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PHYSICS & ASTRONOMY WEEKLY CALENDAR

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WEEKLY CALENDAR

May 19, 2008

Departmental Colloquium

Theoretical and Observational Constraints on Accretion Flows on Black Hole: The Case of sub-Keplerian Motion

3:40 pm – Wednesday, May 28, 2008
109 Nicholson Hall

Sandip K. Chakrabarti[1]
Senior Professor, S.N. Bose National Centre for Basic Sciences

Host: Michael Cherry

Theoretically, matter enters into a black hole with velocity of light and thus every flow, independent of its past history, must be supersonic on the horizon. Not surprisingly, the transonic flow solutions respect such a boundary condition, even when it allows very exciting possibility that flows should pass through shocks and slow the matter down at a few Schwarzschild radii before the horizon. It is thus no surprise that ALL the observations (ranging from spectral state transition, Quasi-periodic oscillations, jets and outflows and non-thermal spectra from black holes) agree to the fact that such a Centrifugal Pressure Dominated Boundary Layer (CENBOL) should exist. There are several post-facto cartoon models in the literature which apparently have no knowledge of such beautiful behaviour of the flow and surprisingly come up with cartoon diagrams having the same behaviour. In our advective disk paradigm, jets are produced when CENBOL is present. Thus it no surprise that some post-facto models include the base of the jet (which is nothing but CENBOL in our picture) in explaining outgoing spectrum from disk surface and thereby creating a confusion that X-rays from the jets are also serious contestants. We show that for every observation that has been a pre-facto prediction of our paradigm of two component advective flow (TCAF). These are re-discovered by many in the literature under new names, pictures and models. What is more important, however, is that the theoretical solutions and the cartoons from fitting observational data are finally converging. This paves the way of further progress in the subject.

[1] Also, In Charge, Academic Affairs, Indian Centre for Space Physics, Kolkata

Publications:

"Altering the decay of quantum entanglement": **A.R.P. Rau**, M. Ali, and G. Alber, Proc. of SPIE 6976, 697601 (2008); Quantum Information and Computation VI, eds. E.J. Donkor, A.R. Pirich and H.E. Brandt.

"Magnetized Neutron-Star Mergers and Gravitational-Wave Signals, "Matthew Anderson, Eric W. Hirschmann, **Luis Lehner**, Steven L. Liebling, **Patrick M. Motl**, David Neilsen, Carlos Palenzuela and **Joel E. Tohline,** Phys. Rev. Lett. 100, 191101 (2008).