

# SAMEER

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## EDUCATION & POSITIONS

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**University of Notre Dame**  
Postdoctoral Research Associate

*Notre Dame, IN*  
*September 2022 -*

**Pennsylvania State University**  
Ph.D., Astronomy & Astrophysics  
Minor in Computer science

*University Park, PA*  
*August 2016 - August 2022*

**Pennsylvania State University**  
Master of Science, Major: Astronomy & Astrophysics

*University Park, PA*  
*Graduation: August 2018*

**Indian Institute of Space Science & Technology**  
Bachelor of Technology, Major: Astronomy & Astrophysics

*Kerala, India*  
*Graduation: August 2011*

## RESEARCH EXPERIENCE

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**Graduate Student Researcher, Penn State**  
Thesis advisor: Prof. Jane Charlton

*University Park, PA*  
*2018 - present*

- Dissertation focused on [characterizing the circumgalactic medium](#) using UV/Optical spectroscopy.
- Developed BAYESIAN inference based methods for [multiphase ionization modeling](#) of Quasar Absorption Line Systems.
- Experienced in analysing UV/Optical spectroscopic data, both ground based (HIRES and UVES) and COS/*HST*.
- Extensive experience with data reduction and processing in a PYTHON environment.
- Adept at parallel computing using cluster architecture. Dedicated access to CyberLAMP cluster at Penn State, and allocation on Stampede2 cluster.
- Experience in analysing *Chandra* X-ray data of [BAL to non-BAL transforming quasars](#).

## WORK EXPERIENCE

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**Observational Astronomer & Mass Spectroscopist**  
Physical Research Laboratory

*Ahmedabad, India*  
*Aug 2011 - Aug 2016*

- Handled the operations of a 1.2m telescope for carrying out [variability study of blazars](#) in the Near Infrared and Optical regimes from Mt. Abu Infrared Observatory (MIRO), Rajasthan. Developed PYTHON based codes to handle data from a variety of focal-plane instruments i.e. CCDs in Optical and NICMOS in Infrared.
- Handled the operations of a secondary ion mass spectrometer (NanoSIMS) to carry out [studies of early solar system objects](#) such as meteorites and cometary material. Developed MATLAB based codes for real time processing of data acquired with the NanoSIMS.

## TEACHING & MENTORING EXPERIENCE

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**ASTRO-11**  
Taught introduction to Astronomy for non science majors.

*Spring 2018, Spring 2017, Fall 2016*

**ASTRO 320**

*Fall 2016*

**Observational Astronomy & Experimental Physics**  
Oversaw the setup of telescopes for observing and instruments for experimentation.

**Undergraduate mentoring**

*Fall 2021-*

Shengdi You - Penn State undergraduate, mentoring on different projects to apply multiphase ionization modeling on COS G130M/G160M and HIRES data.

## AWARDS

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<b>Zaccheus Daniel Fellowship</b> Penn State	<i>2018, 2019, 2021</i>
<b>Astrophysical Frontiers in the Next Decade and Beyond</b> Travel Grant by NRAO	<i>2018</i>
<b>Homer F. Braddock/Nellie H. and Oscar L. Roberts Fellowship</b> Penn State	<i>2016</i>
<b>Academic Excellence Award</b> Indian Institute of Space Science & Technology	<i>2011</i>
<b>Full scholarship</b> Indian Institute of Space Science & Technology	<i>2007 - 2011</i>

## GRANTS

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<b>HST program 16607, Co-PI (\$295,000)</b> Title: Is There a Relationship Between the Metallicity of the Circumgalactic Medium and the Galaxy Orientation?	<i>2021 (Cycle 29)</i>
<b>HST program 17051, Co-I</b> Title: A ULLYSES Survey of the Magellanic Clouds: a Laboratory for the Physics of Interfaces between Hot and Cold Gas	<i>2022 (Cycle 30)</i>

## COMPUTE ALLOCATIONS

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<b>XSEDE Allocation</b> PHY210047: Multiphase, Cloud-by-Cloud, Bayesian Analysis of the Relationship Between the Metallicity of the Circumgalactic Medium and Galaxy Orientation	<i>2000 SUs on Stampede2</i>
<b>ACCESS Allocation</b> PHY220103: Development of Emulators for Accurate and Faster Ionization Modeling of Absorption Line Systems	<i>200,000.0 ACCESS Credits</i>

## TALKS & COLLOQUIA: 14 TOTAL, 1 SCHEDULED

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<b>Dissertation Talk</b> AAS 240	<i>June 16, 2022</i> <i>Pasadena</i>
<b>Invited Talk</b> Carnegie Tea Talk	<i>January 27, 2022</i> <i>Online, Carnegie Observatories</i>
<b>Contributed Talk</b> STARs Lab Meeting	<i>November 5, 2021</i> <i>Online, ASU</i>
<b>Contributed Talk</b> Milky Way Halo Research Group Meeting	<i>October 15, 2021</i> <i>Online, STScI</i>
<b>Contributed Talk</b> Lunch Talk	<i>September 21, 2021</i> <i>Online, Penn State</i>
<b>Invited Talk</b> Baltimore Winds Workshop	<i>August 19, 2021</i> <i>Johns Hopkins University</i>
<b>Contributed Talk</b> Galread Extragalactic Discussion Group	<i>April 5, 2021</i> <i>Online, Princeton</i>
<b>Contributed Talk</b> High Energy Astro Group Seminar	<i>March 25, 2021</i> <i>Online, MIT</i>
<b>Tutorial contributor</b> & presenter Fundamentals of Gaseous Halos	<i>Jan 20, 2021</i> <i>Online, UCSB</i>
<b>Invited presentation</b> Data Science Consortium	<i>Oct 29, 2020</i> <i>Online, University of Michigan</i>
<b>Department Colloquium</b> Astronomy & Astrophysics	<i>June 19, 2020</i> <i>Online, New Mexico State University</i>

## PRESS COVERAGE

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[timesofindia.com](#): Black & bright: PRL joins world to gauge black hole spin.

## PROFESSIONAL SERVICE & OUTREACH

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Referee for MNRAS	2022-
Subject Matter Expert	2021-
Space Telescope Science Institute Public Outreach	Online
AAS Chambliss Judge	2021
Judge for iPoster presentations	Online
ASTROFEST	2016-2019
Volunteer for Telescope viewing	Penn State
<a href="#">StackOverflow</a> contributor	2018-Present
Experimental demonstrations for public	2011-2014
NanoSIMS Lab, Physical Research Laboratory	

## CONFERENCES

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iPoster presentation	June 9, 2021
Statistical Challenges in Modern Astronomy VII	Online, Penn State
<a href="#">iPoster presentation</a>	2021
American Astronomical Society	Online
Poster presentation	2019
American Astronomical Society	University of Washington
Poster presentation	2018
Astrophysical Frontiers in the Next Decade and Beyond	NRAO

## REFEREED PUBLICATIONS ([ADS](#)): 19 TOTAL / 3 IN PREPARATION

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### FIRST AUTHOR

**Sameer**, Charlton, J. C., Kacprzak, G. G., Narayanan, A., Sankar, S., Richter, P., Wakker, B. P., Nielsen, N. M., & Churchill, C. W. (2022). Probing the physicochemical properties of the Leo Ring and the Leo I group. *MNRAS*, *510*(4), 5796–5820. <https://doi.org/10.1093/mnras/stac052>

**Sameer**, Charlton, J. C., Norris, J. M., Gebhardt, M., Churchill, C. W., Kacprzak, G. G., Muzahid, S., Narayanan, A., Nielsen, N. M., Richter, P., & Wakker, B. P. (2021). Cloud-by-cloud, multiphase, Bayesian modelling: application to four weak, low-ionization absorbers. *MNRAS*, *501*(2), 2112–2139. <https://doi.org/10.1093/mnras/staa3754>

**Sameer**, Brandt, W. N., Anderson, S., Hall, P. B., Vivek, M., Filiz Ak, N., Grier, C. J., Ahmed, N. S., Luo, B., Myers, A. D., Rodríguez Hidalgo, P., Ruan, J., & Schneider, D. P. (2019). X-ray and multi-epoch optical/UV investigations of BAL to non-BAL quasar transformations. *MNRAS*, *482*(1), 1121–1134. <https://doi.org/10.1093/mnras/sty2718>

### SECOND & THIRD AUTHOR

Nielsen, N. M., Kacprzak, G. G., **Sameer**, Murphy, M. T., Nateghi, H., Charlton, J. C., & Churchill, C. W. (2022). A complex multiphase DLA associated with a compact group at  $z = 2.431$  traces accretion, outflows, and tidal streams. *MNRAS*, *514*(4), 6074–6101. <https://doi.org/10.1093/mnras/stac1824>

Narayanan, A., **Sameer**, Muzahid, S., Johnson, S. D., Udhwani, P., Charlton, J. C., Mauerhofer, V., Schaye, J., & Yadav, M. (2021). A partial Lyman limit system tracing intragroup gas at  $z \approx 0.8$  towards HE 1003 + 0149. *MNRAS*, *505*(1), 738–754. <https://doi.org/10.1093/mnras/stab1315>

Kaur, N., **Sameer**, Baliyan, K. S., & Ganesh, S. (2017). Optical intra-day variability in 3C 66A: A decade of observations. *MNRAS*, *469*(2), 2305–2312. <https://doi.org/10.1093/mnras/stx965>

Mishra, R. K., Marhas, K. K., & **Sameer**. (2016). Abundance of  $^{60}\text{Fe}$  inferred from nanoSIMS study of QUE 97008 (L3.05) chondrules. *Earth and Planetary Science Letters*, *436*, 71–81. <https://doi.org/10.1016/j.epsl.2015.12.007>

### **>=4th author**

Dorigo Jones, J., Johnson, S. D., Muzahid, S., Charlton, J., Chen, H. .-, Narayanan, A., **Sameer**, Schaye, J., & Wijers, N. A. (2022). Improving blazar redshift constraints with the edge of the Ly  $\alpha$  forest: 1ES 1553+113 and implications for observations of the WHIM. *MNRAS*, *509*(3), 4330–4343. <https://doi.org/10.1093/mnras/stab3331>

Marra, R., Churchill, C. W., Doughty, C., Kacprzak, G. G., Charlton, J., **Sameer**, Nielsen, N. M., Ceverino, D., & Trujillo-Gomez, S. (2021). Using cosmological simulations and synthetic absorption spectra to assess the accuracy of observationally derived CGM metallicities. *MNRAS*, *508*(4), 4938–4951. <https://doi.org/10.1093/mnras/stab2896>

Pradeep, J., Sankar, S., Umasree, T. M., Narayanan, A., Khaire, V., Gebhardt, M., **Sameer**, & Charlton, J. (2020). Solar-metallicity gas in the extended halo of a galaxy at  $z \sim 0.12$ . *MNRAS*, *493*(1), 250–266. <https://doi.org/10.1093/mnras/staa184>

Yi, W., Vivek, M., Brandt, W. N., Wang, T., Timlin, J., Filiz Ak, N., Schneider, D. P., Fynbo, J. P. U., Ni, Q., Vito, F., Indahl, B. L., & **Sameer**. (2019). Broad Absorption Line Disappearance/Emergence in Multiple Ions in a Weak Emission-line Quasar. *ApJ*, *870*(2), Article L25, L25. <https://doi.org/10.3847/2041-8213/aafc1d>

Dey, L., Valtonen, M. J., Gopakumar, A., Zola, S., ..., **Sameer**, Ciprini, S., Matsumoto, K., Sadakane, K., Kidger, M., Nilsson, K., Mikkola, S., Sillanpää, A., Takalo, L. O., Lehto, H. J., Berdyugin, A., Piirola, V., Jermak, H., Baliyan, K. S., ... Zielinski, P. (2018). Authenticating the Presence of a Relativistic Massive Black Hole Binary in OJ 287 Using Its General Relativity Centenary Flare: Improved Orbital Parameters. *ApJ*, *866*(1), Article 11, 11. <https://doi.org/10.3847/1538-4357/aadd95>

Goyal, A., Stawarz, L., Zola, S., Marchenko, V., ..., **Sameer**, Ciprini, S., Baran, A., Ostrowski, M., Wiita, P. J., Gopal-Krishna, Siemiginowska, A., Simon, A. O., Siwak, M., Schweyer, T., Soldán Alfaro, F. C., Sonbas, E., Strobl, J., Takalo, L. O., ... Giroletti, M. (2018). Stochastic Modeling of Multiwavelength Variability of the Classical BL Lac Object OJ 287 on Timescales Ranging from Decades to Hours. *ApJ*, *863*(2), Article 175, 175. <https://doi.org/10.3847/1538-4357/aad2de>

Kaur, N., Baliyan, K. S., Chandra, S., **Sameer**, & Ganesh, S. (2018). Optical Variability in IBL S5 0716+714 during the 2013-2015 Outbursts. *AJ*, *156*(1), Article 36, 36. <https://doi.org/10.3847/1538-3881/aac5e4>

Kaur, N., Chandra, S., Baliyan, K. S., **Sameer**, & Ganesh, S. (2017). A Multiwavelength Study of Flaring Activity in the High-energy Peaked BL Lac Object 1ES 1959+650 During 2015-2016. *ApJ*, *846*(2), Article 158, 158. <https://doi.org/10.3847/1538-4357/aa86b0>

Ahnen, M. L., Ansoldi, S., Antonelli, L. A., Arcaro, C., ..., **Sameer**, Bangale, P., Barres de Almeida, U., Barrio, J. A., Bednarek, W., Bernardini, E., Berti, A., Biasuzzi, B., Biland, A., Blanch, O., Bonnefoy, S., Bonnoli, G., Borraacci, F., Bretz, T., ... Grishina, T. S. (2017). Multiwavelength observations of a VHE gamma-ray flare from PKS 1510-089 in 2015. *A&A*, *603*, Article A29, A29. <https://doi.org/10.1051/0004-6361/201629960>

Zola, S., Valtonen, M., Bhatta, G., Goyal, A., ..., **Sameer**, Krzesinski, J., Siwak, M., Ciprini, S., Gopakumar, A., Jermak, H., Nilsson, K., Reichart, D., Matsumoto, K., Sadakane, K., Gazeas, K., Kidger, M., Piirola, V., Alicavus, F., ... Blay, P. (2016). A Search for QPOs in the Blazar OJ287: Preliminary Results from the 2015/2016 Observing Campaign. *Galaxies*, *4*(4), 41. <https://doi.org/10.3390/galaxies4040041>

Valtonen, M. J., Zola, S., Ciprini, S., Gopakumar, A., ..., **Sameer**, Kidger, M., Gazeas, K., Nilsson, K., Berdyugin, A., Piirola, V., Jermak, H., Baliyan, K. S., Alicavus, F., Boyd, D., Campas Torrent, M., Campos, F., Carrillo Gómez, J., Caton, D. B., ... Blay, P. (2016). Primary Black Hole Spin in OJ 287 as Determined by the General Relativity Centenary Flare. *ApJ*, *819*(2), Article L37, L37. <https://doi.org/10.3847/2041-8205/819/2/L37>