

November 5th, 1950
P.O. Box 4868
Cleveland Park Station
Washington, D.C.

Dr. J. H. Oort
Sterrewacht
Leyden, Netherlands

Dear Dr. Oort:

The copy of Transaction of the I.A.U., volume VII, 1950 arrived a few days ago. I was very pleased to receive this. Thanks very much. I note that the work is comprehensive and has certainly been done in an excellent manner by the printer. The various people concerned with getting out this fine volume are to be congratulated.

From all reports, radio astronomy in this country is definitely taking second place to the large effort now being made in Australia. Presently, nearly all government science exists or falls upon whether or not the subject matter has relation to the public interest; and public interest is defined upon whether or not the matter relates to national defense. Confiscatory tax structures are fast eliminating non government sources of funds which remain in appreciable amounts. Whether or not one likes it, we are marching down the same road taken by the Germans and the Russians. The names and mile posts are marked in a different terminology but the trail appears well travelled.

Most of August and September I spent in Alaska with the Naval Research Laboratory. This expedition was to observe a total eclipse of the sun at Attu using radio equipment. We were successful in obtaining good data upon three frequencies near 465mc, 3000mc and 9500mc. In all cases the minimum was achieved 2 minutes after totality. These minimum were 26%, 15%, 5% respectively of the unobscured sun. At the two lower frequencies marked drops were seen when the limb of the moon covered a large group of spots near the center of the sun. Equal rises were encountered as these spots were uncovered. At the lowest frequency a 10% rise above unobscured value was secured at first and fourth contact. This is probably due to grazing reflection from the surface of the moon. This phenomenon was only about 1% at 3000mc. Some evidence of limb brightening was secured at 465mc but none at the higher frequencies. A full report will be published when we have figured out in detail just what we have caught. This was probably the first total eclipse which was successfully observed during a torrential downpour of rain in a gale!

At NBS we are still investigating the fine structure of solar radio waves. The basic element of all these bursts seems to be a "pip" which may, at any given wavelength vary over a range of 10,000 to one in intensity but only over a range of 2 to 1 in duration. The duration at one half peak amplitude is roughly proportional to wavelength and is about one second per meter of wavelength. The spectral width of these pips is very small, certainly less than 1% of the mean frequency. The sweeping method of the Australians is very powerful. However the rate of sweep should be raised a hundred times or more to really see what is going on. They are merely getting the gross overall picture which is perhaps a good starting point. Nothing has been published of the above matters because we wish to get the thing in a more solid state. All evidence indicates that these pips are the fundamental building blocks of all radio transients in the solar atmosphere.

Some day I hope to be able to do some more measurements on Cosmic Static. This will require a new and better setup at a location different from that now available. The Lloyds mirror scheme of the Australians is very powerful. However since two celestial coordinates are required, two independent sets of data are necessary. These may be secured by observing the source both rise from and set into the sea. This requires a high mountain on an island in the clear (not a lot of other islands around) at a low latitude, but not on the equator. The best I've been able to locate so far are some places in the Hawaiian Islands. Presently I'm investigating practical matters relating to such an installation with a view to obtaining funds. Since the amount of money needed will be large, a great many things must be considered so that the risk will not be great.

Please give my good wishes to Van de Hulst.

Sincerely yours,

Grote Reber

P.S. I'm enclosing a note by Kiepenheuer on a new approach to the origin of Cosmic Static. I don't know if its much good, but at least it is better than working over old ideas. Please get Van de Hulst's reaction.

G.R.