

## **THE “LUNAR FAR SIDE RADIO LAB” STUDY OF THE IAA**

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The “Lunar Farside Radio Lab” Study of the IAA, started in 1998 by late French astronomer Jean Heidmann (1923-2000), underwent substantial extensions and revisions since its coordination was taken up by this author. These modifications can be summarized as follows:

- 1) The goal of the Study was enlarged so as to encompass the whole of radio astronomy, rather than just SETI.
- 2) It was stressed that, from the Lunar Farside, one can detect radio frequencies lower than 15 MHz (i.e. wavelengths longer than 20 m) impossible to detect from the Earth because of the blocking effect of the Earth’s ionosphere. By detecting these radio waves from the Farside of the Moon, new discoveries should be expected especially in the fields of Cosmology and Stellar Astrophysics.
- 3) Lunar Farside Crater Saha, initially selected by Heidmann to host a radiotelescope, was replaced by Lunar Farside Crater Daedalus, located just at the Earth’s Antipode on the Moon Farside. In fact, Daedalus is much more shielded than Saha not only against the radiation emitted by any future spacecraft orbiting the Earth at distances higher than the geostationary orbit, but even against the radiation emitted by the future Space Stations located at the triangular Lagrangian points L4 and L5 of the Earth-Moon system that were proposed decades ago by Jerry O’Neill of Princeton University.
- 4) Four different scenarios were envisaged for the relevant space mission, dubbed RadioMoon:
  - a) Cheapest and easiest of all, just a spacecraft orbiting the Moon in its equatorial plane and carrying a 3-meter inflatable antenna detecting radio signals from the Universe when inside the Shadow of the Earth, and downloading the data when above the Nearside.
  - b) More expensive but not-so-hard-to-make: just the same as a) but with two or more spacecrafts, so as to create and interferometric Array in orbit around the Moon.
  - c) More expensive still and hard-to-make, landing a Phased Array inside Daedalus and keeping the link with the Earth by a relay satellite in circular orbit around the Moon.
  - d) Very expensive and difficult: the same as in b) but with the goal of creating of an Array of Phased Arrays inside Daedalus. Much robotic work would then be requested plus one or more relay satellites orbiting the Moon.

Finally, legal protection of Daedalus from radio-pollution was sought, initially by virtue of the IISL.

The “Lunar Farside Radio Lab” Study of the IAA should be completed by October 2003 with a number of distinguished contributions.

Its present status and prospects are explained and motivated in this paper.