

Curriculum Vitae

Dr. Anshu Gupta

Postdoctoral Fellow
School of Physics
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Nationality: Indian

Education

December 2018 Doctor of Philosophy (Astronomy)
 Australian National University, Canberra
 Thesis: Chemical evolution of star-forming galaxies in the overdense environment
 Supervisor: Prof. Lisa Kewley, Dr. Tiantian Yuan

May 2013 Dual Bachelor and Master of Science
 Indian Institute of Science Education and Research Mohali, India
 Majors: Physics (GPA: 9.2/10)
 Thesis: ^3He [II] - An alternative probe for Reionization
 Supervisor: Prof. Jasjeet Bagla

July 2008 AISSCE (12th)–CBSE
 D.A.V. Public School, Yamuna Nagar, Haryana, India
 Marks: 91.6%

Professional Research Experience

06/2018 – present Postdoctoral Fellow with Prof. Kim-Vy Tran
 The University of New South Wales, Sydney, Australia

10/2013 – 03/2018 PhD thesis Research
 Australian National University, Canberra, Australia

Publications

* Denotes most important first author publications

IN PREPARATION

13. **Gupta, A.**, Alcorn, L. Y., Tran, K.-V. H., Harshan, A., in prep, *MOSEL survey: Merger driven growth of massive galaxies between $z = 3$ to 2*
12. Harshan, A., **Gupta, A.**, Alcorn, L. Y., Tran, K.-V. H., in prep, *Environmental effects on electron density at $z = 1.62$*
11. Sharma, S., Richard, J., Yuan, T., **Gupta, A.**, Kewley, L., Patrcio, V., Leethochawalit, N., Jones, T., in prep, *SDSS1958+5950 at $z = 2.225$: A test case for pixelated source plane reconstruction in Lenstool*

REFEREED PUBLICATIONS

10. Tran, K.-V. H., Forrest, B., Alcorn, L. Y., Yuan, T., Nanayakkara, T., Cohn, J., Cowley, M., Glazebrook, K., **Gupta, A.**, Kacprzak, G. G., Kewley, L., Labb'e, I., Papovich, C., Spitler, L. R., Straatman, C. M., 2019, submitted, *MOSEL: Strong [OIII]5007Å Emitting Galaxies at ($3 < z < 4$) from the ZFOURGE Survey*
9. Alcorn, L. Y., **Gupta, A.**, Tran, K.-V. H., Cohn, J., Forrest, B., Glazebrook, K., Harshan, A., Kacprzak, G. G., Kewley, L., Labb'e, I., Nanayakkara, T., Papovich, C., Spitler, L. R., Straatman, C. M., 2019, submitted, *A Tale of Two Clusters: An analysis of gas-phase metallicity and nebular gas conditions in proto-clusters galaxies at $z \sim 2$*
8. Watson, C., Tran, K.-V. H., Tomczak, A., Alcorn, L. Y., Salazar, I. V., **Gupta, A.**, Momcheva, I., Papovich, C., Dokkum, P.V., Brammer, G., Lotz, J., 2019, The Astrophysical Journal, 874, 63, *Galaxy merger fractions in two clusters at $z \sim 2$ using the hubble space telescope*
7. Sharma, S., Richard, J., Yuan, T., **Gupta, A.**, Kewley, L., Patrcio, V., Leethochawalit, N., Jones, T., 2018, Monthly Notices of the Royal Astronomical Society, 481, 1427, *High-resolution spatial analysis of a $z \sim 2$ lensed galaxy using adaptive coadded source-plane reconstruction*
6. * **Gupta, A.**, Yuan, T., Torrey, P., Vogelsberger, M., Martizzi, D., Tran, K.-V. H., Kewley, L. J., Federico M., Dylon, N., Pillepich, A., Hernquist, L., Genel, S., and Springel, V., 2018, Monthly Notices of the Royal Astronomical Society, 477, L35, *Chemical pre-enrichment of infalling galaxies in dense environment over the past 10 billion years*
5. Yuan, T., Tran, Richard, J., **Gupta, A.**, Federrath, C., Sharma, S., Kewley, L. J., Groves, B., Cen, R., and Birnboim, Y., K.-V. H., 2017, The Astrophysical Journal, 850, 18, *The most ancient spiral galaxy: A 2.6 giga-year disk with a tranquil velocity field*
4. * **Gupta, A.**, Yuan, T., Martizzi, D., Tran, K.-V. H., and Kewley, L. J. 2017, The Astrophysical Journal, 842, 75, *Survival of Massive Star-forming Galaxies in Cluster Cores Drives Gas-phase Metallicity Gradients: The Effects of Ram Pressure Stripping*
3. Kaasinen, M., Bian, F., Groves, B., Kewley, L. J., and **Gupta, A.** 2017, Monthly Notices of the Royal Astronomical Society, 465, 3220, *The COSMOS-[OII] survey: evolution of electron density with star formation rate*
2. * **Gupta, A.**, Yuan, T., Tran, K.-V. H., Martizzi, D., and Kewley, L. J. 2016, The Astrophysical Journal, 831, 104, *Radial distribution of ISM gas-Phase metallicity In CLASH clusters at $z \sim 0.35$: A new outlook on environmental impact on galaxy evolution*
1. Kanekar, N., **Gupta, A.**, Carilli, C. L., Stocke, J. T., and Willett, K. W. 2014, The Astrophysical Journal, 782, 56, *A Blind Green Bank Telescope millimeter-wave survey for redshifted molecular absorption*

Press Release

1. *The most ancient spiral galaxy confirmed using cutting-edge technique*, press release 2017: Swinburne University Press; Gemini Observatory; ASTRO 3D; Astronomy.com; Phy.org

Successful telescope Proposals (as PI)

- European Southern Observatory Very Large Telescope, KMOS, 3 nights, P.I. Anshu Gupta, *Galactic-scale Outflows in Nascent Star-forming Galaxies at $z \sim 3.5$*
- Keck Observatory, DEIMOS, 2 nights, 2015A_Z265D, P.I. Anshu Gupta, *Spectroscopic Survey of Strong Lensing Clusters with DEIMOS*

Observational experience

- Two 0.5 nights on MOSFIRE, Keck observatory, 2019 (PI: Tiantian Yuan)
- 1 night on FourStar, Magellan, 2018 (PI: Stephanie Bernard)
- 0.5 night on OSIRIS, Keck observatory, 2017 (PI: Soniya Sharma)
- 7 nights on ANU 2.3 metre, WiFeS, 2013

Data Expertise: I am very well versed in spectroscopic data reduction from all previously listed instruments, especially multi-slit spectrographs (DEIMOS and MOSFIRE) and integral field spectrographs (WiFeS and OSIRIS). I developed the telluric correction, flux calibration and emission line extraction codes for the post-pipeline analysis of DEIMOS data. I have extensive experience with data from cosmological hydrodynamical simulations, specifically IllustrisTNG. I am also familiar with the HST and Green Bank Telescope data reduction.

Grants & Awards

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| 2019 | International Astronomical Union travel grant for participation in the IAU Symposium 352 |
| 2016 | Research School of Astronomy & Astrophysics Travel grant to visit Prof. Kim-Vy Tran in Texas A&M, College Station, Texas, USA. |
| 2013 – 2016 | University Research fellowship at Australian National University awarded for the duration of PhD in Astronomy and Astrophysics based on academic merit. |
| 2012 | VSRP summer research fellowship (<i>Analysis of CO absorption features in GBT observations</i> , host: National Center for Radio Astrophysics, Pune, India). |
| 2011 | Visiting Student Research Program (VSRP) Fellowship and Indian Academy of Science (IAS) Fellowship (host: Tata Institute of Fundamental Research, Mumbai, India) |
| 2008 – 2009 | C.N.R. Rao Foundation Award (Received Twice) for outstanding academic achievement in the first and second semester of the Dual BS-MS. |
| 2008 – 2013 | KVPY Fellowship by Department of Science and Technology, Government of India (A prestigious fellowship for school students with an aptitude towards science and research. Only 100 fellowships per year.) |

Supervisory and Mentoring Experience

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| 2018 – present | Co-supervisor of Scientia Ph.D. scholar Anishya Harshan at UNSW |
| 2018 – 2019 | Mentored Ph.D. scholar Leo Alcorn at Texas A&M |
| 2018 | Taste-of-research 2nd year undergraduate student Keshavi Charde |
| 2018 | Work experience school students Rhea Baweja and Tea Worrada |

Team/Collaboration Membership

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| 2018 – present | Member of the Multi-Object Spectroscopic Emission Line Survey (MOSEL, PI: Kim-Vy Tran) |
| 2019 – present | Liaison for “First Galaxies” in ASTRO3D |
| 2019 – present | Member of the MaunaKea Spectroscopic explorer. |

Service Experience

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| 2018 – present | Referee of Astronomy & Astrophysics |
| 2018 – present | Organiser, Astro Journal club UNSW |
| May, 2019 | Local Organizing Committee, LSST@Asia conference, Sydney Australia <i>Exploring the Wide, Fast and Deep Universe</i> |
| 2016 – 2018 | Organiser, Gears3D group meeting |
| 2017 – 2018 | Organiser, Stromlo Weekly Women’s Writing Morning |
| 2015 – 2016 | Member, Telescope allocation committee for WiFeS at 2.3 metre telescope |
| 2009 – 2010 | Coordinator & Co-founder, IISER Mohali Astronomy & Astrophysics club |
| 2009 – 2013 | Member & Co-founder, YATN (Youths Attempt To Nurture) - IISER Mohali: To teach under-privileged kids. |

Public Outreach

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| June 2019 | ASTRO3D sponsored Astronomer in residence at Ayers rock resort, Uluru |
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Talks

COLLOQUIA & INVITED TALKS

26. Invited to participate in workshop on *Revolutionary Spectroscopy of Today as a Springboard to Webb*; Leiden, The Netherlands, October 2019
25. *Chemical evolution of star-forming galaxies in cluster environment*; Thesis colloquium at Research School of Astronomy & Astrophysics, ANU, Australia, February 2018
24. *Radial dependence of global metallicity of star-forming galaxies in giant galaxy clusters*; National Centre for Radio Astrophysics (NCRA), Pune, India, December 2015

CONFERENCE TALKS

23. Kinematics of galaxies at $z \sim 3.5$ via MOSEL survey; Astronomy Society of Australia (ASA) annual general meeting, Perth, Australia, July 2019
22. Kinematics of galaxies at $z \sim 3.5$ via MOSEL survey; ASTRO3D science meeting, Sydney, Australia, May 2019
21. Kinematics of galaxies at $z \sim 3.5$ via MOSEL survey; Exploring the Wide, Fast and Deep Universe, Sydney, Australia, May 2019
20. *MOSEL: Galaxies at $z \sim 3.5$* ; Life and death of star-forming galaxies, Perth, Australia, March 2019

19. *Chemical pre-processing of star-forming cluster galaxies over the past 10 billion years*; Linking galaxies from the Epoch of initial star-formation to today, Sydney, Australia, February 2019
18. *Gas in dense environments: Inflows, outflows and everything in between*; Gas fuelling of galaxy structures across cosmic time, Adelaide, Australia, November 2018
17. *How does environment affect chemical evolution of star-forming galaxies?*; Annual science meeting of American Astronomical Society 2018, Washington, USA, January 2018
16. *IllustrisTNG simulations: Pre-processing of metals in infalling groups*; GMT science meeting: Chemical evolution of the Universe, New York, USA, September 2017
15. *Does environment effect ISM metallicity of star-forming galaxies?*; Early stages of galaxy cluster formation, Garching, Germany, July 2017
14. *Survival of the fittest: Influence of ram pressure stripping on star-forming galaxies*; Galaxy Clusters Across Cosmic Time, Aix-en-Provence, France, July 2017
13. *Origin of a cluster-scale abundance gradient in the gas-phase ISM metallicity*; ITSO symposium 2017, Canberra, Australia, May 2017
12. *Origin of a cluster-scale abundance gradient in the gas-phase ISM metallicity*; Annual science meeting of American Astronomical Society 2017, Grapevine, USA, January 2017
11. *Existence of cluster-scale abundance gradient in the gas-phase ISM metallicity*; CAASTRO science meeting 2017: The Changing face of galaxies, Hobart, Australia, September 2016
10. *Metallicity gradient: Probing galaxy evolution*; Annual science meeting of Australian society of Astronomy 2015, Perth, Australia, July 2015

SEMINARS

9. *Chemical pre-processing of star-forming cluster galaxies over the past 10 billion years*; University of Texas, Austin, USA, January 2019
8. *Chemical pre-processing of star-forming cluster galaxies over the past 10 billion years*; Texas A&M, Texas, USA, January 2019
7. *Chemical evolution of star-forming galaxies in cluster environment*; Macquarie University, Sydney, Australia, September 2018
6. *Chemical evolution of star-forming galaxies in cluster environment*; European Southern Observatory, Santiago, Chile, August 2018
5. *IllustrisTNG simulations: Pre-processing of metals in infalling groups*; Center for Astrophysics - Harvard, Cambridge, USA, September 2017
4. *Origin of a cluster-scale abundance gradient in the gas-phase ISM metallicity*; Carnegie Mellon University, Pittsburg, USA, January 2017
3. *Existence of cluster-scale abundance gradient in the gas-phase ISM metallicity*; University of Austin, Texas, USA, April 2016
2. *Existence of cluster-scale abundance gradient in the gas-phase ISM metallicity*; Texas A&M University, College Station, Texas, USA, April 2016
1. *Existence of cluster-scale abundance gradient in the gas-phase ISM metallicity*; Research School of Astronomy & Astrophysics, ANU, Canberra, Australia, March 2016

Software Experience

IDL (primary programming language), Python (primary programming language), C, C++, MySQL, HTML, Fortran; LaTeX word processing; basic IRAF

Astronomy Softwares; PROSPECTOR, FAST, GALFIT, LePhare, SExtractor, Lenstool

Language Skills

Hindi (*native speaker*); English (*fluent*).

References

Prof. Kim-Vy Tran

School of Physics, The University of New South Wales, Sydney, Australia || Department of Physics & Astronomy, Texas A&M, College station, USA

Email: kimvy.tran@gmail.com

Prof. Lisa Kewley

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Email: lisa.kewley@anu.edu.au

Dr. Tiantian Yuan

ASTRO 3D Fellow || Centre of Astrophysics and Supercomputing, Swinburne University of Technology, Melbourne, Australia

Email: tiantian.yuan@anu.edu.au

Prof. Sarah Brough

ARC Future Fellow || School of Physics, The University of New South Wales, Sydney, Australia

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