops

- Mar 2019 ■ NSF Astronomy & Astrophysics Grant Review panelist
- May 2018 ■ Writing Successful Grants workshop held at the University of Notre Dame

Teaching Experience

- Sep 2020 ■ Lecturer, JINA Nuclear Astrophysics Lecture Series (virtual)
 - title: "Galactic archaeology: an astrophysical approach to understanding the formation and evolution of the elements"
- May 2019 ■ Summer school lecturer, JINA-CEE First Frontiers Summer School, Michigan State University, East Lansing, MI
 - Lecture about stellar evolution and elemental production processes
- 2002–2004 ■ Graduate Teaching Assistant, Department of Physics and Astronomy, Stony Brook University
 - Introductory Astronomy, Planetary Sciences, Physics Labs
- 2001–2002 ■ Adjunct Faculty (lecturer and Lab instructor), Department of Physics, University of Seoul
 - Introductory Physics I and II classes for engineering and science students
- 1999–2001 ■ Graduate Teaching Assistant, School of Physics, Seoul National University
 - Grading for introductory Physics I and II classes for engineering and science students for 4 semesters
- 1998–1999 ■ Undergraduate Teaching Assistant, Department of Physics, University of Seoul
 - Tutoring teaching university-level physics to a high school student
- 1997 ■ Tutoring calculus to a high school student

Teaching Workshops

- Attended several teaching workshops held at University of Notre Dame (Kaneb Center for Teaching and Learning)
- 2017 ■ Beyond the Abstract: Teaching with Scientific Literature
 - Maker Series: Adobe Spark Video
 - A Landscape View of Digital Teaching and Learning: How to Jump in
 - Helping Students in Distress
 - Understanding and Fostering Student Motivation
- 2016 ■ Teaching Writing across Disciplines
 - Foundations of Teaching in STEM Session I-IV
 - Once Upon a Time: Storytelling as a Tool for Teaching and Learning

Mentoring Experience

- 2019–Present ■ Leading and mentoring a group of graduate students (Dmitrii Gudín, Devin Whitten, and Joseph Zepeda) for a project (CASPER; CEMP Group Assignment and Stellar Parameter Estimation Routine), which analyzes very cool ($3500 < T_{\text{eff}} < 4500$ K) CEMP stars and develops a python stellar parameter estimation routine package for cool CEMP stars.
- 2017–2018 ■ Di Tian (REU student at University of Notre Dame and undergraduate student from Xi'an Jiaotong University, China)
 - now a Ph D student at Tsinghua University
 - kinematics studies of the high latitude high proper motion stars
 - Explored A(C)–[Fe/H] relation of satellite dwarf galaxies
 - Resulted in a publication for the Astrophysical Journal (Yoon et al., 2019, ApJ, 878,97)
- 2017–2019 ■ Dmitrii Gudín (Graduate student at University of Notre Dame)
 - Study of galaxy formation via data of metal poor stars from cosmological simulations and the project CASPER.
- 2017–2020 ■ Devin Whitten (Graduate student at University of Notre Dame)
 - Developing a novel technique to derive reliable stellar parameters for very cool carbon stars
 - Resulted in two publications (Yoon et al. 2019 ApJ 878, 97 and Yoon et al. 2020 ApJ, 894, 7) and two articles in preparation (“CASPER: CEMP Group Assignment and Stellar Parameter Estimation Routine”)
- 2016–2020 ■ Sarah Dietz (Graduate student at University of Notre Dame)
 - Kinematics studies of the metal-poor stars and metallicity gradient in the Galactic halo
 - Resulted in three articles (Dietz et al. 2018 Proceedings of IAU S334, 329, Yoon et al. 2018, ApJ, 861, 146, and Dietz et al. 2020 ApJ 894, 34)
- 2015–2016 ■ Kaitlin Rasmussen (Graduate student at University of Notre Dame)
 - First-star nucleosynthesis using CEMP stars
 - Resulted in a publication (Yoon et al., 2016, ApJ, 833, 20)
- Summer 2005 ■ Danielle Kumpulian (REU student from Rensselaer Polytechnic Institute at Stony Brook University)
 - Helping basic linux operation and programming

Outreach Activities

- 2020 ■ Astronomy Club (3rd graders), Kennedy Primary Academy, South Bend, IN
 - A public outreach talk and demo (emission spectroscopy using spectrum tubes) titled “Origin of the Elements: Star Stuff”
- 2019 ■ *Our Universe Revealed* series, an outreach public program at the Department of Physics at University of Notre Dame
 - A public outreach talk titled “Galactic Archaeology”
- South Bend community science fair ‘Science Alive’ for general public audience
 - Lead an activity of explaining body composition and the origins of the elements

Outreach Activities (continued)

- 2017 ■ Great American Solar Eclipse
– Help with public observation
- 2016 ■ JINA-CEE Art2Science Camp for 2–8th grade students
– Leading Atomic spectroscopy activity
- Michiana Astronomical Society Meeting, South Bend, IN
– A public outreach talk titled “Galactic Archaeology: Search for the oldest stars”
- South Bend community science fair ‘Science Alive’ for general public audience
– led an activity explaining the nature of outer space using vacuum chambers
- 2016–Present ■ AAS Astronomy Ambassador
- 2004–2008 ■ Public observation sessions at Stony Brook University

Professional Associations

- 2016–Present ■ AAS Astronomy Ambassador cohort 2016
- 2015–Present ■ Joint Institute for Nuclear Astrophysics–Center for the Evolution of the Elements
- 2006–Present ■ American Astronomical Society (AAS)

Service

- 2020–Present ■ Referee, Astronomy & Astrophysics
- 2019 ■ Serving as a mentor for Advancing Women Leaders program at University of Notre Dame
- Co-organizer and lecturer, First Frontiers Summer School, Michigan State University, East Lansing, MI
- Grant review panelist, National Science Foundation, 2019 Astronomy and Astrophysics Grant Review
- 2018 ■ Organizing chairperson, JINA-CEE Frontiers in Nuclear Astrophysics, University of Notre Dame, IN University of Notre Dame, IN
– Featured at <http://www.jinaweb.org/docs/Newsletters/JINA-CEE-Newsletter-September-2018Final.pdf>
– Overseeing local and scientific organizing for both Junior Researchers Workshop (~ 70 people) and the main conference (~ 130 people)
– The main conference consisted of invited science talks, contributed talks, poster sessions, and breakout sessions.
– Offered a diversity & inclusion talk titled as “Blinded to Excellence” based on neuroscience and behavioral studies.
– Junior Research Workshop offered scientific writing, grant writing, publishing AAS journals, speaking skills, outreach workshop along with overview talks and contributed talks
- 2017 ■ Reviewer, Gemini Fast Turnaround Program proposals
- Co-organizer, JINA-CEE Frontiers in Nuclear Astrophysics, East Lansing

Service (continued)

- Session chair, Junior Researcher workshop, JINA-CEE Frontiers in Nuclear Astrophysics, East Lansing, MI
- 2016 ■ Co-organizer, JINA-CEE Frontiers in Nuclear Astrophysics, South Bend, IN
- 2016 – Present ■ AAS Astronomy Ambassador, Astronomical Society of Pacific and American Astronomical Society

Project Management

- 2018–present ■ Project leader and mentor for the CASPER project, which analyzes very cool ($3500 < T_{\text{eff}} < 4500$ K) carbon-enhanced metal-poor stars and is developing a python stellar parameter pipeline package, University of Notre Dame
- 2018–2019 ■ Mentoring a project which explores metallicity gradient in the Galactic halo and mentoring a graduate student, Sarah Dietz, for this project
- 2017–2018 ■ Organizing chair for 2018 JINA-CEE Frontiers meeting (130+ people) and Junior researchers workshop (~ 70 people), University of Notre Dame and Joint Institute for Nuclear Astrophysics-Center for the Evolution of the Element

Science and Technical Experience

- Observation ■ Large Binocular Telescope (MODS) and Gemini (GMOS) using [JSkyCal](#), [modsTools](#), Gemini PIT/OT, LBTO OT
- Observation scheduling for Stellar Imager Design Reference Mission
- Spectroscopy ■ High-resolution (ELODIE), Low-/Medium-resolution (LBT/MODS and Gemini/GMOS)
- Data reduction ([modsCCDRed](#), IRAF, DS9)
- Spectral Analysis (line identification, abundance analyses, spectral synthesis using [MOOG](#), Spectroscopy Made Hard (SMH))
- Use of stellar parameter pipelines ([SSPP](#) for SEGUE spectra, [n-SSPP](#) for non-SEGUE spectra)
- Development of stellar parameter pipeline in Python ([CASPER](#))
- Interferometry ■ Navy Precision Optical Interferometer (simulations in C, ROCHE)
- Development ■ Chemical Abundance Stellar Parameter Estimation Routine in Python ([CASPER](#))
- Stochastic chemical evolution modeling using [NuPyCEE](#) pipeline
- Modeling 2D rapidly rotating stars (ROCHE C code) to produce composite synthetic spectra and interferometric parameters
- Observation scheduling IDL code for Stellar Imager Design Reference Mission at NASA
- Software packages ■ C (CFITSIO, ROCHE)
- IDL ([idlutils](#), stellar pipelines: SSPP, n-SSPP)
- Fortran (spectral synthesis: [MOOG](#))

Science and Technical Experience (continued)

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|---------------|---|
| | <ul style="list-style-type: none"> Python (Astropy, galpy, Matplotlib, Jupyter Notebook, NuPyCEE, scikit-learn, scipy, seaborn, Spectroscopy Made Hard (SMH)) R (agnes, kmeans) Graphics (gnuplot, Matplotlib, PGLOT, seaborn) |
| Database | <ul style="list-style-type: none"> Astronomical archive/databases (ADS, Gaia, ELODIE, SAGAdatabase, SDSS/SkyServer, SIMBAD, X-Match) SQL, PostgreSQL |
| Coding | <ul style="list-style-type: none"> awk, C, IDL, Python, R, Shell, |
| OS | <ul style="list-style-type: none"> Linux, Mac OS X |
| Miscellaneous | <ul style="list-style-type: none"> Adobe Spark, html, \LaTeX |

Media/Press/Newsletters

| | |
|----------|---|
| Sep 2018 | <ul style="list-style-type: none"> "Frontiers in Nuclear Astrophysics meeting 2018" featured at JINA-CEE newsletter |
| Dec 2016 | <ul style="list-style-type: none"> "Second-generation stars identified, giving clues about their predecessors", by Brian Wallheimer featured at Notre Dame News, Science Daily, Phys.org, EurekAlert, eScience News. |
| Aug 2016 | <ul style="list-style-type: none"> "Evidence for multiple progenitors for CEMP-no stars", featured at JINA-CEE newsletter |
| Jul 2016 | <ul style="list-style-type: none"> "Hints of Universe's Very First Stars" by Bruce Dorminey featured at Forbes magazine |

References

Timothy C. Beers (postdoc advisor)
 Grace-Rupley Professor
 Department of Physics and JINA-CEE
 University of Notre Dame
 Notre Dame, IN 46556 USA
 ☎ +1-574-631-4088
 ✉ tbeers@nd.edu

Volker Bromm
 Professor
 Department of Astronomy
 University of Texas at Austin
 Austin, TX 78712 USA
 ☎ +1-512-471-3432
 ✉ vbromm@astro.as.utexas.edu

Young Sun Lee
 Associate Professor
 Department of Astronomy & Space Science
 Chungnam National University
 Daejeon 34134, South Korea
 ☎ +82-42-821-5466
 ✉ youngsun@cnu.ac.kr

Andrew McWilliam
 Staff Member
 Observatories of the Carnegie Institution
 for Science
 Pasadena, CA 91101, USA
 ☎ +1-626-304-0249
 ✉ andy@carnegiescience.edu

Ian U. Roederer
 Associate Research Scientist
 Department of Astronomy
 University of Michigan
 Ann Arbor, MI 48109, USA
 ☎ +1-734-615-7374
 ✉ iur@umich.edu

Sung-Chul Yoon
 Professor
 Department of Physics and Astronomy
 Seoul National University
 Seoul, 151-742, South Korea
 ☎ +82-2-880-6627
 ✉ yoons@astro.snu.ac.kr