GAVRT: a radio astronomy based science curriculum for K-12 students

Glenn Jones*
California Institute of Technology, Pasadena, CA 91125

The Goldstone Apple Valley Radio Telescope (GAVRT) is a program run by the Lewis Center for Educational Research with support from JPL that trains K-12 educators on the basics of radio astronomy and observations. The program also provides a curriculum to teach science concepts in the context of radio astronomy. The curricula are designed by a group of educators in collaboration with a radio astronomer. In exchange for helping with the curriculum design, the radio astronomers have access to large amounts of data collected with a 34m telescope. The observations are designed so that the radio astronomer collaborates with the many classrooms repeating the same observation, thus stimulating the students while providing valuable scientific data. The existing program, utilizing a 34m antenna, DSS-12, with narrow-band S and X band receivers has been quite successful for projects including scintillation studies of quasars and monitoring synchrotron emission from Jupiter.

Recently, a second 34m antenna, DSS-28 has been donated to the program, and is currently being retrofitted. Caltech is involved in building a unique extremely wide-band receiver and accompanying digital back-end for this new telescope. The system will be capable of continuum, polarimetric, spectroscopic, and pulsar observations. The receiver is implemented in two bands: the low band will cover approximately 500 MHz to 4 GHz, while the high band will extend from around 2 GHz to 14 GHz. By providing them with unprecedented amounts of instantaneous bandwidth, large amounts of observing time, and a great public outreach opportunity, it is hoped that GAVRT-II will attract collaborations from many more radio astronomers around the world.