

**JSPS Core-to-Core Program**  
**FY2008 Implementation Plan (Project No. : 16002)**

Research Theme Ultrafast Intense Laser Science

Duration of Project 2006/4/1 -2009/3/31 (36 months)

Core Institution in Japan (Co-Chair) The University of Tokyo (Prof. Kaoru YAMANOUCHI)

**Implementing Organizations**

○ **Japan**

Japan	Core Institution	School of Science, The University of Tokyo	
	Co-Chair (name and title)	Kaoru YAMANOUCHI • Professor	
	Cooperating Institutions	School of Engineering Univ. of Tokyo, ISSP Univ. of Tokyo, RIKEN, TITech, JAEA, Tohoku Univ., Osaka City Univ., Ritsumeikan Univ., IMS, Keio Univ., Osaka Univ., NTT Basic Research Lab., Kyoto Univ., Univ. of Tsukuba	Number of Cooperating Institutions
			14

○ **Partner Countries**

Canada	Core Institution	Laval University	
	Co-Chair (name and title)	See Leang CHIN • Professor (Canada Research chair of Ultrafast Intense Laser Science)	
	Cooperating Institutions	Univ. of Sherbrooke, NRC, INRS, Univ. of Alberta	Number of Cooperating Institutions
			4

France	Core Institution	French Atomic Energy Commission, Saclay	
	Co-Chair (name and title)	Didier NORMAND • Department Head	
	Cooperating Institutions	LOA, Paul Sabatier Univ., CELIA	Number of Cooperating Institutions
			3

Germany	Core Institution	Friedrich-Schiller-University Jena	
	Co-Chair (name and title)	Gerhard G. PAULUS • Professor	
	Cooperating Institutions	University Bielefeld, MPI for Quantum Optics, MBI for Nonlinear Optics and Short Pulse Spectroscopy, MPI for Nuclear Physics, MPI for Physics of Complex Systems, Forschungszentrum Dresden Rossendorf	Number of Cooperating Institutions  6
Italy	Core Institution	University of Palermo	
	Co-Chair (name and title)	Gaetano FERRANTE • Professor	
	Cooperating Institutions	CNR research area Pisa, Univ. of Milano Bicocca, Univ. of Roma Tor Vergata, Univ. of Pisa, ENEA, Politechnical Univ. of Milano, CNR EURATOM-ENEA-CNR Association	Number of Cooperating Institutions  7
U.K.	Core Institution	University of Strathclyde	
	Co-Chair (name and title)	Kenneth LEDINGHAM • Professor (William Penny Professor of Laser Induced Nuclear Physics)	
	Cooperating Institutions	Rutherford Appleton Lab., Blackett Lab. Imperial College London, Univ. of Reading	Number of Cooperating Institutions  3
U.S.A.	Core Institution	Temple University	
	Co-Chair (name and title)	Robert LEVIS • Professor	
	Cooperating Institutions	Univ. of Michigan, Univ. of Maryland, Univ. of Texas at Austin, Lawrence Livermore National Lab., American Univ., Colorado School of Mines, Univ. of Central Florida, Univ. of Delaware, Ohio State Univ.	Number of Cooperating Institutions  9

## Objectives of Research Exchange (including the five years after the project finishes)

Intense laser-field science is a new interdisciplinary research field, which emerged recently based on the discussion and research exchanges among the researchers in the fields of physics, chemistry, and laser engineering, stimulated largely by the recent innovative development of the ultrashort-pulsed laser technology. The counterpart countries involved in this Core-to-Core project are Canada, France, Germany, Italy, UK, and US. The member researchers of this international network will make an effort cooperatively in order to expand the frontiers of this new research field by taking advantage of their respective research expertise. It is encouraged that researchers in the younger generation will join this program actively by attending seminars and symposia as well by being involved in a joint research program with other research groups in the network.

## Results to the present

According to the annual plans, organizations of international symposia, dispatches of researchers in Japan Team overseas, and invitations of researchers from abroad have been actively made, which have triggered and promoted strongly international research exchanges and collaborations. Significant scientific achievements have been reported one after another based on these collaborations. Researcher exchanges of young researchers have also been made. In addition to these achievements, matching funds have been arranged for supporting our Core-to-Core program from the counterpart countries. It can be said that the significant achievements were made during the first and second fiscal year for activating further our international cooperation for coming years. It should be noted that our Core-to-Core Program has been supported cooperatively by Center for Ultrafast Intense Laser Science that was established in February, 2005, as one of the research centers of Graduate School of Science, the University of Tokyo. In addition, we started publishing the new review book series, "Progress in Ultrafast Intense Laser Science," from Springer on the basis of research activities supported by our Core-to-Core Program and other research programs and organizations in Japan, and the Volume I of PUILS was published in September 2006, the Volume II was published in March 2007, and the Volume III was published in January 2008.

## Summary of FY 2008 Exchange Plan

### **Joint Research**

Collaborations are now in progress between Prof. Kaoru Yamanouchi (Univ. Tokyo) and Prof. See Leang Chin (Laval University, Canada) on Physics and chemistry of interaction between ultrashort pulsed intense laser fields and matter, and its applications, between Prof. Kaoru Yamanouchi (Univ. Tokyo) and Prof. Farhad Faisal (University Bielefeld, Germany) on Theoretical and experimental studies on molecular dynamics in intense laser fields, between Prof. Kaoru Yamanouchi (Univ. Tokyo), and Prof. Mauro Nisoli (Polytechnical University of Milan, Italy) on attosecond probing of ultrafast hydrogen atom migration in molecules in intense laser fields, and between Prof. Hiroaki Nishimura (Osaka University) and Dimitri Batani (Univ. Milano, Bicocca) on energy transport and deposition in ultra-high intensity laser produced plasma.

### **Seminar**

The following international gatherings are now being planned: (i) COAST Symposium on Ultrafast Intense Laser Science 4 (March 23rd-24th, 2009 at Tokyo), (ii) The COAST/CORAL Autumn School on Advanced Intense Laser Science (November 20th - 22nd at Tokyo), (iii) The 7th International Symposium on Ultrafast Intense Laser Science (November 24th – 28th, 2008 at Kyoto; Co-chairs: Andre Bandrauk, Gustav Gerber and Kaoru Yamanouchi)

### **Researcher Exchanges**

For activating joint projects among the member researchers in the Core-to-Core network, exchanges of young researchers will be encouraged. Such exchanges of young researchers are now being planned between Prof. Yamanouchi's group and Prof. S.L.Chin's group, between Prof. Yamanouchi's group and Prof. F. Faisal's group, between Prof. Yamanouchi's group and Prof. M. Nisoli's group, and between Prof. Nishimura's group and Prof. Batani's group.