

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
DEPARTMENT OF PHYSICS
CAMBRIDGE, MASSACHUSETTS 02139

February 21, 1985

Hon. Olympia Snowe
202 Harlow Street
Bangor, Maine 04401

Dear Representative Snowe,

Angela Alopis in your Bangor office suggested that we write you concerning the possible choice of a site in Maine for the facilities to be used in a project to detect gravitational waves from outer space.

The Massachusetts Institute of Technology and the California Institute of Technology have jointly proposed a project to the National Science Foundation to detect gravitational waves from astronomical objects. The sources of the the waves are phenomena in the universe such as the death of stars and the explosion which is believed to have occurred at the time of the origin of the universe. The waves have been predicted by Einstein but to date have not been directly observed.

Even though the waves originate from violent events in the universe, their strength at the earth is extremely small and highly sensitive equipment, situated at quiet places on the earth, will be required to detect them. Research at MIT and Caltech has over the past decade developed the sensitive equipment needed for the observations and we are now ready to build the large scale facilities to carry out the observations.

The technique we use to detect the gravitational waves is to carefully measure the motion of three suspended masses arranged at each end point and at the vertex of an apparatus that looks like the letter "L". The gravitational waves will shorten one leg of the L while at the same time lengthening the other leg. We sense the miniscule motions by recording the time it takes laser light to travel along the legs.

The facility for the observations will consist of a large L. Each leg will be a tube four feet in diameter and three miles long. The tubes will be evacuated to allow the laser beam to travel undisturbed along the legs. There will also be a number of small buildings to house electronic equipment and lasers.

In order to carry out the observations, two facilities and sites are required. We hope to situate one near the East coast and another near the West coast. As the equipment is sensitive to ground motion and sounds, we need to find places far from large cities, noisy highways and machinery. The sites should furthermore be reasonably flat to reduce construction costs.

We have made an initial study of the engineering, siting and costs for this project in conjunction with Arthur D. Little, Inc. and Stone and Webster, Inc. in Massachusetts and the Jet Propulsion Laboratory of Caltech. The study estimated a capital cost of 50 million dollars (1983) for the project. We have also identified several sites which would be suitable.

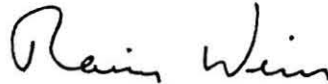
One of the best sites on the East coast lies in your district in the blueberry barrens of Washington County slightly north of Cherryfield, Maine (see enclosed map). The site was brought to our attention by the State of Maine Department of Conservation. The site is flat and dry and has convenient access to power lines which cross the site. The soil conditions would allow us to bury the facilities in a shallow trench so that the tubing would be out of the elements and the land above the tubes could be restored to its original use, thereby minimizing the environmental impact.

The land is privately owned, primarily by the Jasper Wyman Company. In the next month we intend to approach the owners to discuss their willingness to lease the 40 acres required for the facility. Our plan would allow them to resume blueberry cultivation on the disturbed land after the period of construction lasting about two years. The present plan for the project is to carry out a detailed design study during fiscal 1985 and 1986 and, if the NSF approves, to begin construction in fiscal 1987 with the first observations to begin in fiscal 1989.

The project would bring close to 20 million dollars to Maine during the construction phase as we intend to use local contractors and labor. During the operational phase of the project ten to fifteen scientists and engineers from MIT, Caltech and other scientific institutions would spend time at the site each year. Five to ten local people would be employed as technicians and service personnel. The operations budget is estimated at close to 3 million dollars per year, 1/2 million per year alone will be spent on electrical power which would be supplied by Bangor Hydroelectric.

Should the local landowners be favorably disposed to our project, we would like to arrange a meeting with you, as well as other members of the Maine delegation in Washington, to discuss the project - its scientific merit and its effect on Maine, in particular Washington County.

Sincerely yours,



Rainer Weiss, MIT

R. P. D. RW

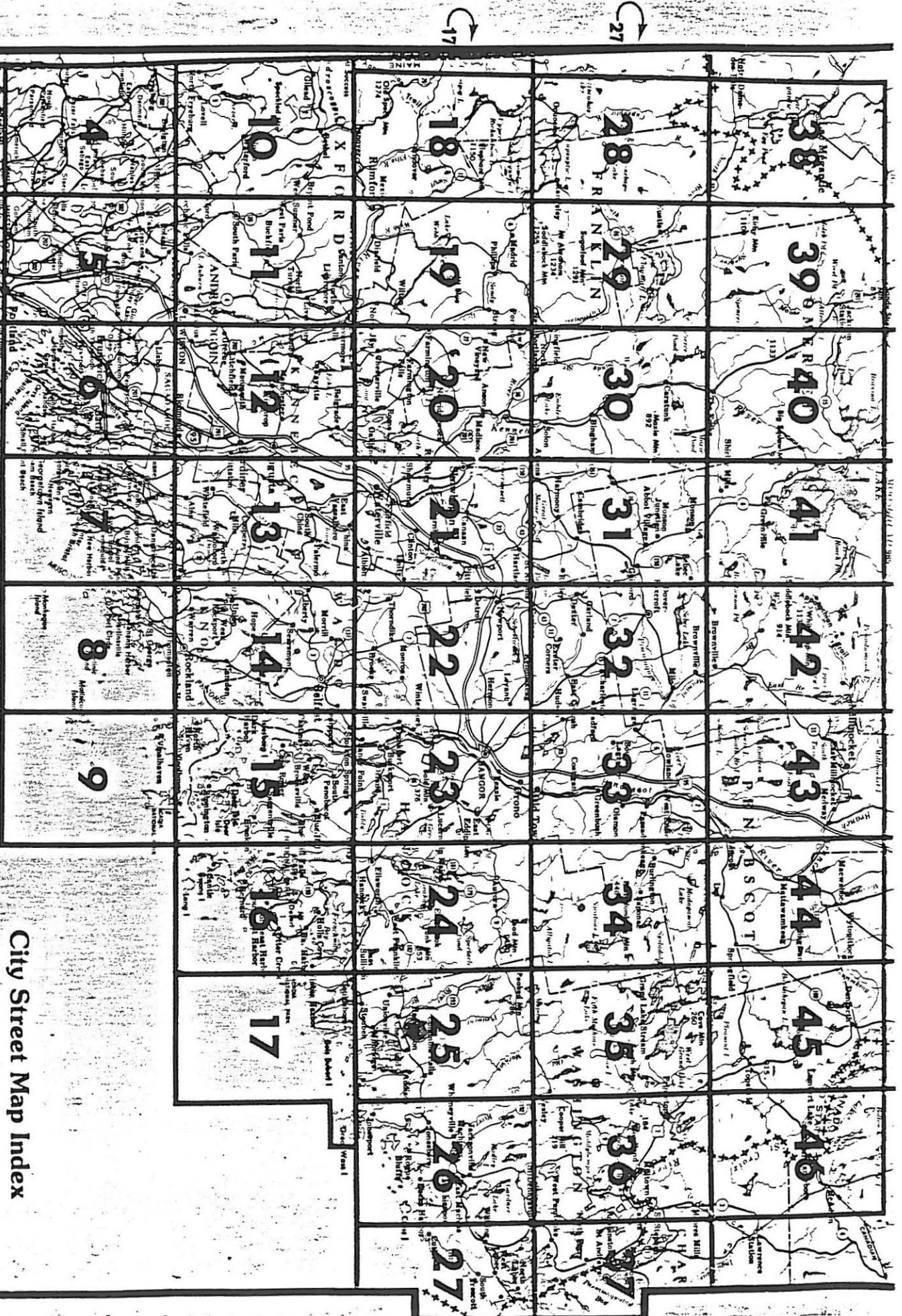
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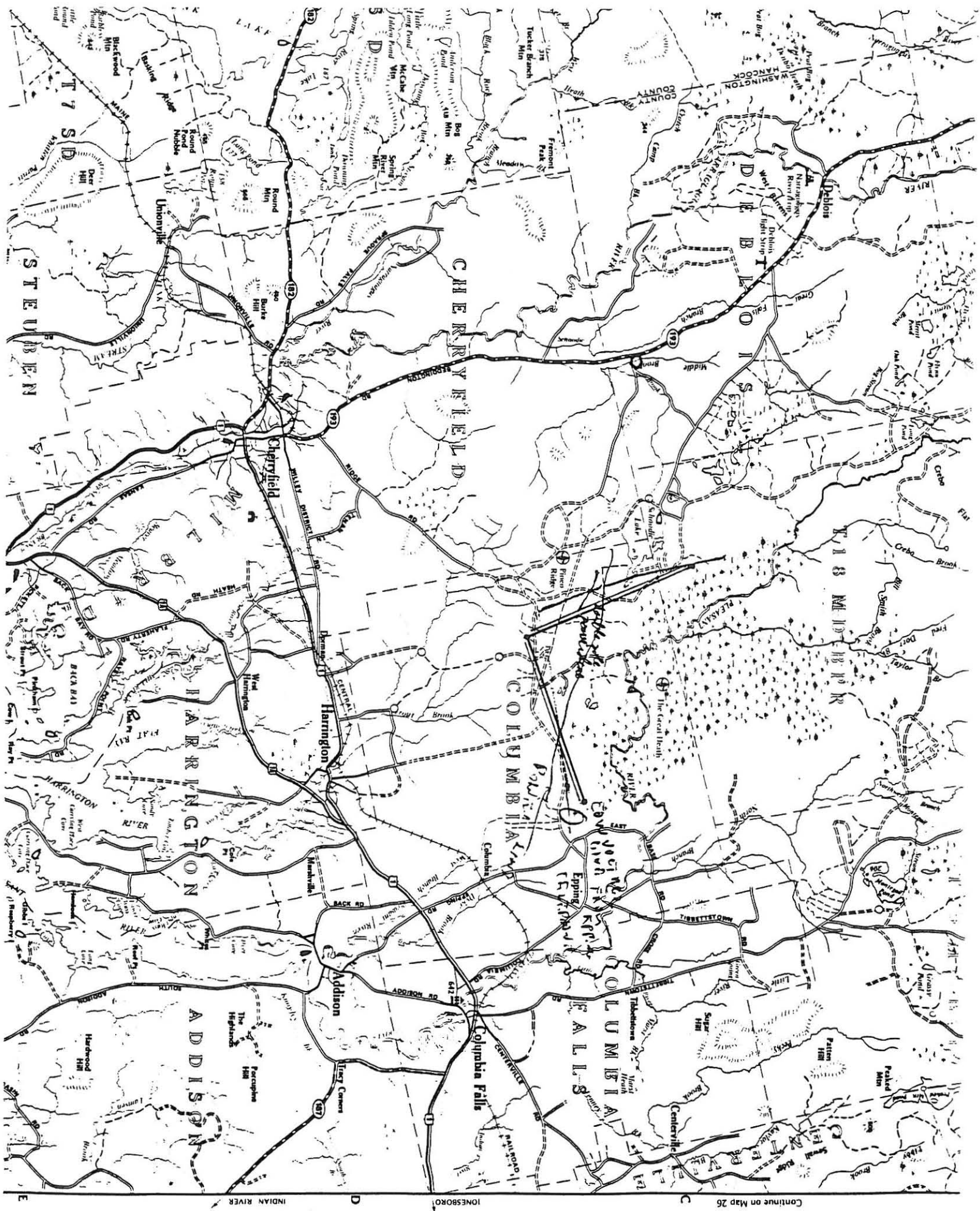
RW/eb
Enclosure



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