



## Spectrum Management for Science in the 21st Century

*By National Research Council, Division on Engineering and Physical Sciences, Board on Physics and Astronomy, Committee on Radio Frequencies, Committee on Scientific Use of the Radio Spectrum*

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**Spectrum Management for Science in the 21st Century** By National Research Council, Division on Engineering and Physical Sciences, Board on Physics and Astronomy, Committee on Radio Frequencies, Committee on Scientific Use of the Radio Spectrum

Radio observations of the cosmos are gathered by geoscientists using complex earth-orbiting satellites and ground-based equipment, and by radio astronomers using large ground-based radio telescopes. Signals from natural radio emissions are extremely weak, and the equipment used to measure them is becoming ever-more sophisticated and sensitive.

The radio spectrum is also being used by radiating, or "active," services, ranging from aircraft radars to rapidly expanding consumer services such as cellular telephones and wireless internet. These valuable active services transmit radio waves and thereby potentially interfere with the receive-only, or "passive," scientific services. Transmitters for the active services create an artificial "electronic fog" which can cause confusion, and, in severe cases, totally blinds the passive receivers.

Both the active and the passive services are increasing their use of the spectrum, and so the potential for interference, already strong, is also increasing. This book addresses the tension between the active services' demand for greater spectrum use and the passive users' need for quiet spectrum. The included recommendations provide a pathway for putting in place the regulatory mechanisms and associated supporting research activities necessary to meet the demands of both users.

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