

HARVARD UNIVERSITY

DEPARTMENT OF PHYSICS
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in the transition, as in any property of the hydrogen atom that can be measured with precision: our best values of the fundamental atomic constants are based, in part, on the measured frequency of this transition. It is possible that the interstellar line, because of the absence of collision broadening, will afford an even more precise determination of the frequency.

An experiment of the sort described has been in the minds of many people, I am sure, and it is not unlikely that someone will beat us to it. However, we have been in touch with the principal radio-astronomy projects in this country, and it appears that although exploration of the 1400 Mc region is included on some of the long-range programs, the present effort is going in other directions. We have set ourselves the limited objective of detecting the line, if possible. Clearly, once the existence of the effect is established, many more elaborate investigations would suggest themselves.

Of the equipment mentioned above, some parts are already available, and some can be borrowed. Certain critical items must be purchased or built in the laboratory, and it is to defray these expenses that I request a grant, in the amount of \$500, to be spent approximately as follows:

Construction and mounting of horn	\$150
Purchase of war surplus transmitter (APT-5) for use as local oscillator	100
Material for and construction of power supply for oscillator	75
Construction of microwave mixer	100
Construction of special waveguide circuit elements	75
Total	\$500

Any apparatus of permanent value so obtained would be suitably marked as acquired by a grant from the Rumford Fund, and would be made available subsequently to other researchers, or disposed of in any way you might designate. None of the funds requested would be used to pay research assistants. Money budgeted for items requiring construction would be used to defray machine shop and carpenter shop charges.

I hope that the Rumford Committee will feel that this project is a suitable one for support by the Rumford Fund and is worthy of the assistance requested. Naturally I shall be very happy to provide any additional information the Committee may need.

Sincerely yours,

E. M. Purcell
Professor of Physics

EMF/pb