

## News Release



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## World economic recession won't jeopardise the square kilometre array

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The opportunities, benefits and challenges of building the world's biggest radio telescope - the Square Kilometre Array (SKA) - were in the spotlight at the SKA Forum 2009 in Cape Town this week. Leading South African and international astronomers met with representatives from governments and funding agencies from around the world. South African industry was also well represented. The SKA Forum was the highlight of two weeks of specialist meetings that focused on the design, construction and science goals of this mega instrument.

Delegates felt that the current world economic crisis should not have a negative impact on the project and in fact presents an unrivalled opportunity to invest in critical science infrastructure and skills. Speakers emphasized that countries which would recover best from the economic malaise were those which invested in the future.

"The world's current and future challenges demand scientific thinkers and technological innovation," said Professor John Womersley of the Science and Technology Facilities Council in the UK. "The quickest way to get out of the economic dilemmas is to be able to evolve scientifically and that requires a scientifically trained workforce," he explained. Womersley added that only 20 - 30% of astronomy is about understanding the universe. "The rest is about training people!"

Dr Robert-Jan Smits of the European Commission confirmed EU support for the project because of its enormous potential to shift the frontiers of knowledge. He called on SKA project leaders to broaden the political support for this project in more countries around the world. Already 19 countries and 55 scientific institutions are involved in the SKA project, and several more countries are expected to join the consortium soon.

Dr Gill Marcus, Chair of the South African banking group ABSA, expressed the hope that the SKA will be built in Africa. She is convinced that the telescope will give young Africans a sense of purpose and inspire them to pursue maths and science at school, and to follow careers in science and engineering. This will create a critical mass of problem-solving thinkers, able to find solutions to the water, food, health, energy and environmental challenges of the continent. "Africa's time has come," she believes. "The SKA presents an enormous opportunity for the African continent to show the world that we can be the best."

Dr Bernie Fanaroff, project director of SKA South Africa agreed that the SKA presents a new way of looking at development. "Telescopes look at very weak signals and so need to push the limits of technology. It often produces new technologies which later give rise to innovations and products which can be commercialised, which we can't predict at this stage," he explained.

"On the science side, the SKA represents an enormous leap in radio astronomy into an area that we have not investigated before," said Professor Malcolm Longair, eminent cosmologist from Cambridge University in the UK. "It will open up a new era in astrophysics and cosmology for all astronomers and has huge potential for new discoveries." Professor Longair went on to say that these great discoveries will be made by young people, because they don't know how difficult these problems are. "They don't know that these questions are impossible to solve and therefore they will go and solve them!"

While astronomers are excited about the SKA's potential to answer questions about the universe, governments and funders view this project as a way to attract young people into science and engineering and to equip them with very high-level skills.

The SKA will consist of thousands of dishes and other collecting devices, spread over a vast area, but working together as one instrument with a joint receiving surface of one square kilometre. Cutting edge technologies and computing power like never before will make this a true "time machine", able to detect very faint celestial signals in order to look back to the early universe. "Once the SKA comes online, its computing power will be equal to all the people on the planet doing a billion calculations per second all at the same time," explained Dr Bruce Elmegreen of IBM in the USA.

The two countries shortlisted to host the SKA are South Africa and Australia. Both are building radio telescopes (called "pathfinders") to contribute to the SKA technology. Both pathfinder telescopes will be premier telescopes in their own right. South Africa has begun construction on the Karoo Array Telescope (called MeerKAT) and the Australians are working on the Australian SKA Pathfinder (ASKAP). At the Forum, South Africa's Minister for Science and Technology, Mosibudi Mangena, announced a new collaborative venture between South Africa and Australia on science programmes that will be possible because of the complementary nature of the two telescopes.

Preceding the Forum, 60 astronomers and funding agency representatives visited South Africa's site in the Karoo, in the Northern Cape Province. Everyone was tremendously impressed by the progress on the infrastructure and facilities in place.

If the SKA is built in South Africa, it will have outstations in at least eight other African countries. These African partners were also at the Forum to re-affirm their commitment to this project and to plan with the South African project team for future SKA preparations in their countries.

Before the final site for the SKA can be announced between 2011 and 2012, many more studies will be done. These studies will compare radio frequency interference, configuration, availability and cost of infrastructure, cost of construction and life-cycle costs for the South African and Australian sites. It is clear that both the Australian and South African sites are excellent and both countries enjoy support from their governments to host the SKA.

"South Africa probably has a cost advantage and we also have excellent legislation to protect our site from radio frequency interference, now and in the future," Dr Fanaroff added. "What will definitely improve our chances is to be able to show that South Africans are behind this bid, as they were in the Football World Cup bid."

Construction on the SKA should start in 2013. Early SKA science will be done from 2017 onwards.