Climate Change: A Global Challenge
Hello readers!

I have recently joined the CEFIPRA family as its new Director and this is my first communication with most of you through this newsletter. I sincerely hope that through this newsletter, CEFIPRA will be able to continue providing the valuable and useful information about the Indo-French cooperation in Science, Technology and Innovation (STI). Enhancing the awareness about Indo-French cooperation in STI and reaching out to the new stakeholders is the main aim of this newsletter. Centre’s interventions to support this bilateral cooperation through various activities are aimed to generate outputs which can help to deal with global challenges. Climate Change is one of such challenges which needs a uniform action by all the nations to deal with. 21st Session of the Conference of the Parties (COP21), one of the largest climate conferences ever organized on Climate Change issue, is happening in November/December 2015 at Paris in France. It is a unique conference in the sense that for the first time, it will act as a facilitator to achieve universal and legally binding international agreement on the climate, applicable to all countries. India is also participating in this major event. CEFIPRA has supported Indo-French scientific collaborations in the field of Environment and will continue to do so in the future with an aim to contribute towards climate change adaptation and mitigation activities.

At this juncture, I wish to successfully contribute to the activities of CEFIPRA which should help to steer achievements of the Centre along with its mandate and goals to generate more sustainable outputs through Indo-French cooperation. I request the scientific communities in India and France for their kind cooperation in this endeavour.

Dr. Mukesh Kumar
Director, CEFIPRA
The Conference of the Parties (COP), made up of all “States Parties”, is the supreme decision-making body of UNFCCC. It meets every year in a global session where decisions are made to meet goals for combating climate change. Decisions can only be made unanimously by the States Parties, or by consensus. COP21 will be significant for France in more ways than one. Not only would it be the largest diplomatic event ever hosted by the nation, it will also be the largest of all climate conferences ever organized. COP21 is anticipated to achieve a new universal & legally binding agreement on the climate change with the ultimate aim of limiting rise in global temperatures to not more than 2°C from normal levels. Achieving this goal is necessary to effectively combat climate change and to boost the pace of transition towards a resilient, low-carbon society, and economy. The agreement will enter into force in year 2020 and will have to be sustainable to enable long-term change. UN has already released the draft of the Paris Climate deal in the first week of October 2015 seeking an ambitious mitigation plan by countries, and, enhancing the flow of funds towards poor countries for undertaking adaptation measures. France will therefore be playing a leading international role to ensure points of view converge and to facilitate the search for consensus by the United Nations, as well as within the European Union, which has a major role in climate negotiations.

Every member country is required to publish its National Communication outlining its efforts in the context of climate change, as soon as possible, but before COP21. This exercise is a new component of international climate negotiations. France has undertaken to work with several countries who need assistance in preparing their respective National Communications. This is in order to ensure that each country can present its activities that correspond with the global efforts against climate change. Shortly before COP21, the UNFCCC secretariat will publish a summary of these contributions to give an indication of the cumulative impact of all such efforts.

Another key objective of COP21 is related to the financial investment aspects for climate change. This is the proposed mobilization of $100 billion per year by developed countries, from public and private sources w.e.f. year 2020. This commitment, made in Copenhagen, shall enable developing countries to combat climate change whilst promoting fair and sustainable development. Some of these funds will pass through the Green Climate Fund, which has already received its initial capital of $10.2 billion, including almost $1 billion from France. France has mobilized all its energies to host COP21/ CMP11. The agencies involved include not only various key ministries of the French Government, but also several public sector organisations and local government bodies whose efforts and commitment will play a decisive role in success of COP 21. These include the Ministry of Foreign Affairs and International Development; Ministry of Ecology, Sustainable Development and Energy and Ministry of Agriculture, Agrifood & Forestry. Several local government bodies and public sector institutions of France are also involved. These include the Agence nationale de l’habitat (French national agency for housing improvement, Ana); French Environment and Energy Management Agency (ADEME); Bureau de recherches géologiques et minières (French geological survey, BRGM); National Centre for Scientific Research (CNRS) Observatoire national sur les effets du réchauffement climatique (French national observatory on the effects of climate change) and French Agricultural Research Centre for International Development (CIRAD).

Many French companies from diverse sectors, that are already involved in the fight against climate change through their products and services, have stepped forward to support the organisation and conduct of COP21 by way of financial and/or in-kind contributions.

**INDO-FRENCH COMMITMENTS AND COOPERATION IN THE CONTEXT OF CLIMATE CHANGE**

Indian government has shown its robust commitment towards efforts associated with climate change mitigation through its various actions. This was reflected in India’s Initial National Communication in year 2004 to the United Nations Framework Convention on Climate Change. In 2008, the then Indian Prime Minister Shri Manmohan Singh released India’s first National Action Plan on Climate Change (NAPCC) outlining existing and future policies and programmes addressing climate mitigation and adaptation. The plan identifies eight core “national missions” running through 2017 and directs the concerned ministries to submit detailed implementation plans to the Prime Minister’s Council on Climate Change. India has already submitted its climate action plan in the last week of September 2015 committing itself to a reduction in emission intensity for its GDP growth by 35% by year 2030.


Tackling the issue of climate change was a prominent highlight of the visit of Indian Prime Minister Shri Narendra Modi to France in April 2015. In his discussions with French President H.E. François Hollande the Indian Prime Minister extended his full support to France for a successful outcome of COP21. Both the leaders expressed confidence that the COP 21 will be able to finalize a historic agreement covering the phase beyond the year 2020. They also underlined the importance of enhancing Indo-French cooperation on joint research and development and technology innovation as well as diffusion of clean energy and efficiency solutions that will help in transitioning towards a climate resilient and low carbon economy.

Recently during a round table discussion on climate at a South Korean University in Seoul, the French President H. E. François Hollande mentioned in context of carbon emission plans submitted by different countries that funding clean energy projects would help nations such as India.

CEFIPRA, with its emphasis on environmental research as a supported domain under its core scientific collaborative research programmes, is in a unique position to bring together the Indian and French scientific communities for a better understanding towards this global challenge. The outcomes of research conducted under CEFIPRA supported projects on climate change related issues can impact the outcome of such global scale negotiations and help in building consensus over various delicate matters in a meaningful way. CEFIPRA can also play a role of an enabler with climate change research oriented targeted programmes to be supported by the national funding agencies of both the countries.

In this context, it is mentionable that CEFIPRA is supporting an Indo-French Seminar on Catalysis for Green and Sustainable Chemistry at Indian Institute of Chemical Technology, Hyderabad (4-7 November 2015). Catalysis, which plays a pivotal role in the production of a large proportion of chemical products, is a practicing science for chemists today is to develop chemical processes based on green and sustainable chemistry. The primary objective of this seminar is to bring together chemists from India...
Welcome to the new Director

CEFIPRA welcomes Dr. Mukesh Kumar as its new Director. He is a visionary with a career spanning more than 3 decades, in multiple roles of researcher and science administrator. With his wide experience and abilities he has earned the reputation of an inspiring knowledge manager in the domains of Science, Technology and Innovation.

Dr. Kumar made significant contributions in his earlier role as Deputy Director General (Senior Grade) and Head of International Health Division at Indian Council of Medical Research (ICMR), New Delhi for coordination & evaluation of International Cooperation in Biomedical Sciences and Health Research between India and other countries.

He has developed several documents and analytical reports on outcomes of international collaborative research projects & programmes. He has, in the past, undertaken a WHO sponsored project on competence building among young scientists and was the Indian Nodal Officer for several international collaborative programmes. He has also represented Government of India in various Joint Working Groups & Joint Steering Committees for international collaboration.

With deep commitment towards excellence and a strong determination to enhance Indo-French cooperation based on Science, Technology and Innovation, Dr. Mukesh Kumar has taken over as the new Director of Indo-French Centre for the Promotion of Advanced Research (CEFIPRA) with effect from 16 October 2015.

CEFIPRA is committed to supporting collaborative efforts between scientists and institutions of India and France that lead to the development of global common goods and enable the world to deal with global issues such as climate change.

Constraint-based design of controllers and prefilters

For a Hawk’s Eye

Many applications in science and engineering require automatic control of several variables that strongly interact with each other. Examples of such applications are automotive control, flight control, and industrial control systems. For such applications, it is necessary to design robust multivariable control systems to effectively handle variations in the system parameters and cope with external disturbances.

Quantitative Feedback Theory (QFT) is a well-known approach for design of robust multivariable control systems. In QFT, the key and difficult step is of obtaining a controller and prefilter that satisfies the various design constraints arising from stability and performance specifications. Hitherto, in the multivariable QFT context, the controllers and prefilters have been designed manually, relying on designer’s skill and experience. However, the manual approach is often tedious and time taking, and usually leads to considerable overdesigns.

Motivated by these concerns, CEFIPRA supported project “Constraint-based design of controllers and prefilters” was aimed to devise an automated procedure for designing robust multivariable control systems, based on QFT and tools of Interval Constraint Satisfaction Techniques (ICST) that are used to narrow down the domains by removing locally inconsistent intervals containing no solution of some constraint. And, as a by-product, to also develop the first freely available ICST MATLAB toolbox, along with an ICST-based QFT MATLAB toolbox for robust control.

MATLAB® is the high-level language and interactive environment used by millions of engineers and scientists worldwide. It allows to explore and visualize ideas and collaborate across disciplines including signal and image processing, communications, control systems, and computational finance.

Project Objectives

» To develop computer code for the proposed procedures, and to integrate it into industrial strength MATLAB toolboxes.

» To test and validate the computer codes through extensive computer simulations.

» To test the efficacy of the developed procedures and codes, via real-time experiments performed on a magnetic levitation system in the laboratory.

» Development of an optimization-based procedure that permits designing a prefilter and a controller in only one step instead of two.

» Development of the code for the procedure in C++ with bridges in MATLAB instead of directly in MATLAB.

The Team

The Indian team comprised of Prof. P. S. V. Nataraj, System and Control Engineering Group, IIT Bombay; Prof. Dr. Mukesh D. Patil, Rammano Adik Institute of Technology (RAIT), Bombay and Prof. Dr. Manoj M. Deshpande A.C. Patil College of Engineering, Kharghar, Navi Mumbai.

The French team comprised of Dr. Alexandre Goldsztajn, Dr. Frédéric Goualard, Dr. Laurent Granvilliers and Dr. Christophe Jermann. All members of the French side were from LaboratoireInformatique de Nantes-Atlantique.

Salient Achievements

The main achievement of the project is also the least expected one since it originates from a deviation from the original objectives, viz. the definition of a method to design both a controller and a compatible prefilter in one step only instead of two. Such a method does not require backtracking from an incompatible prefilter to a new controller design, as is necessary with the two steps.

First order rejection tests for multiple-objective optimization. Alexandre Goldstein, Frédéric Goualard, Laurent Granvilliers, and Christophe Jermann. Twenty-second International Conference on Multiple Criteria Decision Making, Malaga, Spain, 2013.


approach initially considered. As a result, it is possible to automate fully the process of designing a controller and its prefilter. It is also now possible to search for optimal parameters using local or global optimization procedures. In the proposed method, the QFT controller and prefilter design is obtained by solving inequalities that capture robust stability and performance specifications. The proposed method uses optimization techniques to solve the nonlinear, non-convex constraints. This technique is capable of finding the controller and prefilter parameters simultaneously in given search domains, so that all the stability and performance QFT bounds are satisfied.

Another achievement of the project is the design and implementation of a complete interval constraint system in C++ based on Realfpaver, with a complete redesign of the procedures to evaluate expressions, in order to achieve a better/faster solution to the problems arising from the modeling of the controllers and prefilters. That system is not limited to solving QFT problems and will be usable in many other areas, as was the case with its ancestor Realfpaver.

Future Significance of Research Results

The proposed method can be used for developing highly efficient and robust control systems. The robustness of the control system ensures that the performance is guaranteed, in spite of system degradation, wear and tear, etc. Moreover, the control input required is well tuned to the desired levels of performance. These features make the proposed method a practical and cost-effective one to employ in several key real-world applications, including aerospace, automotive, and industrial control.

Project Based Publications


BIRAC, a Government of India Enterprise, has been set up to promote and nurture affordable innovation research. CEFIPRA is an Indo-French bilateral organization, which aims to promote collaborative research between India and France in cutting edge science and technology.

BIRAC and the French Embassy in India, represented by the Science and Technology Service (SST) have joined hands to support Indian and French collaborative projects involving academic actors, biotech start-ups and SMEs for promoting the innovation ecosystem in both the countries. On behalf of BIRAC & the French Embassy in India, CEFIPRA will manage this programme. The support will be provided for challenge-oriented, high-quality solution-driven bilateral projects that i) combine innovative approaches towards new concepts and technological breakthroughs in human health, ii) encourage and enable Indo-French collaboration between public and private research groups, industry, clinicians and end-users in order to improve the competitiveness of both Indian and French biotech industries.

The proposals must be innovative and market-driven towards the development or substantial improvement of new products, devices, drugs, processes, etc. for human health.

Themes of the Call

- Molecular diagnostic for prediction of Alzheimer’s and other dementia;
- New assisting technologies for mobility of physically challenged (including prosthetics and robotics applications);
- Biomaterials and cell engineering for health applications.

WHO CAN APPLY

The proposals must involve at least two French partners (one academia and one industry) and two Indian partners (one academia and one industry), and should clearly show the added value of the bilateral collaboration. Duration of the projects will not exceed 2 years. Maximum two projects will be supported under this programme. The proposals must be written jointly by Indian and French partners. The details eligibility and guidelines of this programme is in http://wwwCEFIPRA.org/pdf/Adv_Publicaiton%28BIRAC-SST.pdf.

HOW TO APPLY

Interested applicants can submit a complete proposal in the prescribed format (http://www.CEFIPRA.org/pdf/Adv_Publicaiton%28BIRAC-SST.pdf) to the mail id targetedprograme@CEFIPRA.org by 15th Jan 2016 at midnight (India time). For further information please contact Director, CEFIPRA, email: director@CEFIPRA.org or Dr. Jyoti Shukla, Manager (Technical). BIRAC email: jshukla.birac@nic.in
# RAMAN CHARPAK FELLows 2015

## Indian Fellows 2015

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<tr>
<th>Domain</th>
<th>Name</th>
<th>Institutional Affiliation</th>
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<tbody>
<tr>
<td>Physical Sciences</td>
<td>Santosh Kumar Singh</td>
<td>Academy of Scientific &amp; Innovative Research</td>
<td>Lille University of Science and Technology</td>
</tr>
<tr>
<td>Chemical Sciences</td>
<td>Amit Kumar Mondal</td>
<td>Indian Institute of Science Education And Research Bhopal</td>
<td>Centre de Recherche Paul Pascal CRPP-CNRS UPR 8641</td>
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<tr>
<td>Life Sciences</td>
<td>Sreekala S Nampoothiri</td>
<td>National Institute of Technology Calicut</td>
<td>UMR1141 INSERM - Université Paris Diderot, Département Hospitalo-Universitaire PROTECT, Hôpital Robert Debré</td>
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<tr>
<td>Material Sciences</td>
<td>Jincy Joy</td>
<td>Indian Institute of Technology Delhi</td>
<td>U1148- LVTS</td>
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<tr>
<td>Chemical Sciences</td>
<td>Anupam Bera</td>
<td>Indian Institute of Science, Bangalore</td>
<td>Institut Lumiere Matiere, Lyon, France</td>
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<td>Engineering Sciences</td>
<td>Nivedita Basu</td>
<td>Indian Institute of Science, Bangalore</td>
<td>Ecole Nationale Supérieure de Chimie de Paris</td>
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<tr>
<td>Engineering Sciences</td>
<td>Monjoy Saha</td>
<td>Indian Institute of Technology Kharagpur</td>
<td>Sorbonne Universités, University Pierre and Marie Curie (UPMC) - Paris 6</td>
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<tr>
<td>Life Sciences</td>
<td>Ravi Raghavbhai Sonani</td>
<td>Sardar Patel University</td>
<td>Commissariat A L&quot;Energie Atomique (CEA), Saclay, France</td>
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<tr>
<td>Chemical Sciences</td>
<td>Rahul Panwar</td>
<td>University of Delhi</td>
<td>University of Western Brittany</td>
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<td>Mathematical and</td>
<td>Sandip Banerjee</td>
<td>Academy of Engineering Science and Technology</td>
<td>INRIA Sophia-Antipolis M ´diterran ´e</td>
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<tr>
<td>Computational Sciences</td>
<td>Isha Taneja</td>
<td>Academy of Scientific and Innovative Research (AISIR) New Delhi</td>
<td>Ecole Nationale Vétérinaire de Toulouse</td>
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## French Fellows 2015

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<tbody>
<tr>
<td>Life Sciences</td>
<td>Claire Lambert</td>
<td>University Lille 2</td>
<td>Institute of Life Science (ILS) Odisha</td>
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<tr>
<td>Material Sciences</td>
<td>Camille Thevenot</td>
<td>Université de Lorraine</td>
<td>International and Inter University Centre for Nanoscience and Nanotechnology, Mahatma Gandhi University, Kottayam</td>
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<tr>
<td>Engineering Sciences</td>
<td>Muhammad Khoirul Khakim Habibi</td>
<td>Ecole Nationale Supérieure des Mines de Saint-Étienne</td>
<td>Indian Institute of Technology Kharagpur</td>
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<td>Mathematical and</td>
<td>Sébastien Eskenazi</td>
<td>University of La Rochelle</td>
<td>Indian Statistical Institute Kolkata</td>
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<td>Computational Sciences</td>
<td>Daniel Thomert Balouek</td>
<td>Ecole Normale Supérieure de Lyon</td>
<td>Mahindra Ecole Centrale, Hyderabad</td>
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<td>Material Sciences</td>
<td>Selim Bel Haj Salah</td>
<td>Ecole Nationale Superieure de Mecanique et Aerotechnique</td>
<td>Jawaharlal Nehru Centre for Advanced Scientific Research Bangalore</td>
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MOBILITY OF SCIENTISTS SUPPORTED UNDER CEFIPRA PROJECTS
SEPTEMBER-OCTOBER 2015

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<tr>
<th>S. No.</th>
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<tr>
<td>1</td>
<td>Genome wide recruitment profiling of BLM after DNA damage</td>
<td>Sagar Sengupta</td>
<td>National Institute of Immunology</td>
<td>Laboratoire de Biologie Moleculaire et Cellulaire du Controle de la Proliferation Toulouse</td>
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<td>2</td>
<td>Tropical cyclones in the Bay of Bengal: Oceanic response and air-sea interactions</td>
<td>Neetu</td>
<td>National Institute of Oceanography</td>
<td>Laboratoire Océanographie et de Climatologie: Experimentation et Analyses Numériques, Université Pierre et Marie Curie</td>
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<td>3</td>
<td>Tropical cyclones in the Bay of Bengal: Oceanic response and air-sea interactions</td>
<td>Teesha Mathew</td>
<td>National Institute of Oceanography</td>
<td>Laboratoire Océanographie et de Climatologie: Experimentation et Analyses Numériques, Université Pierre et Marie Curie</td>
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<td>4</td>
<td>Novel nanotechnological approaches for treatment of leishmaniasis using 2 propylquinoline</td>
<td>A. Jayakrishnan</td>
<td>Indian Institute of Technology Madras</td>
<td>Labex LERMIT, Faculté de Pharmacie Université Paris Sud II</td>
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<td>5</td>
<td>Novel nanotechnological approaches for treatment of leishmaniasis using 2 propylquinoline</td>
<td>V Kesavan</td>
<td>Indian Institute of Technology Madras</td>
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<td>6</td>
<td>Tropical cyclones in the Bay of Bengal: Oceanic response and air-sea interactions</td>
<td>Matthieu Lengaigne</td>
<td>Laboratoire Océanographie et de Climatologie: Experimentation et Analyses Numériques</td>
<td>National Institute of Oceanography</td>
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<td>7</td>
<td>Control of melanosome biogenesis by small GTPases</td>
<td>Gangi setty</td>
<td>Indian Institute of Science Bangalore</td>
<td>Institut Curie-CNRS, Paris</td>
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<tr>
<td>8</td>
<td>Development of fulvene-based Zr(II) and Ti(II) chemistry: organometallics, reactivity and applications in organic synthesis</td>
<td>K.V. Radhakrishnan</td>
<td>National Institute for Interdisciplinary Science &amp; Technology, Thiruvananthapuram</td>
<td>Université de Reims Champagne-Ardenne IOMR-CNRS</td>
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<td>9</td>
<td>Material Sciences</td>
<td>Milan Sanyal</td>
<td>Saha Institute of Nuclear Physics Kolkata</td>
<td>Université du Maine</td>
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<td>10</td>
<td>Pure and Applied Chemistry</td>
<td>Pradeep Tripati</td>
<td>National Chemical Laboratory</td>
<td>ECPM, University of Strasbourg</td>
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<td>11</td>
<td>Gene resources from polluted soils</td>
<td>M.S. Reddy</td>
<td>Thapar University</td>
<td>Ecologie Microbienne Université Lyon 1</td>
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<td>12</td>
<td>Developing design guidance for rammed earth construction</td>
<td>Nanjunda Rao</td>
<td>Indian Institute of Science Bangalore</td>
<td>DGCB-Ecole National des Travaux Publics de l’Etat</td>
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<td>13</td>
<td>Supra molecular approach to composite materials for advanced technologies</td>
<td>Uday Maitra</td>
<td>Indian Institute of Science Bangalore</td>
<td>Institut des Sciences Moléculaires-Université Bordeaux 1, CNRS</td>
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<td>14</td>
<td>Thermo-hydrodynamics of phase-change induced oscillating Taylor bubble flows</td>
<td>Frederic Lefèvre</td>
<td>INSA Lyon, Centre de Thermique de Lyon (CETHIL)</td>
<td>Indian Institute of Technology Kanpur</td>
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<td>15</td>
<td>Extreme QCD in the LHC Era</td>
<td>Jean Yves Ollitrault</td>
<td>Institut de Physique Théorique-CEA Saclay, Gif sur Yvette</td>
<td>Tata Institute of Fundamental Research, Mumbai</td>
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<td>16</td>
<td>Effect of the correlations in the statics and the dynamics of extended systems</td>
<td>Alberto Rosso</td>
<td>Laboratoire de Physique Théorique et Modèles, Statistiques-Université Paris Sud</td>
<td>Raman Research Institute Bangalore</td>
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MOBILITY OF STUDENTS SUPPORTED UNDER CEFIPRA PROJECTS
SEPTEMBER-OCTOBER 2015

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<tr>
<td>Life and Health Sciences</td>
<td>Swati Dudhal</td>
<td>National Centre for Biological Sciences, TIFR</td>
<td>Faculté de Médecine, Groupe Hospitalier Pitié-Salpêtrière, 105 Boulevard de l’Hôpital INSERM, Paris</td>
</tr>
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CORRIGENDUM
**Indo-French seminar on “Frontiers in Cytoskeleton Research: Coordination, Adaptation, Fine-tuning”**

A seminar on “Frontiers in Cytoskeleton Research: Coordination, Adaptation, Fine-tuning” was organized by IISER Pune, with CEFIPRA support from October 25-27, 2015 in Pune. About 25 PIs attended along with students from across India as well as local students from Pune who were interested in understanding cytoskeletal processes. Each session was followed by intensive discussions and questions. Intensive discussions also took place between scientists working on cytoskeletal dynamics across many scales. The ideas discussed were then taken further in theoretical models regarding acto-myosin dynamics. Students attending the seminar learnt about specialized cytoskeletal structures such as Cilia and Neurons, where four speakers explained how ciliary motion is required for flow of fluid in the brain and how traffic is controlled within Cilia and Neurons. The discussions then moved to cytoskeleton in mitosis, where new results were shown on kinetochore capture by micro-tubules and mechanisms of spindle aneuploidy. Eight students also gave short talks on their work. These discussions were continued through the poster sessions that were very well attended.

As a concrete outcome of the meeting, it was felt that the Indian and the French scientists have multiple areas of common interest and complementary experimental abilities established in their laboratories. It was agreed unanimously that both countries would benefit significantly by discussing science in future meetings and by exchanging students.

The current scenario in the cytoskeleton field and how collaborations could be sustained between the Indian and the French scientists in the future were also discussed.

**Indo-French workshop on “Chemistry and Physics of Materials”**

A two day Indo-French workshop on “Chemistry and Physics of Materials” was held with CEFIPRA support at Amphithéâtre Charpak, Université Pierre et Marie Curie, Paris from 26th - 27th October, 2015. The workshop aimed to establish and reinforce scientific collaborations working on cytoskeletal dynamics across many scales. The ideas discussed were then taken further in theoretical models regarding acto-myosin dynamics. Students attending the seminar learnt about specialized cytoskeletal structures such as Cilia and Neurons, where four speakers explained how ciliary motion is required for flow of fluid in the brain and how traffic is controlled within Cilia and Neurons. The discussions then moved to cytoskeleton in mitosis, where new results were shown on kinetochore capture by micro-tubules and mechanisms of spindle aneuploidy. Eight students also gave short talks on their work. These discussions were continued through the poster sessions that were very well attended.

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**Indo-French workshop on “Understanding and Facilitation of Neural Plasticity for Enhancing Post Stroke Recovery”**

A workshop on “Understanding and Facilitation of Neural Plasticity for Enhancing Post Stroke Recovery” was organized with CEFIPRA support between October 29-31 in New Delhi. The coordinators were Dr. Anirban Dutta, INRIA, Université de Montpellier, CNRS, France and Dr. Padma Srivastava, Head of Unit II Neurology, AIIMS, New Delhi. India. Around 26 Indo-French scientists and 43 students participated in this workshop.

Interdisciplinary approaches based on the ongoing research in France and India that can be leveraged in future for collaborative proposals were brainstormed. It was noted that there is a lack of funding from health foundations in India that may be relevant to fund more community health approaches for secondary and tertiary prevention in India.

The workshop generated new ideas on non-invasive brain stimulation to facilitate cutting-edge stem cell therapy as well as other combination therapies including Pharmacotherapy; Relevance (and targeting with brain stimulation) of descending tracts other than cortico-spinal tracts for post-stroke motor recovery; Relevance of the role of bilingualism in post-stroke language recovery which has a special significance in India, and, a brain network perspective to reorganization after stroke.

Future areas of collaboration were identified as:
1. ANR-DST proposal on neuro-imaging guided subject-specific electrotherapy for stroke rehabilitation.
2. Technology transfer to India for clinical evaluation of the low-cost approaches for stroke neuro-rehabilitation developed in France (specifically, INRIA-DST project that has one more year of funding).
3. Continuation of discussions on non-invasive brain stimulation to facilitate cutting-edge stem cell therapy as well as other combination therapies for CEFIPRA/ANR-DST funded projects.

Students from Delhi-NCR region greatly benefited from the interactions with the Indian and the French faculty at the workshop where students showed interest in applying for internship positions in France.
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.

Forthcoming Events

- Indo-French seminar on “Catalysis for Green and Sustainable Chemistry”, November 4-7, 2015, Indian Institute of Chemical Technology, Hyderabad.

For further information please contact:
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