

## **The spectrum landscape: prospects for radio astronomy**

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Radio astronomers work within broad constraints imposed by commercial and other non-astronomical uses of the radio spectrum, somewhat modified to accommodate astronomy's particular needs through the provision of radio quiet zones, radio frequency allocations and other devices of spectrum management. As astronomers increase the instantaneous bandwidth, frequency coverage and sensitivity of their instruments, these external constraints, and not the limitations of its own instruments, will increasingly be the greatest obstacles to radio astronomy's ability to observe the cosmos from the surface of the Earth.

Therefore, prospects for future radio astronomy operations are contingent on planning for non-astronomical uses of the radio frequency spectrum. New radio astronomy instruments will have to incorporate a variety of adaptive reactions to external developments and radio astronomers should be encouraged to think in untraditional ways. Even about spectrum management, for instance.

In this talk I'll summarize present trends for non-astronomical radio spectrum use that will be coming to fruition in the next decade or so, categorized into terrestrial fixed and mobile, airborne and space-borne uses, sub-divided by waveband from the cm to the sub-mm. I'll discuss how they will impact terrestrial radio astronomy and the various ways in which radio astronomy should be prepared to react. Protective developments must occur both within its own domain – designing, siting and constructing its instruments and mitigating RFI – and facing outward: engagement with spectrum management is also an important means by which radio astronomy can take an active role in shaping its future environment.