Jinmi Yoon, Ph.D.

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Curriculum Vitae

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**
Barbara A. Mikulski Archive for Space Telescopes (MAST)
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

2017–2020 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

Awards/Honors/Achievements (continued)

- Graduated with a top honor, the department of Physics, The University of Seoul

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

Research Interests

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. & Lee, Y. S. *Two Populations of Carbon-Enhanced Metal-Poor Stars in the Disk System of the Milky Way* Dec. 2020. arXiv: 2012.03463 [astro-ph.GA].
2. 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].
3. **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].
4. **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].
5. **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].
6. **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].

7. **Yoon, J.**, Peterson, D. M., Kurucz, R. L. & Zagarello, 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.

8. **Yoon, J.**, Peterson, D. M., Zagarello, 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. arXiv: 0803.3145 [astro-ph].

9. **Yoon, J.**, Peterson, D. M., Armstrong, J. T., Clark James H., I., Gilbreath, G. C., Pauls, T., Schmitt, H. R. & Zagarello, 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.

Co-Authored Peer Reviewed Journal Articles

10. Schatz, H. *et al. Horizons: Nuclear Astrophysics in the 2020s and Beyond* May 2022. arXiv: 2205.07996 [nucl-ex].

11. Aoki, W., Beers, T. C., Honda, S., Ishikawa, H. T., Matsuno, T., Placco, V. M., **Yoon, J.**, Harakawa, H., Hirano, T., Hodapp, K., Ishizuka, M., Jacobson, S., Kotani, T., Kudo, T., Kurokawa, T., Kuzuhara, M., Nishikawa, J., Omiya, M., Serizawa, T., Tamura, M., Ueda, A. & Vievard, S. *Silicon and strontium abundances of very metal-poor stars determined from near-infrared spectra* Apr. 2022. doi:10.1093/pasj/psab123. arXiv: 2112.07433 [astro-ph.SR].

12. Whitten*, D. D., Placco, V. M., Beers, T. C., An, D., Lee, Y. S., Almeida-Fernandes, F., Herpich, F. R., Daflon, S., Barbosa, C. E., Perottoni, H. D., Rossi, S., Tissera, P. B., **Yoon, J.**, Youakim, K., Schoenell, W., Ribeiro, T. & Kanaan, A. *The Photometric Metallicity and Carbon Distributions of the Milky Way's Halo and Solar Neighborhood from S-PLUS Observations of SDSS Stripe 82* Mar. 2021. arXiv: 2104.00016 [astro-ph.GA].

13. 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 [astro-ph.GA].

14. 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. arXiv: 1702.00195 [astro-ph.GA].

15. 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. arXiv: 1609.02134 [astro-ph.SR].

16. 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. arXiv: 1601.03385 [astro-ph.SR].

17. 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. arXiv: 1511.08197 [astro-ph.SR].

18. 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. arXiv: 1509.05344 [astro-ph.SR].

Pre-prints

19. 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., Perdikakis, 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 [astro-ph.HE].

Conference Proceedings

20. 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.

21. 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.

22. 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.

23. **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.

24. **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.

Presentations

Invited Talks and Seminars

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

Presentations (continued)

Contributed Talks

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

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 Meta-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

Presentations (continued)

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 Côté

• 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

Research Experience (continued)

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 Precison Optical Interferometer)

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"

Grants: Research, Travel, Scholarship

Research

Apr 2021 PI, Spring 2021 STScI Director's Research Fund, $53,304, "Cosmic Origin Study with Galactic Archaeology: Development of an Open-Source Python Tool"

Travel

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

Grants: Research, Travel, Scholarship (continued)

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

Scholarship

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

2019–2020
- Leading and mentoring a group of graduate students (Dmitrii Gudin, Devin Whitten, and Joseph Zepeda) for a project (CASPER; CEMP Group Assignment and Stellar Parameter Estimation Routine), which analyzes very cool ($3500 < T_{\rm eff} < 4500$ K) CEMP stars and develops a python stellar parameter estimation routine package for cool CEMP stars.
- Joseph Zepeda (Graduate student at University of Notre Dame)
  The CASPER project

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 Gudin (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 four articles (Dietz et al. 2018 Proceedings of IAU S334, 329, Yoon et al. 2018, ApJ,861,146, Dietz et al. 2020 ApJ 894, 34, and Dietz et. al, 2021, arXiv:2012.03463)

Mentoring Experience (continued)

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 Kumpulanian (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

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, Nature Astronomy

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

Service (continued)

- 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 ($\sim$ 70 people) and the main conference ($\sim$ 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
- 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 ($3500 < T_{\rm eff} < 4500\,$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 ($\sim$ 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`)

Science and Technical Experience (continued)

- 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`)
- Python (`Astropy, galpy, Matplotlib, Jupyter Notebook, NuPyCEE, scikit-learn, scipy, seaborn, Spectroscopy Made Hard (SMH)`
- R (`agnes, kmeans`)
- Graphics (`gnuplot, Matplotlib, PGPLOT, seaborn`)

Database
- Astronomical archive/databases (ADS, Gaia, ELODIE, SAGAdatabase, SDSS/SkyServer, SIMBAD, X-Match)
- `SQL, PostgreSQL`

Coding
- awk, C, IDL, Python, R, Shell,

OS
- Linux, Mac OS X

Miscellaneous
- Adobe Spark, html, LaTeX

Media/Press/Newsletters

Sep 2018
- "Frontiers in Nuclear Astrophysics meeting 2018" featured at JINA-CEE newsletter

Dec 2016
- "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
- "Evidence for multiple progenitors for CEMP-no stars", featured at JINA-CEE newsletter

Jul 2016
- "Hints of Universe's Very First Stars" by Bruce Dorminey featured at Forbes magazine