ENSEMBLE

Volume 3 (2) | March-April 2015

Newsletter of the Indo-French Centre for the Promotion of Advanced Research

CEFIPRA

Enriching Indo-French Intellectual Property

editor's note

Dr. Debapriya Dutta
Director, CEFIPRA

The emergence of globalization and constant technology changes are steadily transferring our society, making it more knowledge intensive than ever. The underlying basis of knowledge as a source of productivity gain and competitiveness has established the important role of Intellectual Property generation and management in economic development of a country. CEFIPRA's support across the knowledge innovation chain is producing the intellectual property through the network capital of Indian and French scientists nurtured over years in alignment with the Intellectual Property regimes of the two nations.

In this edition, we have presented examples of CEFIPRA's endeavor to nurture the intellectual capital between the two nations through various ways. In our collaborative research programme there is an increasing trend of supporting projects in applied research which is now 71% of the total supported projects over the last 5 years. One of such excellent projects, which has shown the commercial worthiness of the knowledge generated through it, has been reported. Public Private Partnerships (PPP) has recently emerged as an important conduit of knowledge to product transformation pathways. One of our PPP initiatives in Health Technology has been highlighted in this edition. We have also taken initiative to forward chain the Intellectual Property generated through some of the supported projects in collaboration with investor communities. CEFIPRA's Intellectual Property Management guideline which is the only such bilateral guideline between India and France has appropriately been updated to make it relevant. Also, our Industry-Academia Research and Development Programme has recently been revamped to improve its effectiveness in converting knowledge to products.

We thank the Governing Body of CEFIPRA to provide forward looking directions in its 28th meeting held at Paris!

I wish you a Happy Summer ahead!

Je vous souhaite un bon été avance!

inside

Editor-in-Chief
Debapriya Dutta
Director, CEFIPRA

Editorial Consultant
Manoj Dabas

Content Manager
Tarun Ghawana

Layout Design and DTP
Pramod Jha
Rahul Nautiyal

Design, Production and Circulation
Communication & Outreach Division
AFE Consultants Private Limited
Aravali House, 431/D-22, Chhatarpur Hills
New Delhi-110074, India

Published and Printed by :
V.V. Rao on behalf of CEFIPRA from
5B, India Habitat Centre
Lodhi Road, New Delhi-110 003
INDIA

leader

Indo-French Intellectual Property Regime & Role of CEFIPRA

Intellectual Property (IP) reflects the idea that its subject matter is the product of the mind of intellect. IP is the foundation of knowledge-based economy. It pervades all sectors of economy and is increasingly becoming important for ensuring competitiveness of the enterprises.

The IPR framework in India is stable and well established from a legal, judicial and administrative point of view and is fully compliant with the Agreement on Trade-Related Aspects of Intellectual Property Rights. A patent is granted for a uniform period of 20 years from the filing date of the patent application for inventions in all fields of technology and it is a territorial right. Simplified procedure for filing, E-filing facilities and incentives for SMEs are some of the other initiatives in the area of intellectual property rights in India. In the Ministry of Commerce and Industry, the office of the 'Controller General of Patents, Designs and Trade Marks (CGPDTM)' has been set up under the Department of Industrial Policy and Promotion (DIPP). Filing and processing of patent applications viz., examination, grant and post–grant proceedings are carried out at all the four Patent Office locations independently through a virtual network system which links all four Patent Offices; however, there is only one Virtual Patent Office for the purpose of grant of patents.

India became a member of World Intellectual Property Organization (WIPO) in 1975. India has been a member of the World Trade Organisation (WTO) since 1995. All Indian IP related laws are WIPO and Trade-Related Aspects of Intellectual Property Rights (TRIPS) compliant and the Government has taken a comprehensive set of initiatives to streamline the intellectual property administration in the country in view of its strategic significance. The Indian Patent Office has been recognized as an International Searching Authority and an International Preliminary Examining Authority (ISA/IPEA) by World Intellectual Property Organization in October, 2007 under the Patent Cooperation Treaty, and has operationalised the status since 15th October, 2013, thus joining an elite group of 17 countries. Various types of IPR in India are Patent, Design, Trademark, Geographical Indications, Copyright, Plant Variety Protection, Semiconductor Integrated Circuits Layout-Design.

French Intellectual Property Code (IPC) was amended in 2006. The French Intellectual Property Code is made up

of five parts divided into 52 sections. Intellectual property rights in France comprise artistic and creative rights but also industrial property such as designs, patents and trademarks.

The Intellectual Property Code in France is harmonized with the international agreements regulating the protection of intellectual work. France has signed the Berne Convention for the Protection of Literary and Artistic Works, the Universal Copyright Convention of Geneva; it has also adhered to the World Intellectual Property Organization and, as an EU member state, France abides by the European Union's Directives related to intellectual protection. The main regulatory body for the protection of copyrights in France is the National Institute of Industrial Property (INPI).

In France, IP is a growing discipline, because of its strategic vocation in the competitiveness of companies and research centres. However, it is confronted with a strong growth in intellectual property rights filed abroad. France has been a member of the World Intellectual Property Organization (WIPO) since 1974. Within this forum, the Ministry of Foreign Affairs defends French interests and advocates for a balanced approach, as the intellectual property system needs to encourage innovation and creation without penalizing development in poorer countries.

The European patent takes effect automatically in France, regardless of the language of filing, if the grant was published in the European Patent Bulletin after May 1st, 2008. It is not necessary to provide a translation into French. The patent is then valid in France for a period of 20 years from the date of filing the application for a European patent, for an annual fee of EUR 36.

Role of CEFIPRA

Recognizing the importance of laying down guidelines for protecting intellectual property (IP) resulting from collaborative research work carried out in the frame work of CEFIPRA project, an Indo-French working Group was constituted by the Governing Body in 1993. IP guidelines of CEFIPRA had been laid down with the objective of protecting the outputs of the scientific and technical cooperation between the collaborators of the two countries. Since 2002, apart from strengthening support in the cutting edge scientific areas, the centre also started to support Academia- industry linkages through Industrial Research Programme of CEFIPRA. Recognizing the involvement of industry under CEFIPRA programme & changing Scenario internationally (Patent Convention Treaty signed in Paris in December, 1998), the guidelines were further revised by an Indo-French Joint IPR Review Committee in 2002. Recently, CEFIPRA has revised the IPR Guidelines under the supervision of a committee of experts constituted in the year 2014. The committee met twice and recommended the following modifications in the current IPR guidelines of CEFIPRA:

- The clause of sharing of 25% of the royalties generated for CEFIPRA should be removed.
- Separate model agreements should be developed for the Scientific and Industrial Research programmes.
- CEFIPRA will not provide financial support for the filling of IP generated from the collaborative projects.
- Commercialization aspect of IPR and sublicensing of IPR should be included in the revised guidelines.

CEFIPRA supported projects have resulted in 18 patents in different domains which can have market benefits for both the countries as well as can benefit the global society. These patents include inventions useful for the preparation of Silicon based thin film solar cells, for synthesis of side chain liquid crystalline polymer for non-linear optical applications, for high performance applications such as pump housings, gears, impellers etc.

Understanding Taylor Bubble Flows

Micro Two-phase Flows

Fundamental understanding of Taylor bubble/slug flows has been lacking in mini/micro channel geometries under different phase-change processes and flow conditions. The captioned project supported by CEFIPRA is aimed at understanding the thermo-hydrodynamic transport and response of Taylor bubble/Taylor slug flows under specific boundary conditions and its effect on thermo-fluidic transport coefficients.

Whenever a gas/vapor flows together with a liquid phase, in a confined closed geometry, such as a small pipe or capillary tube (for example, a thin hollow tube of paper or plastic used for sucking soft/aerated drink from a glass or a bottle), depending on the quantity of each phase (gas or liquid), various flow patterns are possible in the pipe. For example, flow can have small gas bubbles trapped in the liquid phase, which is called as bubbly flow. The central portion of the pipe may be completely occupied with the gas/vapor, which is called as 'Annular flow'.

Slug flow is also one of the important flow patterns, which belongs to a class of intermittent flows. Taylor bubble flow, a sub-set of slug flows, is characterized by a sequence of long bubbles, which are trapped in between liquid-slugs as shown in Figure 1. In general, when such a flow takes place, there are a series of alternating Taylor bubbles, trapping Taylor liquid plugs, in between them.

Typically, in mini-/micro-scale systems, when surface tension dominates over gravitational body force, Taylor bubbles adopt the characteristic capsular shape, with a thin liquid film separating the gas/vapor phase from the wall. Such Taylor bubble-train flows in confined mini/micro-scale geometries have singular distinctive local thermo-hydrodynamic transport features. This is due to their intermittent nature, dominance of surface tension, interfacial dynamics, geometrically confined bubbles, effect of local wettability under some conditions, resulting in enhanced heat/mass transport.

Understanding of the species transport under such a flow configuration is quite a challenging problem. In recent

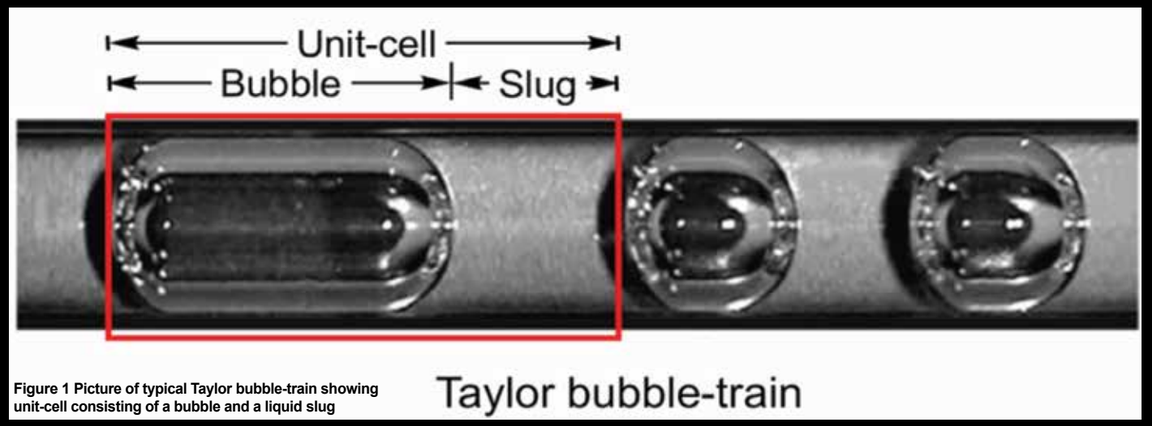


Figure 1 Picture of typical Taylor bubble-train showing unit-cell consisting of a bubble and a liquid slug

years, research on Taylor bubble train flow has increased due to development of mini-/micro scale systems in diverse branches wherein such flows are encountered such as, ranging from bio-medical, bio-chemical to thermal management of electronics, water management of fuel cells, micro-two-phase heat/mass exchangers and reactors, nuclear rod bundles, DNA separation and analysis, lab-on-chips, micro-fluidic devices, loop heat pipes, etc. In all the above emerging technologies, Taylor bubble train flow is one of the dominant flow patterns. Presence of quasi-periodic slipping bubble interfaces, in front and back of the liquid slugs, modifies the flow field inside the liquid slugs compared with conventional single-phase flows.

The Problem

Fundamental under-standing of Taylor bubble/slug flows has been lacking in mini-/ micro channel geometries, such as small dimension tubes, capillary tubes, confined geometries such as plate heat exchangers etc. under different phase-change processes (boiling, condensation or evaporation) and flow conditions (steady/oscillating flows)

The Objectives

The project supported by CEFIPRA aimed at understanding thermo- hydrodynamic transport and response of Taylor bubble/Taylor slug flows under specific boundary conditions and its subsequent effect on thermo-fluidic transport coefficients by using High Speed Videography (HSV), Infra-red thermography (IRT) and Particle Image Velocimetry (PIV). More precisely, the objectives of the project were to study thermo-hydrodynamics of phase-change induced/ oscillating Taylor bubble flows in mini-micro channels under various boundary conditions, viz.:

- Mini-Micro Channels (typical hydraulic diameter range from 500 µm to 3 mm).
- Adiabatic (non-heating) as well as diabatic (heating) conditions.
- Controlled oscillations of Taylor bubbles or uncontrolled oscillations of Taylor bubbles (e.g. phase-change induced thermal driven self-excited auto-oscillations).
- Various fluid/solid combinations, the most important being transparent material for a proper observation of the thermo-hydrodynamic phenomena.

The Work

As planned and proposed, specialized and dedicated range of experiments were conducted at CETHIL-INSA Lyon and IIT Kanpur, incorporating High Speed Videography (HSV), Particle Image Velocimetry (PIV) and Infra-Red Thermography (IRT), with a clear focus on understanding the local thermo-hydrodynamics of Taylor bubbles and Taylor Slugs. While CETHIL focused on generating self-sustained thermally driven two-phase oscillations, complementary and supporting experiments for discerning the local transport by PIV and IRT were done on non-boiling two-phase systems, both adiabatic (non-heated)/ diabatic (under heated condition) and oscillating/non-oscillating Taylor flows at IIT Kanpur.

The work involves design and development of specialized experiments in which Taylor flow conditions are developed under different operating conditions, as useful to the industrial needs. These experiments are designed to decipher the flow velocities, heat transfer and to visualize the flow patterns which come during the flow. We measure these quantities mostly by optical means wherein digital data obtained from the experiments need to be suitably post-processed.

The Scientific Outcomes

The systematic experimental study of Taylor slugs and bubbles, along with basic modelling of the associated thermal-fluidic transport has resulted in the following major outcomes:

- Establishment of a self-sustained and autonomous, thermally driven oscillating two-phase system, and discerning the complex operating thermo-physics of this unique system (which represents a 'unit-cell' of a pulsating heat pipe device), is one of the distinct achievements of the project.
- Discerning the critical role of wetting dynamics on the overall pressure drop and local heat transfer is another achievement.
- A more improved, comprehensive next generation mathematical model of a pulsating heat pipe device is one of the most tangible outputs which will emerge out of the results of the present study. The data is extremely useful for researchers involved in modelling pulsating heat pipes.
- The study provides valuable inputs for the fundamental process of evaporation during motion of Taylor slugs inside capillary tubes, both under steady and oscillatory motion. Such systems are common on Lab-on-chip devices, PEM fuel cell water management, Bio-fluid mechanical systems, Microelectronics cooling, Loop heat pipes, Refrigeration systems, etc.
- The fact that Taylor bubbles are useful for local enhancement of heat transfer (and therefore mass transfer also) only under specific boundary conditions is also an important result which has implications in the design of enhanced heat and mass transfer equipment.

In addition to technical achievements, the project has helped strengthen the professional relationships, not only amongst the research partners, but also between the two institutes, INSA-Lyon and IIT-Kanpur. It has opened a channel for French students doing their Diploma at INSA to do semester research internship at IIT Kanpur and vice versa. One of the researchers associated with the project (Dr.Balkrishna Mehta from IITK) has been offered a post-doctoral fellowship at Institute P-Prime, at Poitiers, France to work on further development of Pulsating Heat Pipes.

Excellent partnership and professional working chemistry between the research partners have seeded the idea of a follow-up project, along with two industrial partners Thales avionics, France (end users of heat pipes) and Golden Star Services Pvt. Ltd., India (manufacturers of heat pipes) for exploring the possibility of joint development of Pulsating Heat Pipes (PHPs) and Loop Heat Pipes (LHPs).

Both participating laboratories have been invited by the European Space Agency to participate in the international topical team on pulsating heat pipes aimed at experiments on the International Space Station in 2017-2018.

Potential for Knowledge Forward Chaining

The results generated via the execution of this project are of fundamental nature. Their implication are in many fields of engineering, especially dealing with single-phase as well as two-phase flow in micro-mini channels, micro heat pipes, pulsating heat pipes and loop heat pipes. The results are specifically useful for the development of comprehensive models for Pulsating Heat Pipe and understanding the flow in the condenser sub-section of Loop Heat Pipes. No existing mathematical model for describing the thermo-hydrodynamics of pulsating heat pipe includes information that has been generated in the project. Specifically, pressure drop model for liquid slugs, role of thin liquid film, meta-stable states, wetting dynamics of liquid slugs, role of oscillations on the boundary layers, use of Taylor's theory for finding the rate of evaporation, and limitations of ideal gas equation in the two-phase evaporation/condensation process are some of the prominent results which must be included in the next generation of PHP models for efficient prediction of performance.

Project Team

Sameer Khandekar
Professor
Department of Mechanical Engineering
Indian Institute of Technology, Kanpur
Kanpur 208016 India

P. K. Panigrahi
Professor and Head
Department of Mechanical Engineering
Indian Institute of Technology, Kanpur
Kanpur 208016 India

Jocelyn Bonjour
Professor and Director - CETHIL
Bât. Sadi Carnot INSA de Lyon, 20 av. Albert Einstein 69621
VILLEURBANNE Cedex France

Frédéric Lefevre
Professor and Head - Department of Energy and Environmental Sciences
Bât. Sadi Carnot, INSA de Lyon 69621
VILLEURBANNE Cedex France

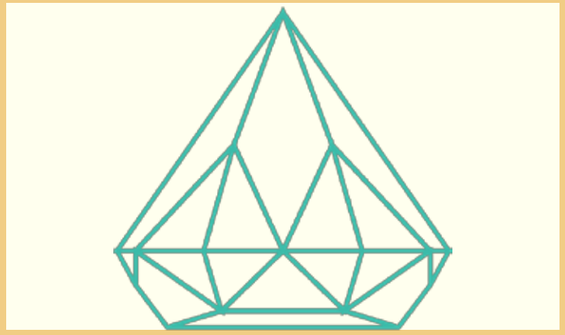
Market Access to Research Products of CEFIPRA

Covering the last Mile

CEFIPRA, over its journey of more than 25 years, has contributed through various activities to the science and technology ecosystem in India and France. CEFIPRA is thankful for cooperation by scientific community of India and France in this journey.

Recently, CEFIPRA has expanded its mandate with a new focus on knowledge forward chain. In this endeavour, CEFIPRA is taking different measures. One of these measures is collaborating with “Hello Tomorrow”, which is a non-profit organization founded in 2011 by Xavier Duporter and Amaud De La Tour. The organization aims at creating bridges between scientists, investors and entrepreneurs in all major technological fields.

CEFIPRA, with the help of this NGO, aims to showcase the research products/technologies, which have the potential to get commercialized, to the investors. In this regard, CEFIPRA is facilitating a meeting of the collaborators of these research products/technologies with potential investors through Hello Tomorrow. For this purpose, collaborators are requested to make presentations discussing about the core technology developed, problems their technology can solve, the potential size of the market for each of the problem, the team and requirements to enable the access for the technology to the market.



Some of these technologies, which are at different stages of development, are related to nitrate removal from the water, fly ash reclamation, modification of wastes having potential for other applications such as odour treatment and in the energy sector, drugs against malaria, neurodegenerative disorders treatment, detection of renal failure etc.

CEFIPRA is making efforts to identify more such research products so as to create market opportunities for such products. The Centre looks forward to the success of such events in the form of meaningful collaborations.

PPP Initiatives

BIRAC-CEFIPRA-bpifrance Technology Programme in Health Sector

bpifrance- A PUBLIC INVESTMENT BANK

bpifrance is a public sector financial institution from France which provides assistance and financial support to small and medium-sized enterprises, facilitating access to banks and equity capital investors, in particular during the high-risk phases: Start-up, Innovation, Development, and International Buy out.

bpifrance supports SMEs through a decentralised network of 37 regional offices in France, having a direct contact with the entrepreneurs and their partners. Local level decision making is an important characteristic of this support. Companies are supported through innovation funding, bank guarantees, investment and operational cycle funding and equity investment. Companies are also supported in exporting their products through a specific arm ‘bpifrance Export’.

At the international level, bpifrance has agreements covering innovation activities with several countries: Brazil, Canada, Russia, India, China, Israel, Japan and Korea.

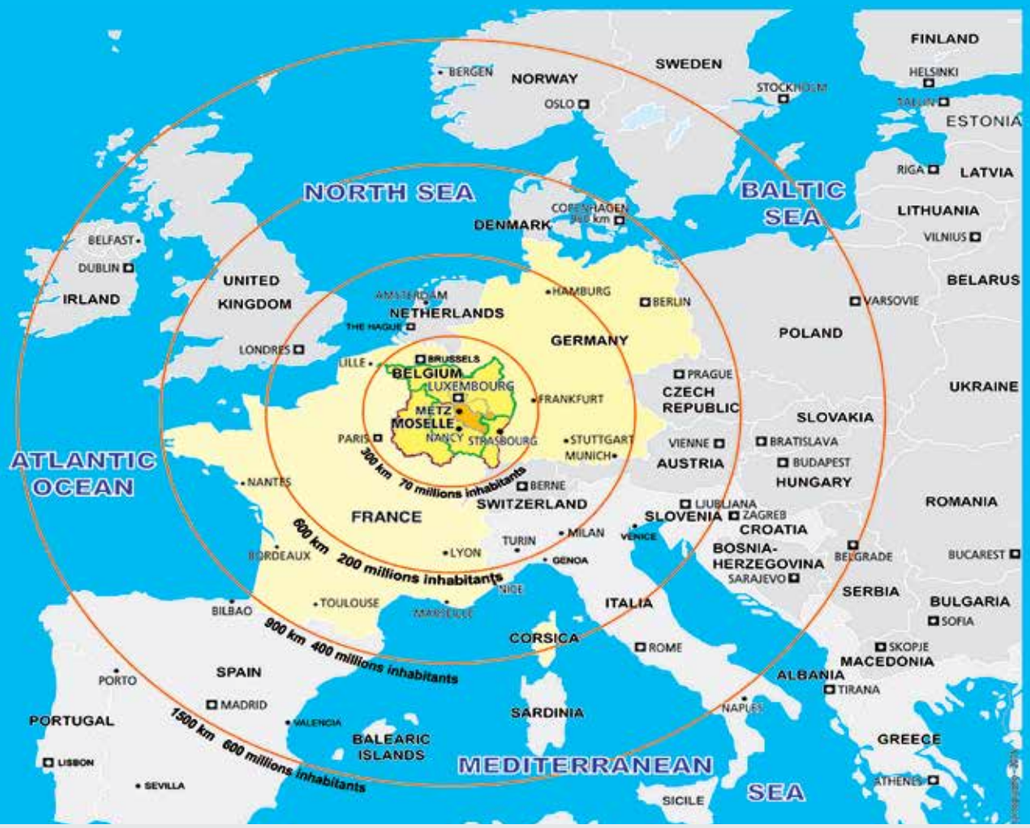
INDO-FRENCH HEALTH TECHNOLOGY PROGRAMME

CEFIPRA has expanded its activity by bringing bpifrance as a new stakeholder and launched the Indo-French Health technology programme in association with bpifrance and BIRAC in the area of red biotechnology upto pre-commercialization. Under this programme, bpifrance is handling the programme in French side and will also provide support to the French SME/ Startup. BIRAC will provide support to the Indian Collaborators through CEFIPRA. On behalf of BIRAC, CEFIPRA manages the implementation of programme on Indian side and coordinates between BIRAC & bpifrance.

This programme will focus on the development of industrial application oriented health technologies in the specific priority areas of both the countries ie cancer, cardiac and infectious diseases on the following themes:

- Identification of new targets or biomarkers.
- Development of new therapeutic.
- Affordable process development for existing therapeutics having potential implication on effective industrial scale-up for cost effective production.

Maximum 3-5 projects will be supported each year under this programme from proof of concept to pilot scaling.



Official inauguration of EITS 2014 in Metz in December 2014: Mr Philippe LEROY, President of Moselle Development Agency; HE Mr Arun Kumar SINGH, Ambassador of India in France; Mr Patrick WEITEN, President of Moselle Department Council

MOSELLE, TERRITORY OF EUROPE

Open to the world and to the future

Thierry Petry
Business Development Officer (India, Japan)

Located in Lorrain region in north eastern France, Moselle Department is located at the confluence of two major economies and markets of Western Europe namely, France & Germany. Moselle is well placed to provide quick & direct access to a market of 150 million consumers within a 600 km radius. With its capital in the city of Metz, Moselle has its unique franco-german particularism (geographic, cultural & linguistic proximity) and is one of the major actors of the **European Valley for Energy & Materials**, with strong identified competences.

With its vibrant industrial tradition and strengths in important sectors like automotives, railways, logistics, Moselle is an important hub in the flow of goods, services and human resources in a very dynamic economic landscape.

Understandably, the Moselle Department seeks to be identified as an important entry point for Indian companies and businesses targetting the European market.

In pursuit of this goal, the Moselle Development Agency (MDA) has been very active in India since 2009 through Corporate Catalysts India (CCI), its representation office in New Delhi. Its mandate is to promote Moselle, and the unique business opportunities it offers, amongst Indian companies interested in expanding business operations in Europe.

Way back in 2009, MDA recognised the absence of an iterative business event having the scale and stature to pull in relevant stakeholders, resulting in a sub optimal harnessing of business potential between India and Europe.

To fill this gap, MDA proposed **Euro India Transportation Systems (EITS)**, the first Euro-India business convention on transportation systems as it corresponded well with one of the main competences of the Moselle Department, the Great Region and even the two major West European markets which are France and Germany. As a business convention, **EITS** enables positioning of the Moselle as a preferred destination on the India-Europe business map.

MDA launched EITS in year 2009 which targeted sectors like transportation systems, automotives, railways, airways, waterways, bus, trucks and was a significant success.

Euro India Transportation Systems 2014
Highlights

- 289 participants
- 192 companies/agencies
- 157 B2B meetings organised in advance
- 10 countries represented
- 32 corporate presentations
- 12 technical talks
- 41 stands (exhibitors + sponsors + car manufacturers).

Second edition of EITS was organised in 9-10 December 2014 at the Technology Campus in Metz illustrating the development strategy of a European Valley specialising in Energy and Materials.

EITS 2014 attracted as many as 300 participants from diverse sectors and institutions seeking to identify new commercial opportunities, discovering novel technological solutions, promote technological knowledge and to meet potential partners. Focusing on sectors in constant evolution and source of major innovations, EITS 2014 has enabled several new economic and technological relationships which could lead in the medium/long term, to the emergence of innovative products or processes.

In addition to B2B meetings, EITS arranged technical talks, pitches and exhibition spaces. It was inaugurated by the Indian Ambassador to France HE Shri. Arun Kumar Singh, with Mr. Patrick Weiten, President of Moselle “County Council” and Philippe Leroy, President of Moselle Development Agency. An initial round table on business opportunities between Europe and India attracted more than 100 people to hear the views of the Ambassador Shri. Arun Kumar Singh, Jean-Joseph Boillot, economist, co-founder of EIEBG (Euro India Economic & Business

Group) and author of numerous books such as “India for Dummies” and Dirk Matter, Director of the German-Indian Chamber of Commerce and Industry in Germany.

There was an amazing evening at TCRM-BLIDA, a third place encouraging creativity, production, artistry/ innovation and the digital sector, at the invitation of Metz Métropole Développement.

More than 10 countries from three continents (India, Germany, Italy, Japan, Switzerland, Luxembourg, Ivory Coast, Belgium, Finland and France) were represented in EITS 2014.

Moselle-India Connections

Indian connection with Moselle is gathering strength. The metro rail systems of the cities of Chennaï and Hyderabad are equipped with rails made in Hayange in Moselle. Major international companies located in Moselle also have a presence in India. These include Cryolor/Air Liquide, Lapp, Grundfos, Schneider, Viessmann, Thyssenkrupp.

Cryolor (Air Liquide group), located in Moselle, has set up a plant employing 100 people in Chennaï in Tamil Nadu (Cryolor Asia Pacific) to produce vessels for industrial gases. This development was remarkable as it entailed technology transfer (welding techniques). The company is also discharging its Corporate Social Responsibility through proactive employment of young women facing social stresses.

Ecole Centrale Supelec, an engineering school, located on Metz technological campus, has established a campus in Hyderabad in India in collaboration with Indian corporate house Mahindra & Mahindra.

It can be hoped that as a result of the EITS initiative of the MDA, the Indian presence in the Moselle Department will see significant enhancement in the times to come giving more vibrancy and facility to Indian entrepreneurs seeking to deepen their roots in France in particular and European Union in general. ●

For further information on Moselle
In India: Mr Sateesh KULKARNI (CCI): sateesh.kulkarni@cci.in | In Europe: Mr Thierry PETRY (MDA): tpetry@cg57.fr

CEFIPRA GUIDELINES FOR INTELLECTUAL PROPERTY RIGHTS

In all fairness

Having a transparent and fair mechanism to manage and secure intellectual property arising out of joint research and development efforts is an important condition for fostering vibrant and productive collaborative efforts.

CEFIPRA recognised the need to codify guidelines in this context well ahead in time.

The Centre was established in 1987 with the support from the Department of Science & Technology, Government of India and the Ministry of Foreign Affairs, Government of France. The governments of both the countries have wished that the rights of the intellectual property resulting from the joint research should be duly protected. Accordingly these guidelines have been laid down with the objective of developing the scientific and technical cooperation between the collaborators of the two countries.

Collaborative projects supported under Collaborative Scientific Research programme and Industry- Academia Research & Development Programme of CEFIPRA & jointly implemented by the French and the Indian partners.

Before starting the project, the partners shall jointly prepare an Intellectual Property Management Plan and submit it to CEFIPRA after duly signed by the all the partners & head of all the institutes / industries. The Intellectual property Management Plan may be jointly modified later if needed. Each partner shall be free to determine the sharing of the rights, interest and royalties as well as the liabilities between itself and its employees as per the legislation and practices applicable to the said partner.

Recently, CEFIPRA has revised the IPR Guidelines under the supervision of a committee of experts. These guidelines have been approved in the latest meeting of the Governing Body.

SCOPE AND OBJECTIVES

- These guidelines are applicable to the intellectual property arising from the collaborative research projects supported by CEFIPRA and jointly carried out by the partners.
- These guidelines define the modalities of protecting and exploiting the intellectual property and allocating the rights, interests and royalties among the partners.
- The partners are bound by the provisions of these Guidelines.
- The Agreement for Intellectual Property Management Plan for Collaborative Scientific Research programme and Industry- Academia Research & Development Programme shall be based on the provisions of this Guideline.

Some of the major highlights of the revised guidelines are as follows:

- The rights of intellectual property arising from the collaborative project shall be in principle, the joint property of the partners.
- The first application for securing the rights of the Intellectual Property, particularly for the patents should preferably be made under the procedure of the Patent Cooperation Treaty (PCT), to get the benefit

of the period described therein, during which the priority is protected in the member countries of the PCT.

- In the event that one partner cannot or does not wish to file application, the other partner will give him in return a non-exclusive, irrevocable, royalty-free license.
- The partner shall take all necessary steps for the commercial exploitation of the rights obtained, to the fullest possible extent that is reasonably practicable, without undue delay. They shall jointly determine the modalities of commercialization of the intellectual property protected in the concerned countries.
- The partner(s) shall include in the terms and conditions of commercialization provision for making available the IP protected products to the public at reasonably affordable cost taking care of the legitimate interest of the person commercializing the protected IP.
- The net revenue earned through the commercial exploitation of the rights of the intellectual property shall be shared among the partners. In some cases any profit made by each partner in its territory of exclusive rights belongs to the partner who obtained these profits. However everything could be stated in the management Plan.
- The partners shall decide on a list of the countries where they intend seeking protection of the rights of intellectual property.
- Each of the partners has the right to publish the results emanating from the programme. However, before such publication (s), the partners shall ensure in consultation amongst themselves that no rights are compromised.
- The partners shall try to resolve any dispute regarding the rights of intellectual property arising from the programme through mutual discussion. If they fail to reach the agreement, the head of the institute (s) / Industries (S) should be involved to resolve the problem. If they fail to reach an agreement, the dispute shall be referred to the two co-chairmen of the Governing Body of CEFIPRA for settlement. If no settlement out of the court is possible, the applicant shall ask for the settlement of the dispute before an arbitrate court such as the International Chamber of Commerce. Partners should agree upon and should be clearly mention in the Intellectual property Management Plan by an arbitration clause. ●

Revising the Industrial Research Programme of CEFIPRA

Considering the changing scenario of global scientific landscape with emphasis on innovation, the Governing Body and Industrial Research Committee of CEFIPRA directed the Centre to update the Industrial Research Programme of CEFIPRA.

Accordingly CEFIPRA revised the programme. Highlights of this updation are:

- The revised name of the Industrial Research programme is “Industry-Academia Research & Development Programme”.
- To provide support for manpower for small Industries i.e. SME, MSME and Start up.
- Partial or full support (depending upon the cost of the technology) for technology acquisitions for enhancing Industrial competitiveness of both the countries. ●

Saint-Gobain Research India, Saint-Gobain’s 7th transversal global R&D center

Saint-Gobain Research India (SGRI), Saint-Gobain’s 7th transversal global R&D center was launched at Chennai, India, in December 2012. Among the various key pursuits of this R&D center, one is to develop sustainable habitat solutions for hot and humid climates. The working model of the R&D center includes working with premier academic institutions for the advancement of the science for the benefit of our businesses. SGRI and CEFIPRA signed an MOU in October 2013, whereby CEFIPRA will contribute 300k Euros over three years for collaborative research at Indian public institutes in the area of “Sustainable Habitat for Hot and/or Humid Climates” with equal in kind contribution from SGRI.

Dr. Anand Tanikella
Managing Director, Saint-Gobain Research India, Chennai

Four research programs have been launched under the collaboration. These are on Glass Fiber Reinforced Gypsum Multistory Building Seismic Design (at IIT Madras with Prof. D. Menon and Prof. Meher Prasad), Daylighting (at IIT Madras, with Prof. Benny Raphael), Building Energy Envelope Design (at IIT Delhi with Prof. B. Bhattacharjee) and Sloped Cool Roof Testing & Analysis (at IIIT Hyderabad with Prof. Vishal Garg).

The next call for proposals is expected to be launched shortly. A post-doctoral fellowship program will also be launched soon under this collaboration. This type of public private partnership is rather unique and CEFIPRA’s leadership in starting such collaboration is commendable. This serves as a model for aspiring public institutes to encourage and support industrialization. Students & Professors working on these programs and researchers from SGRI will mutually benefit in connecting basic sciences to industrial R&D. ●

Forthcoming **Events**

Indo-French Seminar on “Interdisciplinary Investigations of Ion Beam Interactions with Matter: From Fundamental Aspects to Nanotechnology to Hadron Biology”; May 11-14, 2015, Centre de recherché sur les ions, les Materiauxet la Photonique-GANIL, CAEN.

MOBILITY OF SCIENTISTS SUPPORTED UNDER CEFIPRA PROJECTS
MARCH - APRIL 2015

S. No.	Project Title	Name | Institutional Affiliation	Institution Visited	
1	Epigenetics of transcription by RNA polymerase III	**Purnima Bhargava** Centre for Cellular & Molecular Biology Hyderabad, India	Equipe Organization et Dynamique Nucleaire, Université Paul Sabatier, Toulouse, France	
2	Chemistry and application of Metallasila and Metallagermaboranes derived from group 14 unsaturated organic substrates	**Sundergopal Ghosh** Department of Chemistry Indian Institute of Technology Chennai, India	UMR 6226 CNRS Université de Rennes Rennes, France	
3	Research and Development of Micromegas Detector and related devices	**Supratik Mukhopadhyay** Saha Institute of Nuclear Physics Kolkata, India	CEA-Saclay IRFU Gif sur Yvette, France	
4	Research and Development of Micromegas Detector and related devices	**Nayana Majumdar** Saha Institute of Nuclear Physics Kolkata, India	CEA-Saclay IRFU, Gif sur Yvette, France	
5	Slow Highly charged Ion molecule collisions	**C. P. Safvan** Inter University Accelerator Centre New Delhi, India	Centre de Recherche sur les Ions, les Matériaux et la Photonique Caen, France	
6	Two dimensional electron gas physics in oxide heterostructures	**Anjana Dogra** National Physical Laboratory	Laboratoire de Physique et d'Etude des Matériaux, ESPCI, Paris, France	
7	Correlated studies of response properties of Open-shell molecules in the relativistic Framework	**Debashis Mukherjee** Indian Association for the Cultivation of Sciences Jadavpur, India	Laboratoire de Chimie et Physique Quantiques, Université de Toulouse 3 (Paul Sabatier), Toulouse, France	
8	All polymer flexible gas sensors (flexi sensors)	**Mohamed Chehimi** Organisation et Dynamique des Systèmes; Université Paris Diderot-CNRS Paris, France	Technical Physics Division Bhabha Atomic Research Centre, Mumbai, India	
9	Studying the Role of rpoN, the Alternative Sigma Factor, in Pathogenicity of *R. solanacearum*	**Stephane Genin** CNRS, Laboratoire des Interactions Plantes Micro-organisms; Castanet Tolosan	Department of Molecular Biology & Biotechnology, Tezpur University Tezpur, India	

MOBILITY OF SCIENTISTS SUPPORTED UNDER CEFIPRA PROJECTS
MARCH - APRIL 2015

S. No.	Project Title	Name | Institutional Affiliation	Institution Visited	
10	High Anisotropy Molecular Magnets: Synthesis & Modelling	**Jean Pascal Sutter** Laboratoire de Chimie de Coordination-Toulouse, France	Indian Institute of Science Bangalore, India	
11	Collective Migration in the Fly Nervous System	**Angela Giangrande** Institut de Génétique et de Biologie Moléculaire e Cellulaire Stransbourg, France	National Centre for Biological Sciences Bangalore, India	
12	Monte Carlo and Learning Schemes for Network Analytics	**Konstantin Avratchenkov** Inria Sophia Antipolis - Méditerranée	Indian Institute of Technology Mumbai, India	

MOBILITY OF STUDENTS SUPPORTED UNDER CEFIPRA PROJECTS
MARCH - APRIL 2015

Domain	Name | Institutional Affiliation	Institution Visited	
Pure and applied Physics	**Sandeep Reddy** Department of Physics Indian Institute of Technology Kanpur, India	Laboratoire de Physique Statistique, Ecole Normale Supérieure Paris, France	
Pure and applied Physics	**Vishwanath Shukla** Department of Physics Indian Institute of Technology Kanpur, India	Laboratoire de Physique Statistique, Ecole Normale Supérieure Paris, France	
Pure and Applied Chemistry	**Sharon Priya Gnansekhar** Dept. of Inorganic & Physical Chemistry Indian Institute of Science Bangalore, India	Département de Physique Moléculaire, UMR 6251 CNRS- Université de Rennes 1 Rennes, France	
Pure and Applied Physics	**Uthayakumar** Department of Physics Pondicherry University Puducherry, India	Laboratoire Interdisciplinaire Carnot de Bourgogne, UMR 6303 CNRS, Université de Bourgogne, F-21078 DIJON Cedex, France	
Pure and Applied Chemistry	**Sangita Sen** Raman Centre for Atomic, Molecular, Optical Science, Jadavpur, Kolkata 700032, India	Laboratoire de Chimie et Physique Quantiques, Université de Toulouse 3 (Paul Sabatier) Toulouse, France	

RAMAN CHARPAK FELLOWS 2015

Domain	Name | Institutional Affiliation	Institution Visited	
Mathematical and Computational Sciences	**S. R. Arjuna** Department of Sanskrit Studies University of Hyderabad Hyderabad, India	Centre De Recherche Paris - Rocquencourt Domaine de Voluceau Rocquencourt Le Chesnay France	
Mathematical and Computational Sciences	**Prateek Karandikar** Chennai Mathematical Institute Chennai, India.	Philippe Schnoebelen LSV, CNRS & ENS de Cachan 61, CACHAN, France	
Chemical Sciences	**Himanshu Singh** Department of Chemical Sciences Tata Institute of Fundamental Research Mumbai, India	Dept. of Structural Biology and Chemistry Institut Pasteur Paris, FRANCE	
Life Sciences	**Aurore Géraldine Vaitinadapoule** DSIMB, UMR-S1134 INTS Paris, France	National Centre for Biological Sciences Tata Institute of Fundamental Research Bangalore, INDIA	

RAMAN CHARPAK FELLOWSHIP CALL 2015

The Raman–Charpak Fellowship program is in honour of two Nobel Laureates in Physics, Prof C.V. Raman, Indian Nobel Laureate, 1930 and Prof Georges Charpak, French Nobel Laureate, 1992. The Fellowship was launched during the State visit of the President of France, Mr. Francois Hollande, to India on February 14-15th 2013. The aim is to facilitate the exchange of doctoral students between the two countries, in order to broaden the scope and depth of future engagements in science, technology and innovation.

The Fields of Research are:
Atmospheric and Earth Sciences
Life Sciences
Medical Sciences
Chemical Sciences
Material Sciences
Engineering Sciences
Mathematical and Computational Sciences
Physical Sciences
Approximately 20 fellowships from India and France may be supported under this scheme, to attract the best of talent from India and France.

Deadline for Submission of Applications : 31st May, 2015.

Only online submission will be considered, candidates have to apply at
www.cefipra.org or log on to: http://cefipra.org/raman-charpak/

CENTRE FRANCO-INDIEN POUR LA PROMOTION DE LA RECHERCHE AVANCEE

CEFIPRA

INDO-FRENCH CENTRE FOR THE PROMOTION OF ADVANCED RESEARCH

Industry Academia Research & Development Programme

CEFIPRA, under its Industry Academia Research & Development Programme supports industry centric collaborative projects involving research institutions and industries including SME, MSME, start-up more then three year old. The objective of IARDP is to promote the development of new processes or products, or improvement of existing processes or products, in order to enhance competitiveness of industries in the international markets.

Domains of Cooperation

All the areas of technology which are of interest to the Industry.

Eligibility

The project proposals that can be submitted in the framework of this programme should preferentially involve at least one industrial partner and one research instituteseach from India & France (2+2 Model).

However, project proposal not fulfilling this 2+2 model are also eligible (at least one industrial partner either in France or in India and a research institute from the other country) but the proposal documents must proved the region.

Project Components funded

Proposal Involving big industries

For academic institutions: Manpower (PhD/ Postdoctoral positions for French Partners; JRF/SRF/

RA for Indian Partners), consumables and contingency, Small equipment to Indian partners and Travel (Domestic and International).

For industrial partners: Travel (International). Industries are expected to invest in R & D in kind.

Proposal Involving small industries

For academic institutions: Manpower (PhD/ Postdoctoral positions for French Partners; JRF/SRF/

RA for Indian Partners), consumables and contingency, Small equipment to Indian partners and Travel(Domestic and International).

For industrial partners: Travel (Domestic and International) & Manpower. Small Industries have to invest the recurring expenses and equipment for carrying foreword the R&D at their level.

How to Apply

Send a 2-3 page pre-proposal to CEFIPRA in described formate available at CEFIPRA website. Shortlisted pre-proposals will be requested to submit detailed proposals.

For further information please contact:
Pour touta information complémentaire, veuillez contacter:
Director
Indo-French Centre for the Promotion of Advanced Research
5B, Ground Floor, India Habitat Centre, Lodhi Road, New Delhi-110 003 INDIA
Tel: 011 2468 2251, 2468 2252, 2463 3567, 4352 6261 Fax: +91 -11-24648632
E-mail: director@cefipra.org | Web: www.cefipra.org

28th Meeting of the Governing Body of CEFIPRA

13 April 2015
Paris

28th meeting of the Governing Body of CEFIPRA was held in Paris on 13th April 2015. It was co-chaired by Prof. Ashutosh Sharma, Secretary, Department of Science and Technology, Government of India and Mme. Anne Grillo, Direction de la Coopération culturelle, universitaire et de la recherche, Direction Générale de la Mondialisation et des Partenariats, Ministère des Affaires Etrangères et du Développement International, France. During the meeting, the Annual Report 2013-14 of CEFIPRA was released by the co-chairs. Director, CEFIPRA presented the Action Taken Report and Agenda for discussion to the Governing Body. After discussions and deliberations, Governing Body took decisions regarding way ahead for CEFIPRA. ●

Indo-French Workshop on Scientific Cooperation for Agricultural Research

9 - 11 March 2015
New Delhi

An Indo-French workshop on Scientific Cooperation for Agricultural Research was organized from March 9 -11, 2015. 14 French scientists and 80 Indian scientists from different ICAR institutes, State Agricultural Universities and other national & international organizations from India participated in the workshop to formulate possible project ideas in the following areas in alignment with the meta-programmes of INRA:

- Sustainable Management of Crop Health
- Adaptation of Agriculture & Forests to Climate Change
- Diet Impacts and Determinants: Interactions & Transitions
- Genomics Selection
- Study of Transitions for Global Food Security
- Ecosystem Services
- Food Processing & Technology

In his address, H. E. Mr. François Richier, Ambassador of France, emphasized on the growing dual challenge of endeavoring towards an agricultural production that is both mindful of the growing global population and respectful of the environment. Dr. François Houiller, Director General, INRA (l'Institut national de la recherche agronomique), spoke about the relevance of the workshop in bringing out the current scientific developments of the leading agricultural institutes of India and France, and how their shared experiences could benefit their common ambition to achieve sustainable and inclusive agricultural growth. Dr. S. Ayyappan, Secretary DARE & Director General, ICAR, welcomed the coming together of scientific coordinators from both France and India, with the aim of collaboratively working on seven themes that have been

flagged as priority areas for agricultural research.

The plenary session was held on the final day of the workshop. In this session Dr. Debapriya Dutta, Director, CEFIPRA; Dr. Nisha Mendiratta, Director, Climate Change Programme Division, Department of Science and Technology, Govt. of India, Dr. Vivek Dham, Policy Officer, Research & Innovation, Delegation of European Union to India, Dr. Aggarwal, ICAR and Dr. Olivier Le Gall, INRA presented the role of their respective organizations in respect to agriculture science development as well as in general, about the promotion of ideas & research projects in science and technology.

It was decided that CEFIPRA will follow up with the DBT, DST, ICAR in India to find the funding for the network based research programmes. Similarly, Institute de la Recherche Agronomique (INRA) in France will do the follow up with national funding agencies on the French side. ●

Indo-French Workshop on Emerging Trends in Electron Device Modelling

30 March - 1 April, 2015
Bangalore

An Indo-French Workshop on Emerging Trends in Electron Modelling was organized From March 30 to April 1, 2015. The workshop aimed to bring the researchers from both countries together by providing them a common platform to exchange ideas, collaborate and work towards the next-generation electron device model development. The event was jointly organised by the Indian Institute of Science (IISc) and Institut Supérieur d'Electronique de Paris (ISEP), France and sponsored by the Indo-French Centre for the Promotion of Advanced Research (CEFIPRA). The workshop was held at the Faculty Hall, IISc Bangalore. Dr. Jenifer Clark, S&T Attaché of French consulate in Bangalore and Dr. Debapriya Dutta, the director of CEFIPRA also participated in this workshop.

After the introductory talk given by Dr. Clark and by Dr. Dutta, researchers from leading Indian and French institutes delivered talks on state-of-the-art techniques in electron device modeling. Discussion topics encompassed a very wide spectrum of device modelling. Some of them were very applied in nature e.g., "Finfet modeling for 10nm and beyond - Si, Ge and III-V channel", "Compact modeling for FDSOI technology: challenges and available solutions", and "Compact modeling of asymmetric double gate MOSFETs", whereas some of them dealt with fundamentals of carrier transport at nanoscale: "Quantum transport modeling- new paradigms and possibilities" and "Quantum transport modeling of nanowire and double-gate transistors: the non-equilibrium Green's function approach". The discussions and presentations were not limited only to crystalline electron devices but also extended to amorphous flexible material based transistors (Device physics and modeling of non-crystalline semiconductor) and the emerging nano-materials (Atomistic simulations of 2D Materials). There were also interesting talks on device modeling for SRAM design, reliability and advanced analog circuits.

Student participants from different Indian institutes presented posters on their research activities. They received several useful feedbacks from the delegates. The workshop concluded with visit of the delegates to the Centre of the Nano Science and Engineering (CeNSE). ●

Indo-French Workshop on Sustainable Water Purification Technologies

Feb. 11 - 13, 2015
Karaikudi

With water resources coming under ever increasing pressures of exploitation and contamination, scientists and policy makers are more active than ever before to identify strategies and technologies to conserve water sources from further degradation.

CSIR- Central Electrochemical Research Institute (CECRI), Karaikudi and the Université Paris-Est in association with the Indo-French Water Network organized an Indo-French Workshop on Sustainable Water Purification Technologies on February 11-13 at CECRI, Karaikudi. The workshop offered a platform for knowledge sharing to stakeholders in the water/ wastewater sectors and covered a rich variety of subjects, technologies and practices, thereby giving a comprehensive overview on the subjects.

Prof. M. A. Oturan of the Université Paris-Est, Paris and Dr. S. Vasudevan, CICERI coordinated the workshop which had as many as 72 registered delegates including 6 speakers and 3 students from France and 12 speakers from India .

Delivering his presidential address Dr. Vijayamohanan K. Pillai, Director, CECRI said that more important than the availability of water treatment technologies, it is the affordability of clean water that was a more pressing concern. Dr. S. Sundarrajan, Director of the National Institute of Technology, Trichy inaugurated the workshop. In his remarks he stressed that cooperation between India and France was an unexplored treasure trove and highlighted the importance of conserving water resources.

Mr. Jayesh Wagh, Scientific Coordinator at the French Embassy, Bangalore gave a presentation on the avenues open to scientists, technologists and research scholars to take up collaborative research programs with institutions in France. He referred to the funding of 900 million euros chipped in by ANR, the French national research funding agency. He also drew attention to the numerous programs udertaken by the Indo-French Water Network based in Bangalore.

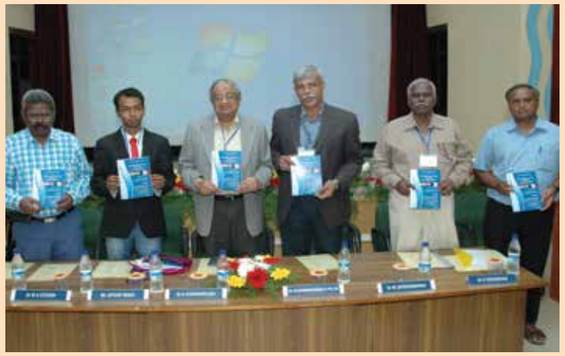
Dr. M. Jayachandran, Chief Scientist, CECRI welcomed the gathering. Dr. Jayachandran highlighted the technological capacities at CECRI such as domestic- and community-level de-fluoridators, de-arsenators, de-nitrators, electro-chlorinators and electro-ozone generators. Dr. R. Meenakshisundaram, Senior Principal Scientist, CECRI proposed a vote of thanks.

A panel discussion was held on the 3rd day focusing on common problems of India and France on water related issues, affordability and scalability of water treatment technologies, disposal toxic wastes from water treatment processes.

The panelists included Dr. Amitava Bandopadhyay, ISTAD, CSIR, New Delhi (moderator), Prof. M.A. Oturan, Prof. Marc Cretin, European Membranes Institute, University of Montpellier, and Prof. Gaetane Lespes, Université de Pau et des Pays de l'Adour (UPPA), Dr. Subhash Andey, CSIR-NEERI, Dr. G.Sozhan, CSIR-CECRI, Karaikudi Dr. Venkatesh Davey, M/S/ Davey Products, Chennai. The following ideas were underlined:

- Energy efficient or energy recovery technologies are to be worked out and used
- Recycling process is to be adopted
- The treated waters are reutilized or recovered
- Implementation of bio-electro kinetic and electro oxidation processes
- Electro-deionisation process can be used for water treatment

Finally, among 26 papers presented in the Workshop by Research Scholars and Scientists, 3 best papers were selected and honoured. ●



Indo-French Workshop on Digital Manufacturing and Prototyping

April 13 - 15, 2015
Hyderabad

Mahindra École Centrale College of Engineering (MEC), Hyderabad collaborated with Centrale-Superlec France to organise a workshop on Digital Manufacturing and Prototyping from April 13-15, 2015. The workshop was supported by CEFIPRA. The main objective of the workshop was to foster deliberations between Indian and French researchers to evolve joint project proposals for possible funding by CEFIPRA.

The workshop had three primary themes: i) Materials and Manufacturing ii) Electronics,Communication and Optical technologies and iii) Simulation and Computer Science.

Prof. Krishnamurthy, the workshop co-coordinator, highlighted the current scenario on manufacturing as a whole in India vis-à-vis in other major countries around the world. Founding Director of MEC, Prof Sanjay Dhande, addressed the participants focusing on the synergy between the digital world and manufacturing. He underscored the important role of sensors in digital manufacturing and the need to invest in research in this area. French Coordinator of the workshop, Dr Sebastien Ducruix, of Centrale-Supelec also addressed the participants dwelling upon the mission of the French team.

First technical session, dedicated to the theme of 'Materials and Manufacturing', involved four presentations, one each from IIT Delhi, Bombay and Hyderabad and one from Murugappa Group Bangalore. The session evoked a productive discussion on the developments at a theoretical (IIT, Hyderabad) as well as experimental levels (IIT, Mumbai). Presence of the stakeholders from industry made it more relevant. Applications associated with the ceramic industry were discussed in detail and bringing out the opportunities in this space.

The second session was devoted to the theme of Electronics, Communication and Optical Technologies. Presentations by faculty from CGCRI, Kolkata as well as representatives of Sterlite Technologies(Aurangabad). Importance of niche applications of radio-frequency communication, fiber lasers, free-space optical technologies, and optical sensors in manufacturing industries were deliberated upon during the course of the session.

Day 2 began with a visit by the workshop delegates to facilities and infrastructure at MEC. In the post lunch sessions, the discussions focused on the theme of Computer Science and Simulation. Four presentations included two from industrial outfits namely, Tata Steel and Schneider. Topics like computational fluid dynamics, computational tools and techniques; the need to assess quality of underground water resources through remotely operable sensors, etc were key points of discussions that ensued.

On Day 3 three sub-groups were formed to identify, for each of the three themes covered by the workshop, possible project ideas to be taken forward in the form of proposals for possible submission to CEFIPRA. Groups deliberated for than two hours coming up with a detailed list of topics with possibilities of being converted into project proposals. Possibilities of few industry-specific projects, which could be directly taken forward taken by academic group and industry, without requiring CEFIPRA support were also recognised. Industry participants also raised issues on IPR policy etc.

Prof Dhande in his concluding remarks appreciated the efforts put in by all the participants for success of the workshop and highlighted the next steps in order to sustain the dialogue between different stakeholders. ●

SPECIAL CALL UNDER INDUSTRY ACADEMIA RESEARCH & DEVELOPMENT PROGRAMME OF CEFIPRA

The Industrial Research Programme (IRP) of Indo-French Centre for the Promotion of Advanced Research (CEFIPRA) was launched in 2002 to support collaborative research programme involving Industry & Academia of both the countries. Launching of IRP has worked as an enabling platform for the organizations in India & France to realize their potential in terms of product and process development. It has facilitated innovation, risk taking for Industries and also bringing the private industry, public institutions and the government under one roof to promote the research and innovation between India & France. Recently, CEFIPRA has changed the name of the Programme to Industry-Academia Research and Development Programme. Apart from regular call for pre-proposal in all the areas of technology of interest to the Indian & French Industries, CEFIPRA invites special call for pre-proposal in the following areas:

- Additive manufacturing,
- Robotics
- Affordable Medical Devices

Deadline for Submission of Concept Proposals : 21st May, 2015.

For details, please visit our website
www.cefipra.org

JOINT CALL FOR PROPOSALS IN THE AREA OF NEUROSCIENCES AND ENGINEERING SCIENCES UNDER TARGETED PROGRAMME OF CEFIPRA

Department of Science and Technology (DST), Government of India and AgenceNationale de la Recherche (ANR) has launch a joint call for proposal to foster Indo-French collaboration between scientific communities of two countries (India & France) by supporting joint research projects conducted by the scientists from both the countries. In India, on behalf of the Department of Science & Technology, Indo-French Centre for the Promotion of Advanced Research (Centre Franco-Indien pour la Promotion de la Recherche Avancée, CEFIPRA) invites proposal from the Indian scientists / researchers . Areas of Collaboration (Targeted Topic for the Call): The Proposal will be supported in the following scientific areas: • Neuro Sciences • Engineering (including: material science, chemistry, smart transport, energy, mechanics & Manufacturing).

Extended Deadline for Submission of Proposals : 27th April, 2015.

For details, please visit our website
www.cefipra.org

Indo-French Centre for the Promotion of Advanced Research (CEFIPRA) is a model for international collaborative research in advanced areas of science and technology. The centre was established in 1987 with support from Department of Science & Technology, Government of India and the Ministry of Foreign Affairs, Government of France.

CEFIPRA

For further information please contact:
Pour touta information complémentaire, veuillez contacter:
Director
Indo-French Centre for the Promotion of Advanced Research
5B, Ground Floor, India Habitat Centre, Lodhi Road, New Delhi-110 003 INDIA
Tel: 011 2468 2251, 2468 2252, 2463 3567, 4352 6261
Fax: +91 -11-24648632
E-mail: director@cefipra.org | Web: www.cefipra.org