

## PREFACE

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C-MMACS is in its fifteenth year, and continues its work as the premier institution in the CSIR, and arguably in the country, in the area of computational modeling and simulation.

The major scientific effort is in climate and environmental modeling. After last year's dramatic failure of both the Indian Summer Monsoon, and most of the forecasts, including that of C-MMACS, there has been keener attention on the methodology of numerical weather prediction. C-MMACS has been approached by the Govt of Karnataka for its input to plan for measures to mitigate the effects of a possible third successive year of drought. A major step forward has been the generation of high-resolution advance forecast of monsoon rainfall onset and monthly rainfall using a zoomed 50kmx50km grid dynamical model. Studies of ocean processes, and of coupled models of the ocean and atmosphere, continue to be major users of the high performance computing facility at C-MMACS. C-MMACS collaborates closely with a number of universities and national laboratories like IIT-Delhi, Andhra University and Cochin University. A notable example is the multi-institutional New Millennium Indian Technology Leadership Initiative (NMITLI) project.

Another major area where C-MMACS has assumed the leadership in the country is in the areas of Geological Hazards, Tectonics, GPS Studies and Computational Seismology. Here, C-MMACS now networks with a very large number of premier institutions in the country and abroad. The roll call includes: The University of Trieste, the Abdus Salam International Centre for Theoretical Physics in Trieste, the University of Boulder in Colorado, the Physical Research Laboratory in Ahmedabad, The University of Colorado, NGRI in Hyderabad, G B Pant Institute of Himalayan Environment and Development in Almora, Nainital University, Tezpur University, Guwahati University and IMD in Shillong.

C-MMACS has taken the lead role in preparing a framework for CSIR-Tezpur University collaborative research linking the entire network of CSIR Laboratories with the Central University of Tezpur, with a view to harness the intellectual potential of the North-East region.

In Computational Mechanics, some very basic studies on errors in the Finite Element Method have been made. Efforts are also on in other modeling areas like Impulse Backscattering in Granular Beds, Smart Structural Systems and Cryptography.

A notable milestone in the development of the C-MMACS computing platform, was the addition of 8 processors to the Origin 3400 computer, bringing it to a 24-processor system, the largest number cruncher in the CSIR system. In parallel, the High Availability File Server has been upgraded to 1.5TB. Some important software packages have also been upgraded.

As one of its primary mandates C-MMACS continues to prioritize training and development of high-quality man-power in the areas of mathematical modelling and computer simulation. A large number of students, trainees and young scientists received training in these areas through a number of organized activities.

During the year, C-MMACS organized two scientific meetings. ISMMACS 2002 was the National Conference on Mathematical Modelling and Computer Simulation and was attended by 67 participants who presented 54 papers over 15 sessions lasting two days. Last year was also the Centenary Year of the great philosopher Sir Karl Popper, and a Chautauqua on Popper and Philosophical Perspectives for Reliable Scientific Knowledge was convened at C-MMACS.

With its firm belief on synergy through well developed, resource-sharing collaborative programmes, C-MMACS continues to strengthen its national and international collaborations. Several exchanges and transfer of knowledge took place under the proposed Indo-French Centre for Environment and Climate (IFCEC). A significant upcoming event is the International Conference on Scale Interaction and Variability of Monsoon (SiVoM) co-organized by C-MMACS and Cochin University of Science and Technology (CUSAT) as an activity under IFCEC.

A Research Assessment exercise shows that the per capita scientific output has been maintained at a high 0.5 SCI papers/scientist/year, which places it among the top institutes in the CSIR system. It does reasonably well in External Cash Flow too, generating about Rs 5 lakhs/scientist/year.

C-MMACS' scientists have brought in many honours and distinctions. Dr Anand Kumar was invited to spend a year as a Visiting Professor at the Raman Research Institute in Bangalore. Dr Imtiyaz Ahmed Parvez was awarded the Young Scientist Award for 2001 by the Muslim Association

for the Advancement of Science. Dr Malay Mukul was elected Fellow of the Geological Society of India. Dr Sridevi Jade was a co-author of a paper which collected the Best Paper Award of ISRMTT.

C-MMACS has always been privileged to have its Advisory Committee (AC) chaired by the Director General of CSIR; Dr R A Mashelkar, FRS, continues to chair the AC. C-MMACS expresses its most grateful thanks to the Chairman and the members of the Advisory Committee.

C-MMACS welcomes Dr B R Pai, who now joins the C-MMACS Advisory Committee. As has been always before, the Director, NAL provides unstinted support for all of C-MMACS scientific and administrative functions. Department of Ocean Development (DOD) has continued to support wholeheartedly the scientific work of C-MMACS. I also express my sincere thanks to Prof V S Ramamurthy, Secretary, Department of Science and Technology for the generous help to C-MMACS activities. I thank all the members of Team-C-MMACS for continuing to put up an excellent performance. Dr P Goswami, Convenor, Knowledge Management, has performed the difficult task of compiling and editing the Annual Report and he has been ably assisted by Mr Himesh and Mr Arjun and other members of the Knowledge Management Group.

Gangan Prathap  
Scientist-in-Charge