

===== FIRST ANNOUNCEMENT =====

**PULSAR ASTRONOMY WITH THE SQUARE-KILOMETRE ARRAY**  
**- Enabling the SKA Key Science Projects**

**ATNF, EPPING (SYDNEY), AUSTRALIA, AUG 16-18TH**

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**BACKGROUND:**

The Square-Kilometre Array (SKA) project is a global effort to build a radio telescope interferometer with a total collecting area of a square kilometer. The SKA will be at least an order of magnitude more sensitive than any other facility. The SKA will have multi-beaming capabilities, allowing astronomers to observe different parts of the sky simultaneously and to perform different experiments at the same time. The scientific promise of the SKA is nothing less than the transformation of astronomy - and radio astronomy in particular - into 21-st century science.

Five Key Science Projects have been identified for the SKA. Among those are **STRONG FIELD TESTS OF GRAVITY USING PULSARS AND BLACK HOLES**. These are based on the expectation that pulsar surveys with the SKA will essentially discover all active pulsars in the Galaxy that are beamed toward us. In addition to this complete Galactic Census, pulsars will be discovered in external galaxies as far away as the Virgo cluster. Most importantly for probing relativistic gravity is the prospect that the SKA will almost certainly discover the first pulsar orbiting a black hole (BH). The SKA will enable us to measure both the BH spin and the quadrupole moment using the effects of classical and relativistic spin-orbit coupling -- impossible with the timing precision affordable with present-day telescopes.

The large number of about 1000 millisecond pulsars to be discovered with the SKA can also be used to directly detect gravitational radiation. Pulsars discovered and timed with the SKA effectively act as the end-points of arms of a huge, cosmic gravitational wave detector which can measure a stochastic background spectrum of gravitational waves predicted from energetic processes in the early Universe. This "device" with the SKA at its heart promises to detect such a background, at frequencies that are below the band accessible even to LISA.

**MOTIVATION:**

The SKA project has entered a critical phase where clear decisions about its design have to be made soon. While the basic design parameters are known, a large international community is exploring new technology to make the SKA a reality. The choice of the most cost-effective design will have to be matched to its capability to allow astronomers to conduct the **KEY SCIENCE PROJECTS**. This workshop will address this question by reviewing the science case and relating it to various design issues.

**TOPICS will include:**

- Review of the science case with possible updates
- Review of the stated instrumental requirements
- Consequences of possible design compromises
- Impact of hybrid designs
- Pulsar Searches with the SKA
- Fundamental and practical limits on timing
- A 'day of pulsar observations' with the SKA
- SKA Science & Engineering Compliance matrix
- Synergies with other existing and future facilities

**FORMAT:**

We intend to focus the workshop on practical issues that are relevant for the design and the successful implementation of the SKA Key Science Project. The results of the workshop will be reported to the SKA Project Office, the Science Working Group and the Engineering Working Group, and will be presented at the SKA 2005 meeting in Pune later this year.

The 'working nature' of this workshop means that we will have to restrict the number of participants to about 20-30 people. An early expression of interest in participation is therefore recommended. While the SOC will try to accommodate all wishes, the SOC regrets if it may not always be able to do so.

The participants will discuss the issues on August 16/17th and summarize their results on August 18th. A small number of selected presentations can be made during the sessions on August 16th. A more detailed programme will be published with the Second Announcement.

**ACCOMMODATION:**

A list of possible accommodation around Epping will be made available with the Second Announcement.

**SOC:**

Don Backer (Berkeley)  
Jim Cordes (Cornell, co-chair)  
Simon Johnston (ATNF)  
Michael Kramer (Jodrell Bank, co-chair)  
Joseph Lazio (NRL)  
Ben Stappers (ASTRON)

**LOC:**

George Hobbs  
Simon Johnston  
Michael Kramer

**CONTACT:** Expressions of interest to participate should be sent to Michael Kramer (mkramer@jb.man.ac.uk).