

France	Core Institution	Ecole Polytechnique (CNRS)	
	Co-Chair (name and title)	Laboratoire pour l'Utilisation des Lasers Intenses (LULI) · Senior Scientist · Michel Koenig	
	Cooperating Institutions	Uniersite Pierre et Marie Curie Commissariat Energie Atomique CEA/DAM Île-de-France, Bruyères-le-Châtel Observatoire de Paris-Meudon Laboratoire pour l'Application des Lasers de Puissance (CNRS) ENSMA University of Bordeaux 1	Number of Cooperating Institutions 7

U.S	Core Institution	University of California San Diego	
	Co-Chair (name and title)	Engineering science · Associate Professor · Farhat Beg	
	Cooperating Institutions	University of California, Berkeley Ohio State University Princeton University University of Texas, Austin Lawrence Berkeley National Laboratory Lawrence Livermore National Laboratory Sandia National Laboratory University of Michigan Rice University University of Rochester University of Nevada, Reno General Atomics Purdue University University of Maryland	Number of Cooperating Institutions 14

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

Recent progress of high power laser technologies enables us to access high energy density conditions, which have been never realized before. This high energy density condition is defined as an extreme condition having an enormously greater amount of energy density than the conventional physics studies (e.g. solid state physics, material sciences, and hydrodynamics) have dealt with. The purpose of this project is establishing an international research and an educational network to pursue the high energy density science.

Making the best use of achievements through 2-years-“Integrated Action Initiative”, we will strategically pioneer the high energy density sciences as new domains of interdisciplinary research. The expeditions are made by applying focused and cross-sectional approaches to the following five categories: a) Relativistic Plasma Physics, b) High Pressure Condensed Matter, c) Warm Dense Matter, d) Laboratory Astro Physics, e) Plasma Photonics. The ICHEDS should play a role of one of “the global core centers” in the area of high energy density science, powered by virtual center capabilities to exchange related information and form a network of the next-generation researchers in order to enable joint use of high-power laser facilities all over the world.

Results to the present

Under the project “International Collaboration for High Energy Density Science (ICHEDS)” supported by JSPS Core-to-Core Program, we have strategically explored the high energy density sciences. The expeditions were made by applying focused and cross-sectional approaches to the following five categories: a) Relativistic Plasma Physics, b) High Pressure Condensed Matter, c) Warm Dense Matter, d) Laboratory Astro Physics, e) Plasma Photonics. Joint researches have been made by using high-power laser facilities all over the world under this program. The ICHEDS has played a role of one of “the global core centers” in the area of high energy density science, powered by virtual center capabilities to exchange related information and form a network of the next-generation researchers.

Joint Research

13 in 2007, 20 in 2008 joint researches and experiments were carried out at the Institutions in the world under the core to core program support.

Seminar

We held following 5 seminars, governing about 255 researchers and students in 2008, some events are held as series of some of four 2007 seminars.

- 1) "Seminar on Relativistic Plasma Physics in High Energy Density Science", September 14-15, 2007, Beppu, Japan
- 2) "Japan-France Workshop on High Density Energy Science", October 9-10, 2008, Tokyo, Japan
- 3) "The 2nd Japan-UK workshop on High Energy Density Science", December 15-16, London, UK
- 4) "The 2nd International Symposium on Laser-Driven Relativistic Plasmas Applied to Science, Industry and Medicine", January 19-23, Kyoto, Japan
- 5) "International Workshop on Warm Dense Matter", March 16-19, Hakone, Japan

Researcher Exchanges

Young researchers (doctoral course graduate student etc.) went to Rutherford Appleton Laboratory, York University in UK, and LULI in France, Michigan University, US and others.

Though these researches, seminars, and researcher exchanges, we dispatch 38 researchers to our partner countries as much as 41 researchers in 2007 academic year.

Summary of FY 2009 Exchange Plan

Joint Research

Using effectively and systematically ultra intense lasers and high power lasers in Japan, in USA, at Rutherford Appleton Laboratory in UK, and at LULI in France, we will advance the joint research. Moreover, as for the calculation code in each country, we would like to develop common code for effective and efficient research. In our project, we will make joint research with the condition of joining young scientists and doctoral course graduate students.

Seminar

We are planning 5 workshops related to U.K., France, and U.S. Three will be held in Japan, the others in US and France.

- 1) "Workshop on High Energy Density Plasmas", San Francisco, US
- 2) "US-Japan Workshop on High Energy Density Plasmas", Atlanta, US
- 3) "The 3rd Japan-UK workshop on High Energy Density Science", Osaka, Japan
- 4) "Winter School on High Energy Density Science", Osaka, Japan
- 5) "The 3rd Workshop on High Energy Density Plasmas", Nara, Japan
- 6) "The 2nd France-Japan Workshop and Winter School on High Energy Density Plasmas", Aussoir, France

Researcher Exchanges

Researcher exchange will be performed through the dispatch for the above-mentioned joint research and seminar participation. Especially joint experiments are expected to encourage on-site level exchange by participation of young researchers and doctoral course graduate students. Moreover, young researchers (doctoral course graduate students) will be dispatched to Oxford University in UK, LULI in France, and etc. for few months (Young humane resources). For giving the opportunity of attending the international meeting and standing at the stage of presentation, young researchers (doctoral course graduate student etc.) will be dispatched to the 36th European Physical Society (EPS) conferences on Plasma Physics (June 29 - July 3, 2009, Sofia, Bulgaria), Washington DC., US), Inertial Fusion Sciences and Applications (September 6 – 11, 2009, San Francisco, US), and 51st Annual Meeting of the APS Division of Plasma Physics (November 2-6, 2009, Atlanta, US). Furthermore, Japanese coordinator is going to core and main cooperating institutions in Europe, and U.S. to discuss and start the action for strategical international relationship.

Besides these plans, As Young humane resources' event, young scientists, mainly graduate students will be dispatched to a jointly held winter school (March, 2010, France).