

Dr. Santanu Mondal

Contact information:

Present Address: Indian Institute of Astrophysics, Office No. 213,
2nd Block, Koramangala, Bengaluru 560034, India

Permanent Address: Vill-Shaspur, P.O-Birchandrapur, Birbhum,
731245, West Bengal, India

Date of Birth: 19-06-1987, Category: GEN, Nationality: Indian,

Marital Status: Married

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Website: [GoogleScholar](#), [Scopus](#), [Homepage](#)

Web of Science ResearcherID: HRB-2761-2023



Research Interest: Accretion onto astronomical bodies plays an important role in astrophysics and cosmology, on both small and large scales. On small scales, accreting compact objects show variability in both temporal and spatial domains, raising a range of questions: What causes the fluctuation in mass accretion rate in accretion disks of both low mass and supermassive black holes? How different physical processes are responsible for the origin of Quasi Periodic Oscillations (QPOs)? What is the role of the spin parameter in launching jets? My aim is to propose a self-consistent model to address jet launching, spectral state transition, the origin of QPOs, and changing coronal properties. On the extreme end of large scales, my study includes Fermi Bubbles, their origin, and morphology in our Galaxy through numerical simulation using PLUTO and examining shocks and cold fronts in different galaxy clusters using X-ray imaging. My recent research interest includes ultraluminous X-ray sources, dual active galactic nuclei systems, and twin radio galaxies.

RESEARCH & EMPLOYMENT

Apr. 2021 - Present [Ramanujan Fellow, Indian Institute of Astrophysics](#), India
Jan. 2021 – Apr. 2021 [Post Doctoral Fellow, Indian Institute of Astrophysics](#), India
Nov. 2018 – Dec. 2020 [Kreitman Fellow, Ben-Gurion University of the Negev](#), Israel
Mar. 2016 – Nov. 2018 [FONDECYT Fellow, Universidad de Valparaiso](#), Chile
Feb. 2015 – Mar. 2016 Post Doctoral Fellow under [MoES, India](#), at **Indian Centre for Space Physics**, Kolkata

EDUCATION

Ph.D. in Physics Aug (Provisional)/Dec (Final) 2015, **Indian Centre for Space Physics, University of Calcutta**, Kolkata, India
Thesis Title: *Spectral Properties of Accretion Flows Around Black Holes in Presence of Comptonization and Mass Loss*
Supervisor: Prof. Sandip K. Chakrabarti, External Examiner: Prof. Somak Raychaudhury

Workshop project 2013, **COSPAR Capacity building workshop**, Nanjing, China
Project Title: X-Ray spectrum of the black hole candidate Swift J1753.5 - 0127 using XMM-Newton data

Post M.Sc (Astrophysics) 2010, **S. N. Bose National Centre for Basic Sciences**, Kolkata, India
Project Title: *Radiation spectra due to Comptonization in plasma cloud*

M.Sc in Physics 2009, **Ramakrishna Mission Residential College Narendrapur/ University of Calcutta**, Kolkata, India
Project Title: *Measurement of absorption co-efficient of metal using*

X-Ray detector

B.Sc in Physics (Honours)	2007, Scottish Church College/University of Calcutta , Kolkata, India <i>Minors: Mathematics and Chemistry</i>
10+2 Standard	2004, West Bengal Council of Higher Secondary Education (Science)

PUBLICATIONS:

Total publications in refereed journals: 31

Total Citation: 918 and H-index 15 as of 31/07/2023 from Google Scholar

NASA/ADS: <https://ui.adsabs.harvard.edu/search/q=orcid%3A0000-0003-0793-6066&sort=date%20desc%2C%20bibcode%20desc&p=0>

GoogleScholar: <https://scholar.google.com/citations?user=0ql3Hj4AAAAJ&hl=en>

Five representative papers:

1. **Fermi bubbles: the collimated outburst needed to explain forward-shock edges**, Mondal, Santanu, Keshet, Uri, Sarkar, Kartick C., Gurwich, Ilya, Monthly Notices of the Royal Astronomical Society, 2022, 514, 2581
2. **Variable mass accretion and failed wind explain changing look phenomena in NGC 1365**, Mondal, Santanu, Adhikari, Tek P., Hryniewicz, K., Stalin, C. S., Pandey, A., A&A, 2022, 662, 77
3. **Spectral Signature of mass outflow in the Two Component Advective Flow Paradigm**, Mondal, Santanu, Chakrabarti, Sandip K., Astrophysical Journal, 2021, 920, 41
4. **Effect of turbulent pressure on the origin of low-frequency quasi-periodic oscillations in rotating black holes**, Mondal, Santanu, Monthly Notices of the Royal Astronomical Society, 02/2020, 492, 804
5. **Implementation of Two Component Advective Flow Solution in XSPEC**, Debnath, Dipak, Chakrabarti, Sandip K., and Mondal, Santanu, Monthly Notices of the Royal Astronomical Society Letters, 05/2014, 440L, 121

Full list in Refereed Journal (including best 5)

31. **Misaligned jets from Sgr A* and the origin of Fermi/eROSITA bubbles**, Sarkar, K. C., Mondal, Santanu, Sharma, P., Piran, Tsvi, ApJ, 2023, 951, 36, [arXiv:2211.12967](https://arxiv.org/abs/2211.12967), **IF:5.521, Citation: 0**
30. **Broadband X-ray spectral analysis of the ULX NGC 1313 X-1 using JeTCAF: Origin of the ULX bubble**, Palit, B. and Mondal, Santanu, Publications of the Astronomical Society of the Pacific, 2023, 135, 054101, **IF:5.842, Citation:0**
29. **Spectral and temporal studies of Swift J1658.2-4242 using AstroSat observations with the JeTCAF model**, Mondal, Santanu, and Jithesh, V., Monthly Notices of the Royal Astronomical Society, 2023, 522, 2065, **IF:5.235, Citation: 1**

28. [Study of accretion flows around an ultraluminous X-ray source M82 X-1 using *NuSTAR* data](#), **Mondal, Santanu**, Palit, B., and Chakrabarti, S. K., 2022, *Journal of Astrophysics and Astronomy*, 43, 90, **IF:1.61, Citation:2**
27. [Global Understanding of Accretion and Ejection around Black Holes](#), **Mondal, Santanu [Editorial]**, *Galaxies*, 2022, 10, 64, **IF:2.1, Citation:0**
26. [Variable mass accretion and failed wind explain changing look phenomena in NGC 1365](#), **Mondal, Santanu**, Adhikari, Tek P., Hryniewicz, K., Stalin, C. S., Pandey, A., *A&A*, 2022, 662, 77, **IF:6.24, Citation:6**
25. [Fermi bubbles: the collimated outburst needed to explain forward-shock edges](#), **Mondal, Santanu**, Keshet, Uri, Sarkar, Kartick C., Gurwich, Ilya, *Monthly Notices of the Royal Astronomical Society*, 2022, 514, 2581, **IF:5.235, Citation:5**
24. [Flux and spectral variability of Mrk 421 during its moderate activity state using *NuSTAR*: Possible accretion disc contribution?](#) by **Mondal, Santanu**, Rani, Priyanka, Stalin, C.S., Chakrabarti, S. K., Rakshit, Suwendu, 2022, *A&A*, 663, 178, **IF:6.24, Citation:3**
23. [Low-frequency quasi-periodic oscillations and shocks in accretion on to black hole](#), Chandra B. Singh, **Mondal, Santanu (equal 1st author)**, Garofalo, David, *Monthly Notices of the Royal Astronomical Society*, 2022, 510, 807, **IF:5.235, Citation: 2**
22. [Spectral Signature of mass outflow in the Two Component Advective Flow Paradigm](#), **Mondal, Santanu**, Chakrabarti, Sandip K., *Astrophysical Journal*, 2021, 920, 41, **IF:5.521, Citation:7**
21. [Emission lines from X-ray illuminated accretion disc in black hole binaries](#), **Mondal, Santanu**, Adhikari, Tek P., Singh, Chandra B., *Monthly Notices of the Royal Astronomical Society*, 2021, 505, 1071, **IF:5.235, Citation:3**
20. [Changing accretion geometry of Seyfert 1 Mrk 335 using *NuSTAR*: A comparative study](#), **Mondal, Santanu** and Stalin, C. S., *Galaxies*, 2021, 9, 21, **IF:2.1, Citation:7**
19. [Effect of turbulent pressure on the origin of low-frequency quasi-periodic oscillations in rotating black holes](#), **Mondal, Santanu**, *Monthly Notices of the Royal Astronomical Society*, 02/2020, 492, 804, **IF:5.235, Citation:3**
18. [Estimating disk parameters of black hole X-ray binary MAXI J1543-564: effect of disk irradiation](#), **Mondal, Santanu**, *Advances in Space Research*, 01/2020, 65, 693, **IF:2.611, Citation:6**
17. [Spectral Properties of NGC 4151 and the Estimation of Black Hole Mass Using TCAF Solution](#), Nandi, Prantik, Chakrabarti, Sandip K., and **Mondal, Santanu**, *Astrophysical Journal*, 06/2019, 877, 65, **IF:5.521, Citation:12**
16. [Implications for accretion flow dynamics from a spectral study of Swift J1357.2-0933](#), **Mondal, Santanu**, and Chakrabarti, Sandip K., *Monthly Notices of the Royal Astronomical Society*, 02/2019, 483, 1178, **IF:5.235, Citation:7**
15. [Possible range of viscosity parameter to trigger black hole candidates to exhibit different spectral states of outbursts](#), **Mondal, Santanu**, Chakrabarti, Sandip K., Nagarkoti, Shreeram, and Arevalo, Patricia, *Astrophysical Journal*, 11/2017, 850, 47, **IF:5.521, Citation:19**
14. [Accretion Flow Properties of Swift J1753.5-0127 during its 2005 outburst](#), Debnath, Dipak, Jana, Arghajit, Chakrabarti, Sandip K., Chatterjee, Debjit, and **Mondal, Santanu**, *Astrophysical Journal*, 11/2017, 850, 92, **IF:5.521, Citation:31**

13. [Estimation of Mass of Compact Object in H 1743-322 from 2010 and 2011 Outbursts using TCAF Solution and Spectral Index-QPO Frequency Correlation](#), Molla, Aslam A., Chakrabarti, Sandip K., Debnath, Dipak, and **Mondal, Santanu**, Astrophysical Journal, 01/2017, 834, 88, **IF:5.521, Citation:58**
12. [Spectral study of GX 339-4 with TCAF using Swift and NuSTAR observation](#), **Mondal, Santanu**, Chakrabarti, Sandip K., and Debnath, Dipak, Astrophysics and Space Science, 09/2016, 361, 309, **IF:1.5, Citation:36**
11. [Estimation of the mass of the black hole candidate MAXI J1659-152 using TCAF and POS models](#), Molla, Aslam A., Debnath, Dipak, Chakrabarti, Sandip K., and **Mondal, Santanu**, Jana, Arghajit, Monthly Notices of the Royal Astronomical Society, 08/2016, 460, 3163, **IF:5.235, Citation:59**
10. [Accretion Flow Properties of MAXI J1543-564 during 2011 Outburst from the TCAF Solution](#), Chatterjee, Debjit, Debnath, Dipak, Chakrabarti, Sandip K., and **Mondal, Santanu**, Astrophysical Journal, 08/2016, 827, 88, **IF:5.521, Citation:63**
9. [Accretion Flow Dynamics of MAXI J1836-194 During Its 2011 Outburst from TCAF Solution](#), Jana, Arghajit, Debnath, Dipak, Chakrabarti, Sandip K., **Mondal, Santanu**, and Molla, Aslam A., Astrophysical Journal, 03/2016, 819, 107, **IF:5.521, Citation:81**
8. [Is Compton cooling sufficient to explain the evolution of the observed QPOs?](#), **Mondal, Santanu**, Chakrabarti, Sandip K., and Debnath, Dipak, Astrophysical Journal, 01/2015, 798, 57, **IF:5.521, Citation:45**
7. [Characterization of GX 339-4 outburst of 2010-11: Analysis by XSPEC using Two Component Advective Flow model](#), Debnath, Dipak, **Mondal, Santanu**, and Chakrabarti, Sandip K., Monthly Notices of the Royal Astronomical Society, 02/2015, 447, 1984, **IF:5.235, Citation:83**
6. [Accretion flow dynamics of MAXI J1659-152 from spectral evolution study of its 2010 outburst using TCAF solution](#), Debnath, Dipak, Molla, Aslam A., Chakrabarti, Sandip K., and **Mondal, Santanu**, Astrophysical Journal, 04/2015, 803, 59, **IF:5.235, Citation:67**
5. [Resonance condition and low-frequency quasi-periodic oscillations of the outbursting source H1743-322](#), Chakrabarti, Sandip K., **Mondal, Santanu**, and Debnath, Dipak, Monthly Notices of the Royal Astronomical Society, 10/2015, 452, 3451, **IF:5.235, Citation:66**
4. [Implementation of Two Component Advective Flow Solution in XSPEC](#), Debnath, Dipak, Chakrabarti, Sandip K., and **Mondal, Santanu**, Monthly Notices of the Royal Astronomical Society Letters, 05/2014, 440L, 121, **IF:5.235, Citation:103**
3. [Inference on accretion flow dynamics using TCAF solution from the analysis of spectral evolution of H 1743-322 during 2010 outburst](#), **Mondal, Santanu**, Debnath, Dipak, and Chakrabarti, Sandip K., Astrophysical Journal, 05/2014, 786, 4, **IF:5.521, Citation:89**
2. [Spectral signature of dissipative Standing Shocks with mass outflow in Presence of Comptonization around a black hole](#), **Mondal, Santanu**, Chakrabarti, Sandip K., and Debnath, Dipak, 09/2014, Astrophysics and Space Science, 353, 223, **IF:1.5, Citation:28**
1. [Spectral Properties of Two Component Advective flows with Standing Shocks in Presence of Comptonization](#), **Mondal, Santanu** and Chakrabarti, Sandip K., Monthly Notices of the Royal Astronomical Society, 05/2013, 431, 2716, **IF:5.235, Citation:28**

Submitted

1. Evolution of low frequency quasi-periodic oscillations in GX 339–4 during its 2021 outburst using AstroSat data, **Mondal, Santanu**, Salgundi, Anirudh Salgundi, Chatterjee, Debjit, Jana, Arghajit, Chang, H.-K., Naik, Sachindra, submitted, MNRAS, [arXiv:2303.03742](#)

In Books

2. “[Global Understanding of Accretion and Ejection around Black Holes](#)” **Santanu Mondal (Ed.)**
ISBN 978-3-0365-5610-9 (Hbk); ISBN 978-3-0365-5609-3 (PDF)
WebLink: <https://www.mdpi.com/books/book/6320>

1. **Santanu Mondal**, 2018 “[Transonic Flow Solutions with Explicit Cooling and Viscosity](#)” In: Mukhopadhyay B., Sasmal S. (eds) Exploring the Universe: From Near Space to Extra-Galactic. Astrophysics and Space Science Proceedings, vol 53, page 67-83. Springer, Print ISBN: 978-3-319-94606-1, Online ISBN: 978-3-319-94607-8. DOI: https://doi.org/10.1007/978-3-319-94607-8_6

Publications in Conference Proceedings

13. Accretion around low mass and supermassive black holes with TCAF by S. Mondal, S. K. Chakrabarti, P. Nandi in the proceedings of [The Fifteenth Marcel Grossmann Meeting](#), pp. 231-236 (2022)

12. Accretion Flow Properties of three MAXI Black Hole candidates: Analysis with the TCAF Solution by D. Debnath, S. K. Chakrabarti, A. Jana, D. Chatterjee, A. A. Molla and S. Mondal in the proceeding of 7 years of MAXI : monitoring X-ray transients, 2017, pp.81, Suzuku Umetaro Hall, Riken Wako Campus, Japan

11. Inflow-Outflow Properties of Accretion Disk around MAXI J1836-194 with TCAF Solution during its 2011 Outburst by A. Jana, D. Debnath, S. K. Chakrabarti, D. Chatterjee, A. A. Molla and S. Mondal in the proceeding of 7 years of MAXI : monitoring X-ray transients, 2017, pp.87, Suzuku Umetaro Hall, Riken Wako Campus, Japan

10. Characterization of few transient black hole candidates during their X-ray outbursts with TCAF Solution by D. Debnath, S. Mondal, S. K. Chakrabarti, A. Jana, A. A. Molla, and D. Chatterjee in the proceeding of RETCO-II, ASI Conference Series, 12, 2015, pp.87-88, ARIES, Nainital, India

9. Estimation of mass of MAXI J1659-152 during its first outburst with TCAF fits by A. A. Molla, S. K. Chakrabarti, D. Debnath, S. Mondal, A. Jana, and D. Chatterjee in the proceeding of RETCO-II, ASI Conference Series, 12, 2015, pp.119-120, ARIES, Nainital, India

8. Spectral and Temporal Properties of MAXI J1836-194 during 2011 Outburst by A. Jana, D. Debnath, S. Mondal, S. K. Chakrabarti, A. A. Molla, and D. Chatterjee in the proceeding of RETCO-II, ASI Conference Series, 12, 2015, pp.137-138, ARIES, Nainital, India

7. Compton cooling and signature of Quasi-Periodic Oscillations for few transient Black Hole candidates by S. Mondal, S. K. Chakrabarti, and D. Debnath in the proceeding of RETCO-II, ASI Conference Series, 12, 2015, pp.151-152, ARIES, Nainital, India

6. Possible ASTROSAT observation of transient black hole candidates to study spectral and timing properties with TCAF solution by D. Debnath, S. K. Chakrabarti, S. Mondal, A. Jana, A. A. Molla, and D. Chatterjee in the proceeding of MG14 meeting, 2015, pp.3283-3288, University of Rome Sapienza

5. Evolution of spectral and temporal properties of MAXI J1836-194 during 2011 outburst by A. Jana, D. Debnath, S. K. Chakrabarti, S. Mondal, A. A. Molla, and D. Chatterjee in the proceeding of MG14 meeting, 2015, pp.1038-1043, University of Rome Sapienza

4. Temporal and spectral properties of MAXI J1659-152 during its 2010 outburst by A. A. Molla, D. Debnath, S. K. Chakrabarti, S. Mondal, A. Jana, and D. Chatterjee in the proceeding of MG14 meeting, 2015, pp. 1044-1049, University of Rome Sapienza

3. Study of shock propagation velocity and accretion flow dynamics around the black hole candidates by S. Mondal, S. K. Chakrabarti, and D. Debnath in the proceeding of MG14 meeting, 2015, pp. 1056-1059, University of Rome Sapienza
2. Extracting Flow parameters of H 1743-322 during early phase of its 2010 outburst using Two Component Advective Flow model by D. Debnath, S. K. Chakrabarti, and S. Mondal in the proceeding of Recent Trends in the Study of Compact Objects: Theory and Observation (RETCO-I), ASI Conference Series, 8, 2013, pp. 85-88, IIT Guwahati, India
1. Spectral properties of two component advective flows around black holes with standing shock in presence of Comptonization by S. Mondal and S. K. Chakrabarti in the proceeding of Recent Trends in the Study of Compact Objects: Theory and Observation (RETCO-I), ASI Conference Series, 8, 2013, pp. 59-62, IIT Guwahati, India

Popular Science Article Written

1. [Why do some Active Galactic Nuclei Change their Look?](#) On Changing Look Active Galactic Nuclei in CosmicVarta (A platform to promote Indian Astronomy Research)

Media

[Strange flip-flop behavior of black hole binary star system in Milky Way attributed to its changing mass accretion rate](#) published in DST-media in 2023 based on our recent paper using the data from Indian First Multiwavelength Space Mission AstroSat.

Seminar/Conference/Workshop Organized/Lectures

1. As a local organizing committee member: Organized Three day workshop on “[Black holes: Theory and Observation](#)” at Vainu Bappu Observatory, Kavalur, 15-17 June 2023
2. I gave 3 lectures (3 hrs) and 1 tutorial (1 hr) in IIA Summer School-2023, 20-30 May, at Kodaikanal Solar Observatory, Tamil Nadu

M.Sc. Project/Summer/Internship Students

8. *Rajnil Mukherjee from IISER Mohali*, worked on the **Fermi Bubbles’ data analysis**
7. *Anirudh Salgundi from CHRIST University, Bangalore* worked on **AstroSat Data analysis**, Presently at **IIT Bombay**
6. *Amrutha B R from St. Joseph’s University, Bangalore* worked on **Title: Survey of jet properties in active galactic nuclei**
5. *Mayurakshi Mukherjee from IISER Berhampur*, worked on **Title: Quasi periodic oscillation in accretion disk around black holes (got PhD in SISSA, Italy)**
4. *Swathi Suresh from Bharata Mata College, Kerala*, completed (09/2022) in online mode. **Title: Spectral fitting of changing look active galactic nuclei Mrk 1018**
3. *Aniket Nath (Co-guided with Prof. Mousumi Das) from NISER Bhubaneswar*, completed (07/2022). **Title: Taking a census of active galactic nuclei and to analyze their X-ray spectra**

2. *Pushpendra Kumar from Pt. Ravishankar Shukla University*, completed (04/2022). Title: **Spectral analysis of of ultraluminous source M82 X-1 using NuSTAR**

1. *Biswaraj Palit from Jadavpur University*, completed (04/2022). Title: **Estimation of accretion-ejection flow parameters from broad band spectral analysis of NGC 1313 X-1**, joined Ph.D at [Nicolaus Copernicus Astronomical Center](#), Poland

Observational Proposals accepted

2. Time awarded by the Southern Astrophysical Research (SOAR) Telescope for the optical proposal “*Searching for the optical counterpart of the stellar-mass black hole candidate MAXI J1543-564*” as a P.I. with Co-Is Jesus M. Corral-Santana and Patricia Arévalo in CNTAC cycle 2018-B, Chile

1. Time awarded by *Swift/XRT* for simultaneous X-Ray observation of the stellar-mass black hole candidate MAXI J1543-564 as a P.I (independently).

Academic Recognitions/Sponsored Project/Research Grant

14. Serving as a Guest Editor in a [special issue](#) in [Frontiers in Astronomy and Space Sciences](#) journal

13. Life Member of the Astronomical Society of India (ASI; Membership no: L2347) from 2021-

12. Working as a **Guest Editor** in a special [issue](#) in MDPI/Galaxies journal

11. Awarded **Ramanujan Fellowship** with grant amount INR 1.19 Crore by SERB-DST, Govt. of India, #RJF/2020/000113, title: “*Accretion processes in Astrophysics*” as a P. I. from April 2021-March 2026.

10. Awarded **Kreitman Fellowship** of amount 160416 NIS (INR 32 Lac) to carry out post-doctoral research work with Uri Keshet at the Ben-Gurion University of the Negev, Ben-Gurion, Israel, from Nov. 2018 – Dec. 2020

9. Selected as a Grant Recipient of **42nd COSPAR Scientific assembly**, Caltech, Pasadena, USA, July, 2018

8. Member of La Sociedad Chilena de Astronomia (SOCHIAS, **Chilean Society of Astronomy**) from 2017 – 2018

7. Research grant of **115,000 USD (INR 77 Lac)** by CONICYT-FONDECYT, Govt. of Chile, # 3160350, “*Accretion and ejection around compact objects*” as a **P.I.** (from Nov. 2015 to Oct. 2018), hosted by Patricia Arévalo

6. COSPAR Students’ Fellowship jointly with ISRO, India of **Euro 1700** to visit NASA/GSFC, Aug. 28 - Sep. 30, 2014 to work with Keith Arnaud.

5. Grant Recipient Student of **COSPAR Capacity Building Workshop**, Xuyi, Jianghu, China, 2013

4. Received grant from the South Asian Physics Foundation (SAPF) for attending international conference on “*Accretion and Outflow in Black Hole Systems*”, Kathmandu, Nepal, 2010

3. Qualified Joint Entrance Screening Test (**JEST, India**) examination was held in February, 2010

2. Five years Ph.D. fellowship by **CSIR-NET (JRF)**, India with all India rank 63 to carry out doctoral research from Mar. 2010 to Feb. 2015

1. Prestigious **Charubala Devi Memorial award** from Ramakrishna Mission Residential College (Autonomous), Narendrapur, Kolkata, West Bengal, India for academic performances (1st class 3rd) during all four semesters of M.Sc

Scientific Visits

8. **Indian Institute of Science**, Bangalore, 23rd November 2022
7. **Indian Institute of Technology Indore**, India, in collaborative purposes with Dr. Bhargav Vaidya in August 2022.
6. **European Southern Observatory (ESO)**, **Santiago**, to finish optical proposal with Jesus M. Corral-Santana
5. Astrophysics group (lead by Sandip K. Chakrabarti) of **S. N. Bose National Centre for Basic Sciences**, Kolkata, India, February, 2018
4. High Energy Astrophysics group (lead by Eugene Churazov) of **Max Planck Institute for Astrophysics, Garching**, Germany, July, 2017
3. Astrophysics group (lead by Elisabete de Gouveia Dal Pino and Chandra B. Singh) of **University of Sao Paulo, Brazil**, September, 2016
2. A. R. Rao of **Tata Institute of Fundamental Research, India**, June, 2015
1. K. A. Arnaud of **NASA's Goddard Space Flight Centre, Maryland, USA**, September, 2014

Oral presentations in Seminars/Conferences

Invited

10. "Understanding accretion and ejection around black holes: Theory, observations, and simulation" by Santanu Mondal at **Indian Institute Science, Bangalore**, 23 November 2022
9. "Different facets of accretion-ejection flows around black holes" by Santanu Mondal at **Indian Institute of Technology Indore**, 22 August 2022
8. "Accretion and Ejection Around Black Holes", by Santanu Mondal at the **Indian Institute of Astrophysics**, Bangalore, India, 11 November, 2021
7. "Evolution of spectro-temporal properties in accretion disks around black holes" by Santanu Mondal at the **South-Western Institute For Astronomy Research at Yunnan University (SWIFAR-YNU)**, China, 11 October, 2021
6. "Accretion and ejection around black hole binaries: the role of viscosity and cooling", by Santanu Mondal at the **Hebrew University of Jerusalem**, Jerusalem, Israel, 22 January, 2019
5. "Study of accretion disk dynamics around X-ray binaries using TCAF solution", by Santanu Mondal open talk at **S. N. Bose National Centre for Basic Sciences**, Kolkata, India, 19 February, 2018
4. "Viscosity: a tuner of spectral states" by Santanu Mondal at the **Universidad de Valparaiso**, Valparaiso, Chile, 6 November, 2017
3. "Triggering viscosity of the outbursting black hole candidates to exhibit different spectral states", by Santanu Mondal at **Max Planck Institute for Astrophysics**, Garching, Germany, 21 July, 2017
2. "Theory and observation of black hole accretion" by Santanu Mondal at the **University of Sao Paulo**, Sao Paulo, Brazil, 14 September, 2016
1. "Accretion flow dynamics around black holes" by Santanu Mondal at **NASA/GSFC**, Maryland, USA, 28 September, 2014

Contributed

9. “Estimating binary parameters of the black hole transient Swift J1658.2-4242 using AstroSat data” by Santanu Mondal in 3rd Indo-French CEFIPRA Meeting held at Indian Institute of Astrophysics, Bangalore from 9-13th January 2023.
8. “Simulating the Fermi Bubbles”, by Santanu Mondal in the 65th Annual meeting of the Israel physical Society held on 17 th February 2020 at the Weizmann Institute of Science, Israel
7. “Implications on accretion disk dynamics from spectro-temporal study of different black hole candidates”, by Santanu Mondal at the 64 th Annual meeting of the **Israel physical Society** held on 9 th December 2018 at the Hebrew University of Jerusalem
6. “Spectral study of different black hole candidates and measurement of spin parameter”, by Santanu Mondal at **42nd COSPAR meeting**, Caltech, USA, July, 2018
5. “Evolution of different Spectral States in Black Hole Binaries with TCAF”, by Santanu Mondal at **Marcel Grossmann Meeting XV**, Rome, Italy, July, 2018
4. “Spectral signature of jets around a black hole in presence of Compton cooling”, by Santanu Mondal at **Marcel Grossmann Meeting XV**, Rome, Italy, July, 2018
3. “Compton cooling and the signature of Quasi Periodic Oscillations frequency for few transient black hole candidates”, by Santanu Mondal at **RETCO-II meeting**, ARIES, Nainital, India
2. “X-Ray Spectrum of the Black Hole Candidate Swift J1753.5-0127 Using XMM-Newton Data”, by Santanu Mondal at **COSPAR Workshop**, Xuyi, Jiangsu, China
1. “Spectral properties of Two Component Advective Flows around black holes with standing shock in presence of Comptonization”, by Santanu Mondal at **RETCO-I meeting**, IIT Guwahati, Assam, India

Teaching

1. I gave tutorials (voluntary for two years) on Classical Mechanics, Quantum Mechanics and Atomic Physics to undergraduate students at Ramakrishna Mission Calcutta Students’ Home, Belgharia, Kolkata, India.

Technical Skills

- Astrophysics**
1. Reduction and analysis (Expert) of X-Ray telescope (**RXTE, Swift/XRT, NuSTAR, Chandra, XMM-Newton**) data
 2. Reduction of optical telescope (e.g. **SOAR**) data (Intermediate) using IRAF
 3. Imaging of galaxy clusters using **Chandra data**
 4. Astrophysical simulations using **PLUTO, GAMER** codes
 5. Hydrodynamics and radiative transfer modelling
 6. **FTOOLS/HEASARC-NASA** for data analysis
- Programming** Fortran, Python, Mathematica, LATEX, Shell, Xmgrace, GNUplot, Gimp