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HUYGENS LABORATORIUM - WASSENAARSEWEG 7B

VLB ARRAY MEMO No. 87

Dr. K.I. Kellerman
National Radio Astronomical Observatory
Box 2
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U.S.A.

Leiden, April 21, 1982.

Dear Dr. Kellerman,

Let me first introduce myself. I have been Director of the Instituto Argentino de Radioastronomia (IAR) since 1975 and at present I am spending a year here, at the Leiden Observatory, making use of a sabbatical year.

After a recent talk at Dwingeloo, in which I described the work done at the IAR, I have been suggested by Richard Schilizzi to write to you about our plans.

That is the reason for this letter.

The IAR observatory is located close to Buenos Aires (40 km) and La Plata (20 km). We operate there, since 1966, a 30m dish (CIW-IAR) at the 21cm line. The new receiver has a sensitivity and a stability good enough to produce publishable results on HVC's and galaxies, and on these two aspects the activity will be centered during the next few years. In addition the H166 α recombination line, the OH lines and the continuum can be also observed, so for the near future there will be enough to do with the present system.

We have however to worry about longer term plans and these certainly involve the use of other wavelengths than 21cm. At the same time we would avoid to install future facilities in the place where we are now because of the increasing interference level.

For this last problem there is already a solution. The Argentine government has bought a land of 760 km² in the province of San Juan, in a place called El Leoncito, which will be reserved exclusively for astronomical purposes. In the place is already operating a Yale-Columbia observatory and a building is being built for the 2.15m Argentine optical telescope. High voltage power line, roads and other facilities are available. The place is at 2500m a.s.l., at -30° in latitude, and the sky quality is quite comparable to the Cerro Tololo or Las Silla sites in Chile.

There are mountains and valleys in the area. In San Juan and Mendoza are universities, so professional and computational supports are available in the neighbourhood.

The Argentine National Research Council (CONICET) is the main source for financial support for the radioastronomical activity and we should be able to arrange easily an agreement by which the CONICET would provide the local support and the necessary infrastructure to operate a station. This was the case for the IAR in connection with the Carnegie Institution of Washington (CIW) which provided the elements and the know-how to build the radiotelescope 20 years ago.

We have at present no definite plans for the future, only ideas which are mainly centered on the use of a mm wave telescope or/and VLBI. During the VLBI meeting at Heidelberg in 1978, where I met you, I tried to get people interested in involving the IAR radiotelescope in the VLBI network.

Our main problem at present is the limited steerability of the antenna (-2^h to $+2^h$, -10^o to -90^o) and this probably was one of the factors that made the participation unattractive.

We would need a wholly steerable dish and in our ideas about the future we foresee the possibility in fact of having two dishes of that type, one in Buenos Aires and one in San Juan (distance = 900 km).

It would be however very difficult to obtain from local sources the financial support for such an investment and this is the reason why we have necessarily to depend on the agreement with northern institutions willing to have observational facilities in the southern hemisphere. We forget, for the time being, about the mm waves because of electronic difficulties and because there are already some installations operating or planned to operate in the south but the possibility is not closed.

About the VLBI however there could be maybe more chances to get involved in the plans of other institutions. And this is the reason I am addressing you, after Richard's suggestion, because of the dedicated array. Concretely: Do you consider attractive the idea of having a southern station as part of the array and if yes, do you think that it would be possible to work out an agreement by which you would provide the antenna and the equipment and we would provide the financial and human (technical, scientific) support for the installation and operation? I would like to hear your comments about this proposition. Any suggestion about possible joint projects with the NRAO or other institution will also be welcome.

Yours sincerely,

E. Bajaja.



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June 1, 1982

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Dear Dr. Bajaja:

Thank you for your letter with the suggestion that we consider a site in Argentina for one of the elements of the VLB Array. Our current plans call for all of the antennas to be located in the United States, but we have been discussing the possibility of locating one or two antennas outside the country in order to improve the (u,v) coverage. Sites in the southern hemisphere are particularly attractive to increase the north-south resolution, although locations west of the South American continent appear to be more useful, as South America itself lies east of the main concentration of antennas which are in the southwestern part of the United States.

Our main concern about a South American site relates to the increased logistical problems created if some of the antennas are in other countries. For example, in normal operation, we expect that all of the antenna elements will be under the real-time control of a single central operator using leased telephone lines. This operator will also be able to monitor the performance of each antenna and associated electronics via these same leased lines. While 2 or 3 technicians will be available at each site for normal maintenance and repair, more involved procedures will require the rapid dispatch of trained experts from a central service facility. Also, most spare parts will be kept only at a single location. While these procedures can obviously be modified for a foreign site, we are also concerned about customs problems and changing political situations that will further complicate the operation of a U.S. facility in a foreign country.

Far more attractive, I believe, would be a cooperative arrangement which would allow an Argentine radio telescope to be used part-time in conjunction with the VLBA, for example, when observing at low declinations. I think that you are right that the present lack of interest is due to the restricted sky coverage and absence of any short wavelength capability of the present antenna.

I expect to be in Europe this summer and would be happy to meet with you in Leiden toward the end of July to discuss further your interests. In

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the meantime, I am sending you a report showing the improvement in (u,v) coverage expected with antennas on Easter Island and/or the Galapagos. The analysis can easily be extended to include Argentina.

Yours sincerely,

K. I. Kellermann

KIK/bbs

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