

ACM Winter School on High Performance Computing

Industry Partner – C-DAC

Academic Partner – IIT Kanpur

Dec 5 – 11, 2019

Thanks to ACM, C-DAC and Department of
Computer Science & Engineering, IIT Kanpur

Organizers

ACM

- Hemant Pande
- Chandrashekhar Sahasrabudhe
- Nutan Limaye (ACM-W)

C-DAC

- Ashish Kuvelkar

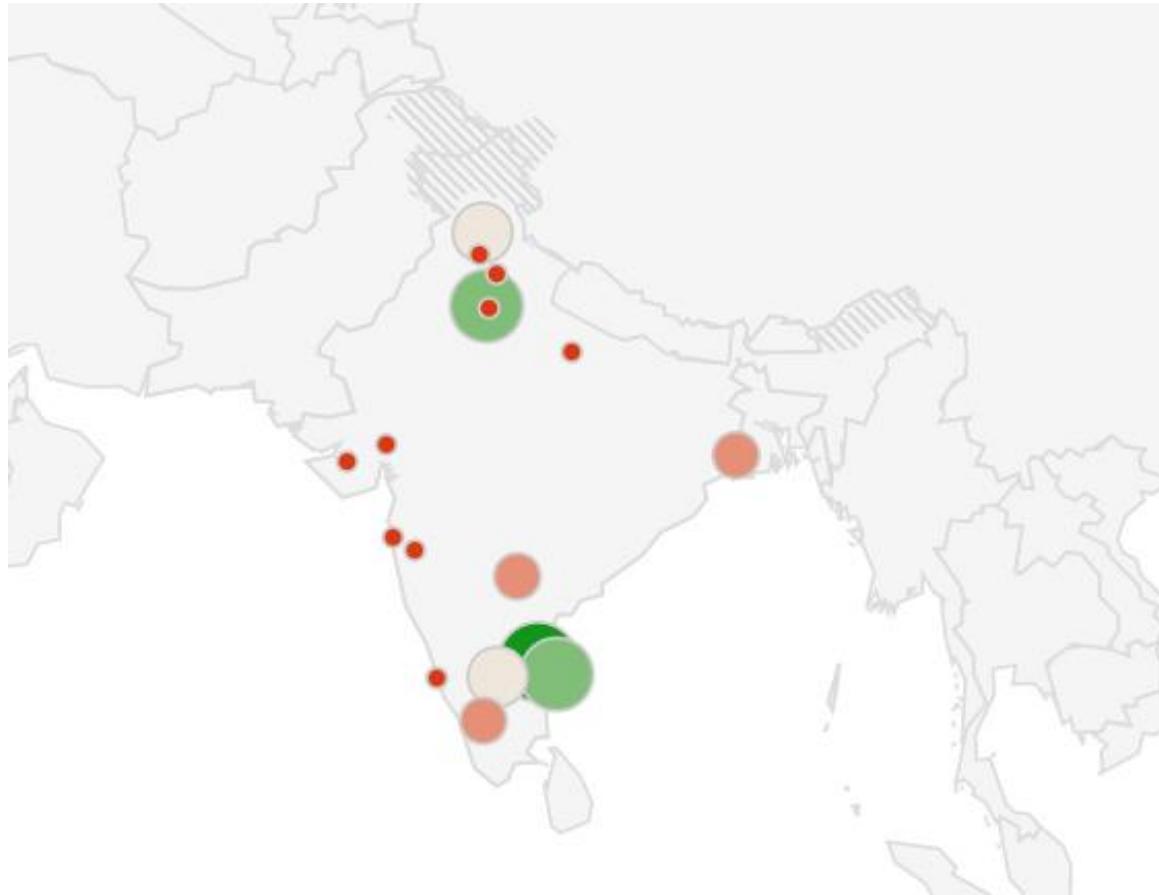
IITK

- Preeti Malakar

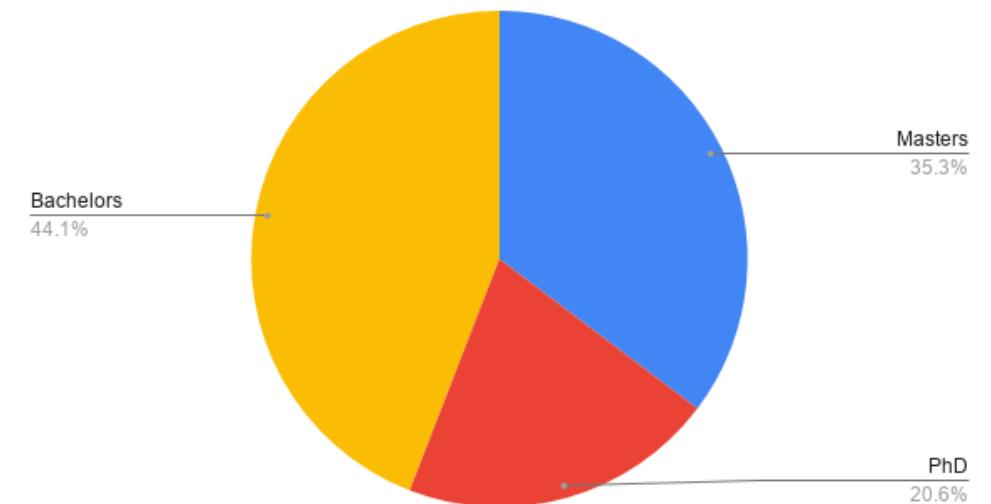


- **ACM**: world's largest educational and scientific computing society
 - **Mission**: advancing computing as science and profession
 - **Members**: ~100,000 worldwide, ~11000 in India
 - Comprising students, faculty, professionals
- **ACM India Chapters**: ~230 student chapters, ~20 professional chapters
- **ACM-W India**: empowering women in computing
- **Research Initiatives**
 - Student research: [IRISS student seminar](#), [best doctoral dissertation](#), [partial travel grant](#)
 - Research conferences: [CODS-COMAD](#), [ISEC](#), [AIMS](#)
- **ACM India Annual Event**: discuss recent trends in technology and celebrate India's achievements in computing
- **Education Initiatives**
 - [Summer and winter schools](#): ~2 week full-time course on technology area
 - [Compute](#): Symposium focused on improving quality of computing education in India
 - [CSpathshala](#): inculcate computational thinking in schools
- **Learning and Professional Development**
 - [Eminent Speaker Program](#)
 - [Industry webinars](#)
 - [Blogs](#): theoreticians and practitioners sharing ideas, opinions
 - ACM global resources: [Digital Library](#), [ACM Learning Center](#)
- **ACM India Membership**
 - Student? [student member form](#)
 - Professional? [professional member form](#)

Registered Participants



Count of Current Academic Program



Welcome to Department of Computer
Science and Engineering, IIT Kanpur

by

Prof. Sandeep Kumar Shukla
HOD, CSE

Speakers

- Mainak Chaudhuri (IIT Kanpur)
- Swarnendu Biswas (IIT Kanpur)
- Preeti Malakar (IIT Kanpur)
- Rupesh Nasre (IIT Madras)
- Konduri Aditya (IISc Bangalore)
- Bharat Kumar (NVIDIA)
- Ashrut Ambastha (Mellanox)
- Ashish Kuvelkar (C-DAC)
- Sandeep Agrawal (C-DAC)

Intel's New Hyderabad Design Center Targets **Exascale Era** Technologies

Intel's Raja Koduri was in India this week to help launch a new 300,000 square foot design and engineering center in Hyderabad, which will focus on advanced computing technologies for the AI and exascale era. "Over the past 50 years, Intel has brought immense compute power to millions of people, transforming the way we live [...]

Top Supercomputers in India (Nov'19)

Rank	System	Cores	Rmax (TFlop/s)	Rpeak (TFlop/s)	Power (kW)
57	Pratyush - Cray XC40, Xeon E5-2695v4 18C 2.1GHz, Aries interconnect , Cray/HPE Indian Institute of Tropical Meteorology India	119,232	3,763.9	4,006.2	1,353.2
100	Mihir - Cray XC40, Xeon E5-2695v4 18C 2.1GHz, Aries interconnect , Cray/HPE National Centre for Medium Range Weather Forecasting India	83,592	2,570.4	2,808.7	954.7

Top Supercomputers in China (Nov'19)

228 entries found.

Rank	System	Cores	Rmax (TFlop/s)	Rpeak (TFlop/s)	Power (kW)
3	Sunway TaihuLight - Sunway MPP, Sunway SW26010 260C 1.45GHz, Sunway , NRCPC National Supercomputing Center in Wuxi China	10,649,600	93,014.6	125,435.9	15,371
4	Tianhe-2A - TH-IVB-FEP Cluster, Intel Xeon E5-2692v2 12C 2.2GHz, TH Express-2, Matrix-2000 , NUDT National Super Computer Center in Guangzhou China	4,981,760	61,444.5	100,678.7	18,482
48	Advanced Computing System(PreE) - Sugon TC8600, Hygon Dhyana 32C 2GHz, Deep Computing Processor, 200Gb 6D-Torus , Sugon Sugon China	163,840	4,325.0	6,134.2	380
75	Lenovo HR650x, Xeon Gold 6133 20C 2.5GHz, 25G Ethernet , Lenovo Service Provider T China	76,000	3,088.6	6,080.0	
81	Lenovo HR650x, Xeon Gold 6133 20C 2.5GHz, 25G Ethernet , Lenovo Service Provider T China	73,600	2,994.0	5,888.0	

Govt to launch Rs 4,500 cr National Supercomputing Mission

The Mission supports the government's vision of 'Digital India' and 'Make in India' initiatives. The government on Wednesday approved launch of National Supercomputing Mission to connect national academic and R&D institutions with a grid of over 70 high-performance computing facilities at an estimated cost of Rs 4,500 crore. The Cabinet Committee on Economic Affairs, chaired by Prime Minister Narendra Modi, has approved the launch of the mission that will enable India to leapfrog to the league of world-class computing power nations, an official release said. "We are going to install 73 supercomputers in different parts of the country and all will be linked by a computer grid. This is about Rs 4,500 crore scheme in which Rs 2,800 crore will come from the Ministry of Science and Technology and the rest, about Rs 1,700 crore, from my department, IT," Communications and IT Minister Ravi Shankar Prasad said. "As far as supercomputing is concern India is ranked at number 74 and China is number 1. We have got 500 supercomputers in world and India has only 9," he said. The mission would be implemented by the Department of Science and Technology and Department of Electronics and Information Technology (DeitY) through Centre for Development of Advanced Computing (C-DAC) and Indian Institute of Science (IISc), Bangalore. This will be done at an estimated cost of Rs 4,500 crore over a period of seven years, the release said. The mission has been conceptualised and evolved keeping in view the ever increasing computing demand of the scientific and academic community in the country, international technology trends and roadmaps, strategic importance and emergence of supercomputing as a benchmark for scientific and technological advancements, it said. It envisages empowering academic and R&D institutions spread over the country by installing a vast supercomputing grid comprising of more than 70 high-performance computing facilities. The Mission supports the government's vision of 'Digital India' and 'Make in India' initiatives. These supercomputers will also be networked on the National Supercomputing grid over the National Knowledge Network (NKN). The NKN is another programme of the government which connects academic institutions and R&D labs over a high speed network. Academic and R&D institutions as well as key user departments/ministries would participate by using these facilities and develop applications of national relevance. The Mission also includes development of highly professional High Performance Computing (HPC) aware human resource for meeting challenges of development of these applications.

How do we achieve Exascale ?

Programming Models

- OpenMP (shared memory)
- MPI (distributed memory)
- OpenACC (accelerators)
- CUDA (GPU)

THANKS

Welcome to ACM Winter School

by

Ashish Kuvelkar
Sr. Director, C-DAC, Pune