Acknowledgments

It has been a great privilege working with various group members of C-DAC, and CMSD on this four days technology workshop.

We would like to express our sincere thanks and gratitude to all the members of Centre for Development of Advanced Computing (C-DAC), Pune, and Centre for Mathematical Modeling & Simulation (CMSD), University of Hyderabad (UoH), who have contributed directly or indirectly to the workshop as well as preparation of the four-days technology workshop titled Hybrid Computing – Coprocessors & Accelerators – Power-aware Computing & Performance of Application Kernels (hyPACK – 2013) (Initiatives on Measurement of Power Consumption & Performance) at CMSD, UoH during the period October 15-18, 2013.

We would like to thank C-DAC and CMSD for supporting these workshop activities. We are most indebted to C-DAC staff members and CMSD, UoH staff members, whose untiring editorial efforts have gone a long way to arrange the laboratory session Infrastructure, improve the quality of the hands-on session and proceedings on Multi-Core Processor Platforms, GPGPU platforms and Hybrid Parallel Processing Platforms with Intel Xeon-Phi Coprocessors and GPU accelerators.

We would like to express our gratitude to Prof. Ramakrishna Ramaswamy, Vice-Chancellor, and University of Hyderabad, who encouraged us to conduct this workshop.

We would like to thank Prof. Rajat Moona, Director General, C-DAC, India, Dr. Hemant Darbari, Executive Director, C-DAC, Pune, Dr. P.K. Sinha, Senior Director, HPC, C-DAC, Pune & Corporate R&D, C-DAC, and Dr. S.K.Udgata Director, CMSD, University of Hyderabad for their continuous support and encouragement towards conducting this hyPACK-2013 workshop. I would like to thank them for giving us the freedom to pursue this work.

We would like to thank staff members of C-DAC Pune and CMSD, University of Hyderabad for their hard work and association with us in various activities of this workshop. Their comments were invaluable in improving various activities of the technology workshop, which include conducting laboratory session on Hybrid Computing with Intel Xeon-Phi Coprocessors, and GPU accelerators and the quality of the material presented. We would like to thank members of CMSD technical staff, University of Hyderabad for providing access to computer facilities for the laboratory sessions.

We would like to thank all our colleagues especially from C-DAC, Pune who were kind enough to spend many hours of hard-work on setting up the laboratory on "Hybrid Computing Platforms i.e., Multi-Core Processor Platforms, ARM Multi-Core Processor Systems" and "Parallel Processing Platforms with Intel Xeon-Phi Co-processors, GPU /GPU Computing platforms" laboratory. We would like to appreciate IT industry experts, speakers and distinguished academic professionals who provided knowledge on practical

aspects of diverse research problems with which we could improve programming on Hybrid Computing platforms based on Coprocessors and GPUs. We also thank to all technical staff of all C-DAC Centres for their feedback on **hyPACK-2013** programme.

We thank C-DAC's Corporate Communications Group, National PARAM Supercomputing Facility (NPSF) Group members, Web team members, Facilitation Staff and others who assisted us and provided many numerous suggestions for this event. We appreciate the efforts of C-DAC Associate Directors, Group coordinators, team leaders of various groups, technical staff in C-DAC, Pune in reviewing the workshop activities and suggesting improvements. We appreciate the efforts of High Performance Computing - Frontier Technologies Exploration (HPC-FTE) group members of C-DAC, Pune who have put in many long hours and assisted us in producing the hyPACK-2013 proceedings. I also want to thank my group members without whom this workshop would not be possible.

Our sincere thanks to all our project trainees, summer interns, the reviewers for identifying errors, and checking the codes for the hands-on and for providing valuable insight into various classroom lectures and laboratory sessions of **hyPACK-2013** workshop. Most importantly, we acknowledge many distinguished professors, and scientists from academic and research organizations of High Performance Computing all over the world to provide access to study and presentation of their material in our proceedings.

This hyPACK-2013 workshop would not have been possible without support from our private IT sector partners like INTEL, NVIDIA, and AMD. We greatly appreciate and would like to thank Department of Electronics & Information Technology (DeitY), Council of Scientific & Industrial Research (CSIR), Ministry of Earth Sciences (MoES) and the Indian Space Research Organization (ISRO) for their continuous support and encouragement to promote these emerging Parallel Processing technology areas of research for Scientific and Engineering applications.

Finally, we would like to thank **hyPACK-2013** organizing committee from C-DAC, Pune, and CMSD, University of Hyderabad who have been continuously working with us for this workshop. Their steady guidance and ability to find resources, as we needed them at crucial points of time and their involvement at early stages of these workshop activities helped us in many ways. We thank C-DAC, Pune & administrative staff, University of Hyderabad for their valuable services to make **hyPACK-2013** participants stay comfortable.

All the great help from our invited speakers, keynote speakers & experts from Industry for this workshop are also very warmly acknowledged.

We hope that readers will find this classroom lecture notes (Soft copy & Hard copy) informative and worth reading. Comments from readers will be greatly appreciated.

For anyone that we may have missed, please accept our apologies.

VCV. Rao

hyPACK-2013 Technology Workshop Coordinator, C-DAC, Pune