

K. McDonald  
February 1, 1989

**Supplementary Proposal**  
**Research and Development on Vertexing and Tracking**  
**for the Bottom Collider Detector**

We seek funding to enable us to initiate a program of research and development in conjunction with our recent R&D proposal (P-784) to Fermilab, a copy of which is appended. The work aims to develop detector techniques suitable for an experiment to measure the production of  $B\text{-}\bar{B}$  pairs at the Tevatron collider at luminosities of up to  $5 \times 10^{31} \text{ cm}^{-2}\text{sec}^{-1}$ .

We have an unusual opportunity to involve Lu Changguo of the High Energy Physics Institute of Beijing in this work, and wish to hire him as a post-doc at Princeton beginning July, 1989. We request **\$30k** for 1/2 year salary in 1989, with a continuing commitment for a total of 2 years.

Lu visited Princeton for 2 years in 1980-81 as part of the scientific exchange program, and since then has been head of the group to produce the proportional-tube chambers for their  $e^+e^-$  detector. He is primarily interested in detector development and wishes to visit the U.S. again. At this early stage of the B-physics program, when physics measurements are some time away, this is exactly the type of person who can make a maximal contribution.

At Princeton we propose to take major responsibility for detector development in two areas, pending further discussions within the B-physics collaboration:

- The mechanical configuration of the silicon vertex detector (in collaboration with technical staff members of Fermilab);
- The construction of a prototype system of straw-tube tracking chambers, including development of tooling for large-scale production (in collaboration with physicists from U.C. Davis).

A rough estimate of apparatus and operating funds for this work is \$50k.

After approval of the R&D proposal by Fermilab, the collaboration will present an overall funding request to the D.O.E., of which the above is only Princeton's part. This presentation is scheduled for the week of 13 Feb. 1989.