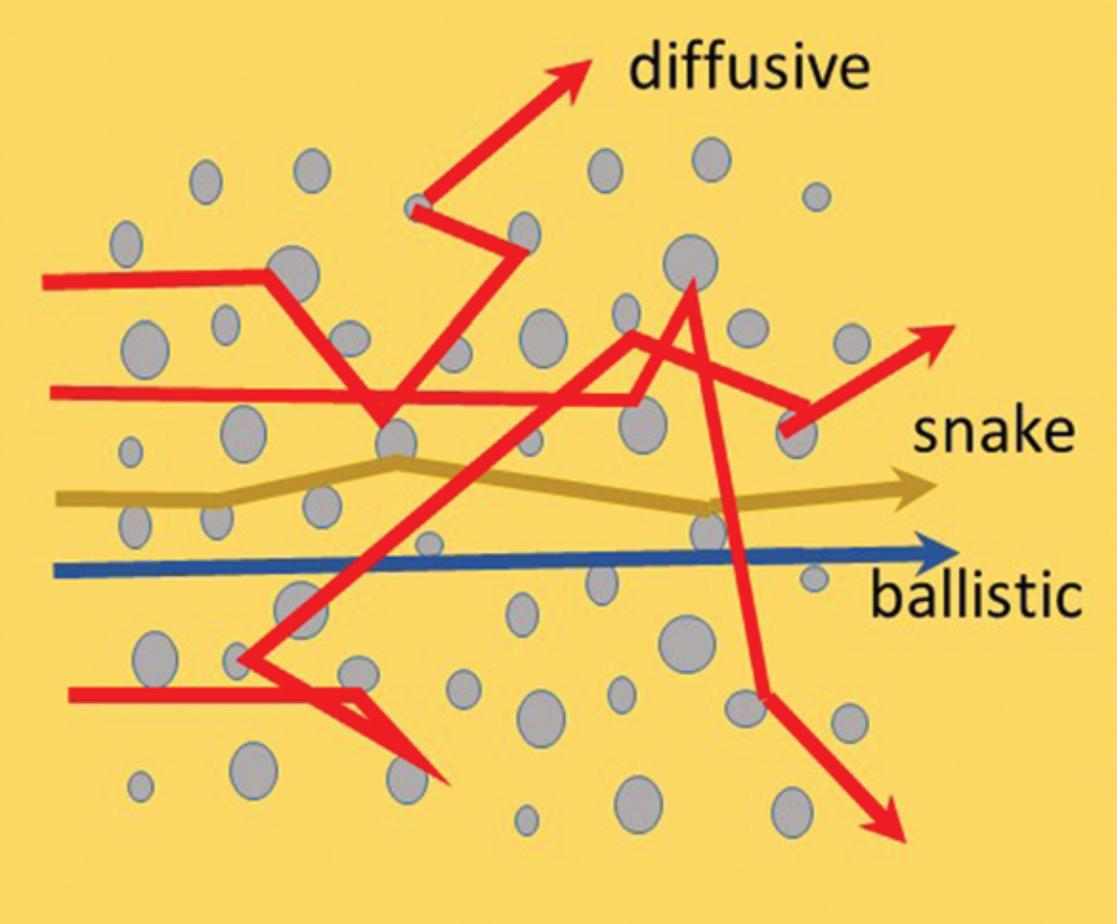
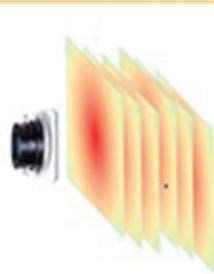
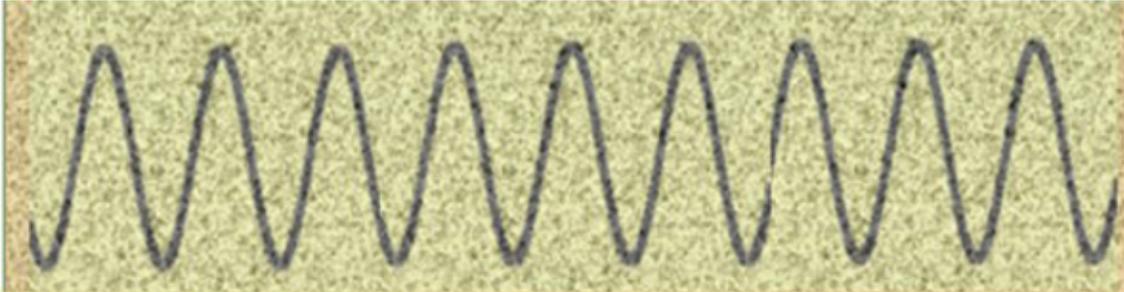


ENSEMBLE

Volume 4 (5) | October–December 2016

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



Imaging through dense scattering media-seeing through fog

Editor's Note

Dear Readers,

CEFIPRA, India's first and France's only bilateral organization for S&T cooperation has evolved over the years in accordance with the need of its external environment and stakeholders in both the nations. Established in 1987, the first two decade of CEFIPRA's existence were focused on bringing scientists from both the countries closer by supporting projects in basic and applied sciences. In response to the opening up of global economy, support was extended for academia-industry collaborations to harness the complementarity between knowledge and entrepreneurial spirit across the two nations.

CEFIPRA, the longest operating bilateral S&T organization, has resulted in a well networked community of Indo-French scientific organizations. With the growth of S&T ecosystem in both the nations and increasing emphasis of respective Governments on innovation for social goods, CEFIPRA's role was evolved as an enabler, catalyser and connector of the Indo-French S&T systems across the knowledge innovation chain. In this role, while the platform of CEFIPRA has been extended to co-opt national funding agencies for "Targeted Programmes", the private sector entities have also been encouraged to utilize this platform to strengthen the knowledge-wealth transformation pathways. Dedicated mobility support programmes for young doctoral/masters students have been encouraged to get exposure to the S&T systems of the each other's nation in order to ensure the sustainability of the bilateral S&T ecosystem.

In this edition of ENSEMBLE, we highlight two excellent projects under CEFIPRA's Collaborative Scientific Research Programme. As a lead article we are focussing a project that has demonstrated innovative, simple and low-cost technique for imaging through turbid media using high-frequency modulated light. Another project has developed knowledge that could be used to provide information and advisory services for forecasting of Tropical Cyclones (TCs).

As we summarize the activities and achievements during the year of CEFIPRA as a growing and dynamic organization, we also look forward in the Year 2017 to meet the growing expectations of our existing stakeholders while also embracing the needs of many new ones!



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Imaging Through Turbid Media Using High-Frequency Modulated Light



Dr. Hema Ramachandran,
Raman Research Institute,
Bangalore



Prof. Mehdi Alouini,
Institut de Physique de
Rennes, Université de
Rennes, Rennes

The project RITFOLD (Real-time Imaging Through Fog Over Long Distances), a collaborative work between scientists at the University of Rennes-1, France and the Raman Research Institute India was concluded recently. The following is a brief summary of the work:

Light travels ballistically, in straight-line paths. Therefore, one can predict the path that light will take when it leaves a source in a particular direction. This means that when light is received at a particular location at the detector, one can definitively say which part of the source it came from. In other words, images can be formed.

The situation is quite different in fog or mist where the microscopic suspended particles scatter light repeatedly in random directions. Light travels through such media diffusively, rather than ballistically. Because of this there is no direct correspondence between points at the detector and points at the source. A photon that reaches a particular point at the detector could have started off from any point at the source and could have taken any one of the infinite number of random paths connecting these two points, or could even come from another light source which is not even in the detector field of view. Because of this, one cannot directly infer anything about an object in the intervening space, thereby preventing direct vision.

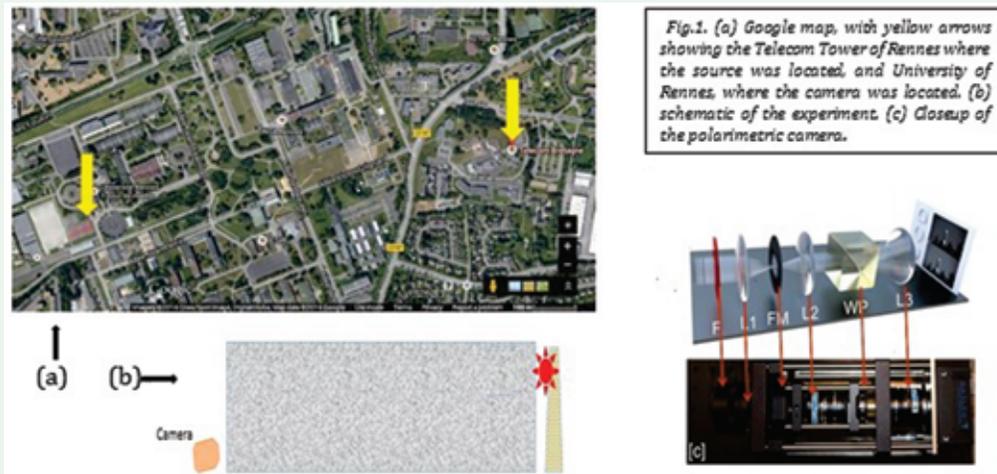
Such difficulty in imaging through scattering media is encountered in a variety of situations like navigation under poor visibility, medical imaging through tissues, rescue operations in fire, under sea exploration etc.

In recent times, a few techniques have been developed that address this problem, primarily in the context of medical imaging. The techniques typically require specialised sources of light and/or fast cameras and are thus expensive. Less expensive techniques require significant amount of computation and cannot provide images in a real-time.

Project RITFOLD started with the following triple aim :

- A. Imaging through fog
- B. Imaging over long distance and
- C. Obtaining processed images in real-time

It was not known whether the techniques developed for imaging through tissues would be applicable to imaging through fog. The latter consists of significantly larger suspended particles and is extremely poly-disperse. Further the suspended particles are in random motion because of which the spatial configuration of the in homogeneities is continuously varying. Hitherto no systematic study had been conducted for imaging through fog in real conditions, over long distance. Project RITFOLD was perhaps the first such investigation, where extensive studies on imaging were performed, over kilometric distances, under conditions of reduced visibility due to fog, mist, rain and snow, continuously, for more than a year and half. An incandescent, polarised beacon was fixed atop the TV tower in Rennes. A specifically designed polarimetric camera in the laboratory of the University of Rennes 1 attempted to view the light source under various weather conditions. Different polarimetric representations were evaluated.



It was seen that no single representation was suitable for all the weather conditions. Each weather condition (foggy day, foggy night, bright sunlight day etc.) required its own representation. Determination of the optimal polarimetric representation was theoretically performed, and implementation of such representation was automated on the imaging setup, achieving the experimental proof of more than ten-fold visibility increase in the best conditions with respect to a non-polarimetric source/detector system. The unique feature of this experiment is that both the light source on the TV tower and the computer in the laboratory for data capture and image analysis could be remotely controlled providing both the Indian and the French team complete access to the experiment.

In the second part of the project, table top experiments were carried out with the aim of imaging through strongly scattering media in real-time. Scattering media, with optical properties equivalent to 250 meters of moderate fog, were interspersed between the object and the camera. One of the objects used was toy model of animals. These were obscured from the view (Fig. 2a) when camera captured the raw images, looking through scattering medium. However, upon processing for the extraction of the (near) ballistic photons and the rejection the diffuse photons, these objects became clearly visible (Fig.2b). Discrimination between the two types of photons was made possible by illuminating the objects by a modulated light source. Using a simplified algorithm of quadrature lock-in detection enabled processing of data on-the-

fly. The use of the Graphic Processing Unit (GPU) of typical desktop computers enabled parallelisation of computation and display. Together, these two enabled more than a 1000-fold increase in the data processing speed, so that processed images could be obtained in real-time and at frame rates higher than the critical frequency of the eye. Any motion of the object relative to the observer thus appears as in natural vision.

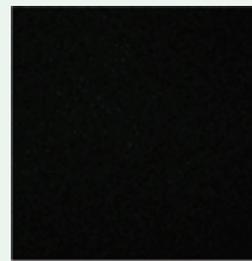


Fig. 2 (a) Unprocessed, raw-data image obtained on the camera, looking at objects hidden from view by intervening strongly scattering media.



Fig. 2 (b) The objects are revealed, in realtime, upon processing by the technique developed.

The techniques developed have potential for application in a variety of fields like different forms of navigation (road, rail, air and sea), medical imaging through tissues, rescue operation through smoke etc.

The work has resulted in several publications and a patent has been filed. The Indian and French teams thank CEFIPRA for support which enabled the two groups to put together their related, but distinct expertise leading to tangible results. The two teams are looking forward to continuing collaboration to further promote the technological developments carried out within the RITFOLD project.

Thematic Track “Climate Resilient Agriculture” under WORLD SUSTAINABLE DEVELOPMENT SUMMIT (WSDS 2016)

World Sustainable Development Summit (WSDS 2016) was held from 5-8th October 2016 with the theme ‘Beyond 2015: People, Planet & Progress’. The thematic session at the WSDS 2016 was organised by The Energy and Resources Institute (TERI) on 5th October, 2016 on “Climate Resilient Agriculture”, wherein speakers called for a robust assessment of climate change projects and research for climate resilient crops. The Hon’ble President of India, Shri Pranab Mukherjee in his inaugural address at Vigyan Bhavan, New Delhi on 6th October, 2016 said that this summit was the first international summit after the Paris Agreement signed during COP-21. He emphasized climate change as an imminent threat, particularly for developing economies, such as India, owing to its dependency on climate-sensitive sectors. He put forward the need for countries to work together for reducing the impact of climate change and said that the action we take now would be the key to protect the planet tomorrow. He described WSDS as a platform that will accelerate sustainable development through exchange of experiences and formation of partnerships. Director, CEFIPRA also attended the WSDS 2016 at New Delhi.

India & France collaborate to establish marine biology institute (DBT-UPMC-CNRS collaborative programmes)

As a follow up, of a Memorandum of Understanding (MoU) signed in 2015 by India’s Department of Biotechnology with the University Pierre et Marie Curie (UPMC) and the Centre National de la Recherche Scientifique (France’s National Centre for Scientific Research – CNRS) to set up a National Institute of Marine Biology and Biotechnology in India, a meeting was organized with officials of Department

of Biotechnology (DBT), Government of India on 18th October, 2016 at CEFIPRA office, New Delhi to explore CEFIPRA’s role & related details to implement the above MoU.

Finance Sub-Committee Meeting at CEFIPRA

The fifth Finance Sub-Committee meeting under the Chairmanship of Joint Secretary & Financial Advisor, DST was held on 20th October, 2016 at CEFIPRA office to scrutinize the annual accounts and budget of CEFIPRA. During the meeting, discussion was held on audited annual accounts for the FY 2015-16. Revised Estimate (RE) for the FY 2016-17 and Budget Estimate (BE) for the FY 2017-18 were approved. The discussion was also held on Action Taken Report (ATR) of the fourth meeting of the Finance Sub-Committee held in February, 2016 and also on other matters like implementation of Employees' Provident Fund Scheme in the Centre etc.

Meeting under CEFIPRA-SGRI PPP Programme

The CEFIPRA organized a Skype meeting with Mr. Ajay Garg, Technical Director, Scientific Methodology & IP, Saint-Gobain Research India Private Limited, Chennai on 21st October, 2016 at CEFIPRA office, New Delhi to discuss various matters related to CEFIPRA-SGRI PPP Programme. Dr. Mukesh Kumar, Director, CEFIPRA reiterated that this programme with SGRI was the first ever initiative of CEFIPRA under PPP mode signed in 2013. He also informed about the status of ongoing projects and discussed the future course of action for next call.

Annual National Conference of Forum for Ethics Review Committees in India & International Colloquium (FERCICon2016)

The 4th Annual National Conference of Forum for Ethics Review Committees in India and International Colloquium-FERCICon2016 was held in Kolkata during November 3-5th, 2016. The theme of the Conference

was “International Collaboration and Special Ethical Issues in Clinical Research”. The Director, CEFIPRA attended the Forum and delivered a talk on 4th November, 2016 on “Ethics of International Research Collaboration: Requirements and Situation in India” and also participated in panel discussions. The vision of the Forum for Ethics Review Committees in India (FERCI) is to foster an integrated and sustainable ethical oversight mechanism (especially Ethics Committees) and towards encouraging a quality and ethical culture in health research in India.

Visit by Officials from French Company Tereos (France, Singapore and Belgium)

A delegation from Tereos consisting Mrs. Anne Wagner Corporate R&D Director; Mr. Katlijin Linster, Head of New Product and Process Development and Mr. Laurent Fabry, Business Development, Director Asia and Dr. Philippe Arhets, Counsellor (S & T) French Embassy in India visited CEFIPRA office, New Delhi on 15th November, 2016. Tereos, a

French Company produces sugar based on sugar beet and sugar cane. The company processes agricultural raw material into sugar, alcohol and starch. Their aim was to discuss various collaborative programmes of CEFIPRA.

Meetings of Scientific Council (SC) and Industrial Research Committee (IRC) of CEFIPRA

CEFIPRA organized meeting of 58th Scientific Council during 23rd - 25th November, 2016 at Varanasi, India. The Scientific Council reviewed fifty new proposals submitted under the Collaborative Scientific Research Programme of CEFIPRA. Out of fifty proposals evaluated, twenty eight proposals were pre-selected and twenty two proposals were not selected. Out of twenty eight pre-selected, six proposals in various domains of S & T were recommended. The Scientific Council also reviewed fifteen ongoing projects for mid-term progress and nine projects which were completed in the preceding months for final review. The Council also considered four proposals for joint workshop/seminar.



Meeting of 58th Scientific Council from 23rd - 25th November, 2016 at Varanasi



Meeting of 29th Industrial Research Committee from 26-27th November, 2016 at Varanasi



The 29th meeting of the Industrial Research Committee (IRC) was held from 26-27th November, 2016 at Varanasi, India. A total of 6 proposals were received under the Industry Academia Research and Development Programme (IARDP) of CEFIPRA. Out of 6 proposals evaluated, 4 proposals were pre-selected and 2 were not pre-selected. The IRC evaluated 4 new pre-proposals including 2 reconsidered proposals from the 28th meeting of IRC and also reviewed progress of 4 ongoing projects under IARDP. In addition, guidance was given by IRC on the matters such as release of funds before receiving of Intellectual Property (IP) Management Plan, framework of PPP Programmes of CEFIPRA with SGRI and AIRBUS and also advised Indian PIs of BIRAC-French Embassy Programme etc.

Lectures by members of Scientific Council

A lecture by Prof Claude Jaupart, Institute de Physique du Globe de Paris, Université Paris was delivered on “The Generation of Cotinental crust and the fate of mafic cumulates’ at Banaras Hindu University, Varanasi on 26th November, 2016. He elaborated upon the evidence for removal of mafic cumulates in large igneous intrusions such as those from the Bushveld (South Africa), Rhum (Scotland) from geophysical (including fluid dynamical and experimental) and geological points of view. His talk enumerated the conditions under which the removal of cumulates can happen and showed that a fraction of the cumulates may be left behind at original emplacement level. He also pointed out that the gravity-driven removal of ultramafic cumulates does not lead to the formation of eclogites.



Professor Stephane Noselli, CNRS-INSERM-UNSA Université Nice Sophia-Antipolis delivered a very interesting talk at Banaras Hindu University, Varanasi on 26th November, 2016 on his lab’s work on the regulation of left-right asymmetry during *Drosophila* development, taking examples of the genitalia rotation in males and looping of the gut. He talked about the roles of *Abd-A*, *Myo-ID* and *Dachsous* genes in deciding the dextral or sinistral rotation and the consequent left-right asymmetry that emerges in the two organs. He also emphasized the relevance of these studies in the fly model for human development. The lecture was attended by many faculty members and large number of research students of the Zoology department and from other departments like Molecular & Human Genetics and Biochemistry, where also there are labs using *Drosophila* as model organism.

Dr. Anne Imberty, CERMAV-CNRS, Grenoble, France, delivered a talk on “Lectins from bacteria and fungi: Therapeutical targets and research tools” at Banaras Hindu University, Varanasi on 26th November, 2016. Her talk was focused on biologically active





oligosaccharides and significance of lectins as a potential therapeutic target for antimicrobial drug discovery. Dr. Ann's laboratory has been doing interdisciplinary research from target identification to drug development. Her talk was divided into two parts: first, the significance of the sugar molecules in terms of various biological aspects including the blood group chemistry was presented. Second, the significance of lectins was discussed as a novel biological target to discover the antibiotics. The success story of various sugar molecules as anti-lectin developed in

her lab was presented. In order to show the proof of concept her lab has tested simple sugar molecules in *in-vivo* antibacterial animal model. Based on the initial results various substituted triazole containing sugar molecules were fully characterized in terms of chemistry and biology. The lead molecules were further refined to reduce the size while maintaining the desired anti-lectine activity. Anne has presented various biological tools like ITC, X-ray crystallography images, computational and *in-vivo* data. Her seminar was very interesting and highly appreciated in the department. She interacted with the students and faculty members. She also visited the laboratories in the department for possible collaborations in future.

Workshop on Advances in Phase-Change Thermal Systems during 27-30th November, 2016 at Khajuraho

The two days Indo-French workshop was organized by Indian Institute of Technology- Kanpur and INSA-Lyon France, during 27- 30th November, 2016 at Khajuraho to bring together Indian and French experts on a



common platform and share the state-of-the-art on topics related to phase-change thermal systems with academia and industry, especially focusing on fundamentals and specific terrestrial applications in defence sector, nuclear power and space thermal management technology. The workshop was attended by fifty Indian participants, including faculty and doctoral students from IITs, NITs and other technical schools, and industry catering to defence, space and nuclear sectors. There were seven participants from French universities, including teaching and research staff. The workshop led to intense networking among the peers and discussions on future possibilities of cooperation. A total of 19 invited lectures and four guest lectures were delivered. In addition, 32 posters were presented by the students in four separate sessions.

The inaugural address was delivered by the Chief Guest, Dr. Mukesh Kumar, Director, CEFIPRA encapsulating the joint R&D eco-system which operates under the aegis of CEFIPRA/IFCPAR. The guest of honour at the workshop was Dr. Sandrine Maximilien, an Attaché for Science and Technology at the Consulate General of France, Mumbai. She delineated on the breadth of opportunities and incentives for Indian researchers to conduct joint projects with French counterparts. Dr. Sridhar Kaveri (Director, CRNS India), through his Skype talk gave an overview of the CRNS initiatives in India and presented a roadmap for furthering cooperation between French and Indian researchers. Prof. P. K. Panigrahi, Head, Department of Mechanical Engineering and Prof. K. Muralidhar, Dean of Faculty Affairs, were also present during the workshop.

Joint Selection Committee meeting under BIRAC-CEFIPRA-Bpifrance Programme

Under the Framework of Targeted Programme of CEFIPRA and the MoU signed in February, 2014 between Biotechnology Industry Research Assistance Council (BIRAC), Department of Biotechnology, Govt. of India and CEFIPRA to foster collaboration in the area of biotechnology, a programme was initiated for

supporting high-quality bilateral innovative research projects towards new concepts and technological breakthroughs in human health. Bpifrance, a public investment bank from France, joined hands with BIRAC and CEFIPRA. This partnership, known as the BIRAC-CEFIPRA-Bpifrance Programme aims to improve the competitiveness of both Indian and French biotech industries and academia.

The second call for this programme was launched in November, 2015 in the areas of Digital Healthcare and Individualized Medicine. A Joint Selection Committee meeting was held on 7th December, 2016 at CEFIPRA office in New Delhi to evaluate the proposals received under this call. The experts from the Indian side were Prof. Rita Mulherkar, Ex-Chairman and Professor, ACTREC, Navi Mumbai and Dr P.K.S. Sarma, Head Technical (Discovery & Product Development) BIRAC, New Delhi, Dr. Mukesh Kumar, Director, CEFIPRA and Dr. Aparna Sharma, BIRAC, New Delhi participated. The participants from the French side were Prof. Marie Thérèse Paternostre, Member of Industrial Research Committee, CEFIPRA, Mr. Patrick Cornet, Head of International Collaborative Programmes, Bpifrance and Ms Whitley Anais Kihanguila, Europe and International Project Officer, Bpifrance through videoconferencing. During the meeting, the Joint Selection Committee evaluated the proposals received in the above mentioned two areas.

Expert Committee meeting under DST-Inria-CNRS Targeted Programme in CEFIPRA

The 4th Call for Proposals under the DST-Inria-CNRS Targeted Programme was launched on 1st July, 2016 in the areas of High Performance Computing, Big Data Analytics, Internet of Things (with focus on smart cities), Artificial Intelligence & Machine Learning. A total 24 proposals (20 with CNRS & 4 with Inria) were received from Indian side against the deadline of 30th September, 2016. The meeting of the Expert Committee (Indian Side) to evaluate proposals submitted under 4th call for proposals, and review the annual progress of 8 ongoing projects (under 1st and

2nd call) was held on 20th December, 2016 at CEFIPRA office, New Delhi. Domain experts, representative of Department of Science and Technology (DST), Government of India and Director, CEFIPRA attended the meeting. A total of 7 proposals (6 with CNRS and 1 with Inria) were shortlisted for support. The members of the committee also appreciated this collaboration between DST, Inria and CNRS in the areas of Information and Communication Technology and role CEFIPRA has played in last 3 years for facilitating this programme. It was also highlighted that DST's association with Inria has been successful and the MoU has been renewed upto October, 2019. A joint meeting between representatives of DST, Inria and CNRS will be held in January, 2017 for the final joint selection of proposals.

Launch of New / Revamped CEFIPRA Website

The new website of CEFIPRA was launched on 22nd December, 2016 by Prof. Ashutosh Sharma, Indian Co-Chair, CEFIPRA and Secretary, Department of Science

and Technology, Government of India. Other senior officials from Government of India, representative of French Embassy in India were also present. The new website of CEFIPRA provides a new designed outlook with lots of information readily available to the users. The information like genesis of the Centre's organizational structure, complete programme profile with important deadlines, list of ongoing projects, photo gallery, list of various institutions/universities of India and France, etc. are available. The website also contains various policy related documents, list of members of various scientific and administrative bodies of CEFIPRA, contact information on CEFIPRA staff etc. Amongst the new features, the website also contains integrated social media buttons for Facebook, Twitter to foster improved communication with the users. The website can be accessed across various platforms such as Mobile, Tablet, Desktop, etc. in both English and French versions for better understanding.



New/revamped website was launched by Prof. Ashutosh Sharma, Indian Co-Chair, CEFIPRA & Secretary of DST, Gol at CEFIPRA office on 22nd December, 2016

Mobility of scientists / researchers supported under CEFIPRA projects during October-December, 2016

S.No.	Project / Programme Title	Name/ Institutional Affiliation (From)	Name/Institution Affiliation Visited (To)
1	Decipher the symbiotic program in tropical legumes	Dr. Maitrayee Dasgupta Department of Biochemistry University of Calcutta, Kolkata	Dr. Fabienne Cartieaux Laboratoire des Symbioses Tropicales & Méditerranéennes (IRD), Montpellier
2	Decipher the symbiotic program in tropical legumes	Ms. Anindya Kundu Department of Biochemistry University of Calcutta, Kolkata	Dr. Fabienne Cartieaux Laboratoire des Symbioses Tropicales & Méditerranéennes (IRD), Montpellier
3	Decipher the symbiotic program in tropical legumes	Ms. Kanchan Karamakar Department of Biochemistry University of Calcutta, Kolkata	Dr. Fabienne Cartieaux Laboratoire des Symbioses Tropicales & Méditerranéennes (IRD), Montpellier
4	Understanding mechanical size effects in metallic micro-wires: synergy between experiments and simulation	Prof. Atul Chokshi Indian Institute of Science, Bangalore	Prof. Ludovic Thilly Université De Poitiers, Poitou-Charentes, Poitiers
6	Radio properties of clusters and galaxy lenses	Prof. Joydeep Bagchi Inter University Centre for Astronomy and Astrophysics, Pune	Dr. Bruno Guiderdoni Centre de Recherche Astrophysique de Lyon, Saint Genis Laval
7	Radio properties of clusters and galaxy lenses	Dr. Joe Jacob Inter University Centre for Astronomy and Astrophysics, Pune	Dr. Bruno Guiderdoni Centre de Recherche Astrophysique de Lyon, Saint Genis Laval
8	Sums of integers: Fourier, combinatorics, computation	Dr. Surya Ramana The Institute of Mathematical Sciences, Chennai	Prof. Jean-Marc Deshouillers Institut Mathématique de Bordeaux, Talence
9	Deep structure of the Indian continent	Dr. Ravi Kumar National Geophysical Research Institute, Hyderabad	Prof. Jean Paul Montagner Institut de Physique du Globe, Paris
10	Magnetic nanoparticles for hyperthermia and spintronics	Mr. Manish Anand Indian Institute of Technology-Delhi, New Delhi	Mr. Julian Carrey Laboratoire de Physique et Chimie des Nano-Objets, INSA Toulouse, Toulouse
11	Catecholestrogens in fish reproductive endocrinology	Dr. Radha Chaube Banaras Hindu University, Varanasi	Dr. Alexis Fostier Institut National de la Recherche Agronomique INRA, Rennes
12	Novel Inhibitors of NHEJ against Resistant Tumour Cells	Dr. Sathees Raghavan Indian Institute of Science, Bangalore	Dr. Jean-Baptiste Charbonnier Institute Biology and Technologies of Saclay, Gif-sur-Yvette

S.No.	Project / Programme Title	Name/ Institutional Affiliation (From)	Name/Institution Affiliation Visited (To)
13	Holography and its Applications	Mr. Ashish Shukla Tata Institute of Fundamental Research, Mumbai	Dr. Nick Halmagyi Chargé de Recherche, CNRS, UPMC Université Sorbonne, Paris
14	Controlling for upscaling uncertainty in assessment of Forest aboveground biomass in the Western Ghats of India	Mr. Rakesh National Remote Sensing Centre, Hyderabad	Dr. Pierre Couteron Botanique et bioinformatique de l' Architecture des Plantes, Montpellier
15	Controlling for upscaling uncertainty in assessment of Forest aboveground biomass in the Western Ghats of India	Mr. Jayant Singhal National Remote Sensing Centre, Hyderabad	Dr. Pierre Couteron Botanique et bioinformatique de l'Architecture des Plantes Montpellier
16	Muscle SC self-renewal: A stressful matter?	Prof. Jyotsna Dhawan Tata Institute of Fundamental Research, Bangalore	Dr. Ana FERREIRO Institut National de la Santé et la Recherche Médicale, Paris
17	Olfactory Modulation of Insect Flight	Prof. Jean Francois Ferveur Centre des Sciences du Goût et de l'Alimentation, Dijon	Prof. Gaiti Hasan National Centre for Biological Sciences, TIFR, Bangalore
18	Axially chiral biaryls from C-H activation & radicals	Dr. Joanna Wencel-Delord ECPM-ChimieMoléculaire, Strasbourg Cedex, Grenoble	Dr. K Rajender CSIR, Hyderabad
19	Plasticity of covalent nanoparticles	Dr. Laurent Pizzagalli CNRS-ISAE-ENSMA, Université de Poitiers, Futuroscope	Prof. Umesh Waghmare Indian Institute of Science, Bangalore
20	Plasticity of covalent nanoparticles	Ms. Celine Gernard CNRS-ISAE-ENSMA, Université de Poitiers, Futuroscope	Prof. Umesh Waghmare Indian Institute of Science, Bangalore
21	Rotating and curved boundary-layer instabilities	Dr. Benoit Pier Laboratoire de Mécanique des fluides et d'acoustique, Ecully	Dr. Rama Govindaraj Tata Institute of Fundamental Research, Hyderabad
22	Studying the role of rpoN, the alternative sigma factor, in the pathogenicity of <i>R. solanacearum</i> , the causal agent of bacterial wilt in plants	Dr. Stéphane Genin Laboratoire des Interactions Plantes Micro-organismes (LIPM), UMR CNRS 2594/INRA 441 31326 Castanet, Tolosan	Prof. Suvendra Kumar Ray Tezpur University, Tezpur
23	Characterisation of factors that determine the balance between genomic integrity and diversity in <i>Helicobacter pylori</i>	Dr. J. Pablo Radicella Commissariat à l'Energie Atomique, CEA, Fontenay aux Roses	Prof. Desirazu Narasimha Rao Indian Institute of Science, Bangalore
24	Control of melanosome biogenesis by small GTPases	Dr. Guillaume Van Niel JC Institut Curie, Paris	Dr. Subha Rao Gangi Setty Indian Institute of Science, Bangalore
25	Adaptation of Irrigated Agriculture to Climate Change	Dr. Laurent Ruiz Institut National de la Recherche Agronomique, Rennes	Dr. Muddu Sekhar Indian Institute of Science, Bangalore

S.No.	Project / Programme Title	Name/ Institutional Affiliation (From)	Name/Institution Affiliation Visited (To)
26	Host-Virus Interactions and Antibody Therapy for <i>Japanese Encephalitis</i>	Dr. Sebastien Lacroix-Desmazes Institut National de la Santé Et de la Recherche Médicale (INSERM) UMR S 872 –Centre de Recherche des Cordeliers, 75006, Paris	Dr. Manjula Kalia Translational Health Science and Technology Institute (THSTI), Gurgaon
27	CEFIPRA- High Impact Scientific Network Programme (Network-2 INFRE-HEPNET)	Prof. Jean Yves Ollitrait Institut de Physique Théorique, Orme des Merisiers, bâtiment 774, Point courrier 136, CEA/DSM/IPhT, CEA/Saclay	Prof. Sourendu Gupta TIFR, Homi Bhabha, Mumbai & Indian Institute of Science Education and Research (IISER), Pune
28	CEFIPRA- High Impact Scientific Network Programme (Network-2 INFRE-HEPNET)	Dr. Susan Gascon-Shotkin Institut de Physique Nucléaire de Lyon, Lyon	Prof. Sourendu Gupta TIFR, Homi Bhabha, Mumbai & Indian Institute of Science Education and Research (IISER), Pune

ACKNOWLEDGING THE CONTRIBUTION

Mr Mathew Joseph, Accounts Officer of CEFIPRA opted for voluntary retirement from the service with effect from 31st October, 2016. He joined the Centre as Senior Assistant in June, 1995 and was promoted to Accounts Executive in January, 1998. He was thereafter promoted to Accounts Officer in January 2004. The CEFIPRA family wishes him a good luck and health in his future endeavours.



Forthcoming Events (Supported by CEFIPRA)

- Seminar on “Pressure Effects on Strongly Correlated Materials” during 9-12th January, 2017 at Bharathidasan University, Tiruchirappalli, Tamil Nadu.
- Seminar on “Epigenetic Mechanisms of Male Germ Cell Maturation and Early Development” during 15-18th February, 2017 at Tata Institute of Fundamental Research, Mumbai, Maharashtra.
- Workshop on Water Networking during 22-24th February, 2017 at University of Petroleum and Energy Studies, Dehradun, Uttarakhand.

New Dates for Submission of Projects and Seminars/Workshops under Collaborative Scientific Research Programme and Industry Academia Research and Development Programme (IARDP)

Proposal submission for projects and seminars/workshops cut-off dates for Collaborative Scientific Research Programme from the year 2017 onwards will be 15th January and 15th July of each year.

However, the dates for submission of projects and seminars/ workshops under Industry Academia Research and Development Programme (IARDP) remain the same as 1st February and 1st July of each year.

Project Outcome

Tropical Cyclones in the Bay of Bengal: Oceanic Response and Air-Sea Interactions

Project ID: 4907-1; Duration: April 2013 to June 2016

Principal Project Collaborators: Ms. S. Neetu from National Institute of Oceanography, Goa and Dr. M. Lengaigne from LOCEAN, UPMC, Paris

Tropical Cyclones (TCs) are one of the deadliest natural hazards in coastal areas, causing huge lives and property losses. The Indian sub-continent is one of the most badly affected regions in the world due to its high population density along the coasts and weak disaster management. TCs track and intensity prediction is hence an important part of hazard mitigation programs. In order to address the need of fundamental knowledge about the mutual influence between the ocean and TCs, this Indo-French project focused on three objectives:

- (i) Quantify the oceanic control on TCs-induced surface temperature and chlorophyll response in the Bay of Bengal, with an emphasis on the role of salinity stratification using an ocean model.
- (ii) Understand how this surface cooling retroacts onto the TCs characteristics in this region by using a regional-coupled ocean-atmosphere model.

- (iii) Develop statistical prediction schemes in this region in order to quantify the skill improvement brought by accounting for ocean-atmosphere interactions under TCs.

Key achievements from the study

Principal collaborators developed statistical forecast models for TCs intensity change. A non-linear architecture such as ANN models outperforms the currently used linear (MLR) models and better accounts the air-sea interactions under TCs by including more suitable subsurface oceanic information. This including physically derived oceanic parameters along with non-linear statistical framework further improving the TCs intensity prediction (2-5%). Operational forecasting can be simplified by using climatologically derived environmental predictors rather than using real-time forecast of atmospheric fields. This knowledge/tool generated can greatly benefit the agencies responsible for operational TCs forecast (e.g. INCOIS, IMD). The project was graded excellent by the Scientific Council of CEFIPRA.

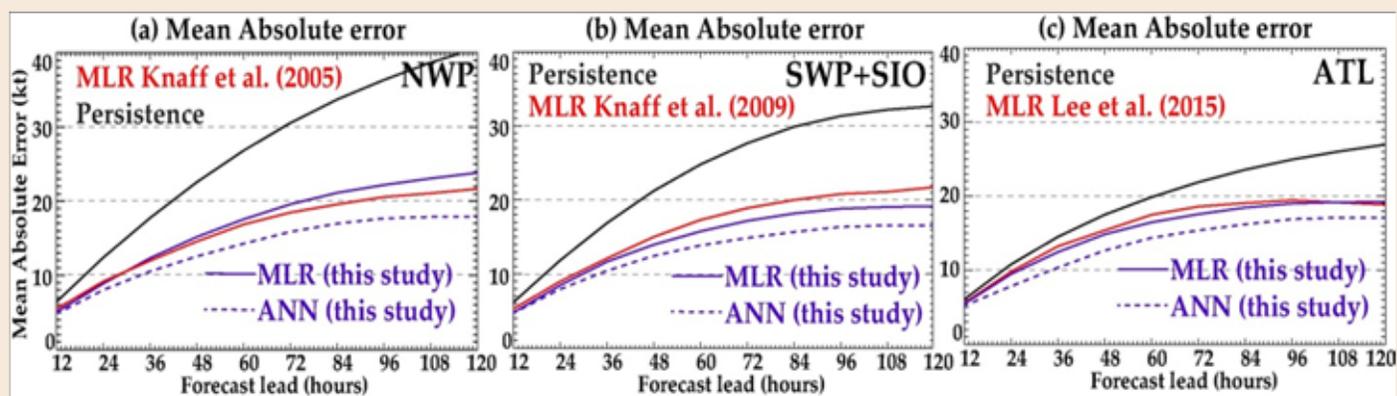


Figure: Mean absolute error (MAE) for persistence (black line), the MLR model (blue continuous line), the ANN model (blue dashed line) and previously published MLR results (red line) as a function of forecast lead for (a) the Northwest Pacific (NWP) for the training dataset (compared to Knaff et al. 2005), (b) the southern hemisphere (SWP+SIO) for training dataset (compared to Knaff et al. 2009) and (c) the Atlantic (ATL) for testing dataset (compared to Lee et al. 2015).



Technology Development Board, Bpifrancefinancement and Indo French Centre for Promotion of Advanced Research (IFCPAR/ CEFIPRA) joint Call for Proposal (s) from Indian & French Companies on Aeronautics; Automotive & Biotechnology

Technology Development Board (TDB), a statutory body of the Department of Science & Technology, Government of India and Bpifrancefinancement (hereafter referred as Bpifrance), a public investment bank, France have signed a Memorandum of Understanding (MoU) to carry out activities related to the exchanging of best practices and the setting up of coordinated measures to foster technological exchanges and innovation, collaborations between companies, organizations and institutions of France and India.

Under this MoU, TDB and Bpifrance, France has launched "a joint Call for proposal(s) for Indian & French Companies/ Industries/ SMEs". On behalf of TDB, this joint call is implemented by the Indo-French Centre for Promotion of Advanced Research (IFCPAR/

CEFIPRA). The targeted areas (with sub-areas in focus, but not limited to) of the call are: ***Aeronautics, **Automotive & ***Biotechnology with special emphasis to health biotechnology.**

Who can apply:

Project shall have at least one Company from India and one from France each as joint applicant. A registered Company from India along with the registered company from France or vis-à-vis shall be the Joint Applicant(s) (1+1 model). Other companies may also participate as partners.

How to apply:

Details of the application submission process, eligibility conditions and other information are available on websites of TDB: www.tdb.gov.in and CEFIPRA: www.cefipra.org

Interested applicants can submit the full proposal through email to: targetedprogramme@cefipra.org; with a copy to: tdbbpifrance@gmail.com and wa.kihanguila@bpifrance.fr, Bpifrance.

*Aeronautics	**Automotive	***Biotechnology
1. Aeronautics Equipment Units <ul style="list-style-type: none"> • Design & Production for Civil & Military Applications • Mechanical, Hydraulic, Electronic & Electrical Equipments • Optronics, Avionics & Stealth features 	1. Automobile Manufacturing 2. Automobile Spare Parts Manufacturing 3. Electrical, Electronic and IT Equipments 4. Mobility & IoT Integration Technologies 5. Fuel efficiency/ other Green Technologies 6. Electric Motors	1. Non-Invasive Tools & Devices including Imaging Techniques for Neurological, Cardiology and Oncology Investigations 2. Preventive Measures, Vaccines, Immunotherapies & Other alternative strategies in the areas of Non-Communicable Diseases
2. Airframe Manufacturing Units		
3. Aircraft Engine Manufacturing Units		
4. Logistics & Fleet Management Solutions		

For more information, please contact:

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TDB: Dr. Preeti Sahai at <preeti.sahai@gmail.com>; **Bpifrance:** Ms. Zena El Kurdi at <zena.elkurdi@bpifrance.fr>



Indo-French Centre for the Promotion of Advanced Research/ Centre Franco-Indien pour la Promotion de la Recherche Avancée (CEFIPRA) is a model for international collaborative research in advanced areas of Science & Technology. The Centre was established in 1987 being supported by Department of Science & Technology, Government of India and the Ministry of Foreign Affairs and International Development, Government of France. CEFIPRA is actively involved in supporting Indo-French Science, Technology & Innovation system through various activities. Collaborative Scientific Research Programme focuses on Academia-to-Academia Collaborations between Indian and French Academic Collaborators in various domains. Industry Academia Research & Development Programme emphasizes to develop the linkage between Industry and Academia from France and India. Dedicated mobility support programmes of CEFIPRA provide exposure to young researchers of the working, social and cultural environment of the partnering country. Targeted Programmes of CEFIPRA provide platform for Indian and French National Funding Agencies to implement programmes for specific areas. Innovation programmes through PPP mode, are the programmes where Industries join hands with CEFIPRA as a funding partner for supporting R & D in defined priority areas.



For further information please contact:

Director

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