

Weizhe Liu

Curriculum Vitae

Department of Astronomy
University of Maryland, College Park
(240) 413 7164

✉ oscarlwz@gmail.com

ORCID: <https://orcid.org/0000-0003-3762-7344>

Brief Bio

My primary research interest is to probe AGN and stellar feedback processes in different systems across cosmic time. I am also interested in the cosmic baryon cycle, and the formation and evolution of high redshift galaxies in general.

Education

- 2016–present **PhD Candidate in Astronomy (Expected in Jul. 2022)**, *University of Maryland*, Advisor: Prof. Sylvain Veilleux, Thesis: AGN Feedback in Ultraluminous Infrared Galaxies and Dwarf Galaxies.
- 2013–2016 **M.S. in Astronomy**, *Shanghai Astronomical Observatory, University of Chinese Academy of Sciences*, Advisor: Prof. Lei Hao.
- 2009–2013 **B.S. in Astronomy**, *Nanjing University*.

Scholarships & Awards

- Oct. 2021 **Andrew S. Wilson Prize for Excellence in Research**, awarded to only one graduate student nearing completion of the Ph.D. dissertation who demonstrates high standards for research and scholarship exemplified by Prof. Andrew S. Wilson.
- Sep. 2018 **John Chi-Lin Wang Award for Academic Excellence**, awarded to the 2nd year graduate student with the best overall performance.
- Dec. 2012 **Annual Scholarship of National Astronomical Observatory of China**, awarded to the top 5 students each year.
- Dec. 2012 **Internship Scholarship of Chinese Academy of Science**, awarded to the best summer intern each year.
- Dec. 2012 **Second Prize of Renmin Scholarship**, awarded to the top 2 students each year.
- Nov. 2011 **National Scholarship of People's Republic of China**, awarded to only 1 of the top 2 students in the entire astronomy department each year.
- Dec. 2010 **Third Prize of Renmin Scholarship**, awarded to the top 6 students each year.
- May 2013 **Excellent League Member of China Communist Youth League**.
- May 2012 **Excellent League Member of China Communist Youth League**.
- Jun. 2011 **Excellent Cadre of Student Union, School of Astronomy and Space Science**.

Publications

- Primary Author:** W. Liu, S. Veilleux, G. Canalizo, et al. 2020, *Integral-Field Spectroscopy of Fast Outflows in Dwarf Galaxies with AGN*, ApJ, 905, 166, [link](#).
- W. Liu, S. Veilleux, K. Iwasawa, et al. 2019, *Elliptical Galaxy in the Making: The Dual Active Galactic Nuclei and Metal-enriched Halo of Mrk 273*, ApJ, 872, 39, [link](#).

W. Liu and L. Hao 2017, *Study of the Photoionization Properties of Galaxies in the Mid-infrared*, Progress in Astronomy, Vol. 35, No. 2, [link](#).

S. Veilleux, D. Rupke, **W. Liu**, et al. 2021, *Galactic Winds across the Gas-Rich Merger Sequence. I: Warm-Hot Ionized Outflows in the QUEST Quasars*, ApJ refereed; resubmission: Oct. 2021.

T. Bohn, G. Canalizo, S. Veilleux, and **W. Liu** 2021, *Near-Infrared Coronal Line Observations of Dwarf Galaxies Hosting AGN-driven Outflows*, ApJ, 911, 70, [link](#).

Others: A. Yazeedi, et al. 2021 (**incl. W. Liu**), *The Impact of Low-luminosity AGNs on Their Host Galaxies: A Radio and Optical Investigation of the Kiloparsec-scale Outflow in MaNGA 1-166919*, ApJ, 916, 102, [link](#).

Publications in Prep.

Primary Author: **W. Liu**, S. Veilleux, D. Rupke, et al. 2021a, *Galactic Winds across the Gas-Rich Merger Sequence. II: Lyman Alpha Emission and Highly Ionized Outflows in the QUEST ULIRGs*, ApJ submission: Nov. 2021, [link](#).

W. Liu, S. Veilleux, et al. 2021b, *Far-Ultraviolet Spectroscopy of AGN-driven Outflows in Dwarf Galaxies*, ApJ submission: Dec. 2021.

O. Foo, **W. Liu**, and S. Veilleux. 2022, *A Census of P V-traced, AGN-driven Outflows with HST/COS*, ApJ submission: Spring 2022, **corresponding author: W. Liu; O. Foo is a student from Poolesville High School.**

W. Liu, S. Veilleux, et al. 2022, *Bolometric Luminosities and Wind-driving Mechanisms for Heavily Reddened Wind-Dominated Quasars*, ApJ submission: 2022.

A. Aravindan, G. Canalizo, **W. Liu**, et al. 2022, *The Relative Importance of AGN- vs. Star-forming-driven Outflows in Dwarf Galaxies*, ApJ submission: 2022.

Others: D. Rupke, et al. 2022 (**incl. W. Liu**), *Q3DFIT: a Powerful New PSF Decomposition and Spectral Analysis Package for JWST*, submission: 2022.

Successful Telescope Proposals

HST **PI**, cycle 27, PID 15915, 17 orbits.

“AGN Feedback in Dwarf Galaxies”

CoI, cycle 29, PID 16698, 25 orbits, PI: Sylvain Veilleux.

“The Impact of Radio-Mode Feedback on the Circumgalactic Medium of Centaurus A”; **Conceived the project together with S. Veilleux; responsible for technical preparation incl. target selection, data analysis & visualization.**

CoI, cycle 26, PID 15662, 50 orbits, PI: Sylvain Veilleux.

“Galactic Winds across the Gas-Rich Merger Sequence”; **Prepared the proposal together with S. Veilleux; Helped with technical preparation incl. sample selection.**

Gemini **CoI**, 2019FT, 10.6 hrs, PI: Sylvain Veilleux.

“AGN Feedback in Dwarf Galaxies”; **Conceived the project and prepared the entire proposal.**

JWST **CoI**, cycle 1, GO 2547, 8.8 hrs, PI: Sylvain Veilleux.

“Quasar Feedback in Action: The Multiphase and Multiscale Outflow of the Most Luminous Quasar in the Local Universe”; **Prepared the proposal together with S. Veilleux; Analyzed the VLT/MUSE and VLT/X-SHOOTER data for the proposal.**

Keck/KCWI **CoI**, 2020A, 1.5 nights, PI: Gabriela Canalizo.

“AGN Feedback in Dwarf Galaxies”.

VLA **Col, 16B-082 (AG984), 20.5 hrs, PI: Joseph Gelfand.**
"Radio Emission in Strong Galactic Outflows"; **Provided the target list.**

Expertise & Other Academic Experience

Expertise: Optical Integral Field Spectroscopy: Keck/KCWI, Gemini/GMOS, VLT/MUSE, SDSS IV/MaNGA, VENGA (VIRUS-P at Harlan J. Smith telescope at McDonald Obs).

1-D Optical/Near-infrared Spectroscopy: SDSS, VLT/X-SHOOTER.

Far-ultraviolet Spectroscopy: HST/COS, HST/STIS.

X-ray Imaging Spectroscopy: Chandra/ACIS.

Other Experience: Member of the Q3DFIT software development team for JWST ERS program "Q-3D: Imaging Spectroscopy of Quasar Hosts with JWST Analyzed with a Powerful New PSF Decomposition and Spectral Analysis Package".

Analysis of NIR AO images of a hard X-ray AGN host galaxy from Keck/NIRC2, in collaboration with Prof. R. Mushotzky (UMD), Dr. M. Koss (Eureka Scientific) & Dr. N. Secrest (USNO).

SED analysis of $z \sim 2$ red quasars, in collaboration with Dr. E. Piconcelli (INAF).

Development of a software for FUV spectroscopy data analysis, including MCMC-based absorption line fits.

Skills: Programming: Python, IDL, Shell, C.

Statistics: Bayesian, Frequentist.

Mentoring

May 2021 – present **Project designer and mentor for a senior student, Orion Foo, from Poolesville High School, A Census of P V-traced, AGN-driven Outflows with HST/COS.**

Professional Talks

Dec. 2021 **Astrocoffee at Institute of Astronomy, U. of Hawaii, Talk (virtual),** Probing AGN Feedback in Dwarf Galaxies and Ultraluminous Infrared Galaxies.

Nov. 2021 **Galaxy Journal Club at STScI, Talk (virtual),** Probing AGN Feedback in Dwarf Galaxies and Ultraluminous Infrared Galaxies.

Nov. 2021 **Monday seminar at UT Austin, Talk (virtual),** Probing AGN Feedback in Dwarf Galaxies and Ultraluminous Infrared Galaxies.

Nov. 2021 **Galread at Princeton, Talk (virtual),** Probing AGN Feedback in Dwarf Galaxies.

Nov. 2021 **Tuesday Lunch Talk at UCLA, Talk (virtual),** Probing AGN Feedback in Dwarf Galaxies and Ultraluminous Infrared Galaxies.

Nov. 2021 **Galaxy Group Seminar at U. of Arizona, Talk (virtual),** Probing AGN Feedback in Dwarf Galaxies and Ultraluminous Infrared Galaxies.

Nov. 2021 **Flash Seminar at UCSC, Talk (virtual),** Probing AGN Feedback in Dwarf Galaxies and Ultraluminous Infrared Galaxies.

Sep. 2021 **Weekly Science Talk at Caltech/IPAC, Talk (virtual),** Exploring AGN Feedback in Dwarf Galaxies and Ultraluminous Infrared Galaxies.

Aug. 2021 **AGN Discussion Group Seminar at NASA/Goddard, Talk (virtual),** AGN Feedback in Dwarfs and ULIRGs.

- May. 2021 **Multi-Object Spectroscopy for Statistical Measures of Galaxy Evolution, STScI (virtual)**, *Recorded Virtual Talk*, Fast, Kpc-scale Outflows in Dwarf Galaxies with AGN.
- Dec. 2015 **The 3rd C-SDSS4 Workshop, Tsinghua Univ., China**, *Contributed Talk*, A Study of Kpc-scale Outflows in AGN Hosts and Galaxies with MaNGA.
- Sep. 2015 **PMO Star Formation and Interstellar Medium Workshop, PMO, China**, *Contributed Talk*, Kpc-scale Outflows in AGN Hosts and Galaxies seen in MaNGA.
- Jun. 2015 **The 2nd C-SDSS4 Workshop, Tsinghua Univ., China**, *Contributed Talk*, A Study of Kpc-scale Outflows in AGN Hosts and Galaxies with MaNGA.
- Mar. 2015 **MaNGA Spring 2015 Team Meeting, Nanjing Univ., China**, *Contributed Talk*, Emission Line Profile across AGN hosts: Probing Broad Line Region and Outflow, Work Presented by Prof. L. Hao.
- Nov. 2014 **The 1st C-SDSS4 Workshop, SHAO, China**, *Contributed Talk*, Emission Line Profile across AGN hosts: Probing Broad Line Region and Outflow.

Poster Presentations

- Oct. 2019 **The 7th GMT Community Science Meeting, Carlsbad, CA, USA**, *Poster & Flash Talk*, AGN Feedback in Dwarf Galaxies.
- Jan. 2018 **231st AAS, Washington, D.C., USA**, *Poster*, Elliptical Galaxy in the Making: The Dual Active Galactic Nuclei and Metal-enriched Halo of Mrk 273.

Teaching & Outreach Experience

- Sep. 2018 **Volunteer**, *Maryland Day 2018*.
- Mar. 2018 **Master of Ceremony**, *UMD Observatory Open House*.
- Spring 2018 **Teaching Assistant**, *ASTR 121*.
- Fall 2016 **Teaching Assistant**, *ASTR 300*.
- Fall 2016 **Teaching Assistant**, *ASTR 340*.