

Conference “Fundamental Physics with the Square Kilometre Array”, Mauritius over May 1-5, 2017.

The conference “Fundamental Physics with the Square Kilometre Array” took place in Mauritius over May 1-5, 2017, with the goals of engaging the theoretical physics community in the science case and design considerations for the Square Kilometre Array (SKA), and of bringing together radio astronomers and theorists to jointly consider ways in which the SKA can test and explore fundamental physics. Around 70 scientists attended, from 23 countries across all six inhabited continents. We particularly wanted to engage the African scientists who will be involved in constructing the SKA; astronomers from South Africa, Mauritius, Kenya and Ghana all attended and gave invited reviews of the radio astronomy research happening in their countries. The remaining science talks were divided into four topics: “Cosmic Dawn and Reionization”, “Cosmology and Dark Energy”, “Dark Matter and Astroparticle Physics”, and “Gravity and Gravitational Radiation”. Under each topic, we had invited reviews from both the observational and theoretical side; followed by several shorter contributed talks (all talks are available for viewing at <http://skatelescope.ca/physics/presentations>). We also held breakout discussion sessions on specific questions within each topic, after which we then reconvened and discussed further in a plenary session. There was sufficient excitement and momentum emerging from the meeting that we are now in the process of writing a white paper summarizing the prospects for fundamental physics with the SKA, sectioned into these same four topics, and to be submitted as a refereed manuscript to Publications of the Astronomical Society of Australia. A draft of this paper will be available to all participants by the end of August, with submission anticipated for September/October. Overall, the feedback we received is that this was a highly stimulating and enjoyable meeting, with an excellent mix of theorists’ vs observers, and faculty vs students. Our ambition now is that the ideas from this meeting become part of the framework and discussion around the specifications for the full SKA, and that we potentially hold a follow-up meeting in a few years to crystallize and further develop these ideas.