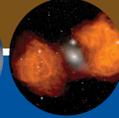


Exascale Radio Astronomy



Monterey CA USA | 30 March - 4 April 2014

WHY EXASCALE RADIO ASTRONOMY?

The Exascale Radio Astronomy (ERA) conference is organized in collaboration with the American Astronomical Society (AAS) with two primary goals:

- 1) Address the “big data” challenge in radio astronomy.
- 2) Deliver a white paper to strongly encourage funding agencies across the world to support exascale radio astronomy research.

The big science questions facing the international radio astronomy community are extensive and profound. They range from exploring the evolution of the universe before the first stars were formed to studying spinning neutron stars (pulsars) that distort space-time for testing general relativity. The scientific enquiry is driving the development of state-of-the-art radio telescopes leading to an unprecedented barrage of data of the order of exabytes (10^{18} bytes) per day. Currently, the computational technologies to handle such massive data volumes and rates are nonexistent, and the roadmap to exascale computing is termed “disruptive” — unlike anything seen before. As the disruption propagates, perhaps for the very first time in the history of science, the research will be rendered unachievable without the essential computational backbone critically needed to process massive data rates and volumes. All aspects of the research from simulations, to data acquisition, processing, analysis, visualization, transport, and storage will be severely affected and require review. This potentially incapacitating challenge stipulates the need for multidisciplinary cooperation from astronomy, computer science, and industry experts to research and develop a standardized, extendable, robust, high-performance, highly scalable, and easily accessible software infrastructure. The severe lack of funding, worldwide, toward crosscutting research and development further deteriorates the indispensable sustained growth. The ERA conference aspires to build worldwide consensus and deliver a white paper with the intention of enabling funding agencies worldwide to effectively help allocate sustained resources and promote international collaboration. The ERA conference provides a dynamic and interactive platform for international experts and enthusiasts from academic and industry backgrounds to introduce, explore, and discuss the scope and challenges of exascale radio astronomy.

This confluence of experts seeks to achieve:

- A foundation for sustainable international collaborations.
- A consensus message to international funding agencies to provide sustained long-term support for research and development.
- Effective academic-industry partnerships.
- Concepts for education and training for future researchers, educators, and students.

Chair and Organizer: Hemant Shukla (UC Berkeley)

Scientific Organization Committee:

Govind Swarup (GMRT)
Sudip Dosanjh (NERSC)
Garrett Mellema (Stockholm)
Brian Glendenning (NRAO)

Melvyn Wright (Berkeley)
Oleg Smirnov (SKA)
Ilian Iliev (Sussex)
David Hawkins (CARMA)

Paul Shapiro (U Texas)
Leon Koopmans (LOFAR)
Joseph Lazio (JPL)
Elena D’Onghia (Wisconsin)

Wen-mei Hwu (Illinois)
Ue-Li Pen (CITA)
Aaron Evans (UVa)
Sui Ann Mao (Wisconsin)