

## Foreword

From the pioneering work of Chandrasekhar on dead stars and the related mass limits, the era of research in compact objects like white dwarfs and later Neutron stars, was initiated. In fact, the discovery of the first extrasolar X-ray source, Sco-X1 (1962), was a major boost in the research of compact objects. General relativity extended the horizon to more enigmatic objects like black holes. The Oppenheimer - Snyder prediction (1939) of dust clouds collapsing into a black hole, is one of the milestones in the annals of general relativity. However, black hole research was increasingly occupying the regime of mathematics rather than physics, until the discovery of Quasar 3C 273 (1963) and X-ray binary Cygnus X1 (1964), which brought back the interest and efforts of physicists towards black hole astrophysics. It was understood that the timing and radiative properties of these extreme objects can only be explained by the accretion of matter onto them. The first tentative steps of converting Bondi's solution around Newtonian star into general relativity by Michel and its subsequent failure to explain the energetics ushered into the era of disc accretion by Shakura and Sunyaev way back in early 1970's. From then, theorists are grappling with the physics of accretion in trying to explain myriad observational features like spectra, variabilities, generation of jets etc. With the emergence of X-ray astronomy, the research in high energy astrophysics in India got a tremendous boost including the work on compact objects. Although India excelled in balloon borne experiments in the 1970s, but first successful attempt in X-ray astronomy is Indian X-ray Astronomy Instrument (IXAE), which was a piggy back instrument on board the satellite IRS-P3 in 1996 and since then, the research interest has grown leaps and bound. Today, India is well set to launch ASTROSAT, a space based dedicated X-ray telescope. The community has shown steady growth in quality and number in these days and more than two workshops/schools are regularly being held annually in various Institutes/Universities across India. This serves the dual purpose of exchanging the latest scientific results and reaching to the wider young research community. With this idea "Recent Trends in the Study of Compact Objects: Theory and Observations" was organized at Indian Institute of Technology Guwahati, Guwahati during 11-13th March, 2013.

Indian Institute of Technology Guwahati, a well known institute for academic excellence, was a perfect setting for the invigorating scientific presentations that ensued for three stipulated days. About forty five researchers from various parts of India presented their work on an array of topics, namely, black hole accretion, neutron stars, white dwarfs, AGNs, supernovae to radio galaxies. Expertise of the speakers ranged from hard core theory, simulations to hard core observation. The exotic locale also added to the aura of the meeting. Apart from the exciting discussions and passionate defense of their respective cases during the presentations, the participants enjoyed off line interactions in the comfortable accommodations arranged at the IIT Guwahati guest house.

One of the reasons to hold the meeting at IIT Guwahati was to attract young minds into the subject. IIT Guwahati was established in 1994. The academic programme of IIT Guwahati commenced in 1995. It has excellent infrastructure for organizing

scientific meetings and also has the ambiance of world class student community.

This national meet on the subject of compact objects was very very successful and there are plans to continue this effort in future as well. The organizers thank all the students of IIT Guwahati Physics department for their tireless effort to make the meeting successful, in particular, Mr. Biplob Sarkar, Mr. Ramiz Aktar, Mr. Indranil Banerjee, Miss. Priyadarshini Kapri and Miss. Susmita Ghosh. The faculties of IIT Guwahati, though specializing in different fields chipped in to help the organizers, among them we express our gratitude to Dr. S. Ghosh, Dr. T. N. Dey, Dr. A. Sil, Dr. S. Nandi, Dr. U. Raha. The organizers fondly acknowledges the encouragement extended by HOD Physics Prof. S. Basu, and Director Prof. Gautam Barua of IIT Guwahati. We are also grateful to S. N. Bose National Centre for Basic Sciences, Kolkata for the financial support through TPSC programme. We also acknowledge the Astronomical Society of India for their kindness to publish the proceedings in their Conference Series. And, last but not the least, we acknowledge the enthusiasm of all the astronomy researchers to make this meeting such a grand success.

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