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Response to ET Docket No. 02-135

Public Comment on Spectrum Policy Task Force  
on issues related to FCC Spectrum Policies.

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From our perspective, conducting radio astronomy observations has become very difficult and discouraging to our research work and to our educational mission. At Haystack Observatory, the effort in building a radio array to detect the deuterium line has become an RFI characterization and mitigation project, and our studies for the low frequency array (LOFAR) have been overwhelmed by RFI monitoring effort to decide the siting of this international telescope. Lots of effort and money goes into such RFI mitigation work, and RFI has become a potential show stopper in many projects, since government research funding agencies request that we demonstrate that such observations can be made in the hostile radio environment that exists around us.

Since it can not be replicated, reproduced, or manufactured, the electromagnetic spectrum is an asset much like land or rare artwork. Therefore it is the responsibility of our government, and governments around the world, to protect it from misuse or theft. Just as our National Wildlife Refuges are owned and protected by our government from private and commercial interests, so too must portions of the electromagnetic spectrum be protected from the economic and market demands of special interests.

The once pristine spectrum used by radio astronomers, and other passive services, is, in fact, more valuable than Wildlife Refuges, National Parks, or rare works of art, because of the technical innovations and scientific discoveries made by radio astronomers over the years. The astronomers' requirements for the most sensitive receivers, the best antennas, and most sophisticated signal processing techniques have put them at the forefront of technical developments in these areas, and have led to applications that benefit society. For example, the same signal processing techniques invented by radio astronomers to create sharper images of objects in the universe have been used for the precise location of cellular telephones. The United States Naval Observatory uses the signals from radio telescopes to monitor the orientation of the earth in space in order to navigate our fleet and support our defense systems. Geophysicists use data from radio telescopes to measure the motion of the tectonic plates. The economic value of all of the contributions of radio astronomy is difficult to quantify, but loss of protected spectrum will endanger such contributions to society in the future.

In the following paragraphs, we answer some of the questions raised in the FCC Public notice.

Question 4. There are circumstances under which adopting more market-oriented allocation and assignment policies would affect other important Commission objectives. The optimal provision of service to Radio Astronomy and other passive services would be hindered by more market-oriented spectrum policies. A market-based system would threaten the passive services by failing to prevent spurious and out-of-band emissions.

Question 11. Defining power limits (in-band, at service area boundaries, and out-of-band) and other measures in the Commission's rules to protect against harmful interference ENCOURAGES innovation. Stricter transmitter standards and guidelines encourage more innovative modulation and filtering techniques and permit transmitters to operate at frequencies closer to adjacent channels and to frequencies allocated to other services, such as radio astronomy, without causing harmful interference in the adjacent channel or band.

Question 16. The Commission should NOT adopt rules for interference that are based on economics. Such a policy would encourage manufacturers to design, manufacture, and market cheap transmitters without innovative engineering which would minimize harmful interference to other users. Causing harmful interference to one's neighbor for economic gain is like stealing; if it weren't against the law, everyone would do it, and chaos would reign.