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In our modern society, there is a need to strengthen the understanding of - and to develop engineering solutions for - measuring, monitoring and controlling the effects of naturally occurring and man-made electromagnetic emissions related to:

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- the Earth environment (the potential effect on the climate system),
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- the monitoring of variations in the space environment (e.g., from variations in solar activity) that may affect space-based services, and, when possible, the correction of these effects.

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A clean, renewable, and therefore sustainable method of energy production that can be substituted world-wide for nuclear as well as fossil energy resources may be provided by Space Solar Power Systems (SSPS). In these systems, solar-radiation energy is collected by huge space-based solar cells and subsequently converted to microwave energy, which is then transmitted to the Earth. Although the feasibility of such systems has been proven, a broad range of technological and environmental questions have to be answered.

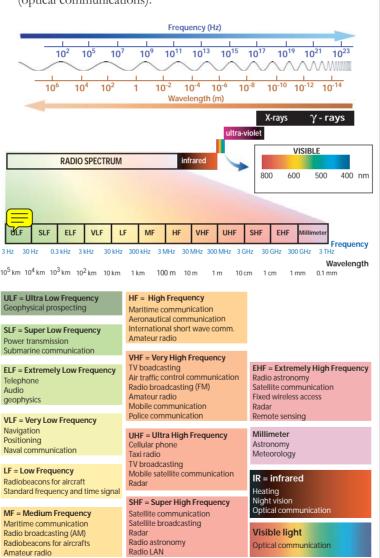
Nanotechnology.

Nanotechnology will have an enormous impact on society, the economy and on the various sciences, as well. It offers the promise of creating not only minuscule circuits, but of constructing biological molecules for medical purposes, including the possibilities of micromachining and nano-surgery. URSI will actively contribute to this field through the development of micro-electronic-mechanical systems (MEMS) and metamaterials.



The electromagnetic spectrum

Electromagnetic waves carry electromagnetic energy through space. In empty space, they propagate at the speed of light. The basic properties (defined by Maxwell's equations) are identical over all of the electromagnetic spectrum that has been investigated so far, i.e., from millihertz to 10^{24} Hz. Each decade of the electromagnetic spectrum below the millimeter-wave range of frequencies (10^{12} Hz) is divided into designated ranges, with their acronyms indicated below. The URSI domain of activities stops slightly above 10^{14} Hz (optical communications).





INTERNATIONAL UNION OF RADIO SCIENCE

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Information is also available on the URSI Web site: http://www.ursi.org

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Presentation

At the international level, almost every branch of science functions under the auspices of, and is represented by, an organization known as a union. For the science involving the various forms of what are commonly called radio waves, the pertinent union is the International Union of Radio Science, commonly referred to by its acronym URSI (based on its name in French: Union Radio-Scientifique Internationale). URSI and other unions associated with other branches of science are, in turn, members of the International Council of Science (ICSU).



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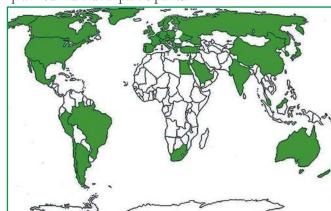
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Remote-sensing techniques to probe and monitor our environment - including air, sea, land and vegetation - play an increasing role in our world. The Wave Propagation and Remote Sensing Commission encourages research on electromagnetic wave propagation through the various layers of the geosphere and biosphere. Forest fires, crop yield and soil moisture are among the important factors to be monitored globally by corresponding satellite-born



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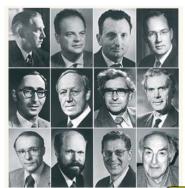
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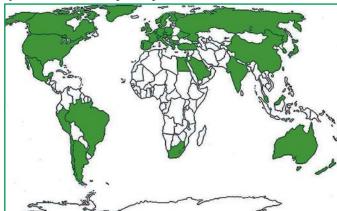
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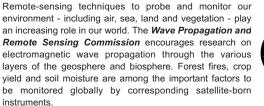
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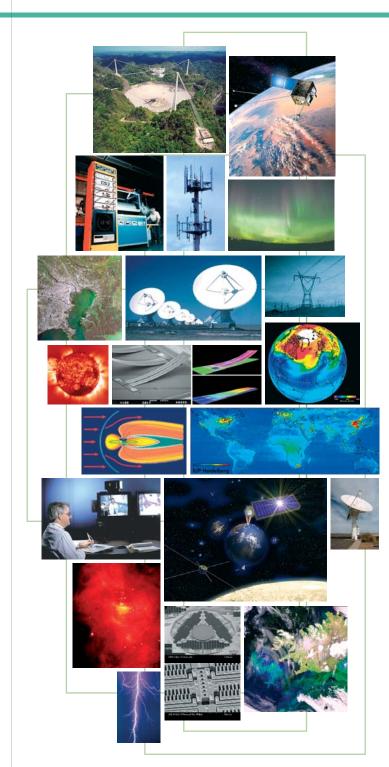
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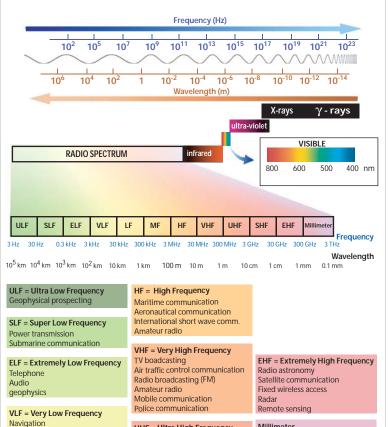
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Mobile satellite communication

SHF = Super High Frequency

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Cellular phone

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Positioning

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Standard frequency and time signal

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