# Greetings from the Chair

*T. Tajima*

The thrill I reported on the rapid progress in ultrahigh intensity lasers in this column last year is still reverberating in my mind and around the world. We are witnessing still further progress in the high intensity laser (HIL) laboratories that are rapidly ever expanding with increasing membership around the world with many reaching the threshold intensity of $10^{19}$W/cm$^2$. For example, in Korea the new organization Institute for Basic Science opened the Center for Relativistic Laser Science directed by Chang-Hee Nam, while in China SIOM is aiming at 10PW laser. India is taking its initiative to host the next ICUIL Conference in India (see in this Newsletter). The Extreme Light Infrastructure (ELI) is among the largest ultrahigh intensity project of the world and it entered the Delivery Consortium (www.extreme-light-infrastructure.eu/). It has as of April 11 (shown in the picture) founded the International Association as the crux of the ELI-DC and our Wolfgang Sandner is serving as Director General of ELI-DC. Congratulations!! Some of the pillars have begun their projects now. This project is an inspiration to the world and ICUIL in the sense that it boldly goes into the uncharted waters beyond 10PW and the science of the highest intensity frontier such as in accelerator beams, attosecond science, and nuclear photonics, all driven by ultrahigh intensity lasers. It goes without saying that ELI is the first large-scale infrastructure pan-European scientific project that has its infrastructure all located in East Europe since the fall of the Iron Curtain. The world is expectant of its extraordinary historic unification spirit that could soothe the rifts of centuries. For example, ELI-Nuclear Pillar (Bucharest) will lead the utilization of laser-driven high-energy gamma beams for investigating nuclear physics and engineering. It so happens that such an approach is extremely helpful to assist the disastrous nuclear calamity of Fukushima. Such an energy-specific directed gamma beam can detect specific isotopes of the molten core of Fukushima reactors through the nuclear resonant fluorescence without ever touching the radioactive material.

The high intensity community is looking even beyond what ELI can deliver. In order to reach EW and ZW, it is now necessary to increase the energy of the laser. This is what IZEST (International Center for Zetta- Exawatt Science and Technology) aims at. This is because the compression of the pulse length is seeing the bottom of the 'lake', i.e. the single laser period of 3fs. In order to reach this goal, two strategies have appeared. One is to utilize (or to be suggested to use) the existing large energy (kJ-MJ) lasers, LMJ in Bordeaux (or NIF in Livermore). The other is to launch a new construction of large energy lasers to address this challenge among others applications, as seen in XCELS of Russia. IZEST, for example, is in the phase of making up its Science Case book defining several major targets.

Our fruitful close collaborative relationship and work between the communities of ICUIL and ICFA (International Committee for Future Accelerators) initiated in late 2008 between the Chairs of

ICUIL and ICFA. Over the last year this has culminated into the formation of a document that described the recommended future course of actions of ICUIL and ICFA communities to address the challenges that the laser acceleration project will face. This document has been complied by the Joint task Force (JTF) of ICUIL-ICFA, collecting the works through its two workshops, and was published in the ICFA Newsletter **#56** (2011). It pointed out that the laser driven acceleration approach is paving a way to help a variety of high-energy accelerator physics issues such as the future high-energy collider, ion beam sources, electron beam source for FEL, and compact ion beam cancer therapy application. It concluded that the scientific case for the laser based accelerator physics is compelling and proven, and yet the community needs to come to grip with the technological requirements. One of the most urgent and glaring needs for development, it states, is to realize the efficient high-average power laser technology.

In order to meet these recommendations and challenges, a project called ICAN (International Coherent Amplification Network) between the laser and accelerator communities was launched last year and is now funded by the European Community (EC). This network has identified the fiber laser as the primary candidate for achieving highly efficient, high-average power lasers in the future. Meanwhile, EC has launched a new initiative centered at CERN by forming EuroNNAc (European Network for Novel Accelerators) encompassing a few dozen accelerator and laser institutions worldwide. It had its first inaugurating workshop last year and recently held its second workshop in May 2012.

I do not have a crystal ball to see how the ultrahigh intensity laser community will thrive this year. I am confident, however, that this community is with full of energy, full of ingenuity, and full of vigor, which I trust will turn in another stellar year.