

## Foreword

The search for quark gluon plasma, a deconfined state of strongly interacting matter is one of the most notable examples of what the collaboration of international community of physicists can achieve in a very short time. To many of us, it seems like yesterday when the proposals of building or modifying the present accelerators to produce relativistic heavy ions were being discussed. It also feels like yesterday when some of the largest experiments ever mounted in the history of nuclear physics like STAR, PHENIX, and ALICE were proposed, discussed, and approved.

Yet the unfolding story of the success of the experiments at BNL AGS, CERN SPS, and BNL RHIC has the uncanny markings of the determinism, where the events have proceeded with the precision and inevitability of a well-made clock. This adventure has become possible due to the dedication of hundreds of accelerator physicists, computer personnel, some of the best engineers and technicians of the world, a large body of students who carried out simulations, designs, and developments whose outcome were to be tested well after they were to finish their PhDs. Many of these students may have to go out of physics for survival and would know of the success of their untiring efforts only indirectly.

This series of International Conference on Physics and Astrophysics of Quark Gluon Plasma, which started in 1988 at a convenient interval of about four years and chosen to intersperse the much more frequent and regular series of Quark Matter Conferences has played a very significant role in building a vibrant community of scientists engaged in this front line area of nuclear physics. The earlier three meetings were held respectively at Mumbai (1988), Kolkata (1993), and Jaipur (1997). The magic of Jaipur enchanted the participants, and when we planned the present conference, we received innumerable suggestions, advices and requests to hold it again at Jaipur. The word had travelled in this close-knit community of physicists of the charms of the Pink City and the celebration of the celestial and terrestrial searches of the quark gluon plasma seen at these meetings.

A large number of those who had been at Jaipur in the Spring of '97, returned for an encore in the late autumn of 2001, undeterred by events which have since then changed the meaning of terror. Yet, quite a few succumbed to the entreaties of their friends and relatives, and had to cancel their participation. It was a difficult decision for us to continue with the organization of the meeting, where many more wanted to come, if we could postpone it. The Chairman of the Organizing Committee took the bold step and decided that postponing the meeting would be tantamount to giving in to virtual terror. The elaborate and yet unobtrusive security arrangements ensured a very successful meeting.

We were treated to outstanding talks detailing the most interesting and exciting developments 'oven-fresh' from the experiments at RHIC where almost all the signs of quark gluon plasma are expected to be emblazoned across the data. The first signs of the jet quenching, the flow, the large multiplicities, the large energy densities, indications of electromagnetic radiations, strangeness equilibrations, etc. were presented. The results from CERN SPS spoke of consolidation of observations of  $J/\Psi$  suppression, medium modification of hadron properties, strangeness equilibration, flow, and electromagnetic radiations. The astrophysics talks covered strange stars, searches for dark matter, MACHOS, and consequences of quark hadron phase transition on the constitution of the stars. In brief, all aspects of quark hadron phase transition were covered in invited talks and in oral and poster presentations of a large number of contributions. These proceedings include the invited talks and the oral presentations.

The Indian participation has increased many folds since the beginning of this conference series, with the building of detectors which were installed at SPS and which are going to be installed at RHIC and LHC. This has led to a large-scale participation by young and brilliant students in various programmes, as is reflected in the contributions.

The conference was sponsored by the Board of Research in Nuclear Sciences of the Department of Atomic Energy and was actively supported by the Physics Department of the University of Rajasthan and by the Birla Institute of Scientific Research. The participants were also treated to an enthralling performance of celestial music by Grammy award winner Pandit Viswa Mohan Bhatt.

When we meet again in a few years, we shall look back at these meetings and wonder once again at the wonder that is physics and which brings together the best of mankind from across the countries shielded from the dogma of religion, chauvinism and cultural barriers, with the single aim of uncovering the face of Nature. And by then the LHC would have moved closer to realization, the ALICE detector would be nearing completion, the analysis of the data from RHIC experiments would have consolidated the results from the first generation of experiments, and the ever restless physicists would be planning the next generation of experiments at RHIC. That would be a wonderful time to meet and to look back. We look forward to our next meeting.

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