

June 12, 2002

Dr. Michael Witherell  
Director, Fermi National Accelerator Laboratory  
P.O. Box 500  
Batavia, Illinois 60510-0500

Dear Mike:

A number of us are in the process of forming an organization to pursue research and development relating to the design and operation of a high energy electron-positron linear collider and detector. This will be an iterative process which will include guidance from the Linear Collider Steering Committee and funding agencies, cooperation with the University Consortium for a Linear Collider (UCLC) being organized through Cornell, discussions with physicists presently organizing through SLAC, and close collaboration with Fermilab's Directorate. Even though we are still in the early stages of this (the first workshop was held at Fermilab April 5) we feel that it is sensible to write to you expressing our intentions at this time.

We expect that the R&D effort will ultimately consist of a number of groups based at universities, Fermilab, and other laboratories. The major efforts will be grouped by topic, with the projects spanning accelerator and detector systems. We feel that it is important that the areas of research be determined by the participants, so organizational and structural details will emerge as the participants begin to assess how their own areas of interest can best be applied to the Linear Collider effort.

In order to make efficient use of our field's resources, we anticipate adjusting the focus of the work (and to some extent the list of participants) in cooperation with the UCLC and another effort using SLAC as its base. We anticipate developing a proposal, possibly in conjunction with these other efforts. It is likely that work will include efforts centered on accelerator projects (such as photoinjector improvement, beam diagnostics and control systems, the surface physics of high-gradient rf cavities, permanent magnet technology, damping ring design, and vibration measurement and suppression) and detector systems (such as digital and energy-flow calorimetry, vertex determination, tracking, muon identification, and creation of a sophisticated test beam facility). Our intention is to prepare the proposal during the spring and summer months, and to submit it to the Department of Energy at the same time the UCLC proposal is submitted to the National Science Foundation, towards the end of September, 2002.

One of the earliest tasks facing participants in this R&D effort is to come to a better understanding of the technical issues associated with finalization of the design of a linear collider. What are the most pressing questions to be answered, and in what sequence should they be addressed in order to permit a viable design to be realized? The accelerator physics community is certainly eager to help us educate ourselves so we will be able to draw on their expertise in order to develop a more acute sense of the relative

importance of the various design issues before writing a formal proposal. It is our hope that the choice of research and development projects, informed by our greater comprehension of the technical challenges, will be sensible and lead to an efficient attack on many of the unanswered questions concerning the optimal design of a linear collider.

In order to begin the initial process of learning about the machine we would like to invite a variety of experts to deliver pedagogical presentations at Fermilab during the spring and summer months. We would expect to do much of the work necessary to organize and publicize these events, but would like to request a modest level of financial support to help defray the costs associated with this.

We anticipate that the membership of the R&D effort will grow over time as more groups turn their attentions towards the Linear Collider. Participation should be open to all interested researchers, though it is likely that a group's source of base funding (through either the NSF or DOE) will play a role in their decision as to which Linear Collider R&D effort to join. In keeping with an open, inclusive philosophy, details of structure and governance will be determined by participants as all involved work towards creating the R&D organization and drafting the proposal for support. In that we share the common goal of exploring the rich physics accessible at a Linear Collider, and will all take pleasure in addressing the intellectual challenges necessary to build the facility, we expect that the formation of a well-focused effort will proceed smoothly.

We welcome the comments, suggestions, and participation of all interested parties. During its initial stages Dan Amidei (amidei@umich.edu) and George Gollin (g-gollin@uiuc.edu) will serve as contact persons.

Sincerely,

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## Expression of Interest for the creation of a Linear Collider R&amp;D Group at Fermilab

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