

## Preface

This special issue of the *Journal of Astrophysics and Astronomy* comprises papers presented at the International Conference on **Diffuse Relativistic Plasmas** organized by the Raman Research Institute, Bangalore and held at the RRI campus between March 1 and 4, 2011. The intent of this conference was primarily to explore vital connections between diffuse synchrotron plasmas on a range of cosmic scales and extreme astrophysics and also, the feedback on cosmic evolution. This relatively neglected discovery space would, however, require advanced knowledge of radio surveys with exceptional surface brightness sensitivities derived from LOFAR, ASKAP and SKA to potentially ensure our understanding. The purpose of this conference therefore, was to aspire to consolidate this very understanding.

Fifty-one participants from nine countries attended this conference which featured invited talks, contributed talks and poster papers and included lively, pertinent discussions. The presentations encompassed topics ranging from particle acceleration to diffuse relativistic plasmas in a variety of objects and also current radio surveys from ATCA, GMRT, and LOFAR. Speakers delved into the phenomenology of diffuse synchrotron structures associated with compact stellar remnants, stellar black holes, super massive black holes and galaxy clusters in a variety of environments and cosmic time. The underlying theme throughout the presentations was the study of high energy astrophysics that creates and sustains particles and fields, the environmental impact of radio mode activity and the role for this phenomenon in cosmic evolution.

The last session involved participants in a discussion; their individual predictions on how our scientific understanding would develop five years into the future were recorded. Expectedly, the results of this conference becomes evident in the new and promising collaborations initiated by the participants.

The palpable success of this conference could not have been achieved without the support from many quarters. We thank Prof. Ravi Subrahmanyam, Director, Raman Research Institute, for initiating the concept of such a conference and for his kind permission to host it. The Scientific Organising Committee had invested thought and effort in determining the contents of the topics which in turn garnered appropriate speakers. We thank all the participants for their active participation.

The complete logistics were very ably taken care of by the Local Organising Committee and the student volunteers. Finally, we would like to thank the Editor of JAA for consenting to publish these proceedings and the **Indian Academy of Sciences** for bringing out this special issue within the desired time frame.

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