



Fermilab
Fermi National Accelerator Laboratory
P.O. Box 500
Batavia, IL 60510-0500

September 16, 2011

Subject: Letter of interest for IZEST and its activities by Fermi National Accelerator Laboratory

Dear Professor Mourou:

I am writing to express Fermilab's support for your efforts to establish joint research activities to extend the capability and applicability of the highest intensity lasers to the fields of particle physics and high field science, and in particular for the development of laser plasma accelerators for high-energy physics. I would like to express our intention to participate in these joint research activities through the newly formed International Center for Zettawatt-Exawatt Science and Technology (IZEST).

I believe that innovative ideas are essential for future advanced ultra-high energy and ultra-high power accelerators. Such accelerators open up not only new paradigms of fundamental physics, but also widespread application in a variety of scientific fields. The laser-plasma accelerator is one of the most challenging and interesting areas for future high-energy accelerators. I believe that the required technological advances will only be realized through a dedicated effort focused on proof-of-principle demonstration, which is an essential element of the IZEST mission. Noting this, the mission of IZEST to increase the laser power and capabilities far beyond the current level by forming a team of international scientific talent is one of the keys for achieving these long-term goals.

Reaching these goals will require forging the effort of the accelerator physics community and laser physics community in a positive collaborative framework. That is why I directed our staff, as Deputy Director of Fermilab, to look into such research possibilities and to participate in the ICFA-ICUIL collaboration on related efforts. I am also aware that much more is necessary to meet these new challenges to realize practical laser accelerators and the associated laser technology that is required. That is why Fermilab is already a participating member of the International Coherent Amplification Network (ICAN) consortium that you head. I am very impressed with the activities and goals of IZEST to erect exawatt lasers that can drive particle accelerators with energies of a TeV and beyond. Fermilab has expertise which will be useful in realizing these goals.

We understand that IZEST will assist and promote the world-wide efforts, for example, at the French LIL exawatt, the Russian Mega Science laser project (XCELS), and possibly the Japanese Exawatt Laser, among others. Fermilab looks forward to closely collaborating in these research activities by bringing in its research capabilities and resources in terms of trained personnel, accelerator and detector components, high energy physics expertise, and expertise in related technologies. By introducing the "Laser-based high-energy and fundamental physics" paradigm, IZEST has the potential to redefine the contours of high-energy physics. I applaud the leading role that France, with the Ecole Polytechnique and the Commissariat à l'Energie Atomique, is taking in this matter. At Fermilab we want to assure you that we will do our utmost to support you in this endeavor to reshape and reenergize high-energy physics based on the development of ultra-high intensity lasers for particle acceleration.

Sincerely,

Young-Kee Kim
Deputy Director, Fermilab
Professor of Physics, the University of Chicago