

# ENSEMBLE

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

INDIA

FRANCE



CEFIPRA



## Climate Change: A Global Challenge

# editor's note

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



leader

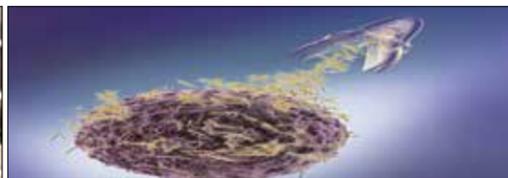
## COP21 in Paris

# For a new climate change agreement

Climate Change is a global phenomenon having potentially serious implications for economy, environment and societies at different spatial scales. United Nations (UN), has been playing an active role in promoting sustainable development on many fronts, climate Change being the foremost amongst them.

United Nations Framework Convention on Climate Change (UNFCCC) is a universal convention of principle, acknowledging the existence of anthropogenic (human-induced) climate change and giving industrialized countries the major part of responsibility for combating it. Adopted during the Earth Summit at Rio de Janeiro in year 1992, and ratified by 196 nation states (or the "Parties" to the Convention), it entered into force w.e.f. 21 March 1994.

The now imminent 21<sup>st</sup> Conference of Parties (COP21) at Paris seeks to enhance effective cooperation between nations to deal with the unprecedented challenges posed by rapid climate change.



## inside

ii | editor's note

iii | **leader**  
COP21 in Paris  
For a new climate change agreement

vii | **feature**  
Constraint-based design of controllers and prefilters  
For a Hawk's Eye

x | **updates**  
Raman Charpak Fellows 2015

xii | Mobility of scientists supported under CEFIPRA projects

xiii | Mobility of students supported under CEFIPRA projects

### Seminars / Workshops

xiv | Indo-French seminar on "Frontiers in cytoskeleton research: coordination, adaptation, fine-tuning"

xiv | Indo-French workshop on "Chemistry and Physics of Materials"

xv | Indo-French workshop on "understanding and facilitation of neural plasticity for enhancing post stroke recovery"

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September-October 2015



### COP21<sup>1</sup>

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.

Hosted by France, the 21<sup>st</sup> Session of COP (or COP21) is scheduled to be held at Paris from November 30 - December 11, 2015. About 40,000 participants/ delegates representing many countries, observers, and members of the civil society are expected to participate in COP21.

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 of 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<sup>2</sup>.

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, Anah); 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, Onerc) 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<sup>3</sup>. 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<sup>3</sup>.

French Government has also adopted a National Adaptation Strategy in 2006, followed by National Action Plan 2011-2015 and the 6th National Communication of France to the UNFCCC submitted in year 2014<sup>4</sup>.

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<sup>5</sup>.

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<sup>6</sup>.

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 contributing 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 developing at a fast pace in sync with the changes in environmental regulations. One of the challenging tasks 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

*Contd.*

## 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.



and France to discuss various aspects related to catalysis. Academicians as well as related Industry representatives are expected to discuss several related topics.

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. ●

### References

1. Websites of cop21 ([www.cop21paris.org](http://www.cop21paris.org)) and French Government (<http://diplomatie.gouv.fr/en/french-foreign-policy/climate/2015-paris-climate-conference-cop21/>)
2. UN's draft of Paris climate deal seeks mitigation plan, Hindustan Times, New Delhi, 6 October, 2015
3. India's Initial National Communication to the United Nations Framework Convention on Climate Change, 2003; NATIONAL ACTION PLAN ON CLIMATE CHANGE, GOVERNMENT OF INDIA, 2008;
4. Stratégie nationale d'adaptation au changement climatique, Observatoire nation a suresafe fete du réchauffement climatique; Plan national d'adaptation de la France aux effets du changement climatique 2011 – 2015; The sixth national communication of France to the United Nations Framework Convention on Climate Change, October 2013
5. India-France Joint Statement during the visit of Prime Minister to France (April 9-11, 2015) issued by Ministry of External Affairs, Government of India
6. Climate Change; Hollande asks rich nations to do their part; Business Standard, Chennai, 5 November 2015

## Constraint-based design of controllers and prefilters

# For a Hawk's Eye

P. S. V. Nataraj  
System and Control  
Engineering Group  
IIT Bombay



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 an ICST-based procedure for automated design of QFT controllers for multivariable systems.
- » To develop an ICST-based procedure for automated design of QFT prefilters for multivariable systems.

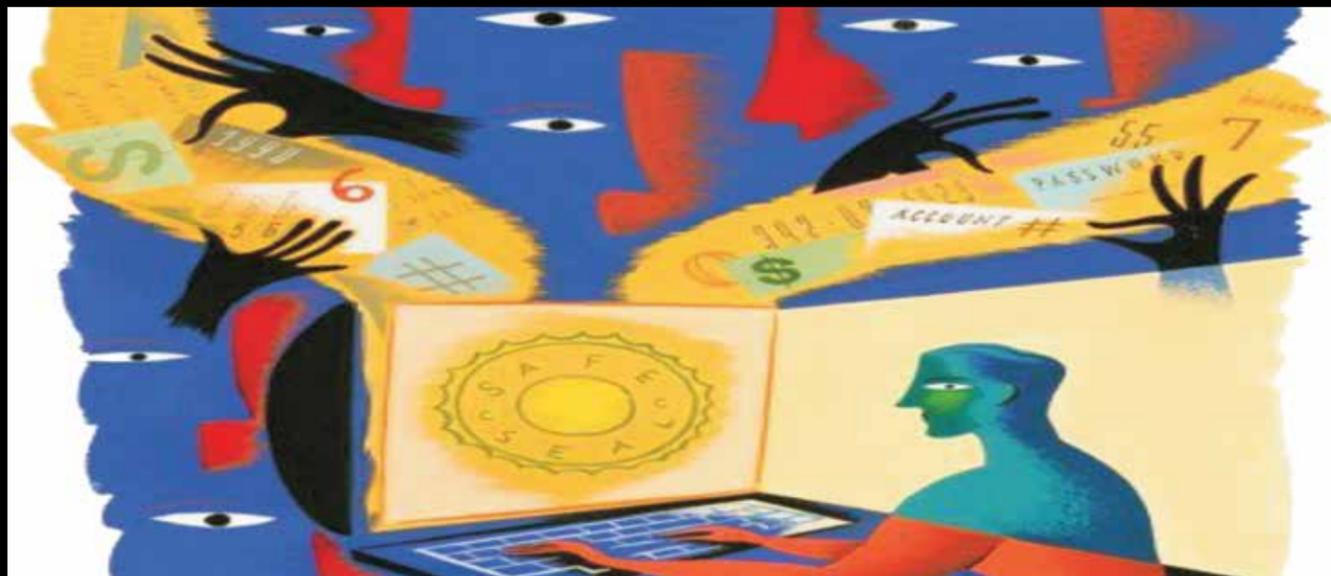
- » To develop computer code for the proposed procedures, and to integrate it into industrial strength MATLAB toolboxes.
- » To test and validate the computer codes through extensive computer simulations.
- » To test the efficacy of the developed procedures and codes, via real-time experiments performed 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, Ramrao 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 Goldsztejn, Dr. Frédéric Goulard, Dr. Laurent Granvilliers and Dr. Christophe Jermann. All members of the French side were from Laboratoire d'Informatique 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



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 Realpaver, 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 Realpaver.

## 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

- » *How do you compute the midpoint of an interval?* Frédéric Goualard. ACM Transactions on Mathematical Software. 40:2, 2014.
- » *First order rejection tests for multiple-objective optimization.* Alexandre Goldsztejn, Ferenc Domes, and Brice Chevalier. J. Glob. Optim. April 2013.
- » *On Continuation Methods for Non-linear Multi-Objective Optimization.* Benjamin Martin, Alexandre Goldsztejn, Laurent Granvilliers, and Christophe Jermann. Twenty-second International Conference on Multiple Criteria Decision Making, Malaga, Spain. 2013.
- » *Bernstein branch-and-bound algorithm for unconstrained global optimization of multivariate polynomial MINLPs.* Bhagyesh V. Patil and P. S. V. Nataraj. Scan 2014.
- » *Robust Controller and pre-filter design using QFT and interval constraint techniques.* Alexandre Goldsztejn, Frédéric Goualard, Laurent Granvilliers, Christophe Jermann, R. Jeyasenthil, P. S. V. Nataraj, Bhagyesh V. Patil, and Harsh Purohit. CoProd 2014.
- » *Automatic Loop Shaping in MIMO QFT using Interval Consistency based Optimization Technique.* R. Jeyasenthil, Harsh Purohit, and P.S.V. Nataraj. IEEE, International Symposium on Industrial Engineering, Turkey, 2014.
- » *Optimized and automated synthesis of robust PID controller with quantitative feedback theory.* Harsh Purohit and P.S.V. Nataraj IEEE International conference on Industrial Instrumentation and Control, Pune, 2015. ●



FRENCH EMBASSY IN INDIA



CEFIPRA



birac  
Ignite Innovate Incubate

Biotechnology Industry Research Assistance Council (BIRAC)

French Embassy in India

Indo-French Centre for the Promotion of Advanced Research (CEFIPRA)

Jointly invite Second Call for Proposals on

## “Red Biotechnology up to pre-commercialization stage”

15<sup>th</sup> October, 2015

Themes of the Call

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

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.

### 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://www.cefipra.org/pdf/Advt\\_Publication%20BIRAC-SST.pdf](http://www.cefipra.org/pdf/Advt_Publication%20BIRAC-SST.pdf)

### HOW TO APPLY

Interested applicants can submit a complete proposal in the prescribed format ([http://www.cefipra.org/pdf/Advt\\_Publication%20BIRAC-SST.pdf](http://www.cefipra.org/pdf/Advt_Publication%20BIRAC-SST.pdf)) to the mail id [targetedprogramme@cefipra.org](mailto:targetedprogramme@cefipra.org) by 15<sup>th</sup> Jan 2016 at midnight (India time). For Further information please contact Director, CEFIPRA, email: [director@cefipra.org](mailto:director@cefipra.org) or Dr Jyoti Shukla, Manager (Technical), BIRAC email: [jshukla.birac@nic.in](mailto:jshukla.birac@nic.in)

## RAMAN CHARPAK FELLOWS 2015

## Indian Fellows 2015

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

## RAMAN CHARPAK FELLOWS 2015

## Indian Fellows 2015

Domain	Name   Institutional Affiliation	Institution Visited	
Physical Sciences	<b>Kakoli Bhattacharya</b> Tezpur University	Institut Lumière Matière	
Atmosphere and Earth Sciences	<b>Unmesh Govind Khati</b> Indian Institute of Technology Bombay	UNIVERSITY OF RENNES 1	
Life Sciences	<b>Devyani Samantarai</b> National Institute of Technology Rourkela	Institut Curie-Centre de Recherche	
Material Sciences	<b>Sruthi Sudhakaran</b> Sree Chitra Tirunal Institute for Medical Sciences and Technology	Université de Bourgogne	

## French Fellows 2015

Domain	Name   Institutional Affiliation	Institution Visited	
Life Sciences	<b>Claire Lambert</b> University Lille 2	Institute of Life Science (ILS) Odisha	
Material Sciences	<b>Camille Thevenot</b> Université de Lorraine	International and Inter University Centre for Nanoscience and Nanotechnology, Mahatma Gandhi University, Kottayam	
Engineering Sciences	<b>Muhammad Khoirul Khakim Habibi</b> École Nationale Supérieure des Mines de Saint-Étienne	Indian Institute of Technology Kharagpur	
Mathematical and Computational Sciences	<b>Sébastien Eskenazi</b> University of La Rochelle	Indian Statistical Institute Kolkata	
Mathematical and Computational Sciences	<b>Daniel Thomert Balouek</b> Ecole Normale Supérieure de Lyon	Mahindra Ecole Centrale, Hyderabad	
Material Sciences	<b>Selim Bel Haj Salah</b> Ecole Nationale Supérieure de Mécanique et Aérotechnique	Jawaharlal Nehru Centre for Advanced Scientific Research Bangalore	

**MOBILITY OF SCIENTISTS SUPPORTED UNDER CEFIPRA PROJECTS**  
 SEPTEMBER-OCTOBER 2015

S. No.	Project Title	Name   Institutional Affiliation	Institution Visited
1	Genome wide recruitment profiling of BLM after DNA damage	<b>Sagar Sengupta</b> National Institute of Immunology	Laboratoire de Biologie Moleculaire et Cellulaire du Controle de la Proliferation Toulouse
2	Tropical cyclones in the Bay of Bengal: Oceanic response and air-sea interactions	<b>Neetu</b> National Institute of Oceanography	Laboratoire d'Océanographie et de Climatologie: Experimentation et Analyses Numériques, Université Pierre et Marie Curie
3	Tropical cyclones in the Bay of Bengal: Oceanic response and air-sea interactions	<b>Teesha Mathew</b> National Institute of Oceanography	Laboratoire d'Océanographie et de Climatologie: Experimentation et Analyses Numériques, Université Pierre et Marie Curie
4	Novel nanotechnological approaches for treatment of leishmaniasis using 2 propylquinoline	<b>A. Jayakrishnan</b> Indian Institute of Technology Madras	Labex LERMIT, Faculté de Pharmacie Université Paris Sud II
5	Novel nanotechnological approaches for treatment of leishmaniasis using 2 propylquinoline	<b>V Kesavan</b> Indian Institute of Technology Madras	Labex LERMIT, Faculté de Pharmacie Université Paris Sud II
6	Tropical cyclones in the Bay of Bengal: Oceanic response and air-sea interactions	<b>Matthieu Lengaigne</b> Laboratoire d'Océanographie et de Climatologie: Experimentation et Analyses Numériques	National Institute of Oceanography
7	Control of melanosome biogenesis by small GTPases	<b>Gangi Setty</b> Indian Institute of Science Bangalore	Institut Curie-CNRS, Paris
8	Development of fulvene-based Zr(II) and Ti(II) chemistry: organometallics, reactivity and applications in organic synthesis	<b>K.V. Radhakrishnan</b> National Institute for Interdisciplinary Science & Technology, Thiruvananthapuram	Université de Reims Champagne-Ardenne ICMR-CNRS
9	Material Sciences	<b>Milan Sanyal</b> Saha Institute of Nuclear Physics Kolkata	Université du Maine

**MOBILITY OF SCIENTISTS SUPPORTED UNDER CEFIPRA PROJECTS**  
 SEPTEMBER-OCTOBER 2015

S. No.	Project Title	Name   Institutional Affiliation	Institution Visited
10	Pure and Applied Chemistry	<b>Pradeep Tripathi</b> National Chemical Laboratory	ECPM, University of Strasbourg
11	Gene resources from polluted soils	<b>M.S. Reddy</b> Thapar University	Ecologie Microbienne Université Lyon 1
12	Developing design guidance for rammed earth construction	<b>Nanjunda Rao</b> Indian Institute of Science Bangalore	DGCB-Ecole National des Travaux Publics de l'Etat
13	Supra molecular approach to composite materials for advanced technologies	<b>Uday Maitra</b> Indian Institute of Science Bangalore	Institut des Sciences Moléculaires-Université Bordeaux 1, CNRS
14	Thermo-hydrodynamics of phase-change induced oscillating Taylor bubble flows	<b>Frederic Lefevre</b> INSA Lyon, Centre de Thermique de Lyon(CETHIL)	Indian Institute of Technology Kanpur
15	Extreme QCD in the LHC Era	<b>Jean Yves Ollitrault</b> Institut de Physique Théorique-CEA Saclay, Gif sur Yvette	Tata Institute of Fundamental Research, Mumbai
16	Effect of the correlations in the statics and the dynamics of extended systems	<b>Alberto Rosso</b> Laboratoire de Physique Théorique et Modèles, Statistiques-Université Paris Sud	Raman Research Institute Bangalore

**MOBILITY OF STUDENTS SUPPORTED UNDER CEFIPRA PROJECTS**  
 SEPTEMBER-OCTOBER 2015

Domain	Name   Institutional Affiliation	Institution Visited
Life and Health Sciences	<b>Swati Dudhal</b> National Centre for Biological Sciences, TIFR	Faculté de Médecine, Groupe Hospitalier Pitié-Salpêtrière, 105 Boulevard de l'Hôpital INSERM, Paris

**CORRIGENDUM**

Reference ENSEMBLE issue no. Vol.3 (2).(July-August, 2015). The correct series of this issue of Ensemble is Vol. 3 (4) (July-August, 2015).

## Seminars / Workshops

### Indo-French seminar on "Frontiers in Cytoskeleton Research: Coordination, Adaptation, Fine-tuning"

October 25 - 27  
2015, Pune

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 actomyosin 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"

October 26 - 27,  
2015, Paris

A two day Indo-French workshop on "Chemistry and Physics of Materials Science" was held with CEFIPRA support at Amphithéâtre Charpak, Université Pierre et Marie Curie, Paris from 26<sup>th</sup> -27<sup>th</sup> October, 2015. The workshop aimed to establish and reinforce scientific and academic contacts between laboratories of the Sorbonne Universités and MATISSE Consortia in France and various Indian institutions in the field of Materials Science.

The workshop structure consisted of scientific

presentations in the domain of Materials Science as well as brief presentations of the Indian institutions and their research facilities. Another important aim was to encourage French students to avail of short-term exchange possibilities during their thesis or post-doctoral opportunities in Bangalore through a dedicated presentation on the issue and interaction with students. The workshop was attended by 76 scientists and students.

On the aspect of future collaborations, it was decided to have a symposium in Bangalore in the autumn of year 2016

## Seminars / Workshops

to allow the French scientific community to appreciate on-site research community in India. An address book including the contact details and talk titles of all speakers has been sent to all speakers to facilitate future contacts. It will also serve for the identification of areas of future collaboration like 2D materials, nanoparticle synthesis, fuel cells, synchrotron spectroscopy, novel ab-initio theoretical methods and high pressure research. On the aspect of student exchange, it was recommended to have an MoU to facilitate student exchange with Masters and Ph.D .level exchange the preferred modes. ●



### Indo-French workshop on "Understanding and Facilitation of Neural Plasticity for Enhancing Post Stroke Recovery"

October 29 - 31  
2015, New Delhi

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 funding.

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. ●



## Forthcoming Events

- Indo-French seminar on “Catalysis for Green and Sustainable Chemistry”, November 4-7, 2015, Indian Institute of Chemical Technology, Hyderabad.
- Indo-French Seminar on “New perspectives on Colour and Light: Science, arts and the humanities”, November 12-14, 2015 Jadavpur University, Kolkata.
- Indo-French Seminar on “Futuristic approach to Alternatives”, November 17, 2015 IIT Bombay, Mumbai.
- Indo-French Seminar on “Application of Structural Biology in Translational Research & Structure-Guided-Drug-Design”, November 19-20, 2015, TMC-ACTREC, Tata Memorial Centre, Navi Mumbai.



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.



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