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# THE SHARJAH VERY LONG RADIO INTERFEROMETER – A UNIQUE RADIO OBSERVATORY IN THE MENA REGION

**Abstract**

In astronomy, having a large optical or radio telescope is necessary to get the maximum amount of light for better resolution and source sampling. In the optical window, a single mirror telescope can reach a size of up to 10 meters or even a little bit larger if it is a segmented one. On the other hand, in the radio window, a steerable single radio dish cannot go beyond 100 meters due to several engineering and weather constraints. For both windows, interferometry has been used to overcome this limitation by combining several mirrors or dishes to simulate a large system. In this context, the Sharjah Academy for Astronomy, Space Sciences, and Technology, located in the United Arab Emirates, is building a 0.6-km radio interferometer that will be unique in the MENA region. The radio interferometers will consist of 9 radio dishes, each 5-m diameter, spread along a Y-shaped configuration, resembling the Very Large Array in New Mexico (USA). Each dish is a SPIDER 500A made by PrimaLuceLab. Each telescope has a motorized altitude-azimuth mount that allows the radio dish to move from 0–90 in altitude and 0–360 in azimuth. The observing frequency of the Sharjah radio interferometer is 1420 MHz. With this frequency and the Y-configuration, the resolution of the system is expected to be one arcmin and to simulate a 15 m radio dish.

The new radio interferometer will enhance the radio astronomy program at the University of Sharjah, allowing undergraduate and graduate students to fully get acquainted with and understand the radio universe. The radio techniques of observing at 1420 MHz, the line of the most abundant element in the universe, hydrogen, will be practiced hands-on with the new interferometer. At the resolution of this new radio observatory, thousands of radio sources will be observed, especially the giant radio sources (GRS), which constitute an intriguing problem for radio astronomers to explain their large sizes, greater than a couple of arcminutes, and also their formation. Furthermore, this system will help us better understand the physics behind the nature of radio emission in the galactic and extragalactic radio universe to develop better models.

This paper will highlight the construction of the new 0.6 km Sharjah radio interferometer, its role in promoting radio astronomy in the MENA region in general, and its usage by the University of Sharjah students in particular.