



A New Window on the Radio Sky: The Evolutionary Map of the Universe

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The next decade promises to be a "golden epoch" for radio astronomy, due to the deployment of many revolutionary radio telescopes. While the most powerful of all, the Square Kilometre Array is still some time off, a flurry of precious radio observations will be earlier delivered by its pathfinders including the Australian SKA Pathfinder [1]. The Evolutionary Map of the Universe, or EMU [2], survey planned with ASKAP will cover a broad range of science from studies of the Milky Way's star formation, supernovae, pulsars and more. Extragalactic science will include the cosmic star formation history of the Universe, Active Galactic Nuclei, and the cosmic web and clusters of galaxies. EMU will also work to answer cosmological questions; testing the nature of dark energy and general relativity. The primary goal of EMU is to produce a deep (~20 microJy/beam rms) radio continuum survey at frequencies ~ 1 GHz of the entire Southern Sky south of Declination +30 deg. The excellent surface brightness sensitivity of ASKAP is unique for such a deep survey, enabling robust detection of radio galaxy structures and morphologies, faint cluster halos, relics, and filaments, nearby supernova remnants and planetary nebulae, as well as Odd Radio Circles (ORDs) and other new objects. An integral part of the project is matching EMU sources with other wavelengths to produce high quality "value-added" science ready data as part of the EMUCAT pipeline. I will give an overview of the planned survey, different key science areas, and work that is already happening with data from the EMU pilot surveys.

[1] <https://www.csiro.au/en/Research/Facilities/ATNF/ASKAP>

[2] <http://www.emu-survey.org>