XINFENG XU

Curriculum Vitae/Aug. 2022

CONTACT INFORMATION

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APPOINTMENTS

Johns Hopkins University (JHU)
Postdoc Researcher (2020 – current)
Advisors: Dr. Tim Heckman (JHU), Dr. Alaina Henry (Space Telescope Science Inst.)

Virginia Polytechnic Institute and State University (VT)
Ph.D., Physics, Astrophysics Emphasis, Aug. 2014 - May. 2020
Advisor: Dr. Nahum Arav

Master of Science, Computer Science, Aug. 2017 - May 2019 (Double Degree)
Advisor: Dr. B. Aditya Prakash

University of Science and Technology of China (USTC)
Bachelor of Science, Physics, Astrophysics Emphasis, Sep. 2010 - Jun. 2014
Advisor: Dr. Junxian Wang

RESEARCH INTERESTS

– SN-driven galactic outflows and feedback effects in star-forming galaxies.

– Quasar-driven outflows and feedback effects in AGNs.

– Connections between emission and absorption line outflows in galaxies (and AGNs).

– Probe of Lyman continuum escape from galaxies and effects on Cosmic Reionization.

RESEARCH HIGHLIGHTS

– 11 first-author, 19 co-authored journal articles totaling over 300 citations (since 2018).

– h-index: 11

– Awarded one PI & 11 Co-I programs on Hubble (over 200 orbits) in Cycles 24 – 30.

– Awarded two Gemini Telescope NIFS IFU Programs (6 hours) and one MDM Telescope program (2 nights).

– Expert on reduction and analysis of HST, VLT, Keck, MMT, and SDSS data.

– Organizing committee for STScI 2022 Spring Science Workshop and JHU Astrocoffee.

SUCCESSFUL TELESCOPE PROPOSALS

Accepted General Observing Proposals:

11. HST Cycle 30, GO (119 orbits; PI: Hayes, Matthew) June 2022

· The Lyman-alpha and Continuum Origins Survey (LaCOS)

10. HST Cycle 30, GO (49 orbits; PI: Leclercq, Floriane) June 2022

· Resolving Lyman Alpha emission in a complete sample of Lyman Continuum leakers and non-leakers

9. HST Cycle 30, GO (12 orbits; PI: Heckman, Timothy) June 2022

· Are There Two Classes of Lyman-Leaky Galaxies?

8. Gemini FT Proposal 2022A, B (3.2+2.7 hrs; PI: Xu, Xinfeng) 2022

· First-ever Mapping [O III] Outflows in a Broad Absorption Line Quasar with Strong AGN Feedback

7. JWST Cycle 1 (74.3 hrs; PI: Kassin, Susan) March 2021

· A Pathfinder for JWST Spectroscopy: Deep High Spectral Resolution Maps of Galaxies over $1 < z < 6$

6. HST Cycle 29, GO (12 orbits; PI: James, Bethan) June 2021

· [C II], a High-z Diagnostic Diamond in the Rough

5. HST Cycle 29, GO (14 orbits; PI: Hayes, Matthew) June 2021

· The ionizing output of galaxies undergoing the most extreme feedback

4. VLA/21B (160.17 hrs; PI: Borthakur, Sanchayeeta) May 2021

· Characterizing Radio Continuum Emission from Low-z Lyman Continuum Leakers

3. MDM Telescope, 2.4m (2 nights, PI: Oey, Sally; Co-PI: Xu, Xinfeng) 2021

· Unusual Balmer Decrements in Local Starburst Galaxies: Incorrect Calibration or New Astrophysics?

2. Keck Telescope, 2021A (2 nights; PI: Jaskot, Anne) Dec 2020

· The Nebular Properties of Lyman Continuum Emitters: Deep Spectroscopy for the HST Low-Redshift Lyman Continuum Survey

1. HST Cycle 24, GO (20 orbits; PI: Arav, Nahum) June 2016

· Deciphering quasar outflows and measuring their contribution to AGN feedback.

Accepted Archival or Theory Research Proposals:

7. HST Cycle 30, AR (PI: Xu, Xinfeng) June 2022

Are Galactic Outflows Seen in Absorption and Emission Lines Tracing the Same Gas?

6. STScI Director Research Fund (PI: Henry, Alaina, Co-PI: Xu, Xinfeng), $\sim$ $48k, retreated since observations failed due to instrument issues on Gemini April 2022

· Emission & Absorption: First-ever Study of Connections in Mapped Quasar Outflows

5. HST Cycle 29, AR (PI: Carr, Cody) June 2021

· Modeling the Mg II-Lyman Alpha Relation as a Calibrator of the Lyman Continuum Escape Fraction

4. HST Cycle 29, AR (PI: Arav, Nahum) June 2021

· Measuring the contribution of quasar outflows to AGN feedback

3. HST Cycle 29, AR (PI: Arav, Nahum) June 2021

· A new paradigm for Seyfert outflows and their connection to AGN feedback

2. HST Cycle 27, AR (PI: Arav, Nahum) June 2019

· Are quasar outflows a major contributor to AGN feedback? HST/COS to the rescue.

1. HST Cycle 24, AR (PI: Arav, Nahum) June 2016

· The COS revolution of AGN outflow science.

DATA REDUCTION EXPERIENCE

Hubble Space Telescope (HST) Data: Worked with the HST/COS about ultraviolet (UV) spectra. Published 6 first-author and 15+ co-author papers.

Very Large Telescope (VLT) Data: Worked with the X-Shooter spectrograph about UV, optical and near-infrared spectra. Published 3 related first-author papers.

Sloan Digital Sky Survey (SDSS) Data: Extracting quasar spectra and conducting large quasar surveys. Published 1 related co-author paper (with significant contribution).

Multiple Mirror Telescope (MMT) Data: Observed remotely for 2 nights adopting MMT/Blue-channel spectrograph. Familiar with data reduction and analyses. Involved in 2 relevant first-author papers.

Keck Telescope Data: Working with Keck/ESI data in my awarded HST AR proposal. Familiar with data reductions and preparing one paper.

TECHNICAL SKILLS

Language: Python, IDL, Latex, R, SQL, HTML.
Operating Systems: Mac OSX, Linux.

AWARDS AND PRESS RELEASES

4. @astronomy.com; by Mara Johnson-Groh, May 2022;
   New CLASSY atlas provides clues about galaxy evolution
   based on my first-author paper and one co-author paper in CLASSY collaboration.
3. @nasa.gov; by Claire Andreoli, Ann Jenkins, Ray Villard, May 2020;
   Quasar Tsunamis Rip Across Galaxies
   based on my first-author paper and one second-author paper in our EUV500 HST project.
2. @VT_CS; Spring 2019
   Virginia Tech MS Research Award
   based on my second-author paper collaborated with ORNL, which won the Centers for Disease Control and Prevention (CDC) FluSight challenge in 2019

1. @VT; Fall 2017
   Virginia Tech Graduate Scholarship

TEACHING APPOINTMENTS

Jan. 2019 - May 2020: Teaching Assistant, Introduction to Astrophysics, VT

Jan. 2017 - Dec. 2018: Research Assistant, VT

Aug. 2014 - Dec. 2016: Teaching Assistant, Instructor for Fdn. of Physics Lab.

MENTORING

Mr. Ziwei Ding, undergraduate student, Virginia Tech	Feb. 2019 – Present
Ms. Yijun Song, undergraduate student, Virginia Tech	May 2019 – Present
Mr. Jake Pighini, REU project, Emory & Henry College	Summer 2018
Mr. Sean Heston, REU project, Virginia Tech	Summer 2018
Mr. Collier Sean, REU project, Virginia Tech	Summer 2018

OUTREACH

Organizing Teams for STScI 2022 Spring Science Workshop	Spring 2022

Hosts for JHU Astrocoffee Weekly Talks Sep. 2021 - present

PRESENTATIONS AND POSTERS

13. "The Properties of Starburst-Driven Warm Ionized Outflows from CLASSY Project". Invited talks presented at the **Star formation and ISM seminar at Princeton University, Mar. 2022.**

12. "Tracing LyC and Lyα escape from Mg II Emission Lines". Talks presented at the **LymanRAS: The production and escape of Lyman photons through time and space**, Jan. 2022.

11. "Tracing LyC and Lyα escape from Mg II Emission Lines". Talks presented at the **SAZERAC: Early Galaxy Formation Near and Far — Preparing for a Long Journey with JWST**, Dec. 2021.

10. "Ionized Outflows Properties and Feedback in Quasars and Star-forming Galaxies". Talks presented at the **University of Science and Technology of China, Seminar 2021**, Oct. 2021.

9. "Connections between Ionized outflows in z $\sim$ 2.0 quasars from absorption and emission". Talks presented at the **JHU Astrocoffee 2021**, Sep. 2021.

8. "From Constraints of the Partial Coverage of Galactic Winds". Invited talk presented at the **Baltimore Wind Workshop** at Johns Hopkins University, Aug. 2021.

7. "Extreme Outflows in Quasars: Most Energetic & Largest Accelerated Outflows". Invited talk presented at **Johns Hopkins University, US**, Feb. 2021.

6. "How Do Quasars Impact Their Host Galaxies?- Studies From Absorption and Emission Quasar Outflows". Invited talk presented at **Space Telescope Science Institute, US**, June 2020.

5. "Distance and Energetics of Quasar Outflows: Contribution to Galactic Feedback Processes". Invited talk presented at **York University in Toronto, Canada**, September 2019.

4. "Extreme-UV Analysis of SDSS J1042+1646 from HST/COS Observations: Distances, Energetics, and Accelerating Outflow". Talk presented at the **American Astronomical Society meeting in Seattle, US,** January 2019.

3. "VLT/X-Shooter Survey of BAL & Mini-BAL Quasars: Distances And AGN Feedback". Talk presented at the Astrophysical seminar in **Virginia Tech, US,** April 2018.

2. "VLT/X-Shooter survey of BAL & mini-BAL quasars: Distances from the central source and Energetics". Poster presented at the **American Astronomical Society meeting in Washington, D.C., US,** January 2018.

1. "A mini-BAL outflow at 1500 pc from central source, VLT/X-Shooter observations". Poster presented at the **AGN Winds Conference on the Georgia Coast, US,** June, 2017.

First-Author Journal Articles or with Significant Contribution:

· 14. **Xu, Xinfeng**; Henry, Alaina; Heckman, Tim; Marques-Chaves, Rui; et al.
The Low-Redshift Lyman Continuum Survey: Optically Thin and Thick Mg II Lines in the Probe of Lyman Continuum Escape
The Astrophysical Journal, submitted, 2022

13. **Xu, Xinfeng**; Heckman, Tim; Henry, Alaina; Berg, Danielle A.; et al.
CLASSY VI: Density and Distance of Ionized Outflows in Galactic Winds
The Astrophysical Journal, submitted, 2022

12. **Xu, Xinfeng**; Henry, Alaina; Heckman, Tim; Chisholm, John et al.
Tracing Lyα and Lyman Continuum Escape in Galaxies by Mg II Emission
The Astrophysical Journal, 2022ApJ..933...202.

11. **Xu, Xinfeng**; Heckman, Tim; Henry, Alaina; Berg, Danielle A.; Chisholm, John; James, Bethan L.; Martin, Crystal L.; Stark, Daniel P. and the CLASSY Team;
The COS Legacy Archive Spectroscopy SurveY (CLASSY) III: The Properties of Starburst-Driven Warm Ionized Outflows
Accepted to The Astrophysical Journal, 2022.

10. **Xu, Xinfeng**; Arav, Nahum; Miller, Timothy; Korista, Kirk T.; Benn, Chris;
Physical Conditions of Iron-peak Low-ionization Lines in the FeLoBAL Quasar Q0059-2735
Monthly Notices of the Royal Astronomical Society, 2021MNRAS.506.2725X.

9. **Xu, Xinfeng**; Zakamska, Nadia L.; Arav, Nahum; Miller, Timothy; Benn, Chris;
Evidence that Emission and Absorption Outflows in Quasars Are Related
Monthly Notices of the Royal Astronomical Society, 2020MNRAS.495..305X.

8. **Xu, Xinfeng**; Arav, Nahum; Miller, Timothy; Kriss G. A.; Plesha, R.;
HST/COS observations of quasar outflows in the 500 – 1050Å rest-frame, II: The Most Energetic Quasar Outflow
The Astrophysical Journal Supplement, 2020ApJS..247...38X.

7. **Xu, Xinfeng**; Arav, Nahum; Miller, Timothy; Kriss G. A.; Plesha, R.;
HST/COS observations of quasar outflows in the 500 – 1050Å rest-frame, IV: The Largest Broad Absorption Line Acceleration
The Astrophysical Journal Supplement, 2020ApJS..247...40X

6. **Xu, Xinfeng**; Arav, Nahum; Miller, Timothy; Kriss G. A.; Plesha, R.;
HST/COS observations of quasar outflows in the 500 – 1050Å rest-frame, VI: Wide, Energetic Outflows in SDSS J0755+2306
The Astrophysical Journal Supplement, 2020ApJS..247...42X

5. **Xu, Xinfeng**; Arav, Nahum; Miller, Timothy; Benn, Chris
VLT/X-Shooter Survey of BAL Quasars: Large Distance Scale and AGN Feedback
The Astrophysical Journal, 2019ApJ...876..105X.

4. **Xu, Xinfeng**; Arav, Nahum; Miller, Timothy; Benn, Chris
A Mini-BAL Outflow at 900 pc from the Central Source: VLT/X-shooter Observations
The Astrophysical Journal, 2018ApJ...858...39X

3. Arav, Nahum; **Xu, Xinfeng**; Kriss G. A. et al. (HST/COS collaboration, 21 co-authors)
Multi-wavelength campaign on NGC 7469, V. Analysis of the HST/COS observations: Super solar metalicity, distance, and trough variation models
Astronomy & Astrophysics, 2020AA...633A..61A

2. Arav, Nahum; **Xu, Xinfeng**; Miller, Timothy; Kriss G. A.; Plesha, R.;
HST/COS observations of quasar outflows in the 500 – 1050Å rest-frame, I: The Most Energetic Quasar Outflows In The Universe And Other Discoveries
The Astrophysical Journal Supplement, 2020ApJS..247...37A

1. Arav, Nahum; Liu, Guilin; **Xu, Xinfeng**; Stidham, James; Benn, Chris; Chamberlain, Carter
Evidence that 50% of BALQSO Outflows Are Situated at Least 100 pc from the Central Source
The Astrophysical Journal, 2018ApJ...857...60

Other Co-Authored Journal Articles:

16. Arellano-Córdova, Karla Z.; Mingozzi, Matilde search by orcid ; Berg, Danielle A.; and the CLASSY Team
CLASSY V: The Impact of Aperture Effects on the Inferred Nebular Properties of Local Star-forming Galaxies
The Astrophysical Journal, 2022ApJ...935...74A

15. Chisholm, J.; Saldana-Lopez, A.; Flury, S.; Schaerer, D.; Jaskot, A. et al.
The Far-Ultraviolet Continuum Slope as a Lyman Continuum Escape Estimator at High-redshift
The Astrophysical Journal, submitted, 2022arXiv220705771C

14. Marques-Chaves, R.; Schaerer, D.; Amorín, R. O.; Atek, H.; Borthakur, S.; et al.
No correlation of the Lyman continuum escape fraction with spectral hardness
Astronomy & Astrophysics, 2022AA...663L...1M

13. James, Bethan L.; Berg, Danielle A.; King, Teagan; and the CLASSY Team
CLASSY-II: A technical Overview of the COS Legacy Archive Spectroscopic SurveY
The Astrophysical Journal Supplement, 2022arXiv220601224J

12. Berg, Danielle A.; James, Bethan L.; King, Teagan; McDonald, Meaghan; Chisholm, John; Heckman, Timothy; Martin, Crystal L.; Stark, Dan P. and the CLASSY Team

The COS Legacy Archive Spectroscopy SurveY (CLASSY) Treasury Atlas
The Astrophysical Journal Supplement, 2022ApJS..261...31B

11. Saldana-Lopez, Alberto; Schaerer, Daniel; Chisholm, John; Flury, Sophia R.; Jaskot, Anne E. et al.
The Low-Redshift Lyman Continuum Survey: Unveiling the ISM properties of low-z Lyman continuum emitters
Astronomy & Astrophysics, 2022AA...663A..59S

10. Flury, Sophia R.; Jaskot, Anne E.; Ferguson, Harry C.; Worseck, Gábor; et al.
The Low-redshift Lyman Continuum Survey. II. New Insights into LyC Diagnostics
The Astrophysical Journal, 2022ApJ...930..126F

9. Flury, Sophia R.; Jaskot, Anne E.; Ferguson, Harry; Worseck, Gabor; Makan, Karill; et al.
The Low-redshift Lyman Continuum Survey. I. New, Diverse Local Lyman Continuum Emitters
The Astrophysical Journal, 2022ApJS..260....1F

8. Wang, Bingjie; Heckman, Timothy M., Ricardo, Amorin; Sanchayeeta, Borthakur; Chisholm, John et al.
The Low-redshift Lyman-continuum Survey: [S II] Deficiency and the Leakage of Ionizing Radiation
The Astrophysical Journal, 2021ApJ...916....3W.

7. Miller, Timothy; Arav, Nahum; **Xu, Xinfeng**; Kriss G. A.;
The contribution of quasar absorption outflows to AGN feedback
Monthly Notices of the Royal Astronomical Society, 2020MNRAS.499.1522M

6. Zeilig-Hess, Meir; Levinson, Amir; **Xu, Xinfeng**; Arav, Nahum;
BALQSO Spectra Explained by Shock Disruption of Galactic Clouds
Monthly Notices of the Royal Astronomical Society, 2020MNRAS.491.4325Z.

5. Miller, Timothy; Arav, Nahum; **Xu, Xinfeng**; Kriss G. A.; Plesha, R.;
HST/COS Observations of Quasar Outflows in the Extreme UV, III: Four Similar and Energetic Outflows in 2MASS J1051+1247 Likely Contributing to AGN Feedback
The Astrophysical Journal Supplement, 2020ApJS..247...39M

4. Miller, Timothy; Arav, Nahum; **Xu, Xinfeng**; Kriss G. A.; Plesha, R.;
HST/COS Observations of Quasar Outflows in the Extreme UV, V: Two Outflows in PKS J0352-0711: Distances, Energetics, and AGN Feedback
The Astrophysical Journal Supplement, 2020ApJS..247...41M

3. Miller, Timothy; Arav, Nahum; **Xu, Xinfeng**; Kriss G. A.; Plesha, R.;
HST/COS Observations of Quasar Outflows in the 500-1050Å Rest Frame. VII. Distances and Energetics for 11 Outflows in Five Quasars
The Astrophysical Journal Supplement, 2020ApJS..249...15M

2. Kriss G. A. et al. (HST/COS, XMM-Newton and NuSTAR collaborations, 27 co-authors)

HST/COS observations of the newly discovered obscuring outflow in NGC 3783
Astronomy & Astrophysics, 2019A&A...621A..12k

1. Miller, Timothy R.; Arav, Nahum; **Xu, Xinfeng**; Kriss, Gerard A.; Plesha, Rachel J.; Benn, Chris; Liu, Guilin
Distance, Energy, and Variability of Quasar Outflows: Two HST/COS Epochs of LBQS 1206+1052
The Astrophysical Journal, 2018ApJ...865...90M

Conference Proceedings Papers:

· 2. Adhikari, Bijaya; **Xu, Xinfeng**; Ramakrishnan, Naren; Prakash, B. Aditya;
EpiDeep: Exploiting Embeddings for Epidemic Forecasting
Participated in U.S. national Centers for Disease Control and Prevention (CDC) flu challenge, 2018–2019 season
Published in Proceedings of the 25th ACM SIGKDD International Conference on Knowledge Discovery & Data Mining, Pages 577-586, 2019

1. Chen, Liangzhe; **Xu, Xinfeng**; Lee, Sangkeun; Duan, Sisi; Tarditi, Alfonso G.; Chinthavali, Supriya; Prakash, B. Aditya;
HotSpots: Failure Cascades on Heterogeneous Critical Infrastructure Networks
Collaborated with Oak Ridge National Laboratory (ORNL), US
Published in Proceedings of the Conference on Information and Knowledge Management (CIKM), Pages 1599-1607, 2017