

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

DEPARTMENT OF PHYSICS

CAMBRIDGE, MASSACHUSETTS 02139

Room 26 - 335

9 September 1983

MEMORANDUM TO: VLBA Configuration/Site Group

FROM: B. F. Burke

SUBJECT: Mauna Kea as a VLBA Site (re: VLBA Memo 251)

Let me urge that the Hawaii station of the VLBA be placed on Mauna Kea. Of the possible Hawaiian sites, it is in my experience the best suited. The drawbacks are minor. The positive aspects are easy to state:

- 1) It is accessible. The drive from Hilo to the summit is not arduous. There is good air freight service to Hilo, and the passenger flights between Honolulu and Hilo are frequent. There are direct communications between Hilo and the West Coast.
- 2) The site is developed.
- 3) There are no unfriendly activities such as high-powered transmitters. The summit is recognized as an astronomical preserve, and this should help keep the site clean in the future.
- 4) There will be other radio astronomy groups on the summit, with good opportunities for exchange of technical and engineering services.
- 5) The site is exceptionally dry and should seldom be down because of weather. It will be a prime contributor to short-wavelength work.

Many of the objections expressed have little substance, in my opinion. These seem to be cost, altitude, ice, and Hilo, which can be addressed as follows:

- 1) High cost is a fact of life for any radio telescope in Hawaii. A high altitude location is an extra surcharge, but worth it.
- 2) The difficulty of working at the summit is greatly exaggerated. Some cannot, but many can. Hire the latter, as the optical and IR observatories have done. I can guarantee that it is possible to go directly from sea level to the summit without ill effects. Those who do so regularly will acclimatize, those doing it fresh must observe reasonable precautions: from the start, one can work deliberately, but not fanatically. Much nonsense has been written about high-altitude debilitation; Mauna Kea isn't high enough to make this a serious concern.
- 3) All mountain locations suffer from bad weather, including ice. The telescope domes on Mauna Kea haven't fallen down, and they operate most of the year. Design for wind loads and you'll have designed for ice loads.
- 4) Hilo isn't a bad place. The sun shines all morning, clouds form in the afternoon, and then it rains. There are shopping centers, churches, and even a branch of U of H - not a major educational institution, admittedly,

but the Honolulu Symphony visits and both drama and chamber music can be found in Hilo from time to time. Flowers flourish, and there is a good boat basin. The airport is close to town. Evaluation: not as good as Charlottesville, far better than Green Bank, perhaps comparable to Socorro. Staff can be found to live there.

Some expansion on the question of summit vs. intermediate altitude such as Halepukahaku is in order. If a 9000-ft. location can be found, great. I have been told, though, that the environmental objections to the placement of dormitories at Halepukahaku were powerful indeed, much more violent than the concerns about the summit. Ultimately, dormitory design had to be most inconspicuous in order to get approval. The summit has domes all over the place, and another structure like a 25-meter telescope is hardly a precedent. The cinder cones are of varying size, rising out of a plateau. The NRAO 25-meter site, one of the minor cones, or even a plateau location would be acceptable and inconspicuous. The central point is that the summit is a scientific preserve, with procedures aimed at regulating but not preventing scientific use. Elsewhere, including Halepukahaku, one is outside the scientific preserve. The varied interests to be satisfied - environmentalists, hunters, state and local officials - guarantee lengthy proceedings with no certainty of a favorable outcome.