Chakrabarti, Sandip Kumar

Position: Adjunct Professor, ICRANET

Senior Professor and Head, Astrophysics and Cosmology
S.N. Bose National Centre for Basic Sciences
And In Charge, Indian Centre for Space Physics

Period covered: 2016

I Scientific Work

We fitted data of several black hole binaries to obtain the mass of the black hole candidate and to get physical parameters such as accretion rates, size of the Compton cloud etc. We have studied vertical oscillation of an avdective flow on its way to a black hole. We also studied the time and phase lag between hard and soft photons emitted from Two component Advective Flows around black holes. We treat the Earth's atmosphere as a gigantic detector and computed the injected spectra from the Sun from the VLF data. I led the balloon borne astronomy team to have a total of 10 balloon missions (D90 to D99) in which good quality data was obtained and various payloads have been tested. Our low cost balloon experiment yielded anti-correlation between the cosmic ray intensity and the solar activity. In astrobiology/astrochemistry work we have studied abundances of Interstellar Carbon Chain molecules.

II Conferences and educational activities

II a Conferences and Other External Scientific Work:

Mar. 2016: "Gravitational Waves and Black Holes" at 'Togetherness for Better Tomorrow' Forum, Tollygaunj, Kolkata.

September, 2016: Gave a course on accretion processes in Black Holes at the University of cape Town, South Africa.

September, 2016: Gave public lectures on "Chemical Evolution of the Universe since Big Bang, and Origin of Life" at the University of Durban and the University of Cape Town.

September, 2016: Gave departmental seminars on "Food Habits of Black Holes" at the University of Durban and the University of Cape Town.

November, 2016: Assessed the performance of TIFR during last five years for it to remain deemed University as a part of NATIONAL ASSESSMENT AND ACCREDITATION COUNCIL (NAAC) of University Grants Commision.

II b Work With Students: In 2016 four students have submitted PhD Thesis. So far 34 PhD students have completed PhD work under my supervision and another 15 are at various stages of completion.

II c Diploma thesis supervision

II d Other Teaching Duties: Took two courses on High Energy Astrophysics and introductory course on Astrophysics.

II e. Work With Postdocs; I work with several Post-Docs and several project scientists. I also work with two engineers, two technical assistants and two helpers in the balloon team.

III. Service activities

III a. Within ICRANet:

III b. Outside ICRANet: I am the Senior most faculty at S.N. Bose National Centre for Basic Sciences, and Head, Department of astrophysics and Cosmology. I am also In Charge of Indian Centre for Space Physics and handle over thirty faculties, engineers and research students

IV. Other

2016 List of Publications

(A) In refereed Journals

1. Jana, Arghajit; Debnath, Dipak; Chakrabarti, Sandip K.; Mondal, Santanu; Molla, Aslam Ali, Accretion Flow Dynamics of MAXI J1836-194 During Its 2011 Outburst from TCAF Solution, Astrophysical Journal, 2016, 819, 107

2. Chakraborty, Suman; Palit, Sourav; Ray, Suman; Chakrabarti, Sandip K., Modeling of the lower ionospheric response and VLF signal modulation during a total solar eclipse using ionospheric chemistry and LWPC, 2016, Astrophysics and Space Science, 2016, 361, 72

3. Das, Ankan; Sahu, Dipen; Majumdar, Liton; Chakrabarti, Sandip K., Deuterium enrichment of the interstellar grain mantle, Mon. Not. R. Astron. Soc., 2016, 455, 540.

4. Nagarkoti, Shreeram; Chakrabarti, Sandip K., Upper Limit of the Viscosity Parameter in Accretion Flows around a Black Hole with Shock Waves, 2016, Astrophysical Journal, 816, 7.

5. Nwankwo, Victor U. J.; Chakrabarti, Sandip K.; Ogunmodimu, Olugbenga, Probing geomagnetic storm-driven magnetosphere-ionosphere dynamics in D-region via propagation characteristics of very low frequency radio signals, Journal of Atmospheric and Solar-Terrestrial Physics, 2016, 145, 154.

6. Deb, A., Giri, K., Chakrabarti, S.K.: Numerical simulation of vertical oscillations in an axisymmetric thick accretion flow around a black hole, MNRAS, 2016, 462, 3502

7. Molla, Aslam Ali; Chakrabarti, Sandip K.; Debnath, Dipak; Mondal, Santanu, Estimation of Mass of Compact Object in H 1743-322 from 2010 and 2011 Outbursts using TCAF Solution and Spectral Index - QPO Frequency Correlation (In press)

8. Nagarkoti, Shreeram; Chakrabarti, Sandip K., Viscosity parameter in dissipative accretion flows with mass outflow around black holes, 2016, MNRAS, 462, 850

9. Etim, Emmanuel E.; Gorai, Prasanta; Das, Ankan; Chakrabarti, Sandip K.; Arunan, 2016, Elangannan, Systematic Theoretical Study on the Interstellar Carbon Chain Molecules (In press).

10. Dutta, Broja G.; Chakrabarti, Sandip K., Temporal Variability from the Two-Component Advective Flow Solution and Its Observational Evidence, 2016, ApJ, 828, 101

11. Ghosh, A.; Chakrabarti, Sandip K., Smearing of mass accretion rate variation by viscous processes in accretion disks in compact binary systems, 2016, ApSS, 361, 310

12. Mondal, Santanu; Chakrabarti, Sandip K.; Debnath, Dipak, Spectral study of GX 339-4 with TCAF using Swift and NuSTAR observation, 2016, ApSS, 361, 309

13. Molla, Aslam Ali; Debnath, Dipak; Chakrabarti, Sandip K.; Mondal, S.; Jana, A., Estimation of the mass of the black hole candidate MAXI J1659-152 using TCAF and POS models, 2016, MNRAS, 460, 3163

14. Chatterjee, Debjit; Debnath, Dipak; Chakrabarti, Sandip K.; Mondal, Santanu; Jana, Arghajit, Accretion Flow Properties of MAXI J1543-564 during 2011 Outburst from the TCAF Solution, 2016, 827, 88

15. Nwankwo, Victor U. J.; Chakrabarti, Sandip K.; Ogunmodimu, Olugbenga, Probing geomagnetic storm-driven magnetosphere-ionosphere dynamics in D-region via propagation characteristics of very low frequency radio signals, 2016, JASTP, 145, 154

16. Palit, S.; Ray, S.; Chakrabarti, S. K., Inverse problem in ionospheric science: prediction of solar soft-X-ray spectrum from very low frequency radiosonde results, 2016, ApSS, 361, 151

(B) BOOKS

None
