Town Hall for U.S. NRC Survey of the Scientific Uses of the Radio Spectrum

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The current system of allocating bands in the radio spectrum was developed over fifty years ago, and a review of the needs of scientific users is in order. In recent years, the explosion of new wireless technologies has significantly increased the demand for access to the radio spectrum. The increased demand has led to discussions in both government and industry about new ways of thinking about spectrum allocation and use. Scientific users of the radio spectrum (such as radio astronomers and earth scientists using remotely sensed data) have an important stake in the policies which will result from this activity.

The scientific uses of the spectrum have changed from the early days of radio astronomy following World War II. At that time radio astronomers sought access mainly to specific narrow bands in order to conduct their research. Today radio astronomers require broader access to the spectrum in order to study new objects and phenomena. Observations of quasars, galaxies at high redshifts, and other exotic objects discovered over the past fifty years do not necessarily fall into the bands allocated for studying the hydrogen line, ammonia line, or other interesting molecules in nearby galaxies.

As the space age has progressed, Earth scientists have greatly benefited from the broad, constant field of view offered by satellites in Earth orbit. Measurements of the sea surface temperature, salinity, and other characteristics led to the discovery of the 'El Nino' effect, for example. Interference in the bands allocated for these activities would have a negative impact on these studies. Other space-based measurements include weather patterns, soil conditions, levels of various gases in the atmosphere, ozone, and many other environmental parameters.

Demand for spectrum from commercial and other users has also grown. The current generation of wireless electronics and communications applications has placed pressure on spectrum managers to open new areas of the spectrum for commercial use. Other technologies such as UWB devices, e.g. vehicular radars, are also threatening access to bands which are needed to conduct scientific research.

The U.S. National Research Council (NRC) has convened a committee with membership drawn both from inside and outside the fields of radio astronomy and Earth remote sensing that is charged to develop a report which identifies those scientific research areas requiring quiet spectrum. To do so, the report will highlight the important science being conducted today which is enabled by the allocation of radio bands for scientific use. The report will also look ahead 10-20 years to envision how these two scientific communities will be using the spectrum, and what changes to the spectrum regulations we should begin working on now in order to enable the science to continue to move forward.

The NRC Spectrum Study Committee requests a session at the January 2008 meeting for the committee to communicate directly with the radio astronomy and Earth remote sensing communities to discuss its concerns and collect its input. Involving the broad community is critical to the report's outcome and impact, which will bear directly upon radio astronomy, and more broadly, the entire field of astronomy. Albin J. Gasiewski, University of Colorado at Boulder (committee co-chair), Donald C. Backer, University of California at Berkeley (committee member), and David B. Lang, U.S. National Research Council, will conduct the session.

The committee keeps a web page at
http://www7.nationalacademies.org/bpa/Spectrum_Study_Home.html.