Indo-French Technology Summit 2013

Convergence & Connectivity
Festive season is here. It also transcends to the celebration of knowledge. The celebration becomes more meaningful when two nations join in it. The scientific and technological communities of France and India are going to meet during the Indo-French Technology Summit on 23rd and 24th October 2013 in New Delhi. The objective of the Summit is to promote technological and trade exchanges between the two countries.

In consonance with this festive mood, in this edition, we bring out the efforts of CEFIPRA in forward chaining knowledge up the innovation chain. We are fortunate that Dr. R. Chidambaram, Principal Scientific Adviser to the Government of India has kindly set the tone with his leader article on Indo-French S&T cooperation. Enumeration of the patents emanated out of the CEFIPRA supported projects and our Intellectual Property Management Plan are the testimony of CEFIPRA’s capacity to support knowledge to product pathway. The message of H.E.François Richier underlines the catalytic role of CEFIPRA in the emerging Indo-French S&T eco-system.

CEFIPRA will be present in the Indo-French Technology Summit to showcase our role in the Indo-French S&T cooperation over the last 25 years and beyond through an exhibition pavilion and three parallel sessions on “Knowledge forward chain”, “Indo-French opportunities for SMEs in Aerospace industries” & “Indo-French Design Collaboration: Emerging Opportunities”.

We invite you to be there to take the next step forward together.

Meilleurs voeux de la saison des fêtes!

Best wishes for the Festive Season!

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There exist many bilateral cooperative Science & Technology agreements between India and France in many specific fields. The creation of the Indo-French Centre for the Promotion of Advanced Research (IFCPAR/CEFIPRA) in 1987, operated by the Department of Science and Technology (DST), India and the Ministry of External Relations, France, however was an important landmark. This Centre was born from an idea shared by the Prime Minister of India Indira Gandhi and the French President Gallery Giscard d’Estaing a couple of years earlier. IFCPAR/CEFIPRA has helped to catalyze the growth of S&T cooperation between India and France over the last 25 years. The Centre has supported about 40 new projects in frontier areas of science covering the domains of computer & information technology, water, environmental science, health care, nanoscience and engineering, catalysis, mathematics and astrophysics, leading to nearly 250 publications in internationally peer-reviewed journals, over the last two years itself. The Centre’s support accounts for nearly one-third of publications emanating from joint work between Indian and French scientists.

India’s cooperation with France ranges from Mathematics to Space Science and Technology. The Indian Space Research Organization (ISRO) and its French counterpart Centre National de Etudes Spatiale (CNES) have a unique history of successful cooperation spanning over four decades, in the peaceful use of outer space. ISRO and CNES have recently realized two world-class joint space projects, whose outputs benefit not only their own scientific communities but also the international scientific community, specially on climate change studies. Two of the satellites built jointly by ISRO and CNES, launched by the Polar Satellite Launch Vehicle (PSLV) of ISRO are MEGHA-TROPIQUES (mass 1000kg; meant for studying water cycle and energy exchange in the tropics – launched in October 2011) and SARAL (mass 410 kg; meant for oceanographic studies, viz. marine meteorology, sea state forecasting and climate monitoring, launched in February 2013). Ariane Space, a major launch service provider based in France, has so far launched 16 Indian geo-stationary satellites on commercial basis, including the recent GSAT-7 in August 2013. Currently the two space agencies are planning to embark upon another joint mission in the field of earth system science and climate change studies.

France being a leader in the nuclear field, with nearly 80% of its electricity needs being met by nuclear power, was the first country with which India entered into an agreement of civil nuclear cooperation (following the waiver given a few years back by the Nuclear Suppliers Group). This enabled India to resume full nuclear cooperation with the international community.
International community. This agreement was signed on 30th September 2008 during the visit of the Indian Prime Minister Dr. Manmohan Singh to France. But Indo-French nuclear cooperation predates that by several decades, particularly in the fast reactor field. The 40 MWe Fast Breeder Test Reactor, established at the Indira Gandhi Centre for Atomic Research (IGCAR) at Kalpakkam in the early eighties, closely followed the design of the French reactor Rhapodie-Fortissimo, but with a power generating system added. India is now building an indigenous 500 MWe Prototype Fast Breeder Reactor (PFBR), which will be commissioned in 2014. Closing the nuclear fuel cycle is important for effective use of the uranium resources and to make nuclear power a sustainable mitigating technology in the context of the climate change threat. Under the French CEA-Indian DAE collaboration, inter alia the focus has been on structural mechanics and liquid-metal cooled fast reactor safety.

India is a participant of many international projects in France. India is a member of the International Thermonuclear Experimental Reactor (ITER) project, Cadarache, where it contributes some major equipments. The European Synchrotron Radiation Facility (ESRF) (one of the best synchrotron radiation facilities in the world), Grenoble, is also being accessed by Indian protein crystallographers using the connectivity of the multi-gigabit per second optical-fibre network NKN (National Knowledge Network) using the connectivity of the multi-gigabit per second network NKN (National Knowledge Network) to the European Union Grid.

The Centre for European Nuclear Research (CERN) recently announced the discovery of the elusive Higgs Boson. The Department of Atomic Energy of India contributed 40 million U.S. dollars worth of equipment, more than a thousand superconducting sextupole and other corrector magnets to the construction of the Large Hadron Collider; and the Tata Institute of Fundamental Research (TIFR), Mumbai is the lead Indian group which contributed equipments and participated in the experiments with CMS (Compact Muon Solenoid) detector, which found the first signatures of the Higgs Boson. Though this Centre is in Geneva, two-thirds of the 100 metre deep 26 kilometer circumference tunnel, through which the colliding particles move, is located in France.

There have been many other important initiatives in which India has been at the forefront and one of the initiatives worth mentioning is the Memorandum of Understanding signed by the Department of Science and Technology (DST), Govt. of India and the French Research Agency (ANR) on 7th March 2012, to jointly fund Indo-French research projects. In India, CEFIPRA acts as a nodal agency to receive, shortlist and scrutinise proposals to provide funding on behalf of DST and, in France, the submitted proposals follow the ANR procedures. An Indo-French Partnership Centre/Laboratory in Applied Mathematics has been established at the Indian Institute of Science, Bangalore, through equal funding by DST and CNRS. In order to make it broad-based, other Indian institutions like, TIFR-CAM Bangalore, IIT Bombay and IIT Kanpur are also partners in this Centre. French President Francois Hollande visited India in February 2013 led to initiation to set up several new Indo-French joint laboratories, including the joint Laboratory in Neurosciences (between the Department of Biotechnology (DBT), Govt. of India and INSERM, France), and the Indo-French Cell on Water Sciences (between the Indian Institute of Science (IISc), Bangalore and IRD, France). The activities of other laboratories like the Joint Laboratory in Catalysis for Sustainable

Ensemble : India and France share a history of engagement spanning over last 6 decades. What role can diplomacy play to enhance S&T cooperation and generation of new knowledge?

Francois Richier : Indeed, India and France share a long-standing and very fruitful cooperation in science. It is a cooperation between equals, which is attested by the high-quality of the collaborative work between the scientists of both countries. Diplomacy has played a key part in reinforcing this relationship, firstly through the Inter Governmental Agreements for Cooperation signed in 1966 and 1978, and then through the visionary agreement to create an autonomous bilateral funding agency, the CEFIPRA, in 1985. It was the first joint international funding agency to be created in India. Nowadays, countries like the USA, and more recently Germany and Russia, have created similar schemes to foster and strengthen bilateral collaborations in science and technology. CEFIPRA has funded over 450 research projects in all scientific fields, which have generated nearly 1500 publications in international peer-reviewed journals.

On 14-15 February earlier this year, President Francois Hollande devoted his first State visit in Asia to India. On this occasion President Holland and Prime Minister Singh underlined the importance he attaches to scientific relations between the two countries. The President of the French Republic was accompanied by a large high-level delegation of ministers, including the Minister for Higher Education and Research, and several directors of universities and research centres. Several agreements were signed during the visit in the field of research and higher education.

Ensemble : Nuclear Energy, Transportation and Health are domains for which France is known for in India. On the other hand, India’s growing economy and knowledge can be of interest for France. Which are the new S&T domains where the two countries can join hands in the times to come?

Francois Richier : Indo-French cooperation is based on the principles of equality, reciprocity and mutual trust. As such, Indo- French S&T partnership must be structured around them, in line with the scientific strengths of both France and India and should allow for the discovery of scientific solutions to identified challenges. During the State visit of the French President in February 2013, Mrs Geneviève Fioraso, the French Minister for Research and Higher Education, and, Mr Jiapal Reddy, the Indian Minister for Science and Technology, discussed thematic research priorities related to global societal challenges: climate science, aging, life sciences and health sciences, innovation, water. The two ministers confirmed their wish to hold the India-France Technology Summit with many players from the private and public sectors to further enhance Indo-French cooperation in many key sectors.

The Technology Summit will take place on 23-24 October with four large focus areas: Cities, Energy & Climate; Biotechnology, Agri-food & Health; Aerospace & Aeronautics; and Chemicals & Materials, with ICT as a transversal theme across the four focus areas. The Summit will inaugurate a closer scientific and technological partnership between France and India and create an ecosystem bringing together French and Indian actors in research, development, innovation and higher education. There are already more than 550 participants (research institutions, universities and companies) registered for the Summit. This important Indo-French event will create the opportunity to forge closer collaborations between our two countries on key technologies for tomorrow’s world.

Ensemble : Small and medium enterprises form the backbone of manufacturing and services in India, where a maximum of innovation can happen. How can SME’s cooperation be encouraged, so as public private partnership?

Francois Richier : With the release of “France 2030”, the EU’s “Innovation Union” and India’s “Decade of Innovation” strategies, innovation is a real priority and this should be developed together by promoting collaborations in a Public Private Partnership model. Collaborations between the private sector and academia are necessary in order to transfer the results of research towards society for sustainable growth. Already, more and more French companies are investing with increasing volumes in research with Indian partners and are opening research and innovation centres in India, such as the recent launch of the L’Oréal R&I India hub and the Saint-Gobain R&D centre. Furthermore, the new “innovation window” of CEFIPRA will provide a platform for French and Indian industries to collaborate with research institutions and universities towards benefits for the economy and the growth of our businesses. I wish to congratulate the CEFIPRA in working to set up two new targeted research and fellowship programs with French companies, Saint Gobain and EADS-Astrium.

As you know, it is important to foster collaborations with SMEs to optimize benefits for the economy and society. The French Competitiveness Clusters bring together SMEs, larger companies, research laboratories & educational establishments to a specific
Every region of a country has its own historical momentum and affinity to certain types of industrial/commercial activity domains. This also results in academic institutions of higher learning to come up in and around the region to meet the demand of training and research. It is understood that if regions with similar industrial/academic affinity and compatible ST&I ecosystems can be paired together through focused knowledge/business exchange development efforts, it can result in significant cross learning with attendant innovation driven commercial possibilities of mutual benefit.

Recognising the scope and benefits of regional synergy CEFIPRA has embarked on an ambitious INDO-FRENCH REGION TO REGION COOPERATION PROGRAM. The aim is not only exchange of ideas and expertise but also to exploit complimentary capabilities at various stages of the knowledge innovation chain. Cooperation at regional level provides an opportunity to state level stakeholders to be able to leverage the strong platform being provided through CEFIPRA to establish links that could be carried forward by them.

The program has two components:

Knowledge Cooperation under which knowledge institutions of both regions are linked through focused programs and projects, and

Business Cooperation that connects small and medium enterprises of the two identified regions.

The first step taken up in this regard has been in the form of cooperation between the State of Karnataka, India and the Region of Aquitaine, France, which are having relatively better ST&I eco-systems in each country. Both these regions are known for their concentration of academic institutions/business enterprises in biotechnology and aerospace domains. This gives rise to a large number of possibilities of collaboration at various levels.

In the course of its journey it is important for an agency to take stock and refine its approach for the future. To realise this objective and to also enlist various outputs emerging from CEFIPRA supported projects, a meeting of PIs of various projects was organised at New Delhi on August 21, 2013. The primary aim of the meeting was to use the inputs received to further fine tune CEFIPRA’s mechanisms for knowledge generation. Twenty eight participants attended the meeting including experts, successful PIs and dignitaries from various backgrounds. This included Prof. R.C.Budhani (Director, National Physics Laboratory, New Delhi) and Prof. C. S. Dey (School of Biological Sciences, Indian Institute of Technology, Delhi).

Following specific points constituted the agenda of the meeting:

- The value of the knowledge generated by the projects supported by CEFIPRA
- Scope of improvement in CEFIPRA’s intervention mechanism of knowledge generation
- Important linkages that need to be strengthened/built up to enhance knowledge generation through Indo-French ST&I cooperation.

The proceedings commenced with a briefing by Dr. Debapriya Dutta (Director, CEFIPRA) about activities of CEFIPRA during the last 25 years in support of the Indo-French ST&I cooperation. An analytical assessment on CEFIPRA’s impact in bilateral knowledge generation during the last 25 years was presented by Dr. Sajit Bhattacharya, Senior Principal Scientist, CSIR-NISTADS, New Delhi.

After presentations and panel discussion, following various unmet needs were identified:

1. Need to build a “Think Tank” consisting of successful PIs from diversified domain of expertise to get periodic feedback.
2. Need to venture into unexplored but promising areas in terms of greater societal relevance and identify major thrust areas of research of mutual interest to both the countries.
3. Need to enhance the degree of networking linkages among the groups of scientists and ST&I institutions through improved mode of communication channels viz., invitation letters, periodic newsletter, blogs and identification of potential targets.
4. Need to provide funding to a group of scientists instead of funding to individual scientist by setting up virtual centres.
5. Need to provide French language tutorials to Indian students working in French laboratories to overcome the language and societal barrier.
6. Need for a long term funding for young researchers to enhance the degree of cooperation and collaboration between the Indian and the French institutions.
7. Need to create a database of Indian students residing in France to form an Indian Student Association to ensure necessary logistical/moral support to the newcomers.
8. Need to devise a mechanism to reach to vast untapped talent pool of Indian biologists having expertise in the areas of drug discovery, disease model and pharmaceuticals. The areas of intervention can be diabetes, cancer, cardiovascular, metabolic, photonics biology (laser operated medical surgery) and infectious diseases etc.

Dr. Dutta concluded the meeting by proposing that some of the promising technologies which were patented but currently suffer from lack of suitable industrial partners for commercialization to showcase their technologies in India-France Technology Summit to be held in the month of October, 2013 at New Delhi for wider dissemination.

From Mathematics to Space (Contd. from page 152)

Science, Bangalore and the Indian Institute of Technology, Bombay, which boast of the best nanofabrication facilities in the world, leading to various international academic institutions collaborating programmes with them. There is a scope of increased Indo-French R&D collaboration in the field of network engineering and cyber security. Today India seeks international cooperation on an ‘equal partner’ basis. Institutional arrangements can be facilitated by international cooperation but for them to be successful and sustainable there is a need for scientists’ groups to be cooperative and collaborative with each other. CEFIPRA has a major role to play in the enhancement of the level of ST&I cooperation between the two countries considering the level of enthusiasm and research ideas existent at both ends.
EXPOSING INDIAN SMEs TO FRENCH INDUSTRIAL ECOSYSTEM

Small and Medium Enterprises (SMEs) hold a strategic significance in the process of economic growth and equitable development of a country. India is no exception to this general rule. SMEs are driving force behind large proportion of S&T innovations that are critical for a country’s economy for their contribution in terms of employment creation, new investments and enhanced exports.

In the backdrop of the critical role of SMEs in the development of a nation, a meeting of stakeholders in the SME space was organised at the India International Center, New Delhi. The purpose of the meeting was to elicit inputs and insights from professional/entrepreneurs engaged in the SME sector in India on the S&T challenges confronted by the Indian SME sector and identify areas where collaboration with French SMEs can be facilitated by CEFIPRA for obtaining the required results.

Thirty eight participants of the meeting included Prof. R. Kumar, Member, Industrial Research Committee, CEFIPRA; Dr. Debapriya Dutta, Director, CEFIPRA; Dr. H.P Kumar, MD, National Small Industries Corporation (NSIC); Dr. Arabinda Mitra, Advisor, International Cooperation (IC), Department of Science and Technology (DST), Govt. of India; Dr. Veronique Briquet-Laugier, Science Counselor, French Embassy in India; Dr. H.K Mittal, Secretary, TDB; Mr. Rajive Chawla, Director, IamsME.

Important takeaways that emerged out of various presentations and ensuing discussions are:

• Urgent need to upgrade current technology level and quality of the products coming out of SMEs.
• Benefits of diversifying production from automobiles to aerospace domain given the similarity in technological base and penetrate new markets through increased exposure to international practices and possible collaboration with suitable partners.
• Need to support knowledge creation in aerospace and automobile sectors through financing new projects involving SMEs in areas of common interest.
• Need for focused interactions between short-listed companies to explore willingness to follow the ASTM’s aerospace material standards through knowledge/skill/technology upgradation.
• Utility of an interaction with an expert from the aerospace material standards. SMEs based ASTM’s standards.
• Ability to collaborate with French industrial organisations.

In his welcome address Dr. Debapriya Dutta recounted the activities being carried out by CEFIPRA over the last 25 years in support of Indo-French S&T cooperation. Dr. Dutta emphasized upon the need for an internal assessment of impact of CEFIPRA on bilateral knowledge generation. The broad scenario of growth and development of SMEs in India was discussed by an expert panel consisting of Dr. H.P Kumar, MD, NSIC; Dr. Arabinda Mitra, Advisor, IC, DST; Dr. Veronique Briquet-Laugier, Science Counselor, French Embassy in India; Dr. H.K Mittal, Secretary, TDB; Mr. Rajive Chawla, Director, IamsME.

Although observation of the Earth’s magnetic field has a long history, theoretical investigations into the origin of planetary magnetic fields are relatively new. Planetary dynamo models are complex because they involve solving the equations of momentum, temperature/composition and the magnetic field in spherical geometries subject to several assumptions, initial conditions and boundary conditions. The equations used by the planetary and astrophysical dynamo communities are broadly similar, but scientists from the two communities rarely interact.

The workshop on DYNAMICS OF EARTH AND PLANETARY CORES organized by Centre for Earth Sciences, Indian Institute of Science, Bangalore (23-26 September 2013) brought to the fore the most recent developments in the modeling of planetary dynamos, and the need to improve field measurements from satellites. Several features of the geomagnetic field such as its dipole structure, secular variation, mantle control and polarity reversals were discussed in depth. The magnetic fields of terrestrial planets like the Earth and Sun (and galaxies) were compared, and the physical mechanisms that generate these fields were analyzed thereupon.

Participants discussed observational, experimental and theoretical aspects of Earth, planetary and astrophysical dynamos. The workshop, perhaps the first of its kind, can be considered as an important step in the direction of popularizing Deep-Earth research in India by establishing some common ground between the planetary and astrophysical dynamo community.

The workshop provided an opportunity to Indian doctoral students to showcase their research before the international community. Tutorial-style review lectures, pitched at the graduate student level, on challenges in planetary dynamo modeling were complimented by 30-minute research presentations made by scientists working on fringe areas of the subject. The purpose was to give starting point ideas to budding scientists in planetary core dynamics to initiate their research efforts in this field. In the final session PhD students from both India and France were made aware of postdoctoral opportunities in Deep Earth research.

New ideas generated through the seminar:

• Improved numerical methods of solving the coupled Magnetohydro-Dynamic (MHD) equations for planetary dynamos are necessary. Observations are constantly improving with the help of satellite-based measurements and fly-by missions.
• Numerical simulations of planetary cores must be backed up by simple laboratory experiments and linear theory, as simulations alone cannot improve our understanding of planetary cores as there are competing physical phenomena whose effects cannot be isolated easily.
• French and Indian scientists need to meet more often to help build the planetary core community in India. India could be the host for one of the future ‘Study of the Earth’s Deep Interior’ (SEDI) meetings.
• Apart from interactions at the PhD student and postdoctoral student levels opportunities for French students to spend a semester in India either in the final year of their undergraduate program or the first year of their Masters through Erasmus Mundus programs needs to be explored.

Ideas for Future Collaboration

Two significant areas of collaborative work between IISC, Bangalore and French Universities were identified at the workshop. The tentative titles of forthcoming project proposals are as follows:

1. Development of a new algorithm for parallelizing geodynamo models in real time (Bnord Sreenivasan, IISC; Bangaloré & Alexandre Fournier, IPGP, Paris).
2. Crystallization at the Earth’s inner core boundary under rotation and magnetic field: an experimental study (Bnord Sreenivasan, IISC; Bangaloré & Stéphane Labrosse, ENS, Lyon)

In addition to the above projects, collaboration in solar/astrophysical dynamos between IISC and French Universities was discussed. A compact disk containing all the talks given at this workshop was also released.
IP MANAGEMENT AT CEFIPRA

The subject of Intellectual Property (IP) has assumed international importance considering its role in promoting invention and innovation. Things are a little more complicated when S&T programs are pursued by multi- institutional teams spread across international borders, as is the case with most projects supported by CEFIPRA. In such a setting it is extremely important to lay down clear guidelines for protecting intellectual property emanating from the collaborative research work.

Given the importance of IP issues in the context of CEFIPRA, the Governing Body of CEFIPRA has been focusing on the question of protection of intellectual property rights for patentable results. Way back in 1992 itself, CEFIPRA had decided to constitute a working group with representatives from both India and France to examine the issue and evolving the guidelines. The working group members devoted considerable effort and there were several discussions and meetings held to find a common ground.

In its 9th meeting in December 1995 at New Delhi, the Governing Body of CEFIPRA considered the recommendations made by the working group which led to a framework document. This has been used for resolving IP issues related to CEFIPRA projects since it was adopted.

The main pillars of CEFIPRA IP management regime are:

- Acceptance of Prior Knowledge existence on both sides
- Equitable IP Sharing Basis
- Scope of Arbitration by 2 Co-Chairs of the Governing Body of CEFIPRA

The significance of these points lies in the way they bring new dimensions of equity. By accepting the fact that prior knowledge about the research issue exists on both sides, both parties acknowledge and accept the scientific levels already achieved by each side. Equitable IP sharing was a unique phenomenon in such type of IP plans since it bounds both partners to accept each other as equal partners of the output generated from the project. This echoed the principles of inter-governmental agreement that lies at the root of CEFIPRA. The provision for arbitration by the two Co-Chairs of CEFIPRA on any dispute arising between the partners gives an additional conflict resolution mechanism where matters can be negotiated at the governmental level at the first instance, instead of directly taking recourse to International Court of Justice.

Since India became a partner to the Patent Cooperation Treaty in the year 1970, Indian Patent Laws have been changed to bring them in conformity with the international regime. In response, and given the nature of CEFIPRA’s work linking industry and research efforts across international borders, IP guidelines to be followed by CEFIPRA’s grantees were modified by the Indo-French Working Group. This culminated in the introduction of a system where a Technology Management Plan had to be agreed by each partner prior to the commencement of a project.

Operational for last 10 years now, IP Guidelines have formed the basis for many agreements that have been implemented covering projects across the knowledge innovation chain. This has also led to a large number of patents filed based on work pursued under CEFIPRA’s supported projects. For more details on these patents see page xii.

Ensemble : What is your key message to S&T professionals of both countries on collaborative projects?

Francois Richier : Firstly I would like to congratulate French and Indian researchers for their enthusiasm to collaborate. It is thanks to their hard work and audacity that we have such a strong bilateral relationship in science and technology. I would also like to ask them to, not only continue this good work by multiplying and strengthening their collaborations, but also to help to encourage further exchanges between researchers and companies from France and India, in particular at the level of Master’s and PhD students. Of course, I would also like to encourage them to come to the India-France Technology Summit taking place next week in Delhi, where we hope to see many more Indo-French collaborations in science, technology and innovation be developed and strengthened.

Ensemble: Congratulations!! Raman — Charpak Fellows - 2013

H.E. Mr. Francois Hollande, Honourable President of France and Dr. Manmohan Singh, Honourable Prime Minister of India launched the “Raman — Charpak Fellowship” during the state visit of the President of France to India during February 14-15, 2013. On behalf of the Department of Science and Technology (DST), Government of India and the French Embassy in India, Ministry of Foreign Affairs, Government of France, CEFIPRA had invited applications from the PhD students of India and France. Based on a rigorous selection process 15 students have been selected for the fellowships (see details below). ENSEMBLE congratulates all of them for their success and wishes them the best in their resultant endeavors.

### Indian Students

<table>
<thead>
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<th>Discipline</th>
<th>Name &amp; Institute</th>
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<tr>
<td>Life Sciences</td>
<td>V.V. Reddy Manipal University</td>
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<tr>
<td>Life Sciences</td>
<td>Sneha C. Sagarkar, RTM Nagpur University</td>
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<td>Mathematics</td>
<td>Bapan Ghosh Bengal Engineering &amp; Science University</td>
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<td>Computational Sciences</td>
<td>W.R.T Navaraj Academy of Scientific and Innovative Research</td>
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<td>Material Sciences</td>
<td>Sreekantan M Unni Academy of Scientific &amp; Innovative Research</td>
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<tr>
<td>Physical Sciences</td>
<td>Purushottam Jha Humty Bhabha National Institute</td>
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<tr>
<td>Physical Sciences</td>
<td>Shubhra Singh IITM University Muzaradah</td>
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<tr>
<td>Chemical Sciences</td>
<td>K.H.V. Reddy Osmania University</td>
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<td>Chemical Sciences</td>
<td>Konala Karnakar Kakinada University</td>
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### French Students

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<tr>
<td>Physical Sciences</td>
<td>Jonathan A Freundlich, J.G.A. Marseilles Université Pierre et Marie Curie</td>
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<tr>
<td>Life Sciences</td>
<td>Esther Dalko Universitat Lille 1</td>
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<td>Chemical Sciences</td>
<td>Simon Dunck Université Paris Sud</td>
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The necessity of the patent lies in the fact that they provide incentives to individuals by the invention. Patents are a form of intellectual property, and like any other property or their assignee for a limited period of time in exchange for the public disclosure of the invention. Patents are a set of exclusive property rights granted by a sovereign state to an inventor or their assignee for a limited period of time in exchange for the public disclosure of the invention. Patents are a form of intellectual property, and like any other property rights, it may be sold, licensed, mortgaged, assigned or transferred. The necessity of the patent lies in the fact that they provide incentives to individuals by offering them recognition for their creativity and a material reward for their marketable innovation.

### Patents from Projects Supported by CEFIPRA

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Patent Name</th>
<th>Number</th>
<th>Inventors</th>
<th>Brief Description</th>
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<tbody>
<tr>
<td>1</td>
<td>A PROCESS FOR THE PREPARATION OF AMORPHOUS SILICON BASED SOLAR CELLS</td>
<td>245361 (Indian)</td>
<td>Chaudhari P, Dutta Gupta N, Ray P P (Indian Association for The Cultivation of Science)</td>
<td>A process for the preparation of amorphous silicon based solar cell having the structure, Glass/Si3N4/p-a-SiCH3: Si:H/a-Si:H/a-Si:H</td>
</tr>
<tr>
<td>2</td>
<td>A PROCESS FOR THE PREPARATION OF MONOSUBSTITUTED CYCLOALKANOINES</td>
<td>197324 (Indian)</td>
<td>Raju SVN, Srinivasan S, Ponrathnam S, Srinivasan KV, Rajan CKMR (Indian National Chemical Laboratory, Pune)</td>
<td>A process for the preparation of monosubstituted cycloalkanones by reacting cycloalkane with 4-aminobenzaldehyde in the presence of an alcoholic solution of alkali metal hydroxide in an inert atmosphere.</td>
</tr>
<tr>
<td>3</td>
<td>HYDROPHOBICALLY MODIFIED POLY (ACRYLIC ACID) (PAA) AND PREPARATION THEREOF</td>
<td>244750 (Indian)</td>
<td>Vinayak BM, Purushotham WP, Kishore LA, Subhash SA (National Chemical Laboratory, Pune)</td>
<td>Development of hydrophobically modified polymers (HMPs), which have emerged as promising materials in diverse fields such as paints, cosmetics, oils, food and textiles.</td>
</tr>
<tr>
<td>4</td>
<td>SINGLE-STEP CATALYTIC PREPARATION OF PARA-AMINO-METHYLPHENOL</td>
<td>205850 A1</td>
<td>Figueras F (Institut de Recerca i desenginyeu Catàleg)</td>
<td>Use of a bi-functional catalyst for the one step preparation of para-aminophenol, said catalyst comprising a mixture of a hydrogenation noble metal and a zincium sulfide.</td>
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<tr>
<td>5</td>
<td>BIOMATERIAL AND BIODEGRADABLE BIOPOLYMER MATRIX</td>
<td>EP 1520808 A1</td>
<td>Alexandru I, (Josef en Jonas, France); Bij B (Mumbai, India); Denis L (Biomateriaux et Polymères, Centre d’Études Pharmaceutiques,); Jayakrishnan A (Kuala University, Thiruvananthapuram); Umdanchar R P (Trivandrum India)</td>
<td>Preparation of a biocompatible, biodegradable biopolymer matrix based on natural polysaccharide chitosan and dextran that can be formed in situ very rapidly.</td>
</tr>
<tr>
<td>6</td>
<td>AN IMPROVED PROCESS FOR THE PREPARATION OF MONOCODENIZED BENZYLIDINE CYCLOALKANOINES</td>
<td>199534 (Indian)</td>
<td>Raju SVN, Ponrathnam S, Sounpaki VM, Rajan CKMR, Srinivasan KV (Indian National Chemical Laboratory, Pune); Noel C (Laboratoire De Physicochimie/Struculaire Et Macromoleculaire Unite Associer Au Cere, France)</td>
<td>Preparation of monocodened benzylidene cycloalkanones.</td>
</tr>
<tr>
<td>7</td>
<td>A PROCESS FOR THE PREPARATION OF DISUBSTITUTED CYCLOALKANOINES BASED MONOMERS</td>
<td>242198 (Indian)</td>
<td>Raju SVN, Srinivasan S, Ponrathnam S, Rajan CKMR (Indian National Chemical Laboratory, Pune)</td>
<td>A process for the preparation of disubstituted cycloalkane based monomers.</td>
</tr>
<tr>
<td>8</td>
<td>A PROCESS FOR THE PREPARATION OF POLY BIS (NAPHThALIMID) SULPHIDES</td>
<td>225645 (Indian)</td>
<td>Ponrathnam S, Yemul OS, Yemul SO, Rajan CKMR (National Chemical Laboratory, Pune)</td>
<td>A process for the preparation of poly bis (naphthalimid) sulfides.</td>
</tr>
</tbody>
</table>

### Patents from Projects Supported by CEFIPRA

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Patent Name</th>
<th>Number</th>
<th>Inventors</th>
<th>Brief Description</th>
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<tbody>
<tr>
<td>9</td>
<td>A PROCESS FOR THE PREPARATION OF NOVEL MONOMERS BASED ON DISUBSTITUTED CYCLOALKANOINES</td>
<td>251580 (Indian)</td>
<td>Subramanium S, Srinivasan KV, Rajan CKMR, Nadipal-Sujoio SV, Ponrathnam S (National Chemical Laboratory, Pune)</td>
<td>A process for the preparation of novel monomers based on disubstituted cycloalkanones,</td>
</tr>
<tr>
<td>10</td>
<td>AN IMPROVED PROCESS FOR THE PREPARATION OF BIS (HALO-NAPHTHALIMID) ALKYLENES</td>
<td>214584 (Indian)</td>
<td>Rajan CKMR, Ponrathnam S, Yemul SO (Indian National Chemical Laboratory, Pune); Fradet A (Laboratoire De Synthese Macromoleculaire, A, Place Jussieu)</td>
<td>A process for the preparation of phenolic crosslinkable copolysulfides by reacting 2, 6 Bis (4-chloro benzilidene) cyclohexanone with alkali metal sulfides in an inert atmosphere.</td>
</tr>
<tr>
<td>11</td>
<td>A PROCESS FOR THE PREPARATION OF POLYESTER-LINKABLE POLYARYLENE SULPHIDES</td>
<td>214584 (Indian)</td>
<td>Rajan CKMR, Ponrathnam S, Yemul SO (Indian National Chemical Laboratory, Pune); Fradet A (Laboratoire De Synthese Macromoleculaire, A, Place Jussieu)</td>
<td>A process for the preparation of aliphatic-aromatic compatibilizers.</td>
</tr>
<tr>
<td>12</td>
<td>A PROCESS FOR THE PREPARATION OF A NOVEL COMBINED POLYMER BLENDS</td>
<td>215019 (Indian)</td>
<td>Ponrathnam TTGCN, Ponrathnam S, Rajan CKMR (National Chemical Laboratory, Pune); Fradet A (Laboratoire De Synthese Macromoleculaire, A, Place Jussieu)</td>
<td>A process for the preparation of a compatibilized polymer blend.</td>
</tr>
<tr>
<td>13</td>
<td>A COMPOSITION AND AN APPARATUS FOR THE PREPARATION OF DISUBSTITUTED CYCLOALKANONES</td>
<td>214584 (Indian)</td>
<td>Sibdas B (Organic Membrane Division, Central Glass &amp; Ceramic Research Institute, Kolkata); Andre L (Institut des Membranes UMR 5635 Campus CNRS-1919 Place Eugene Bataillon, CC 947 Route du Mende 34253 Montpellier cedex 5 France)</td>
<td>The porous ceramic capillary tube made on clay-alumina mixture has high surface area/volume ratio with required physical characteristics.</td>
</tr>
<tr>
<td>14</td>
<td>AN ELECTROCHEMICAL COAGULATION PROCESS FOR THE REMOVAL OF NITRATE FROM DRINKING WATER</td>
<td>2065246 A1</td>
<td>S. Vasudevan (Electroorganic Chemical Division, Central Electrochemical Research Institute, Tamil Nadu)</td>
<td>An electrochemical coagulation process for the removal of nitrate from drinking water wherein the nitrate is removed by adsorption of metal hydroxide, formed by ‘in-situ’ anodic oxidation.</td>
</tr>
<tr>
<td>15</td>
<td>NOVEL BIOACTIVE PLANT LIGNIN COMPOSITIONS AND METHOD FOR ISOLATION AND CHARACTERIZATION OF SAME</td>
<td>12784 A7</td>
<td>Kanoklak N (The Energy and Resources Institute, New Delhi); Dubois MAL (Laboratoire de Pharmacognoise, Unite de Molecules d’interet Biologique); Ofere A C M, Abarya D</td>
<td>Isolation and characterization of the novel bioactive plant saponin compositions from Chlophymyrtium amarum, inclusive of, but not confined to, fosforane and apironene type.</td>
</tr>
<tr>
<td>16</td>
<td>A DEVICE/KIT FOR THE BIODEGRADATION OF METALS &amp; METHOD OF WORK</td>
<td>12784 A7</td>
<td>Adbulloya A (The Energy and Resources Institute, New Delhi)</td>
<td>A device/kit apparatus for the bio-mediated extraction of Chromium (Cr) from the tannery wastes to not only secure the release of the trapped metal but also to ensure its recycled reusability in the tanneries.</td>
</tr>
</tbody>
</table>
### MOBILITY OF SCIENTISTS SUPPORTED UNDER CEFIPRA PROJECTS
#### August - September 2013

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Project Title</th>
<th>Name</th>
<th>Institutional Affiliation</th>
<th>Institute Visited</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Nutrient sensing in plants</td>
<td>Dr. Narendra Tuteja</td>
<td>International Centre for Genetic Engineering &amp; Biotechnology, New Delhi</td>
<td>Biochimie et Physiologie Moléculaire des Plantes, Montpellier</td>
</tr>
<tr>
<td>2</td>
<td>The Kosi river alluvial dynamics and associated risks</td>
<td>Prof. Rajiv Sinha</td>
<td>Indian Institute of Technology, Kanpur</td>
<td>Laboratoire de Dynamique des Fluides Geologiques Institut de Physique du Globe de Paris, Paris</td>
</tr>
<tr>
<td>3</td>
<td>Extreme QCD in the LHC Era</td>
<td>Prof. Rajiv V Gavai</td>
<td>Tata Institute of Fundamental Research, Mumbai</td>
<td>Institut de Physique Theorique CEA Nuclrey, Gil-sur-Yvette</td>
</tr>
<tr>
<td>4</td>
<td>The Kosi river alluvial dynamics and associated risks</td>
<td>Dr. Vikrant Jain</td>
<td>Physical Research laboratory, Gandhinagar</td>
<td>Laboratoire de Dynamique des Fluides Geologiques Institut de Physique du Globe de Paris, Paris</td>
</tr>
<tr>
<td>5</td>
<td>Role of Chromatin Architecture in celluar senescence</td>
<td>Prof. Sanjeev Gande</td>
<td>Indian Institute of Science Education and Research, Pune</td>
<td>Uitit d'Organisation Nucléaire et Oncologique Institut Pasteur, Paris</td>
</tr>
<tr>
<td>6</td>
<td>Reversals of a large scale field on a turbulent background</td>
<td>Prof. Mahendra Kumar Verma</td>
<td>Indian Institute of Technology, Kanpur</td>
<td>Laboratoire de Physique Statistique Ecole Normale Supérieure, Paris</td>
</tr>
<tr>
<td>7</td>
<td>Two dimensional electron gas physics in oxide heterostructures</td>
<td>Dr. Anjana Dogra</td>
<td>National Physical Laboratory, New Delhi</td>
<td>Laboratoire de Physique et D'Etudes des Matériaux(LPEM), Paris</td>
</tr>
<tr>
<td>8</td>
<td>Kinetics and spectroscopy in Extreme Environments: Application to Astrophysics and Astrocchemistry</td>
<td>Prof. Elangamani Arunan</td>
<td>Indian Institute of Science, Bangalore</td>
<td>Département de Physique Moléculaire, Université de Rennes, Rennes</td>
</tr>
<tr>
<td>9</td>
<td>Kinetics and spectroscopy in Extreme Environments: Application to Astrophysics and Astrocchemistry</td>
<td>Prof.K.P.S. Reddy</td>
<td>Indian Institute of Science,Bangalore</td>
<td>Département de Physique Moléculaire, Université de Rennes, Rennes</td>
</tr>
<tr>
<td>10</td>
<td>Anti-factor H aminothybde associated hemolytic uremic syndrome</td>
<td>Dr. Aarti Gupta</td>
<td>All India Institute of Medical Sciences, New Delhi</td>
<td>Centre de Recherche des Cordeliers, Paris</td>
</tr>
<tr>
<td>11</td>
<td>All polymer flexible gas sensors</td>
<td>Dr. Dine K Aswal</td>
<td>Bhabha Atomic Research Center, Mumbai</td>
<td>Interface, Traitements, organisation et Dynamique des Systems(TIDYS), Université Paris Diderot-CNRS, Paris</td>
</tr>
<tr>
<td>12</td>
<td>Effect of the correlations in the statics and the dynamics of extended systems</td>
<td>Dr.P.K. Mohanty</td>
<td>Saha Institute of Nuclear Physics, Kolkata</td>
<td>Laboratoire de Physique Théorique et Modélès, Statistiques, Orsay</td>
</tr>
<tr>
<td>13</td>
<td>Screening for K-RAS and B-RAF mutations in tumor tissues and circulating nucleic acids present in blood-plasma and urine of Colorectal Cancer patients in India</td>
<td>Dr. Alain R Thierry Syrdiaig</td>
<td>Centre for Cellular and Molecular Biology, Hyderabad</td>
<td>Universités Montpellier 1 SystDia, Montpellier</td>
</tr>
<tr>
<td>14</td>
<td>Filling in cucumbers: a non-eclogenic reverse genetic approach for muskmelon crop improvement</td>
<td>Dr. Abdulhadi Bendahman</td>
<td>Bouch Bio Pvt.Ltd., Gujrat</td>
<td>ERGV Lab(INRA), Evry University, France</td>
</tr>
</tbody>
</table>

### Forthcoming Events
- **October 23-24, 2013**, New Delhi, India- France Technology Summit 2013
  E-mail: info@indiafrancesummit.org
- **November 15-19, 2013**, Madurai/Kodaikanal, India- Scientific Council meeting of CEFIPRA
  E-mail: director@cefipra.org
- **November 20-21, 2013**, Madurai, India- Industrial Research Committee meeting of CEFIPRA
  E-mail: director@cefipra.org
- **November 25-27, 2013**, France- Meeting on Indo-French Region to Region Cooperation between Karnataka and Aquitaine
  E-mail: director@cefipra.org
  E-mail: director@cefipra.org

### MOBILITY OF STUDENTS’ VISITS SUPPORTED BY CEFIPRA
#### August - September 2013

<table>
<thead>
<tr>
<th>Domain</th>
<th>Name &amp; Institute</th>
<th>Institute Visited</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantum nanoelectronics</td>
<td>Mr. Tanay Roy</td>
<td>Tata Institute of Fundamental Research, Mumbai</td>
</tr>
<tr>
<td>Materials Science</td>
<td>Ms. Neha Sharan</td>
<td>Indian Institute of Science, Bangalore</td>
</tr>
<tr>
<td>Quantum nanoelectronics</td>
<td>Mr. Shambhu Verma</td>
<td>Inter University Accelerator Centre, New Delhi</td>
</tr>
<tr>
<td>Interface between Physics and Biology</td>
<td>Mr. Shammy Verma</td>
<td>UJF-ESONN Maison des Magistères, Grenoble</td>
</tr>
<tr>
<td>Interface between Physics and Biology</td>
<td>Ms. Neelima Basavappa</td>
<td>UJF-ESONN Maison des Magistères, Grenoble</td>
</tr>
<tr>
<td>Environnemental Sciences</td>
<td>Dr. C. Jayaswal</td>
<td>C. Abdul Hakem College, Tamil Nadu</td>
</tr>
<tr>
<td>Life and Health Sciences</td>
<td>Dr. Suresh</td>
<td>Institute Visited Centre de Neurosciences de Paris Sud, Orsay</td>
</tr>
<tr>
<td>Materials Science</td>
<td>Dr. Duraga Prasad</td>
<td>Indian Institute of Science, Bangalore</td>
</tr>
<tr>
<td>Interface between Physics and Biology</td>
<td>Ms. Vandini Bhandari</td>
<td>UJF-ESONN Maison des Magistères, Grenoble</td>
</tr>
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### Events
- **August - September 2013**, New Delhi, India- France Technology Summit 2013
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  E-mail: director@cefipra.org
  E-mail: director@cefipra.org
Department of Science and Technology (DST) and Institut National de Recherche en Informatique et en Automatique (INRIA) invite proposals for Information and Communication Science & Technology for the year 2014. In India, on behalf of the DST, CEFIPRA invites proposals from the Indian scientists / researchers under this targeted program.

Thrust areas of research for this call are:
- a) Big data
- b) Cyber physical systems (sub area: embedded system)
- c) High performance computing.

The research projects will be funded for a maximum of three years, starting from February 2014.

For more details regarding application procedure & format, funding mechanism, proposal evaluation process and criteria please visit www.cefipra.org, or contact:

A Sathidevi
Scientific Officer, CEFIPRA, 5B, Ground Floor, India Habitat Centre, Lodhi Road, New Delhi 110 003 (India)
Tel: (+91-11) 2468 2251-52 Email: sathidevi@cefipra.org Email: director@cefipra.org Website: www.cefipra.org

Proposal Submission Deadline | 23 October 2013

DST-INRIA JOINT CALL FOR PROPOSALS

Department of Science and Technology (DST) and Institut National de Recherche en Informatique et en Automatique (INRIA) invite proposals for Information and Communication Science & Technology for the year 2014. In India, on behalf of the DST, CEFIPRA invites proposals from the Indian scientists / researchers under this targeted program.

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A Sathidevi
Scientific Officer, CEFIPRA, 5B, Ground Floor, India Habitat Centre, Lodhi Road, New Delhi 110 003 (India)
Tel: (+91-11) 2468 2251-52 Email: sathidevi@cefipra.org Email: director@cefipra.org Website: www.cefipra.org

Proposal Submission Deadline | 31 October 2013

Industrial Research Program of CEFIPRA is designed to support collaborative research projects involving academic and industrial partners. The objective is to promote the development of new processes or products or the improvement of existing processes and products, thus offering industrial partners an enhanced competitiveness at the international level.

Concept Notes (2-3 pages) are invited from Automotive and Aerospace sector industrial organisations (including ancillaries) for examination by Industrial Research Committee of CEFIPRA, comprising of experts from India and France. Shortlisted applicants will be asked to submit detailed proposals subsequently. For detailed terms and conditions visit www.cefipra.org

For further information please contact:

Dr. Debapriya Dutta
Director, Indo-French Centre for the Promotion of Advanced Research (CEFIPRA)
Email: director@cefipra.org Website: www.cefipra.org

Last date for the receipt of applications | 30 October 2013