

# XINFENG XU

Curriculum Vitae/Aug. 2022

## CONTACT INFORMATION

---

**Bloomberg Center 227,  
3400 N. Charles Street,  
Baltimore, MD 21218**

Tel: (+1) 5407509101  
Email: xinfeng@jhu.edu

## 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:*

- |   |            |
|---|------------|
| <b>11. HST Cycle 30, GO (119 orbits; PI: Hayes, Matthew)</b>  | June 2022  |
| · The Lyman-alpha and Continuum Origins Survey (LaCOS)  |            |
| <b>10. HST Cycle 30, GO (49 orbits; PI: Leclercq, Floriane)</b>   | June 2022  |
| · Resolving Lyman Alpha emission in a complete sample of Lyman Continuum leakers and non-leakers                        |            |
| <b>9. HST Cycle 30, GO (12 orbits; PI: Heckman, Timothy)</b>  | June 2022  |
| · Are There Two Classes of Lyman-Leaky Galaxies?  |            |
| <b>8. Gemini FT Proposal 2022A, B (3.2+2.7 hrs; PI: Xu, Xinfeng)</b>  | 2022       |
| · First-ever Mapping [O III] Outflows in a Broad Absorption Line Quasar with Strong AGN Feedback                        |            |
| <b>7. JWST Cycle 1 (74.3 hrs; PI: Kassin, Susan)</b>  | March 2021 |
| · A Pathfinder for JWST Spectroscopy: Deep High Spectral Resolution Maps of Galaxies over $1 < z < 6$                   |            |
| <b>6. HST Cycle 29, GO (12 orbits; PI: James, Bethan)</b>   | June 2021  |
| · [C II], a High-z Diagnostic Diamond in the Rough  |            |
| <b>5. HST Cycle 29, GO (14 orbits; PI: Hayes, Matthew)</b>  | June 2021  |
| · The ionizing output of galaxies undergoing the most extreme feedback  |            |
| <b>4. VLA/21B (160.17 hrs; PI: Borthakur, Sanchayeeta)</b>  | May 2021   |
| · Characterizing Radio Continuum Emission from Low-z Lyman Continuum Leakers  |            |
| <b>3. MDM Telescope, 2.4m (2 nights, PI: Oey, Sally; Co-PI: Xu, Xinfeng)</b>  | 2021       |
| · Unusual Balmer Decrements in Local Starburst Galaxies: Incorrect Calibration or New Astrophysics?                     |            |
| <b>2. Keck Telescope, 2021A (2 nights; PI: Jaskot, Anne)</b>  | Dec 2020   |
| · The Nebular Properties of Lyman Continuum Emitters: Deep Spectroscopy for the HST Low-Redshift Lyman Continuum Survey |            |
| <b>1. HST Cycle 24, GO (20 orbits; PI: Arav, Nahum)</b>   | 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),  
~ \$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
---	-------------

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 Ly $\alpha$  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 Ly $\alpha$  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 Ly \$\alpha\$  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.; Mingozi, 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*