BO-EUN CHOI

she/her
ASTRONOMY PHD STUDENT

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Department of Astronomy
University of Washington
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Education

2021.09 - present
University of Washington
PhD Student, Astronomy

2023.06
University of Washington
MSc, Astronomy

2021.02
Sejong University
MSc, Astronomy and Space Science

Thesis: Line Formation and Spectroscopic Survey of Raman-scattered He II Features in Young Planetary Nebulae

2019.02
Sejong University
BSc, Astronomy and Space Science
BSc, Physics
Cum Laude

Research Interest

Cosmic Baryon Cycle & Chemical Evolution

I am interested in detailed physical processes within the cosmic baryon cycle, how pristine gas is accreted into galaxies and fuel star formation, and how feedback processes efficiently redistribute baryons and enrich metals in gas. I use spectroscopy to trace metals and gas flows along the cycle.

Massive Stars: Powerful Feedback Drivers

Massive stars drive strong radiative, kinematic, and chemical feedback, having a huge impact on the host galaxy, but our understanding of their evolution is limited. I am interested in deciphering their evolutionary history from their observable properties.

Keywords: **CGM, Stellar Feedback, Stellar Evolution, Spectroscopy, Radiative Transfer**

Publications

ADS | **arXiv**

- **Choi, B.-E.**, Werk, J. K. & Tchernyshyov, K., et al. *submitted to ApJ*

  The Metallicity Mapping of the Ionized Diffuse Gas at the Milky Way Disk-halo Interface

- **Choi, B.-E.** & Lee, H.-W. 2020, ApJL, 903, L39

  Discovery of Raman-scattered He II λ6545 in the Planetary Nebulae NGC 6886 and NGC 6881

- **Choi, B.-E.**, Chang, S.-J., Lee, H.-G. & Lee, H.-W. 2020, ApJ, 889, 2

  Line Formation of Raman-scattered He II λ4851 in an Expanding Spherical H I Shell in Young Planetary Nebulae

- Angeloni, R., ..., **Choi, B.-E.**, et al. 2019, AJ, 157, 156

  RAMSES II - RAMan Search for Extragalactic Symbiotic Stars: Project Concept, Commissioning, and Early Results from the Science Verification Phase

Research Experience

Graduate Research Assistant **2021.09-present**
University of Washington, USA

- Advisor: Prof. Jessica K. Werk
  Metallicity study of the ionized diffuse gas at the Milky Way disk-halo interface using HST UV archival data with a precise ionization correction using CLOUDY.
- Advisor: Prof. Emily M. Levesque
  Chemical abundance study of evolved massive stars to search for Thorne-˙Zytkow objects using high-resolution spectral data and stellar atmosphere modeling.

Post-master Researcher **2021.03-2021.07**
UNIST, South Korea
Advisor: Prof. Maurice van Putten
3-body simulation to investigate orbital stability of prograding and retrograding circumbinary planet

Graduate Research Assistant **2019.03-2021.02**
Sejong University, South Korea
Advisor: Prof. Hee-Won Lee
- Spectroscopic survey of Raman-scattered He II features in young planetary nebulae
- Radiative transfer for Raman-scattered He II in a thick H I medium of mass-losing evolved stars.

Successful Observing Proposals

Building a Spectroscopic Tool for TZO Search (P.I.)
- **3.75 hours** with **GHOST - 8.1 m Gemini-South** Telescope (2023B FT)
- **4 nights** with **ARCES - 3.5 m ARC** Telescope (2022Q3, 2023Q2)

*** Spectroscopic Survey for Raman He II Features in Young Planetary Nebulae**
- **4.8 hours** with **GRACES - 8.1 m Gemini-North** Telescope (2019A, 2020B)
- **19 nights** with **BOES - 1.8 m BOAO** Telescope (2019A, 2020A&B)
- **8.5 nights** with **MRES - 2.4 m Thai National Telescope** (Cycle7, 8)

*** Spectropolarimetry Monitoring of Raman-Scattered O VI Features in S-type Symbiotic Stars**
- **3 nights** with **BOES - 1.8 m BOAO** Telescope (2019B)

** Co-I of the proposals, but the primary observer*

Awards Scholarships Grants

Graduate Student Stipends (€500) **2024.04**
MIAPbP

Jacobsen Fund ($350) **2023.07**
Astronomy Department, University of Washington

Outstanding TA Award **2022.09**
Astronomy Department, University of Washington

Jacobsen Fund ($1,700) **2022.04**
Astronomy Department, University of Washington

Outstanding Research Award **2021.02**
Graduate School, Sejong University

Outstanding Presentation Award - Korean Physical Society **2019.10**

Conferences & Talks

MIAPbP - “Some Like It Hot”: A Journey from the Hot IGrM to the Multiphase CGM **2024.04**
Garching, Germany

ESO CGM Group Seminar Talk **2024.04**
Garching, Germany

New Views on Feedback & the Baryon Cycle in Galaxies **2023.07**
Healesville, Australia
Talk: The Metallicity Mapping of the Ionized Diffuse Gas at the Milky Way Disk-halo Interface

Seminar Talk at the RSAA of Australian National University **2023.07**
Canberra, Australia

241st AAS meeting **2023.01**
Seattle, USA
Talk: The Metallicity Mapping of the Ionized Diffuse Gas at the Milky Way Disk-halo Interface

2022 XXXI IAUGA **2022.08**
Busan, South Korea
Poster: Spectral Features and Variability of the Thorne-Zytkow Object Candidates in the SMC

102nd Korean Astronomical Society Meeting **2020.10**
Online
Talk: Discovery of Raman-scattered He II λ6545 in Planetary Nebulae NGC 6886 and NGC 6881 from BOES Spectroscopy
Poster: Activity of Korean Young Astronomers’ Meeting in 2019-2020 Season (co-author)

2019 XVI Latin American Regional IAU Meeting **2019.11**
Antofagasta, Chile
Poster: A Study of Line Formation of Raman-Scattered He II λ4851 in Young Planetary Nebulae

96th Korean Physical Society Meeting **2019.10**
Gwangju, South Korea
Poster: A New Grid-Based Radiative Transfer Simulation for Raman Scattering of He II with Atomic Hydrogen

100th Korean Astronomical Society Meeting **2019.04**
Busan, South Korea
Poster: A New Grid-based Monte Carlo Code for Raman Scattered He II : Preliminary Results

2019 Korea Young Astronomers’ Meeting Workshop **2019.02**
Daejeon, South Korea
Poster: The Emission Line Formation in an Accretion Disk of Schwarzschild Black Hole

Teaching & Adivising Experience

UW Graduate Mentor **2022-2023**
Abbas Jaffery, now Application Engineer at Radiant Vision Systems

UW Astronomy PreMAP Mentor **Fall 2022**

Teaching Assistant **2021-2022**
University of Washington, USA

- Introduction to Astronomical Data Analysis (ASTR 480) Spring 2022
- ASTR 101 Fall 2021, Winter 2022

Teaching Assistant **2018-2020**
Sejong University, South Korea

- Introduction to Astronomical Spectroscopy (300 level) Fall 2018 & 2020
- Astrophysics (300 level) Spring 2019 & 2020
- General Physics 2 (100 level) Fall 2019

Outreach

Astronomy on Tap @ Seattle Flyer Designer	2023 - present
Public Talk at Jungang Girls' High School	2021. 08
Staff of 2021 IAUGA Session of Busan Science Festival	2019.04
Volunteer Instructor at the Observatory of Seoul	2014-2016
Sejong University Starry Night Festival Staff	2014-2016