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Hot News from the HAWC Gamma-Ray Observatory

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The High-Altitude Water Cherenkov (HAWC) TeV Gamma-Ray Observatory is currently under construction at a site about two hours' drive east of Puebla, Mexico on the Sierra Negra plateau (4100 m a.s.l.). HAWC is unique among TeV gamma-ray instruments in that it can observe large portions of the sky simultaneously, and covers half the sky every 24 hours. Therefore, the detector is particularly well-suited to measure extended and large-scale structures in the sky such as diffuse galactic gamma-ray emission and large- and small-scale anisotropies. Discoveries of other extended unidentified objects at TeV energies, for example collocated with the "Fermi Bubbles," and the observation of transient phenomena such as GRBs, are also possible. The construction of HAWC funded through NSF, DoE, and CONACyT, is expected to be complete by Fall 2014. Data are already being collected during construction with an increasingly sensitive detector allowing for synchronous observations with instruments at other wavebands like the Fermi Space Telescope. Analysis of the data set reveals significant anisotropies in the arrival directions of cosmic rays, both on small (below 10s of degrees) and large angular scales. A number of gamma-ray hot spots are also observed along the Galactic plane and the data have been searched for high-energy emission from GRBs detected at lower energies. I will present first results and scientific potential of the experiment.

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