

**JSPS Core-to-Core Program**  
**FY2007 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	The University of Tokyo	
	Co-Chair (name and title)	Kaoru YAMANOUCHI • Professor	
	Cooperating Institutions	RIKEN, TITech, JAEA, Tohoku Univ., Osaka City Univ., Ritsumeikan Univ., ISSP Univ. of Tokyo, IMS, Keio Univ., Osaka Univ., NTT Basic Research Lab., Kyoto Univ., Univ. of Tsukuba	Number of Cooperating Institutions
			13

**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, CEA, Paul Sabatier Univ., CELIA	Number of Cooperating Institutions
			4

Germany	<b>Core Institution</b>	Friedrich-Schiller-University Jena	
	<b>Co-Chair (name and title)</b>	Gerhard G. PAULUS • Professor	
	<b>Cooperating Institutions</b>	Friedrich-schiller-Universitaet Jena, University Bielefeld, MPI for Quantum Optics, MBI for Nonlinear Optics and Short Pulse Spectroscopy, MPI for Nuclear Physics, MPI for Physics of Complex Systems, MBI for Nonlinear Optics and Short Pulse Spectroscopy	<b>Number of Cooperating Institutions</b>
			6
Italy	<b>Core Institution</b>	University of Palermo	
	<b>Co-Chair (name and title)</b>	Gaetano FERRANTE • Professor	
	<b>Cooperating Institutions</b>	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	<b>Number of Cooperating Institutions</b>
			7
U.K.	<b>Core Institution</b>	University of Strathclyde	
	<b>Co-Chair (name and title)</b>	Kenneth LEDINGHAM • Professor (William Penny Professor of Laser Induced Nuclear Physics)	
	<b>Cooperating Institutions</b>	Rutherford Appleton Lab., Blackett Lab. Imperial College London, Univ. of Reading	<b>Number of Cooperating Institutions</b>
			3
U.S.A.	<b>Core Institution</b>	Temple University	
	<b>Co-Chair (name and title)</b>	Robert LEVIS • Professor	
	<b>Cooperating Institutions</b>	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.	<b>Number of Cooperating Institutions</b>
			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 for the first two years, 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 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, and the Volume II was published in March 2007.

## Summary of FY 2007 Exchange Plan

### **Joint Research**

Collaborations are now in progress between Prof. Kaoru Yamanouchi (Univ. Tokyo) and Prof. See Leang Chin (Laval University) on the application of filamentation processes induced by intense laser fields, between Prof. Kaoru Yamanouchi (Univ. Tokyo) and Prof. Farhad Faisal on Theoretical and experimental studies on molecular dynamics in intense laser fields, between Prof. Ohmori and Prof. Robert Levis (Temple Univ., US) on Closed loop control of molecular dynamics with attosecond quantum-phase manipulation, between Prof. Hiroaki Nishimura (Osaka University) and Dimitri Batani (Univ. Milano, Bicocca) on X-ray spectroscopic study of intense-laser-produced plasma and between Prof. Hirohiko Kono (Univ. Tohoku) and Prof. Ingolf V. Hertel (Max-Born Inst.) on Investigation of Nonadiabatic Dynamics of C60 in Intense Laser Fields. A joint project is now being planned between Prof. Kaoru Yamanouchi (Univ. Tokyo) and Prof. Ferenc Krausz (Max-Planck Inst.) on Attosecond probing of ultrafast hydrogen atom migration in molecules in intense laser fields.

### **Seminar**

The following international gatherings are now being planned: (i) International Symposium on Molecular Science of Ultrafast Electronic Dynamics (May 18th -19th, 2007 at Sendai), (ii) COAST One-day Symposium on Ultrafast Intense Laser Science 3 (May 17th, 2007 at Tokyo) (iii) The 2nd COAST autumn school on ultrafast Intense laser science (September to November, 2007 at Tokyo), (iv) The 6th International Symposium on Ultrafast Intense Laser Science (September. 23rd – 27th, 2007 at Pisa, Italy; Cochairs: A. Giulietti, K. Ledingham, and K.Yamanouchi), and (v) COST-COAST Symposium on Ultrafast Intense Laser Science (March , 2008 at Milano; Co-chairs: D.Batani and K.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 researcher exchanges 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. Nishimura's group and Prof. Batani's group, and between Prof. Kono's group and Prof. Hertel's group.