SAMEER

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EDUCATION & POSITIONS

University of Notre Dame — *Notre Dame, IN*
Postdoctoral Research Associate — *September 2022 -*

Pennsylvania State University — *University Park, PA*
Ph.D., Astronomy & Astrophysics — *August 2016 - August 2022*
Minor in Computer science

Pennsylvania State University — *University Park, PA*
Master of Science, Major: Astronomy & Astrophysics — *Graduation: August 2018*

Indian Institute of Space Science & Technology — *Kerala, India*
Bachelor of Technology, Major: Astronomy & Astrophysics — *Graduation: August 2011*

RESEARCH EXPERIENCE

Graduate Student Researcher, Penn State — *University Park, PA*
Thesis advisor: Prof. Jane Charlton — *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

Observational Astronomer & Mass Spectroscopist — *Ahmedabad, India*
Physical Research Laboratory — *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

ASTRO-11 — *Spring 2018, Spring 2017, Fall 2016*
Taught introduction to Astronomy for non science majors.

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

Postdoctoral Lighting Talk Competition - Department Prize *2022*
College of Science, University of Notre Dame

Zaccheus Daniel Fellowship *2018, 2019, 2021*
Penn State

Astrophysical Frontiers in the Next Decade and Beyond *2018*
Travel Grant by NRAO

Homer F. Braddock/Nellie H. and Oscar L. Roberts Fellowship *2016*
Penn State

Academic Excellence Award *2011*
Indian Institute of Space Science & Technology

Full scholarship *2007 - 2011*
Indian Institute of Space Science & Technology

GRANTS

HST program 16607, Co-PI ($295,000) *2021 (Cycle 29)*
Title: Is There a Relationship Between the Metallicity of the Circumgalactic Medium and the Galaxy Orientation?

HST program 17051, Co-I *2022 (Cycle 30)*
Title: A ULLYSES Survey of the Magellanic Clouds: a Laboratory for the Physics of Interfaces between Hot and Cold Gas

COMPUTE ALLOCATIONS

XSEDE Allocation *1280 node-hours on Stampede2*
PHY210047: Multiphase, Cloud-by-Cloud, Bayesian Analysis of the Relationship Between the Metallicity of the Circumgalactic Medium and Galaxy Orientation

ACCESS Allocation *8900 node-hours on Stampede2*
PHY220103: Development of Emulators for Accurate and Faster Ionization Modeling of Absorption Line Systems

TALKS & COLLOQUIA: 14 TOTAL, 1 SCHEDULED

Dissertation Talk *June 16, 2022*
AAS 240 *Pasadena*

Invited Talk *January 27, 2022*
Carnegie Tea Talk *Online, Carnegie Observatories*

Contributed Talk *November 5, 2021*
STARs Lab Meeting *Online, ASU*

Contributed Talk *October 15, 2021*
Milky Way Halo Research Group Meeting *Online, STScI*

Contributed Talk *September 21, 2021*
Lunch Talk *Online, Penn State*

Invited Talk *August 19, 2021*
Baltimore Winds Workshop *Johns Hopkins University*

Contributed Talk *April 5, 2021*
Galread Extragalactic Discussion Group *Online, Princeton*

Contributed Talk *March 25, 2021*
High Energy Astro Group Seminar *Online, MIT*

Contributed Talk *March 23, 2021*
Lunch Talk *Online, Penn State*

Tutorial contributor & presenter *Jan 20, 2021*
Fundamentals of Gaseous Halos *Online, UCSB*

Invited presentation — *Oct 29, 2020*
Data Science Consortium — *Online, University of Michigan*

Department Colloquium — *June 19, 2020*
Astronomy & Astrophysics — *Online, New Mexico State University*

Contributed Talk — *April 19, 2018*
Central Pennsylvania Consortium Astronomers' Meeting — *Dickinson College, PA*

PRESS COVERAGE

timesofindia.com: **Black & bright: PRL joins world to gauge black hole spin.**

PROFESSIONAL SERVICE & OUTREACH

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*

StackOverflow contributor (reached $\sim$ 50,000 people) — *2018-Present*

Experimental demonstrations for public — *2011-2014*
NanoSIMS Lab, Physical Research Laboratory

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

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}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 α 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, Ł., 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., Borracci, 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

Baliyan, K. S., Kaur, N., Chandra, S., **Sameer, S.**, & Ganesh, S. (2016). Multi-wavelength Study of Blazars Using Variability as a Tool. *Journal of Astronomy and Space Sciences*, *33*, 177–183. https://doi.org/10.5140/JASS.2016.33.3.177

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