

Curriculum Vitae

BO-EUN CHOI

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EDUCATION

M.Sc., Astronomy and Space Science Feb. 2021
Sejong University, Seoul, Korea Advisor: Prof. Hee-Won Lee
Thesis: *Line Formation and Spectroscopic Survey of Raman-scattered He II Features in Young Planetary Nebulae*

B.Sc., Astronomy and Space Science / Physics, *Cum Laude* Feb. 2019
Sejong University, Seoul, Korea

RESEARCH INTERESTS

- Late-stellar evolution, Stellar explosions, Stellar binary systems, and ISM
- Observations : Spectroscopy, Spectropolarimetry
- Radiative Transfer, Scattering processes

RESEARCH EXPERIENCE

- *Post-master Researcher, UNIST* Mar. 2021 - Jun. 2021
Advisor: Prof. Maurice van Putten

Stability of P-type Orbits around Stellar Binaries

- *Graduate Research Assistant, Sejong University* Mar. 2019 - Feb. 2021
Advisor: Prof. Hee-Won Lee

Raman Scattering and Mass-loss Processes in Evolved Stars

- Investigated H I distribution and kinematics using Raman-scattered features in planetary nebulae and symbiotic stars to study **mass loss processes in evolved stars**.
- Led the Raman He II **spectroscopic survey** for young planetary nebulae using the Gemini-N telescope, the Thai National telescope, and the BOAO¹ telescope.
- Contributed to the code debugging and analyses of simulation results of **a radiative transfer code for Rayleigh and Raman scattering, STaRS'**.
- Worked on Raman O VI photometric survey of symbiotic stars as a member of [Korea-Chile Collaboration in Stellar Astrophysics](#) to search for the extragalactic symbiotic stars.

- *Undergraduate Research Assistant, Sejong University* Oct. 2017 - Feb. 2019
Advisor: Prof. Hee-Won Lee

Line formation Study in an Accretion Disk of Schwarzschild BH

Calculated the path of photons from accretion disk near Schwarzschild BH using Monte Carlo method and reproduced the work of Tanaka et al. 1995.

Quantum Mechanical Effects on Absorption Line Profile of DLA

Studied asymmetry of absorption line profile of DLA and Ly α forest led by the cross-section of hydrogen atom which can cause overestimation of the redshift.

PUBLICATIONS

[ADS/ arXiv](#)

- **Choi, B.-E.** & Lee, H.-W. 2020, [ApJL](#), 903, L39
“Discovery of Raman-scattered He II $\lambda 6545$ 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 $\lambda 4851$ 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”

¹Bohyunsan Optical Astronomy Observatory, Korea

**ACCEPTED
OBSERVING
PROPOSALS**

Project I. 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)

Project II. Spectropolarimetry Monitoring of Raman-Scattered O VI Features in S-type Symbiotic Stars

- **3 nights** with **BOES - 1.8 m BOAO** Telescope (2019B)

PRESENTATIONS

- **2020 Korean Astronomical Society Fall Meeting, Online** 15 - 16, Oct. 2020
Contributed Talk: Discovery of Raman-scattered He II λ 6545 in Planetary Nebulae NGC 6886 and NGC 6881 from BOES Spectroscopy
Contributed Poster: Activity of Korean Young Astronomer's Meeting in 2019-2020 Season (co-author)
- **2019 XVI Latin American Regional IAU Meeting, Chile** 3 - 9, Nov. 2019
Contributed Poster: A Study of Line Formation of Raman-Scattered He II λ 4851 in Young Planetary Nebulae
- **2019 Korean Physical Society Fall Meeting, Korea** 23 - 25, Oct. 2019
Contributed Poster: A New Grid-Based Radiative Transfer Simulation for Raman Scattering of He II with Atomic Hydrogen
- **Evolved Stars Meeting, Korea** 15, May 2019
Regular meeting of the researchers studying evolved stars
Contributed Talk: A New Grid-Based Monte Carlo Code for Raman-Scattered He II
- **2019 Korean Astronomical Society Spring Meeting, Korea** 10 - 12, Apr. 2019
Contributed Poster: A New Grid-based Monte Carlo Code for Raman Scattered He II : Preliminary Results
- **2019 Korea Young Astronomer's Meeting Workshop, Korea** 15 - 16, Feb. 2019
Contributed Poster: A Study of line formation in the Accretion Disk of Schwarzschild Black Hole

**AWARDS &
SCHOLARSHIP**

- Outstanding Research Award** 19, Feb. 2021
Awarded by the Graduate School, Sejong University
- Outstanding Presentation Award - Korean Physical Society** 25, Oct. 2019
Awarded about 50 from about one thousand presentations
"A New Grid-Based Radiative Transfer Simulation for Raman Scattering of He II with Atomic Hydrogen"
- The 2nd place** at the 6th Natural Science Conference 14, Nov. 2018
Awarded by the College of Natural Science, Sejong University
"A Monte Carlo Study of Line Formation in an Accretion Disk of a Schwarzschild Black Hole"
- The 1st place** at the 3rd Physics and Astronomy Conference 17, Nov. 2017
Awarded by the Department of Physics and Astronomy, Sejong University
"Asymmetric Line Profile of Damped Lyman Alpha System Resulting from the Cross Section of Atomic Hydrogen"
- The 3rd place** at the 4th Natural Science Conference 3, Nov. 2016
Awarded by the College of Natural Science, Sejong University
"Harmonics : Epicycle and the Spiral Structure of the Galaxy"
- Honors Scholarship** Fall, 2014
Awarded to the best student in the grade, Sejong University

TEACHING EXPERIENCE	Teaching Assistant at Sejong University - Introduction to Astronomical Spectroscopy (3 rd year course) - Astrophysics (3 rd year course) - General Physics 2 (1 st year course)	Instructor: Prof. Hee-Won Lee Fall, 2018 & 2020 Spring, 2019 & 2020 Fall, 2019
PROFESSIONAL SERVICES & OUTREACH	<i>Professional Services</i> - Organizing committee of Korea Young Astronomer's Meeting - LOC member of the First Korean Lyman Alpha Workshop - Student Staff of Korean Astronomical Society Spring Meeting <i>Outreach Activities</i> - Staff of Busan Science Festival : the booth of 2021 IAU Busan - Volunteer of Observatory of Seoul - Staff ² of 34-36th Starry Night Festival : an annual outreach activity of Department of Astronomy and Space Science, Sejong University	Jan. 2020 - Feb. 2021 23-25, Jan. 2019 13-14, Apr. 2017 13-14, Apr. 2019 2014 - 2016 13-14, Apr. 2019
COMPUTING & SOFTWARE SKILLS	Highly experienced: Fortran, IRAF, L ^A T _E X Moderately experienced: Python, MPI Basic knowledge of: CASA ³ , CLOUDY ⁴ Operating Systems : Linux, Windows	
OTHER ACTIVITIES	<i>Academic</i> - 2020 KIAS Astrophysics Summer School - The 8th KGMT ⁵ Summer School: Exoplanet - 2019 APCTP ⁶ - NIMS ⁷ - KISTI- UNIST -KASI Summer School on Numerical Relativity and Gravitational Waves - The 7th KGMT Summer School - Sobaeksan Optical Astronomy Observatory Winter School : Long Slit Spectroscopy - Organized and have led the 'Astro-Journal Club' for graduate students and postdoctoral researchers at Sejong University. <i>Extracurricular</i> - Worked and served Fortran instruction in an astronomical computer programming club for 4 years. - Played guitar in an school rock band and performed several times including the university festivals.	27-31, Jul. 2020 15-19, Jul. 2019 24-28, Jun. 2019 28-31, Aug. 2017 6-10, Feb. 2017

²In particular, I was a leader of the 'Gravitational wave' team at the 36th festival in 2016.

³Common Astronomy Software Applications

⁴Photoionization simulations: <https://www.nublado.org/>

⁵Korea Giant Magellan Telescope Program led by KASI (Korea Astronomy & Space Science Institute)

⁶Asia Pacific Center for Theoretical Physics

⁷National Institute for Mathematical Sciences