I write with regard to the questions posed by the new Spectrum Policy Task Force (SPTF). It is always worthwhile to examine the fundamentals behind allocation of resources like the electromagnetic spectrum. I am pleased to see the FCC taking a fresh look at the problem of frequency allocation.

When discussing a problem like frequency allocation, it is important toestablish metrics that will allow the use of the spectrum to be measured and valued. The spectrum is a finite resource that should be allocated in the public interest. Sometimes, the public interest is served by allowing market forces to determine the value of this special commodity. However, there are other uses of the electromagnetic spectrum where the public interest is clearly served even though the value of the service is not so easy to quantify in stictly economic terms. For example, we would all acknowledge that use of the spectrum for a public safety purpose would be important even the economic value of lives saved did not measure up to other possible uses of the same spectral resource. The reason is that we value the safety of our citizens, and it is in the public interest to use the spectrum to advance this goal.

Given the SPTF's set of questions, I am confident that the issue of public safety will be well looked after. Thus, I am writing primarily to remind the Task Force about the scientific use of the spectrum. This is another area where the application is strongly in the public interest and therefore where the use should be properly maintained and protected.

There are two key scientific uses of the spectrum: (1) Earth remote sensing; and (2) radio astronomy. The public interest in the first use is easy to identify. The study of the oceans and atmosphere by remote sensing techniques has delivered many tangible benefits and promises even more as we continue to improve our ability to predict the weather and make long term forecasts. The ability to forecast the weather has huge economic advantages and is a public safety issue as well, since severe storms may be identified so that precautions may be taken. The continued use of passive and active sensing data at radio wavelengths, requires that continued care be taken to protect the allocated frequencies for this purpose. I urge the Task Force to consider this important point as they think about the future of frequency allocations.

One might think that the public interest in radio astronomy would be somewhat more difficult to identify, since everything we study is so far removed from the Earth. However, the public's interest in astronomy is strong, and the scientific interest in radio astronomy will be exceptional as new large telescopes are completed in the next few years. Those of us in the field are excited about the prospects of new and recently upgraded instruments such as the upgraded Arecibo Telescope in Puerto Rico, the Robert Byrd telescope in Green Bank West Virginia, the soon-to-be expanded Very Large Array in New Mexico, the Atacama Large Millimeter Array, being constructed in Chile, and my own group's project the Large Millimeter Telescope which is being built in Mexico as a part of a binational collaboration. Each of these new capabilities, though not expensive in the same way that multi-billion dollar satellite systems are expensive, is a significant part of our nation's investment in scientific research. We make such investments for many reasons:

(1) basic research leads to basic improvements in our economy and our quality of life. I note that our own radio astronomy group at UMass has "spun off" a number of commercial ventures which make use of radio astronomy technology. One company, Millitech, participated in early development of collision avoidance radar for automobiles. (Ironically, radio astronomers really don't like the prospect of extensive use of this capability because of its interference potential). Another company, which spun off from Millitech, is developing passive imaging sensors for airport security that makes use of radio astronomy remote sensing principles (and a few former employees of our Observatory). Clearly, radio astronomy is one area of basic research where tangible economic benefits may be identified.

(2) basic research attracts students to technical fields; these students become a part of the technical braintrust of our society and will be the people who will keep the US at the forefront.

(3) basic research in radio astronomy addresses scientific questions which are of general interest to people everywhere. We all seek to understand our origins and our celestial roots. The research that astronomers will do during the next couple of decades will take us a long way toward understanding both the origin of the universe and the origin of solar systems like our own.

To carry out this research and to make good on the investment in research that our society has already made, we need the SPTF's help to make sure that one more investment, the allocation of special frequencies for scientific purposes, continues. I urge you to consider the value of basic research to the continued development of science and technology as you attempt to develop appropriate metrics for spectrum allocation.

F. Peter Schloerb
Professor, University of Massachusetts at Amherst
Director, Five College Radio Astronomy Observatory