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FOREWORD

It gives me great pleasure to write these few words.

When Prof. Naresh Dadhich suggested the idea that the XVIII th conference of the IAGRG may be hosted by the Institute of Mathematical Sciences, I felt it was a welcome opportunity. There was a perception that while classical general relativity, gravitation, astrophysics, cosmology are active areas in their own right and as such have been discussed at the IAGRG meetings in the past, it is perhaps time now to expand the scope of these meetings to include the quantum gravity and particle physics aspects as well. Traditionally the general relativity community and the particle physics community have followed some what non overlapping developments. It would be mutually beneficial and healthier if both communities can interact more closely and share their experiences and perceptions. It is here that IMSc had a significant opportunity to play a role. Some of my colleagues concurred with this perception and we decided to host the XVIII the Conference of the IAGRG.

Just around the time we took the decision, Prof. S. Chandrasekhar passed away. In view of the phenomenal contributions of Chandra to General Relativity and Gravitation, it was but natural to dedicate this meeting to his memory. IMSc owes a special debt to Chandra as he played a crucial role in the foundation and the early stages of development of this Institute. Indeed the birth of the Institute of Mathematical Sciences was marked by the inaugural lecture by Prof. Chandrasekhar on January 3, 1962 in the lecture halls of Presidency College.

This IMSc report reflects the envisaged expanded scope of the IAGRG meeting and I hope that this trend will continue in the future IAGRG meetings as well. I also hope that these proceedings will make the frontline developments accessible to a larger body of researchers in the country particularly to those from the universities and colleges.

I may also take this opportunity to thank Drs G. Date and Bala Iyer for their efforts as Secretaries in the smooth conduct of the Conference and in putting together these proceedings.

R. Ramachandran
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This Institute of Mathematical Sciences Report contains the proceedings of the XVIII Conference of the Indian Association for General Relativity and Gravitation (IAGRG), held during February 15-17, 1996. The conference was attended by over 50 participants from all over the country, about half of them being from universities and colleges. The topics range over classical general relativity, astrophysics, gravity waves, cosmology and quantum aspects of gravity. The invited talks were intended to give an overview and current status of research in the respective areas. In addition, there were presentation of abstracts and theses which were collated in the form of a booklet available to the participants at the time of conference.

The conference was dedicated to the late Prof. S. Chandrasekhar. Prof. N. Panchpakesan kindly agreed to the difficult task of summarising some of Chandra’s contributions to General Relativity. Prof. R. H. Dalitz who was visiting the Institute of Mathematical Sciences at the time of conference also kindly consented to speak on his personal encounters with Chandra. We are thankful to both of them.

Prof. C.V. Vishveswara delivered the traditional Vaidya-Raychaudhuri endowment lecture. We thank him for the very delightful talk. Prof. P.C. Vaidya, as is usual, made his presence felt throughout the conference.

Since publication of the proceedings is usually a long drawn process, we felt that we could bring out the proceedings much faster as an Institute of Mathematical Sciences Report. In this computer age, with authors doing most of the document preparation effort, it is relatively easy to put together the proceedings. Thanks to the various e-print archives available, these proceedings will also be made available to a much wider set of researchers. We would like to thank the speakers for giving their manuscripts in tex/latex formats which helped reduce the editorial work considerably.

It is a pleasure to acknowledge the encouragement and help we received at various stages. We thank Prof. R. Ramachandran, Director, Institute of Mathematical Sciences and Prof. N. Dadhich, President of the IAGRG, for their active encouragement and participation at all stages of organisation. We thank Dr. Parthasarathi Majumdar who was a member of the Local organising Committee in the beginning stages of the conference and who had pointed out that the conference may be dedicated to Prof. S. Chandrasekhar. Thanks are due to the members of the Local Organizing Committee and the members of the Scientific Organizing Committee. The editors thought it would be of some interest to include some quotes on Chandra and by Chandra. Many of the quotes by Chandra are from the wonderful biography ‘CHANDRA’ by Kamesh Wali.

We acknowledge the efficient assistance of Mr. Jayaraman, Mr. Sankaran and their colleagues from the administrative staff; Mr. Sampath and his colleagues from the guest house staff; the library staff; the computer network of IMSc and the volunteers from IMSc.

We thank G. Manjunath of Raman Research Institute for his patient help in the preparation of these proceedings for final publication. We also thank Dr. Dipankar Bhattacharyya of RRI for advise and assistance in resolving vexatious \LaTeX{}’ical and Post-Script problems.

We thank the speakers and participants for their active participation. Last but not the least we thank the Department of Science and Technology, Govt. of India, the U.G.C and the Inter University Center for Astronomy and Astrophysics, Pune and the Institute of Mathematical Sciences, Madras for the financial support.

G. Date
B. R. Iyer
I practice style in a very deliberate way. I acquired my style from not only just reading, for instance, the essays of T.S.Eliot, Virginia Woolf, and Henry James, but also by paying attention to how they write—how they construct sentences and divide them into paragraphs. Do they make them short or long? For example, the idea of just using one sentence for a paragraph, or of a concluding sentence without subject or object, just a few words... 'so it is'... or some small phrase like that. I deliberately follow such devices. In fact there is one technique I started following when I was writing my book ‘Radiative Transfer’, and I have followed it since; that is, as you know, in music you repeat periodically the same phrase in exactly the same form. Very often in my books, when I have a key idea, and I have to restate it at a later stage, I don’t leave it to chance. I go back and copy exactly what I had written before.

— S. CHANDRASEKHAR
List of Contributed Papers

1. Static and non static global string  
   A Banerjee, N Banerjee, A Sen

2. Black hole complementarity and fermions  
   Arundhati Dasgupta

3. Comments on Yilmaz’s theory of gravitation  
   C.S.Unnikrishnan

4. Cosmic censorship in Tolman Bondi dust collapse  
   C.S.Unnikrishnan

5. Energy in a gravitational field : Can it make local sense?  
   C.S.Unnikrishnan

6. Constant Declaration parameter in higher dimension  
   D Panigrahi

7. The trajectory of particles around cosmic strings  
   G Alagar Ramanujam, K Anandan, G Vasanthakumari

8. The trajectory of particles in the gravitational field of a tachyon  
   G Alagar Ramanujam, K Meenakshi, H Sridharan

9. Certain results in the $\lambda$ varying cosmology  
   G Alagar Ramanujam, M Pankajavalli, S Varadharajan

10. String models in some nontrivial backgrounds  
    G V Vijayagovindan

11. The orbits of charged particle in an electromagnetic fields on Kerr background geometry  
    K N Mishra, K Chakraborty

12. Singularities, hamiltonians and infinite dimensional Lie algebras in general relativity  
    K.H.Mariwalla

13. Metric in axially symmetric radiation zone  
    M.D.Patel and R.M.Patel

14. A Modified Ozer-Taha Type cosmological model  
    Moncy V John, K Babu Joseph

15. Einstein pseudotensor and total energy of the universe  
    N Banerjee, Somasri Sen

16. Viscous fluid universe interacting with electromagnetic and zero-mass scalar fields  
    N Ibotombi Singh

17. On the relationship between Killing-Yano tensors and electromagnetic fields on curved spaces  
    Ng. Ibohal

18. Squeezed state representation of black hole radiation  
    P.K.Suresh and V.C.Kuriakose
19. Gauss map and 2+1 gravity
   R. Parthasarthy

20. A cylindrically symmetric stiff fluid solution of Einstein’s equations
    and gravitational collapse
   Ramesh Tikekar, M. C. Sabu

21. How far singularity theorems imply the big-bang singularity?
    S. S. Sharma

22. Distortion of GW signals from binary systems due to presence of accretion disks
    Sandip Chakrabarty

23. Bianchi type-1 Vacuum cosmological model in scale invariant theory
    of gravitation
   Sk. Md. Daud, G. Mohanty

24. Hermitian Wheeler-Dewitt Operators and the wave function of the universe
    Subenoy Chakraborty Nabajit Chakravarty

25. Spherically symmetric non-static space-time and monopoles
    Subenoy Chakraborty, Lalit Biswas

26. Quantum temporal logic, dynamic evolution, and symmetries in the histories
    approach to quantum theory
   Tulsi Dass, Yogesh Joglekar

27. Can there be a theory of everything in physics?
    Uma S Sharma
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