

Climbing Mount Exaflop – Computing for the Square Kilometre Array

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A proposal to build a "Square Kilometre Array" is currently being developed by an international consortium of radio astronomy groups and observatories. SKA is planned to come online in 2020.

Compared to existing radio telescopes, the SKA will offer much increased sensitivity and field of view. Australia's contribution to the development of the proposal is to build a 1% pathfinder - the Australian Square Kilometre Array Pathfinder. ASKAP is funded now, with a cost of AU\$100M, and is scheduled to start scientific observations in 2012.

The processing required to turn the raw observations from radio synthesis telescopes such as ASKAP and SKA into scientifically useful images, cubes, and catalogs is very substantial. For the SKA, the computing load is expected to be about 1 Exaflop/s. At the deployment time of 2020, the telescope will thus depend on one of the fastest computers in the world. Some of the data processing fits the grid model of distributed resources, and some doesn't. Thus a mixture of models is likely to be necessary. I will describe this aspect in particular of the many challenges in SKA computing.

