2025-11-18

CURRICULUM VITAE

Contact Information

Full Name:	Woorak Choi (ORCID: https://orcid.org/0000-0001-5033-7208)
Address:	ABB 348, 1280 Main Street West, Hamilton, Ontario, Canada, L8S 4M1
Tel:	+82-10-6217-2289 (+1-905-570-6289)
E-mail:	woorak.c@gmail.com (choiw27@mcmaster.ca)
Affiliation:	Department of Physics and Astronomy, McMaster University

Education

2017.09 – 2024.02	Ph.D. (Ph.D. Advisor: Prof. Aeree Chung) High-resolution radio observations and GMC-scale simulations as probes of galaxy evolution Yonsei University, Seoul, Korea
2013.03 – 2017.08	Bachelor of Science in Astronomy Yonsei University, Seoul, Korea

Research Interests

Molecular line (CO) observation – GMCs – Barred galaxies – Environmental driven galaxy evolution – Ram pressure stripping simulation – Magnetic field – Polarized continuum observation – Radio data processing

Research Experiences

2024.09 – present
McMaster University, Department of Physics and Astronomy, Hamilton, Canada
Postdoctoral Researcher, Supervisor: Christine D. Wilson

2024.03 – 2024.06
Yonsei University, Department of Astronomy, Seoul, Korea
Postdoctoral Researcher, Supervisor: Aeree Chung

2019.11 – 2020.02

University of Oxford, Sub-department of Astrophysics, Oxford, UK

Visiting researcher, Supervisor: Martin Bureau

Topic: WISDOM - Investigate the properties of the GMCs in the central region of the galaxies.

2017.09 – 2024.02

Yonsei University, Department of Astronomy, Seoul, Korea

Research assistant, Supervisor: Aeree Chung

- Topic 1: Investigating giant molecular clouds in the central region of galaxies using high-resolution ALMA observations (Collaborate with Martin Bureau at Oxford Univ.)
- Topic 2: Analyzing the impact of the ram pressure on the multiphase ISM by using TIGRESS simulations (Collaborate with Chang-Goo Kim at Princeton Univ.)
- Topic 3: Investigating the role of magnetic field under ram pressure using high-resolution VLA polarized continuum observation.
- Topic 4: Investigating giant molecular clouds in the central region of galaxies using TIGRESS simulations (Collaborate with Chang-Goo Kim and Sanghyuk Moon at Princeton Univ.)

2016.02 – 2016.09

Yonsei University, Department of Astronomy, Seoul, Korea

Undergraduate researcher, Adviser: Myungkook James Jee

Topic: A comparative study of colliding galaxy simulations using GADGET2 and RAMSES

Observing Experiences

<PI>

Karl G. Jansky Very Large Array, C-config. (7.4 hours, PID: 20A-310, Priority-B, Accepted)

ALMA Cycle 8, (15.3 hours, PID: 2021.1.01491.S, Accepted)

Karl G. Jansky Very Large Array, B-config. (co-PI, PI-Anan Lu, 25B-266, 30 hours, Accepted)

JWST (13 hours, co-PI of 9246, joint-VLA/JWST, Accepted)

Karl G. Jansky Very Large Array, C-config (53.15 hours, PID: 26A-474, Priority-C, Accepted)

<co-I>

ALMA Cycle 8, (13.4 hours, co-I of 2021.1.01098.S, Accepted)

ALMA Cycle 9, (co-I, PI-Thomas Wiliams, 2022.1.00141.S, Accepted)

ALMA Cycle 9, (co-I, PI-Martin Bureau, 2022.1.01122.S, Accepted)

ALMA Cycle 9, (co-I, PI-Bumhyun Lee, 2022.1.01556.S, Accepted)

ALMA Cycle 11, (co-I, PI-Thomas Williams, 2024.1.00297.S, Accepted)
ALMA Cycle 12, (co-I, PI-Jiayi Sun, 2025.1.00193.S, Accepted)

Karl G. Jansky Very Large Array, B-config. (co-I, PI-Anan Lu, 23A-265, 5.5 hours, Accepted)
Karl G. Jansky Very Large Array, B-config. (co-I, PI-Anan Lu, 24A-294, 22 hours, Accepted)

MeerKAT S-band (co-I, PI-Ian Roberts, MKT-25083, 38 hours, Priority B1)

Awards

Postdoctoral Fellowship Program by NRF of Korea (2024.10-2025.09 / Grant No. RS-2024-00413394)
Best Poster Presentation Award in KAS Meeting (2018.04)
Brain Korea 21 (BK21) scholarship (2017.09-2023.08)

Professional Services

2024 – present ApJ, ALMA peer review

Supervising

2025.05 – 2025.08 Jose Carlos (Mitacs summer undergraduate intern)

Publications

<1st Author>

- Title: Ram Pressure Stripping of the Multiphase ISM: A Detailed View from TIGRESS Simulations
- Author: **Woorak Choi**, Chang-Goo Kim, Aeree Chung
- DOI: https://doi.org/10.3847/1538-4357/ac82ba

- Title: WISDOM Project - XV. Giant Molecular Clouds in the Central Region of the Barred Spiral Galaxy NGC 5806
- Author: **Woorak Choi**, Lijie Liu, Martin Bureau, Michelle Cappellari, Timothy A.

Davis, Fu-Heng Liang, Anan Lu, Thomas G. Williams, Aeree Chung
- DOI: https://doi.org/10.1093/mnras/stad1211

- Title: WISDOM Project – XXI. Giant Molecular Clouds in the Central Region of the Barred Spiral Galaxy NGC 613
- Author: **Woorak Choi**, Martin Bureau, Lijie Liu, Michelle Cappellari, Timothy A. Davis, Fu-Heng Liang, Anan Lu, Thomas G. Williams, Aeree Chung
- DOI: https://doi.org/10.1093/mnras/stae1394

- Title: The impact of ram pressure on the radio spectral index and magnetic field of NGC 4522: A high-resolution VLA continuum study
- Author: **Woorak Choi**, Aeree Chung, Chang-Goo Kim, Bumhyun Lee, Luca Cortese, Toby Brown, Barbara Catinella, Eric Emsellem, Amelia Fraser-McKelvie, Jiayi Sun, Adam Watts
- Submitted to ApJ

<Co-Author>
- Title: WISDOM Project - X. The morphology of the molecular ISM in galaxy centres and its dependence on galaxy structure
- Author: Timothy A Davis, Jindra Gensior, Martin Bureau, Michele Cappellari, **Woorak Choi**, Jacob S Elford, J M Diederik Kruijssen, Federico Lelli, Fu-Heng Liang, Lijie Liu, Ilaria Ruffa, Toshiki Saito, Marc Sarzi, Andreas Schruba, Thomas G Williams
- DOI: 10.1093/mnras/stac600

- Title: WISDOM project – XI. Star formation efficiency in the bulge of the AGN-host Galaxy NGC 3169 with SITELLE and ALMA
- Author: Anan Lu, Hope Boyce, Daryl Haggard, Martin Bureau, Fu-Heng Liang, Lijie Liu, **Woorak Choi**, Michele Cappellari, Laurent Chemin, Mélanie Chevance, Timothy A Davis, Laurent Drissen, Jacob S Elford, Jindra Gensior, J M Diederik Kruijssen, Thomas Martin, Etienne Massé, Carmelle Robert, Ilaria Ruffa, Laurie Rousseau-Nepton, Marc Sarzi, Gabriel Savard, Thomas G Williams
- DOI: 10.1093/mnras/stac1583

- Title: WISDOM Project – XII. Clump properties and turbulence regulated by clump-clump collisions in the dwarf galaxy NGC 404

- Author: Lijie Liu, Martin Bureau, Guang-Xing Li, Timothy A Davis, Dieu D Nguyen, Fu-Heng Liang, **Woorak Choi**, Mark R Smith, Satoru Iguchi
- DOI: 10.1093/mnras/stac2287

- Title: WISDOM Project - XVII. Beam-by-beam Properties of the Molecular Gas in Early-type Galaxies
- Author: Williams, Thomas G, Bureau, Martin, Davis, Timothy A., Cappellari, Michele, **Choi, Woorak**, Elford, Jacob S, Iguchi, Satoru, Gensior, Jindra, Liang, Fu-Heng, Lu, Anan, Ruffa, Ilaria, Zhang, Hengyue
- DOI: https://doi.org/10.1093/mnras/stad2455

- Title: WISDOM project - XX. Strong shear tearing molecular clouds apart in NGC 524
- Author: Anan Lu, Daryl Haggard, Martin Bureau, Jindra Gensior, Sarah Jeffreson, Carmelle Robert, Thomas G Williams, Fu-Heng Liang, **Woorak Choi**, Timothy A Davis, Sara Babic, Hope Boyce, Benjamin Cheung, Laurent Drissen, Jacob S Elford, Lijie Liu, Thomas Martin, Carter Rhea, Laurie Rousseau-Nepton, Ilaria Ruffa
- DOI: https://doi.org/10.1093/mnras/stae1395

- Title: The resolved star-formation efficiency of early-type galaxies
- Author: Thomas G Williams, Francesco Belfiore, Martin Bureau, Ashley T Barnes, Frank Bigiel, **Woorak Choi**, Ryan Chown, Dario Colombo, Daniel A Dale, Timothy A Davis, Jacob Elford, Jindra Gensior, Simon CO Glover, Brent Groves, Ralf S Klessen, Fu-Heng Liang, Hsi-An Pan, Ilaria Ruffa, Toshiki Saito, Patricia Sánchez-Blázquez, Marc Sarzi, Eva Schinnerer
- DOI: https://doi.org/10.1093/mnras/staf498

- Title: WISDOM project – XXIII. Star-formation efficiencies of eight early-type galaxies and bulges observed with SITELLE and ALMA
- Author: Anan Lu, Daryl Haggard, Martin Bureau, Jindra Gensior, Carmelle Robert, Thomas G Williams, Fu-Heng Liang, **Woorak Choi**, Timothy A Davis, Ilaria Ruffa, Sara Babic, Hope Boyce, Michele Cappellari, Benjamin Cheung, Laurent Drissen, Jacob S Elford, Thomas Martin, Carter Rhea, Laurie Rousseau-Nepton, Marc Sarzi, Hengyue Zhang
- DOI: https://doi.org/10.1093/mnras/staf675

- Title: WISDOM Project – XXIV. Giant molecular clouds of the spiral galaxy NGC 5064: high fraction of retrograde rotation
- Author: Lijie Liu; Fanglin Shu; Martin Bureau; Kyoko Onishi; Timothy A Davis; Fu-Heng Liang; **Woorak Choi**; Thomas G Williams; Anan Lu; Satoru Iguchi
- DOI: https://doi.org/10.1093/mnras/staf1159

Paper in preparation

<1st Author>

- Title: Structure and kinematics of molecular gas at the cloud scale in the simulated nuclear ring
- Author: **Woorak Choi**, Sanghyuk Moon, Chang-Goo Kim, Aeree Chung

- Title: PAHs and star forming regions of M 64 using JWST
- Author: **Woorak Choi**, Jiayi Sun, Christine Wilson

- Title: MAUVE-ALMA: Giant Molecular Clouds of Virgo cluster galaxies
- Author: **Woorak Choi**, Jiayi Sun, MAUVE team

<Co-Author>

- Title: WISDOM Project: Giant molecular clouds of the lenticular galaxy NGC 1387: similarities with spiral galaxy clouds
- Author: Fu-Heng Liang, Martin Bureau, Lijie Liu, Timothy A Davis, Hope Boyce, Marc Sarzi, **Woorak Choi**, Jindra Gensior, Anan Lu

- Title: MAUVE–MUSE: Environmental Transformation of the Ionized Interstellar Medium
- Author: Toby Brown, MAUVE team

Presentation & Poster

Date	Type	Event	Location
2025.10	Oral	GEESE-ON workshop	Waterloo
2025.10	Oral	Astroseminar at University of Waterloo	Waterloo

2025.05	Poster	The ecology of Galaxies	Hungary
2024.12	Oral	Astronomy Journal Club in McMaster	Hamilton
2024.04	Oral	Center for Galaxy Evolution Research Forum	Seoul
2024.02	Poster	The 8th Yonsei Astro Poster Jamboree	Seoul
2024.01	Oral	East Asia Young Astronomers Meeting	Thailand
2024.01	Oral	243rd American Astronomical Society Meeting	USA
2023.04	Oral	Meeting of the Korean Astronomical Society	Jeonju
2022.08	Poster	IAUGA - Busan	Busan
2022.04	Oral	Meeting of the Korean Astronomical Society	Busan
2022.02	Oral	Environmental Workshop 2022	Seoul (Online)
2022.01	Oral	East-Asia ALMA workshop	Online
2021.10	Oral	1st KooGiG-Junior workshop	Online
2021.04	Poster	Meeting of the Korean Astronomical Society	Online
2021.02	Oral	Environmental Workshop 2021	Seoul (Online)
2020.10	Poster	Meeting of the Korean Astronomical Society	Online
2019.12	Oral	Galaxy Evolution Seminar in Oxford Univ.	Oxford
2019.10	Oral	Meeting of the Korean Astronomical Society	Cheongsong
2019.04	Poster	Meeting of the Korean Astronomical Society	Busan
2019.02	Poster	The 2nd Yonsei Astro Poster Jamboree	Seoul
2018.08	Poster	Radio telescope user's meeting	Daejeon
2018.04	Poster	Meeting of the Korean Astronomical Society	Hongcheon

Computing Skills

Languages: Python, LaTex, IDL (intermediate), Matlab (intermediate), Fortran (basic)
Astronomical tools: CASA, AIPS, IRAF, SExtractor, 2DBAT, 3DBarolo, Sofia2, RAMSES (basic), Athena (basic)

Others

<Teaching Assistant (TA)>
2016 (2016.02-2017.02): Teaching Assistant for the advanced course for middle school students at Yonsei University
2017-2 (2017.09-2017.12): Astronomy 101

2018-1 (2018.03-2018.06): Astrophysics I
2018-2 (2018.09-2018.12): Introduction to Astronomy II
2019-1 (2019.03-2019.06): Introduction to Astronomy I

<Computing & Network Assistant in Department of Astronomy>
2019.09-2020.08

<BK21 Research Assistant (RA)>
2020.09-2023.02

<Volunteer>
2022 IAUGA-Busan Volunteering: 40 hours

<Committee>
2022.03-2023.02: President of Korea Young Astronomers Meeting (KYAM, official division of Korean Astronomical Society, https://k-yam.weebly.com/)

<Public Outreach>
2014-2016: Astronomy magazine & website (Wouldyoulike**, www.wouldyoulike.org): Head manager and writer, 12k USD awarded from KOFAC

** "Wouldyou" has the same pronunciation as the Korean word “우주”, and “우주” means universe in Korean.

Academic References

- Prof. Aeree Chung
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  Yonsei University

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  University of Oxford

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  changgoo@princeton.edu / +1-609-258-2611
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  Princeton University

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