IUCAA-HPC mini workshop & training program

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1 Aims, and scope of the activity

- To make IUCAA-HPC users familiar with the existing systems available, and train them to use the various software, libraries, packages etc., installed, effectively.
- To introduce HPC to new users (IUCAA students, post-docs, project students and other interested people from IUCAA and may be few from outside IUCAA)
- To provide opportunity to IUCAA-HPC users to present the scientific problems they are working on (related to HPC) or planning to work on, which can help to exchange ideas. This activity can also provide inputs for the IUCAA-HPC requirements.
- Slides of all the presentations, programs and content created or compiled during the activity will be archived which can be used for future reference.

2 Participants

- IUCAA-HPC users
- New users who want to learn HPC from basics and have some background of computer programming but are not exposed to parallel computation or HPC.
- Non-IUCAA users who can contribute also in the training program (basically can give presentations on MPI,OpenMP, CUDA etc.,).
- Some members from IUCAA-HPC system administration, who can introduce the IUCAA-HPC systems, and also can discuss administrative issues. Apart from that they can also help setting the systems for the demonstration sessions.
- The number of participants may be around 20, roughly half of which will be experienced users, who can give presentations also, and half will be new users i.e., second year students etc.

3 Mode of the activity

- It will be useful to have it a 3 or 4 days activity since packing a lot of things in one or two days will confuse people and may not give any scope for demonstration.
- There can be two sessions everyday, one before the lunch and one after the lunch.
- There can be one one hour lecture and two 45 minutes presentations in the morning session everyday and a two hours lab/demonstration session in the afternoon.

The rough schedule of the activity can be as follows:

	9.30-10.30	10.30 - 11.15	11.15-11.45	11.45 - 12.30	3.30 - 5.30
Day 1	MPI	IUCAA-HPC system	Break	science talk	Lab
Day 2	OpenMP	Pkg/Lib	Break	science talk	Lab
Day 3	threading	Pkg/Lib	Break	science talk	Lab
Day 4	CUDA/GPU	pkg/lib	Break	science talk	Lab

Table 1: Rough schedule of the activity

4 Content of the activity

The following topics can be covered in the activity. Plase feel free to suggest any other topic you want to learn/teach about.

- LSF
- MPI
- OpenMP
- Pthreads
- CUDA
- PVM
- Intel-Threading building blocks
- High performance FORTRAN
- Hyper-threading
- Compilers & debuggers
- Scientific libraries like GSL, MKL, Lapack, Blas, FFTW etc.
- Visualization tools like pgplot etc.
- HPC with mathematica and matlab
- Benchmarking & Optimization
- Data formats : FITS, HDF5, binary files etc.
- Dynamic & static libraries
- Science topics

5 Requirements

- Lecture room
- Some place for demonstration having few systems set up. Basically I expect half of the participants will come with their laptops and can remotely access the systems needed.
- Speakers, who can speak about one or more topics (or any other topic not listed above) listed above.
- Some people can talk about their work for which they use IUCAA-HPC systems and explain the challenges. Basically this activity will fill the gap between the activity being totally new and everything being too familiar.
- Some volunteers who can help in various ways, like documenting the content and program, setting-up the systems etc.

6 Time of the activity

Sometime in September or October 2011, when there is no other activity (conference etc.,) in IUCAA and most of the interested people are around.