

## **Chakrabarti Sandip K.**



Position: Senior Professor

S. N. Bose National Centre for Basic Sciences, Kolkata

and

In Charge, Academic Affairs, Indian Centre for Space  
Physics

Recent period in which ICRA was visited: July 19-29<sup>th</sup>, 2006; Oct. 28-30<sup>th</sup>, 2007; Aug. 29<sup>th</sup>-Sept. 1<sup>st</sup>, 2008

### **I Scientific Work**

His main research work consists of study of the Astrophysical Flows around black holes. He studies the spectral and temporal properties of black holes, from quasars to nano-quasars. However he is also spending some time on formation and evolution of bio-molecules in star-forming region. He has published about 155 papers in International Refereed journal and a similar number of papers in Proceedings. He has written a book and edited several volumes.

### **II Conferences and educational activities**

#### *Doctorate Students Supervision*

Last twelve years he has produced 15 Ph.D. scholars and another 6 students are registered and would submit their thesis soon. Four more students have joined since last year. The students mainly worked on (a) jets and outflows; (b) nucleosynthesis around black holes, (c) Planetary ring dynamics; (d) Quasi-periodic Oscillations of GRS 1915+105; (e) Transonic accretion flows with heating and cooling; (f) gravitational waves emitted from a binary which has an accretion disk also; (g) Multiwavelength studies of SS433; (h) Spectral properties of accretion disks having shock waves; (i) Formation of simple bio-molecules during star formation; (j) Grain chemistry using Monte-Carlo simulations etc.

Seven of his students have already received permanent positions in national institutions.

Other Teaching Duties: Generally he takes courses on high energy astrophysics at S.N. Bose Centre and R.K.M. College (autonomous MSc in Astrophysics).

Work With Postdocs: he has several colleagues including post-docs.

### **III Service activities**

*Within ICRANet :*

- (a) Participated in the activities of Minsk Conference (April, 2009)
- (b) Participated in the Marcel Grossman Conference (July, 2009)
- (c) Participated in the Galileo-Xu-Guanqi conference (October, 2009)
- (d) Contributed in writing Erasmus Mundus joint PhD programme (May, 2009) which was successful.

### **2009 List of Publications**

*Talks/papers*

- (a) Presented a paper on Astrobiology at the Minsk conference in absentia and wrote the paper for the proceedings of the conference (AIP)
- (b) Chaired the Session on Astrophysical Black Holes in Marcel Grossman meeting at the UNESCO HQ (July, 2009). This trip was supported by ICRA NET also.
- (c) Attended the 1<sup>st</sup> Galileo -Xu Guanqi meeting in Shanghai (October, 2009) and presented a talk on Unifying model on Accretion on black holes.

*Papers in Journals:*

1. S. K. CHAKRABARTI, D. DEBNATH, A. NANDI and P.S. PAL, 2008, Evolution of Quasi-Periodic Oscillation Frequency in GRO J1655-40 -- Implications on Accretion Disk Dynamics, *Astronomy and Astrophysics* , 489L, 41
2. K. CHAKRABARTI, M.M. MAJUMDAR and S.K. CHAKRABARTI, 2008, Accretion onto compact objects viewed as a flow in converging-diverging ducts, *IJMPD*, 17(5), 799
3. P. BASU, S. MONDAL, S.K. CHAKRABARTI, 2008, Gravitational wave emission from a massive companion black hole in presence of an accretion disk around a super-massive Kerr black hole, *MNRAS*, 388, 219
4. A. DAS, K. ACHARYYA, S. CHAKRABARTI, S.K. CHAKRABARTI, 2008, Formation of Water and Methanol in Star forming Molecular clouds, *Astronomy & Astrophysics*, 486, 209
5. S. Das & S.K. CHAKRABARTI, Dissipative accretion flows around a rotating black hole, 2008, *MNRAS*, 389, 371
6. D. DEBNATH, S. K. CHAKRABARTI, A. NANDI & S. MANDAL, Spectral and Timing evolution of GRO J1655-40 during its outburst of 2005, 2008, *BASI* 36, 151
7. S. MANDAL & S. K. CHAKRABARTI, 2008, Spectrum of an accretion disk around a super-massive black hole: an application to M87, *Astrophysical Journal*, 689, 17

8. S.K. CHAKRABARTI, B.G. DUTTA & P.S. PAL, 2009, Accretion flow behaviour during the evolution of the Quasi Periodic Oscillation Frequency of XTE J1550-564 in 1998 outburst, 2009, MNRAS, 394, 1463
9. S. MONDAL, P. BASU AND S. K. CHAKRABARTI, 2009 Studies of accretion flows around rotating black holes - III. Shock oscillations and an estimation of the spin parameter from QPO frequencies, MNRAS, 396, 1038
10. S. Sasmal & S.K. Chakrabarti, 2009, Ionospheric Anomaly due to Seismic Activities -I: Calibration of the VLF signal of VTX 18.2KHz Station From Kolkata and Deviation During Seismic events, Nat. Hazards Earth Syst. Sci., 9, 1403-1408.

*Edited Volume:*

1. S. K. Chakrabarti and A. S. Majumdar (Eds): OBSERVATIONAL EVIDENCE FOR BLACK HOLES IN THE UNIVERSE: Proceedings of the 2nd Kolkata Conference on Observational Evidence for Black Holes in the Universe held in Kolkata India, 10 - 15 February 2008 and the Satellite Meeting on Black Holes, Neutron Stars, and Gamma-Ray Bursts held 16 - 17 February 2008 (AIP).

*Papers in Proceedings:*

1. Das, A., Acharyya, K. Chakrabarti, S., Chakrabarti, S. K., Methanol formation: A Monte Carlo study by 2008, in Organic Matter in Space, Proceedings of the International Astronomical Union, IAU Symposium, Volume 251, p. 121 (CUP).
2. Chakrabarti, S. K.; Bhoumik, D.; Debnath, D.; Sarkar, R.; Nandi, A.; Yadav, V.; Rao, A. R., CSPOB-Continuous Spectrophotometry of Black Holes, 2008, in AIP Conf. Proc. 1053, p. 409 (AIP).
3. Bhoumik, D., Mondal, S., Chakrabarti, S. K., Developments of Si-PIN detectors for Continuous Spectro-photometry of Black Holes (CSPOB), 2008, in AIP Conf. Proc., 1053, 403 (AIP).
4. Palit, S., Chakrabarti, S. K.; Debnath, D., Yadav, V., Nandi, A. Fresnel zone plates for Achromatic Imaging Survey of X-ray sources, 2008, in AIP Conf. Proc., 1053, 391 (AIP).
5. Ghosh, H., Chakrabarti, S. K.; Laurent, P., Inverse Comptonization in a Two Component Advective Flow: Results of a Monte Carlo simulation, 2008, in AIP Conf. Proc., 1053, 373 (AIP).
6. Das, S., Chakrabarti, S. K., Standing accretion shock waves around rotating black holes in presence of cooling, 2008, in AIP Conf. Proc., 1053, 373 (AIP).
7. Chakrabarti, S. K., Black Hole Accretion: From Quasars to Nano-Quasars, 2008, in AIP Conf. Proc., 1053, 325 (AIP).
8. Sarkar, R.; Chakrabarti, S. K.; Nandi, A., X-ray Observation of SWIFT J1753.5-0127 with RXTE & XMM-Newton, 2008, in AIP Conf. Proc., 1053, 215 (AIP).

9. Pal, Partha S., Nandi, A., Chakrabarti, S. K., Dynamical Nano Quasar GRS 1915+105, 2008, in AIP Conf. Proc., 1053, 209 (AIP).
10. Debnath, D.; Nandi, A.; Pal, P. S.; Chakrabarti, S. K., QPO Evolution in 2005 Outburst of the Galactic Nano Quasar GRO J1655-40, 2008, in AIP Conf. Proc., 1053, 171 (AIP).
11. Dutta, Broja G.; Chakrabarti, Sandip K.; Pal, Partha S., Evolution of QPOs in XTE J1550-564 in 1998 outburst: a Case of Quasi Outburst?, 2008, in AIP Conf. Proc., 1053, 171 (AIP).
12. Choudhury, A. K.; Chatterjee, A. K.; Bari, W.; Chakrabarti, S. K., Live Coverage of Class Transitions in the Nano Quasar GRS 1915+105, 2008, in AIP Conf. Proc., 1053, 161 (AIP).
13. Basu, Prasad; Chakrabarti, Sandip K., Gravitational wave emission from a companion black hole in presence of an accretion disk around a super-massive Kerr black hole, 2008, in AIP Conf. Proc., 1053, 161 (AIP).
14. Chakrabarti, S.K., Mondal, S.K., Sasmal, S. and Bhowmick, D., Detailed lightcurves of ICSP VLF observation of SGR/AXP 1E1547.0-5408, 2009, GCN, 8900
15. Chakrabarti, S.K., Mondal, S.K., Sasmal, S. and Bhowmick, D., ICSP VLF observation of the signatures of SGR/AXP 1E1547.0-5408 bursts, 2009, GCN, 8881.