

## Network Activities on High Field and Photon Science in Asia and in Japan

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Recent developments in network activities on high field science in Asia and in Japan are reported. The Asian Intense Laser Network has been active since 2004 in organizing conferences, workshops and summer schools in Asia. In Japan, the MEXT Photon Frontier Network Program has been started in 2008 to promote research and foster young researchers in photon science. Due to establishment of the broader and stronger bases in high field science in Asia, it will be possible to form closer collaboration between the Asian community and the broader international communities.

### Asian Intense Laser Network

The Asian Intense Laser Network (AILN, <http://apri.gist.ac.kr/ailn/>) was established in 2004 in order to promote scientific exchanges and collaboration among the scientists and young researchers in Asia. (Development of the international and Asian networks on intense laser science has been reviewed by Y. Kato at ASILS4 and published in ref. 1.) Under organization of AILN, the Asian Symposium on Intense Laser Science (ASILS) has been held in 2004, 2006, 2007 and 2008 in Japan, India, Malaysia and Korea, respectively (Fig. 1). Together with the Asian Summer School on Laser Plasma Acceleration and Radiation held in every year since 2006 and the Asian Workshop on Generation and Applications of High Order Harmonics held in every 2 years since 2005, these meetings have been effective in forming close relationships among the scientists and young researchers in Asia. In 2009, AILN will organize High Order Harmonics Workshop in Wuhan, China in 11-12 June, Summer School in Hsinchu, Taiwan in 17-21 August, and ASILS5 in Hanoi, Vietnam in 2-5 December.

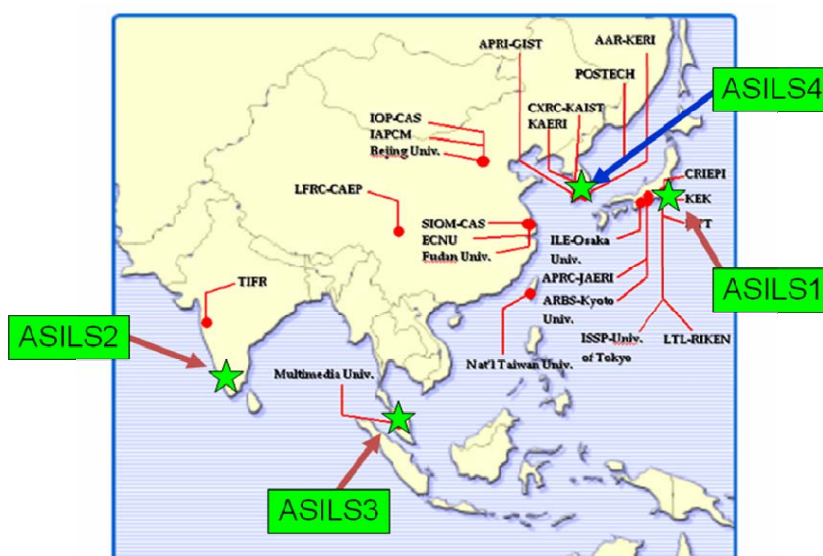


FIG. 1 Locations of ASILS1~4 held in Asia during 2004-2008.

## Photon Frontier Network

A new 10-year program “Photon Frontier Network” has been started in 2008 by the Ministry of Education, Culture, Sports, Science and Technology (MEXT) in Japan [ref. 2]. This Program is intended to explore frontier of photon science and technology, to foster young researchers, and to enhance collaboration with industry. The Photon Frontier Network is organized by a Program Director (Y. Kato) and 3 Program Officers (T. Yabuzaki, Y. Sano and Y. Yagi).

The Photon Frontier Network is composed of two research consortia; “Advanced Photon Science Alliance (APSA)” located in Kanto District and “Consortium for Photon Science and Technology (C-PhoST)” located in Kansai District (Fig. 2). The APSA is directed by M. Gonokami (University of Tokyo) and the C-PhoST by R. Kodama (Osaka University). These two consortia are composed of several Core Organizations with the Principal Investigators shown in Fig. 2. Since other organizations will join as Cooperating Institutes to these consortia, it is expected that an extensive research/education network will be formed in Japan. Exchanges and collaboration with overseas programs in optical science are also planned.

The two consortia of the Photon Frontier Network are composed of very active researchers working in different fields and with different scales, from standard size laboratory to larger size facilities. It is expected that intensive interaction among these top scientists will result in new ideas and new fields which will not be born from independent researches. Also strong interaction with industry will enable working on various problems encountered in real worlds. This very active and interactive environment will be very effective to foster young researchers with broad scope and competitiveness.

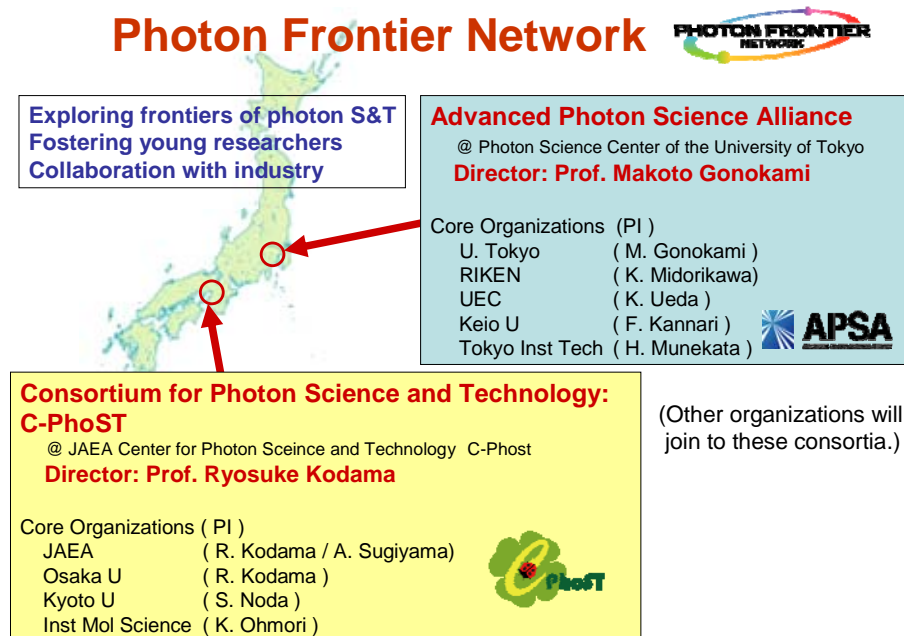


FIG. 2. Organization of the Photon Frontier Network

The major research plan at APSA (Fig. 3) is based on collaboration between the specialists in the optical frequency standard research and the attosecond science research, through control of frequency and phase of the optical waves. Also planned is the development of fiber lasers and ceramic lasers with high power and in UV regions by collaboration between the material science and the laser science researchers.

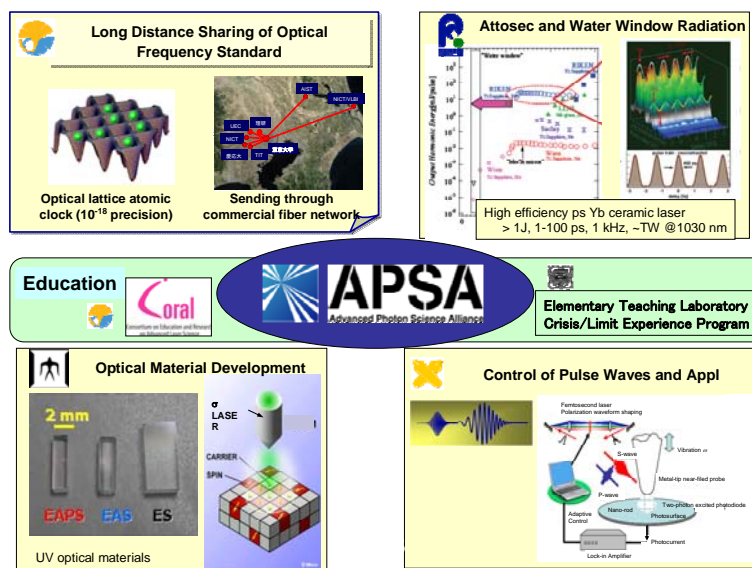


FIG. 3. The Advanced Photon Science Alliance (APSA)

The C-PhoST is based on the collaboration between the specialists in high power lasers and semiconductor lasers (Fig. 4). A high quality laser system QUADRA will be developed, where LD-pumped high average power Yb ceramic laser will pump OPCPA to generate ultrashort duration, high rep rate, high peak power laser. QUADRA will be used to generate radiations from THz to gamma-ray regions, to develop plasma photonic devices, and to apply quantum control to basic science and energy research.

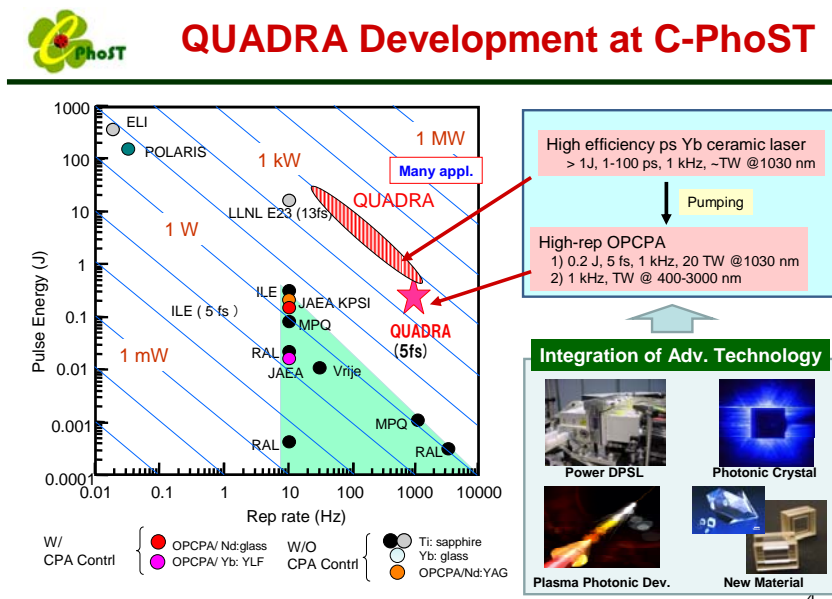


FIG. 4. The Consortium for Photon Science and Technology (C-PhoST)

## References

1. Y. Kato, International and Asian Networks on Intense Laser Science, *J. Opt. Soc. Korea* **13**, 2-7 (2009).
2. Y. Kato, M. Gonokami, R. Kodama, Y. Sano, S. Yagi and T. Yabuzaki, Photon Frontier Network, in *X-ray Lasers 2008*, IOP Conference Proceedings, to be published.