

INFOSYS PRIZE 2015

INFOSYS SCIENCE FOUNDATION

“The constant happiness is curiosity.”

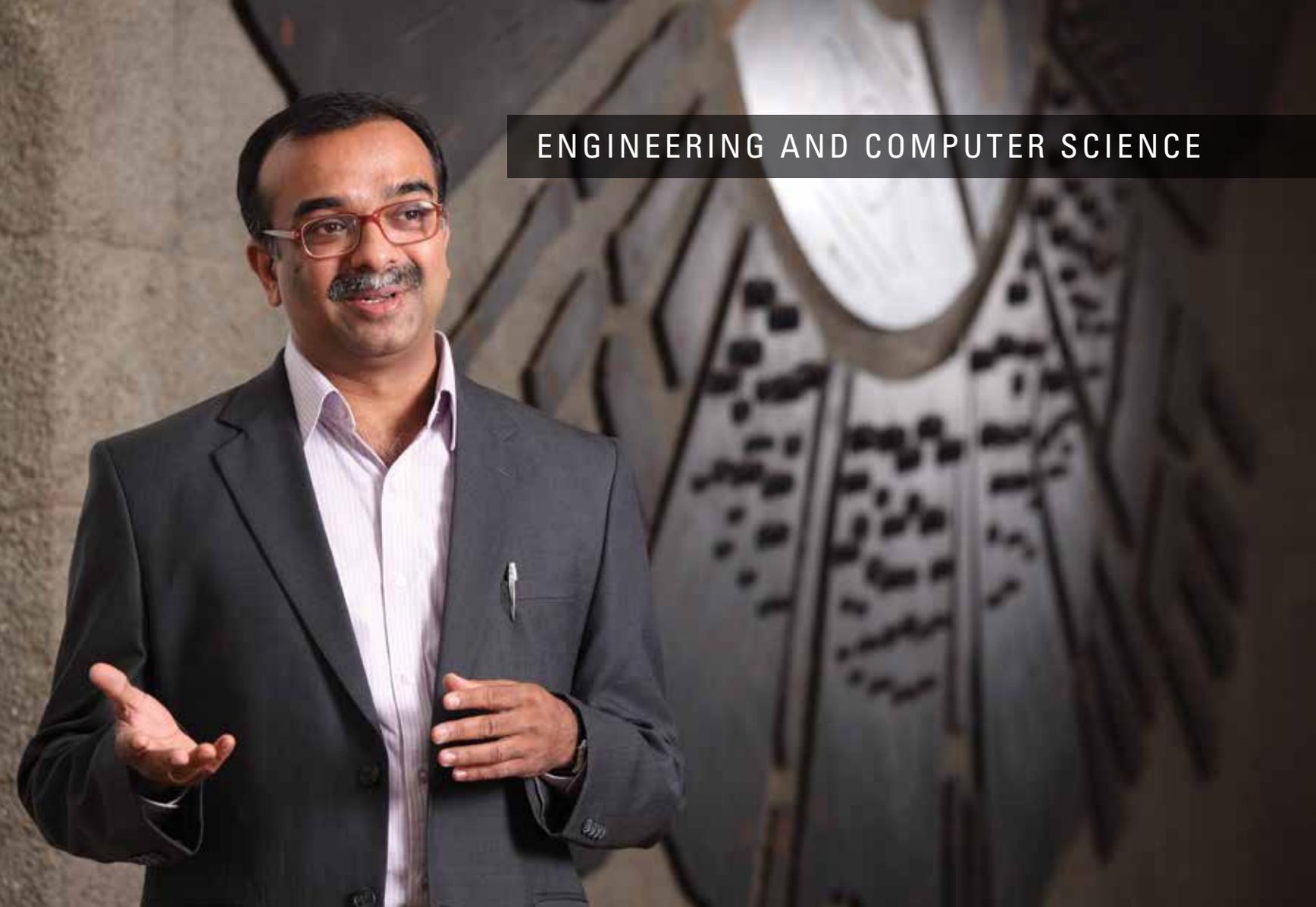
– Alice Munro

THE INFOSYS SCIENCE FOUNDATION

SECURING INDIA'S SCIENTIFIC FUTURE

The Infosys Science Foundation is a not-for-profit trust set up in 2009. It confers the Infosys Prize to honor outstanding achievements across six categories of research: Engineering and Computer Science, Humanities, Life Sciences, Mathematical Sciences, Physical Sciences and Social Sciences. A jury comprising eminent leaders in each of these fields evaluates the achievements of nominees against the standards of international research, placing the winners on par with the finest researchers in the world. The prize consists of a gold medal, a citation and a purse of ₹65 lakh.

In keeping with its mission of spreading the culture of science, the Foundation has instituted the Infosys Science Foundation Lectures – a series of public talks, mostly by jurors and laureates of the Infosys Prize. These talks and interactions aim to inspire young researchers and students by igniting their curiosity and opening up a world of possibilities. In 2014, the Foundation also piloted *Gnanadeepa*, a training program for school teachers from rural Karnataka, to improve the delivery of concepts in science and mathematics.



ENGINEERING AND COMPUTER SCIENCE

UMESH WAGHMARE

Professor, Theoretical Sciences Unit, Jawaharlal Nehru Centre for Advanced Scientific Research, Bengaluru

Prof. Umesh Waghmare is currently Professor in the Theoretical Sciences Unit of Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bengaluru. He completed his B.Tech. in Engineering Physics from IIT-Bombay in 1990 and obtained his doctorate in Applied Physics in 1996 from Yale University, New Haven, USA. He did his postdoctoral research in Harvard University (1996–2000).

He joined the faculty of JNCASR in 2000, and became a Full Professor in 2009. His national honors and awards include fellowship of the three science academies of India, Shanti Swarup Bhatnagar Prize, B M Birla Science Prize, J. C. Bose National Fellowship, and the Materials Society of India Medal, among others.

The Infosys Prize in Engineering and Computer Science is awarded to Prof. Umesh Waghmare for his innovative use of first-principles theories and modeling in insightful investigations of microscopic mechanisms responsible for specific properties of specific materials such as topological insulators, ferroelectrics, multiferroics and 2-dimensional materials like graphene. His work has high potential impact in technological applications of these industrially important materials.

ABOUT WAGHMARE'S WORK AND ITS IMPACT

Prof. Waghmare has provided a much needed bridging between the microscopic details of a material and its properties at various length and time scales by using systematic hierarchical modeling strategies, especially for topological insulators, smart multi-functional materials and nano-materials.

He has been able to complement experimental studies of materials by providing unbiased information at the length-scales smaller than a few nanometers, which is hard to access experimentally, and design new materials from first-principles.

The range of materials that he has worked on include topological insulators, which are characterized by nontrivial topological invariants of its bulk electronic states; ferroelectrics, which are a class of smart materials that are used in micro and nano electromechanical systems; multiferroic materials, which exhibit more than one ferroic order parameter and are useful in multifunctional devices; catalytic oxides, which play an important role in oxidation of harmful gases; dilute magnetic semi-conductors, which are useful in spintronic devices and circuits; and 2-dimensional materials like graphene, and MoS_2 , which have applications in electronic devices.

Waghmare is a rare theorist, who has demonstrated how state of the art first-principles calculations can be used on a wide range of materials to develop material-specific models through a systematic

approach that starts at electronic scales, and used quantum or statistical mechanical analysis of these models to predict material behavior as a function of temperature and other external fields, while also assessing their potential for use in engineered devices.

CITATION BY THE JURY

Prof. Waghmare has made original contributions to fundamental physics of materials besides providing deep insights into the electronic and magnetic behavior of novel materials.

In topological insulators, he resolved a puzzling observation of an unusual Raman anomaly at a pressure induced transition in $r\text{-Sb}_2\text{Se}_3$, showing that the observed transition is from a band-insulator to a topological insulating state, with the time-scales of electrons and phonons becoming comparable at the transition.

In ferroelectrics, Waghmare showed that spatial fluctuations in the order parameter are crucial to the first-order character of the ferroelectric transition. He solved the long-standing question of giant dielectric response of a ferroelectric even away from the ferroelectric transition.

In multiferroics, Waghmare showed how coupling of phonons with spin and electric field leads to magneto-electric and magneto-capacitive effects.



"I am impressed with the way Waghmare has seamlessly transcended the boundaries of physics, chemistry and engineering of materials, and has impacted our understanding of the microscopic mechanisms responsible for the material behavior of engineering materials of importance to industry."

– Pradeep K. Khosla

JONARDON GANERI

Global Network Professor of Philosophy, New York University, New York and Visiting Professor, Department of Philosophy, King's College London

Prof. Jonardon Ganeri holds an M.A. in Mathematics from Cambridge University. He obtained his M.Phil. in Philosophy from King's College London in 1989 and a D.Phil. in Philosophy from Oxford University in 1994. He has taught in some of the most distinguished universities in the world. He is currently Global Network Professor of Philosophy,

in the top-ranked Philosophy Department in the United States, at New York University. He is also Visiting Professor, Department of Philosophy, King's College London. He is a Fellow of the British Academy.

The Infosys Prize 2015 in Humanities is awarded to Prof. Jonardon Ganeri for his outstanding scholarship and originality in interpreting and scrutinizing analytical Indian Philosophy. He has thrown light on the shared ground as well as the dichotomy between Indian and Greek traditions of philosophical reasoning, thereby illuminating both.

ABOUT GANERI'S WORK AND ITS IMPACT

Prof. Ganeri's first book *Artha* (or *Semantic Powers*) shows how widely the intensely brilliant theories of meaning that analytic philosophers had produced in the last two or three decades of the 20th century had very substantially been anticipated in the 17th century by Indian philosophers, in particular in the theoretical account they offered of singular reference—both proper names and such phenomena as anaphora. This is one of the books that opened up the minds of philosophers in the English-speaking world to the riches of Indian Philosophy,

His highly original book *The Concealed Art of the Soul* argues at length and with real persuasive force that in an entire tradition of philosophy, the communication of an idea is deeply embedded in the notion and practice of reading, which can be the basis of self-transformation. In his remarkable book, *The Self*, Ganeri first removes the conventional wedge that is drawn between the Buddhist and other Indian traditions of the study of mind, by unearthing deep ambiguities in the idea of the ownership of mental states, and thereby expanding the concept of the self.

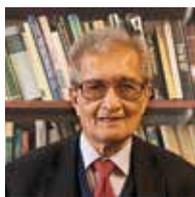
In a bold recent work, *The Lost Age of Reason*, Ganeri demonstrates that there was in the 17th century an upheaval of philosophical thought that amounted to a form of incipient modernity in India, with the creation of networks of new intellectuals seeking to clarify, integrate, and refashion their relationship with the past, with a view

to generating a new form of the human 'subject'. Though based on the Sanskrit philosophical literature, his work is deeply informed by the Islamicate and Persian context in which it emerged and flowered.

CITATION BY THE JURY

Prof. Ganeri brings to the study of Indian Philosophy both an acute form of rigor derived from his training first in Mathematics and then in Analytic Philosophy, and a tremendous range of work, spanning the fields of logic, the semantics of natural language, epistemology, metaphysics, philosophy of psychology, ethics, and in recent years, even political philosophy.

Of the many classical philosophical traditions in the world, Indian Philosophy stands shoulder to shoulder with the Greek and Chinese traditions in its richness, and Ganeri is the most productive and penetrating scholar and interpreter of analytical Indian Philosophy today. He has explored with great skill a variety of non-classical logics and has written scholarly papers of considerable brilliance on Jaina Logic, Informal Logic, the 'Indian syllogism', and the Nava Nyaya logical theory. He currently holds a professorial position with the title Global Network Professor of Philosophy within New York University.



"I congratulate Jonardon Ganeri for his contributions to Indian analytical philosophy, which stands shoulder to shoulder with other analytical traditions like the Greek and the Chinese. But they have often been neglected, partly because of an excessive focus on the religious and mystical aspects of Indian Philosophy. Ganeri has done a lot to bring that heritage to us and make it a lively part of the Indian intellectual thinking today."

– Amartya Sen



AMIT SHARMA

Head, Structural and Computational Biology Group, International Centre for Genetic Engineering and Biotechnology, New Delhi

Dr. Amit Sharma is a structural biologist who is currently Head, Structural and Computational Biology Group at the International Center for Genetic Engineering and Biotechnology (ICGEB), New Delhi. He obtained his doctoral degree in 1995 from Northwestern University, Evanston, USA, in the area of Protein Crystallography. From 1996–2000 he was a junior research fellow

at Oxford University, UK in the area of structural biology. He joined ICGEB, as a Wellcome Trust International Senior Research Fellow and rose to the rank of group leader. His work has been recognized with many accolades and awards that include the Shanti Swarup Bhatnagar Award in Biological Sciences, B M Birla Science Prize and election to all three premier Indian science academies.

The Infosys Prize in Life Sciences is awarded to Dr. Amit Sharma for his pioneering contributions towards deciphering the molecular structure, at the atomic level, of key proteins involved in the biology of pathogenesis of the malarial parasite.

ABOUT SHARMA'S WORK AND ITS IMPACT

Dr. Sharma's laboratory has published a series of high profile papers, which highlight the structural features of numerous malaria parasite proteins. This information is now being utilized for structure-based inhibitors discovery of small molecule agents that may serve as potential inhibitors of malaria parasites.

Sharma's laboratory has also made key contributions to parasite bioinformatics. His studies have provided glimpses of specific motifs potentially involved in protein-protein interaction networks within the parasite. He also provided startling analysis of the unusual amino acid composition of *Plasmodium falciparum* proteins.

Insights from studies on protein synthesis enzymes called tRNA synthetases, that are critical for charging tRNAs with the correct amino acid for incorporation into growing polypeptides, has revealed that blocking these enzymes inhibits cell growth and hence can be used to kill parasites. Blocking the charging of amino acids by tRNA synthetases inhibits cell growth.

The exciting feature of Sharma's studies is that he is increasingly working on structure determinations of *P. falciparum* tRNA synthetases in complex with inhibitors. These investigations have included inhibitors of prolyl tRNA synthetase, lysyl tRNA synthetase and methionyl tRNA synthetase using natural products like febrifugine and cladosporin.

Of considerable excitement internationally is a series of structures from malaria parasite proteins that provide a valuable platform with multiple avenues for arriving at compounds with improved

properties, such as better selectivity and improved bioavailability, while maintaining affinity.

Sharma's choice of biological problems provides a tight link between basic and applied research, and each of the molecules he has published so far are targets for inhibition of the parasite lifecycle.

CITATION BY THE JURY

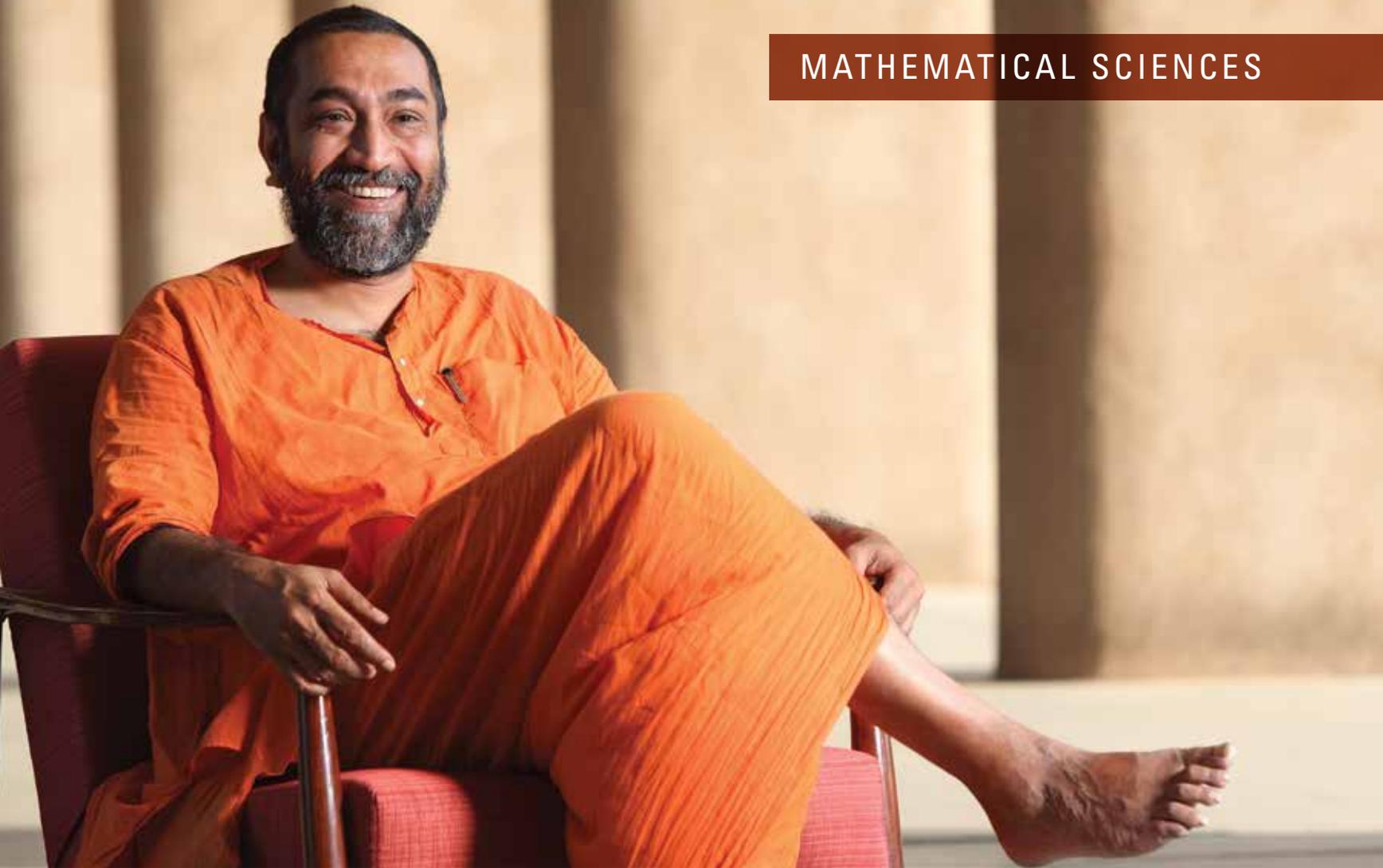
Dr. Sharma studies the fundamental science of malaria, one of the most insidious diseases worldwide. He has carried out crystal structure determinations of proteins in the field of crystallographic instrumentation with an international network of innovators. Sharma has advanced structural biology and worked at the frontiers of basic science to solve major medical problems in infectious diseases. His studies on tRNA synthetases and related enzymes from tropical parasites like *Plasmodium* and *Trypanosomatidae*, will ultimately allow him to arrive at therapeutically useful compounds.

Sharma applies protein crystallography to unravel crucial aspects of malaria biology to the atomic level. Purifying and crystallizing proteins from *P. falciparum* is made difficult by its unusual codon usage and the frequent insertion of loops into proteins. Despite this, Sharma's group has succeeded in the overexpression, crystallization and crystal structure determination of numerous key *P. falciparum* proteins. These results help us to understand host cell invasion by the malaria parasite, as well as the parasite protein synthesis pathways. These could potentially help in design of structure-based vaccines and therapeutics.



"I am impressed that Dr. Sharma is applying the powerful method of protein crystallography to unravel crucial aspects of malaria biology down to the atomic level. His work is at the confluence of basic and applied life sciences and there are numerous indications of his high national and international standing, and his far-reaching initiatives to science education in India."

– Inder Verma



MAHAN Mj

Professor, School of Mathematics, Tata Institute of Fundamental Research, Mumbai

Prof. Mahan Mj was born Mahan Mitra in 1968 and went to St. Xavier's Collegiate School in Kolkata. He went to IIT-Kanpur, initially to major in Electrical Engineering, but switched later to mathematics. He graduated with a Masters degree in 1992. He received his Ph.D. from the University of California, Berkeley in 1997. His thesis was

called *Maps on Boundaries of Hyperbolic Metric Spaces*. After a few months at the Institute of Mathematical Sciences, Chennai, he joined the Ramakrishna Mission in 1998 and received his saffron robe and became a monk in 2008. He received the Shanti Swarup Bhatnagar award in 2011.

The Infosys Prize 2015 in Mathematical Sciences is awarded to Prof. Mahan Mj for his outstanding contributions to geometric group theory, low-dimensional topology and complex geometry. In particular, Mahan established a central conjecture in the Thurston program to study hyperbolic 3-manifolds and introduced important new tools to study fundamental groups of complex manifolds.

ABOUT MAHAN'S WORK AND ITS IMPACT

Prof. Mahan has made a substantial impact in the fields of geometric group theory, low-dimensional topology and complex geometry. His work in all these fields is characterized by its creativity and clever use of delicate geometric arguments.

In the 1970's, Thurston introduced a far-reaching program to study hyperbolic 3-manifolds which complemented his approach to his Geometrization Conjecture. In the last decade, tremendous progress has been made on Thurston's original program and most of his conjectural picture has now been verified. One highlight of this success was Mahan's proof that every Kleinian surface group admits a Cannon-Thurston map. This result has already had many applications within the study of hyperbolic manifolds and Mahan and his co-authors have generalized the techniques involved to apply to much more general situations arising in geometric group theory.

More recently, Mahan has expanded his research program to the study of complex geometry. His work has clarified which groups can arise as fundamental groups of various classes of complex manifolds. For example, in collaboration with Biswas, he characterized exactly which one-relator groups arise as fundamental groups of Kahler manifolds.

CITATION BY THE JURY

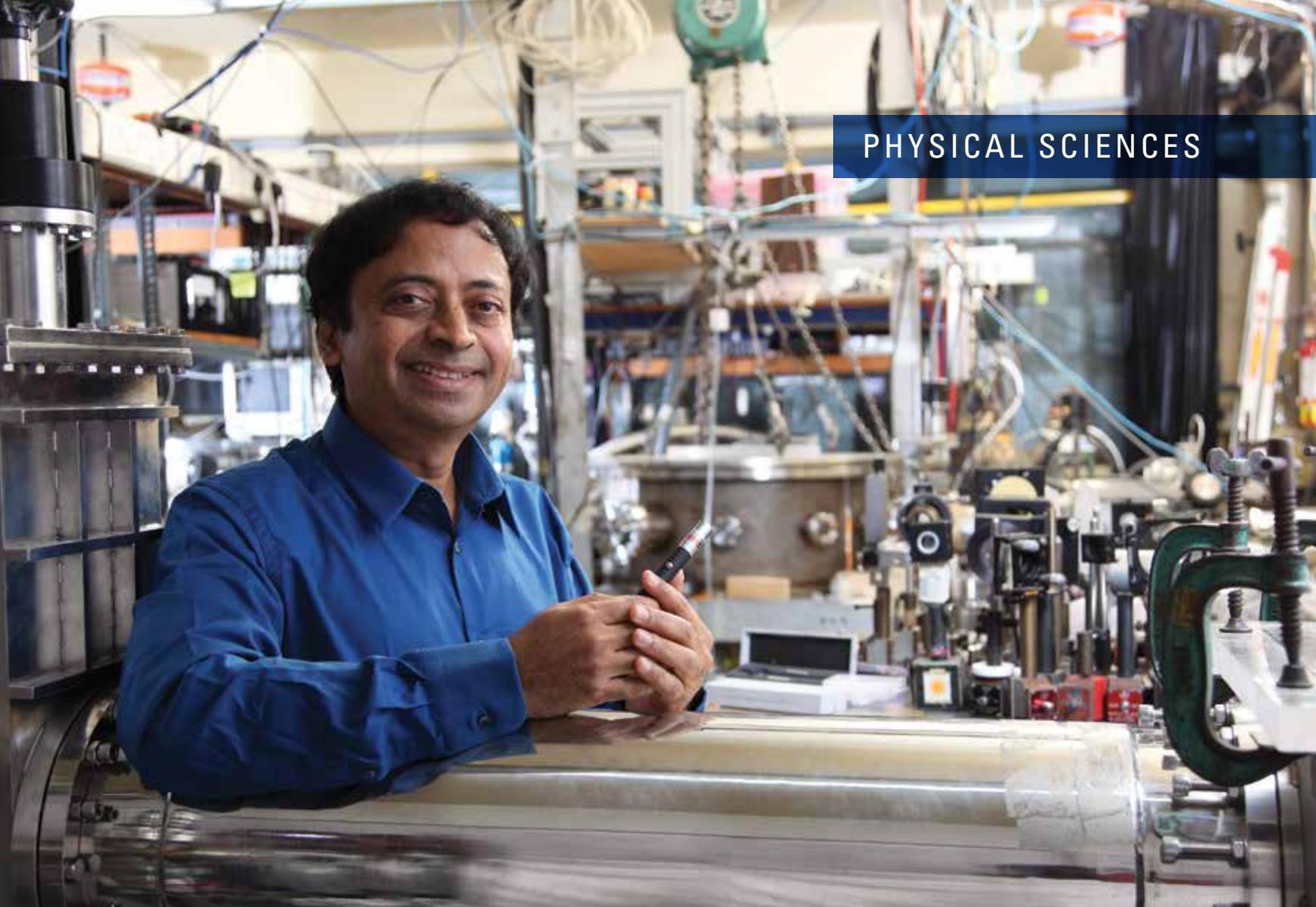
Prof. Mahan Mj's most prominent result is a proof of Thurston's conjecture that every Kleinian surface group admits a Cannon-Thurston map. A Kleinian surface group is a properly discontinuous action of the fundamental group of a closed surface on hyperbolic 3-space by isometries. A Cannon-Thurston map is a continuous equivariant map from the boundary of the surface group into the boundary of hyperbolic 3-space. In many cases, the Cannon-Thurston map will be a sphere-filling curve. As a consequence, Mahan Mj proves that if the limit set of a finitely generated Kleinian group is connected, then it is locally connected.

This result has already had many applications in the study of hyperbolic 3-manifolds and Mahan and his co-authors have studied Cannon-Thurston maps in more general geometric group theoretic settings. The jury was also impressed by Mahan's varied work on pattern rigidity and fundamental groups of complex manifolds.



"Mahan's work is an important milestone in Thurston's program, started almost forty years ago, of classifying and understanding the possible shapes of low dimensional spaces using the group of symmetries that they have as a tool."

– Srinivasa S. R. Varadhan



G. RAVINDRA KUMAR

Senior Professor, Department of Nuclear and Atomic Physics, Tata Institute of Fundamental Research, Mumbai

Prof. Gattamraju Ravindra Kumar holds a B.E. (Hons) in Mechanical Engineering and M.Sc. (Hons) in Physics, both from the Birla Institute of Technology and Science, Pilani, in Rajasthan, India. He obtained his Ph.D. from the Department of Physics in IIT-Kanpur in 1990. After a year of postdoctoral work, in 1992, he joined the Tata Institute of Fundamental Research, Mumbai, in the group now known as

UPHILL (Ultra-short Laser Pulse High Intensity Laser Laboratory) in the Department of Nuclear and Atomic Physics. At TIFR, he has established a strong laboratory for studying the physics of hot dense matter produced by ultra-short laser pulses. He is now a Senior Professor at TIFR, and a Fellow of the Indian Academy of Sciences and the Indian National Science Academy.

The Infosys Prize 2015 in Physical Sciences is awarded to Prof. G. Ravindra Kumar for his pioneering experimental contributions to the physics of high intensity laser matter interactions. In particular for providing, for the first time, unequivocal evidence of turbulent magnetic fields and the discovery of terahertz frequency acoustic waves, in laser produced hot dense plasmas. These results have significance to testing stellar and astrophysical scenarios.

ABOUT KUMAR'S WORK AND ITS IMPACT

Prof. Ravindra Kumar is an experimental physicist, studying plasma at high energy densities created by ultra-short laser pulses interacting with a variety of targets. The physics of this state of matter is of great contemporary interest in the context of the efforts in major international laboratories to achieve thermonuclear fusion by multiple converging laser beams. His laboratory at TIFR was the first to observe and quantify turbulent magnetic fields created by instabilities of the high current electron beams driven by the laser pulse. The control of these instabilities, using a novel carbon nanotube based target, allowed transport of the current over distances of up to a millimeter, many times higher than what was earlier achieved. The rapidly varying spatiotemporal profile of the plasma generated by these pulses was probed by using reflection of different frequencies from different layers.

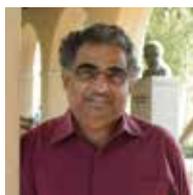
In the context of fusion, minimizing reflected energy is a major goal and Ravindra Kumar has demonstrated the effectiveness of plasmon excitation in sub-wavelength structures in achieving near complete absorption. More recently, he has discovered a new terahertz acoustic mode in a laser produced hot dense plasma.

All these studies called for a variety of sophisticated diagnostic tools – polarimetry X-ray, ion and neutral detection. They have opened

up new areas for follow up, and directly impact the laser fusion effort. Novel tabletop X-ray and energetic particle generators based on these studies are already envisaged. The work has significant implications for laboratory testing of high energy astrophysics scenarios for supernova explosions and high energy particle production.

CITATION BY THE JURY

Prof. Ravindra Kumar is being recognized for his pioneering experimental contributions to the physics of high intensity laser matter interactions that probe matter at extreme densities and temperature. His significant contributions include: i) the first measurement of mega-gauss turbulent magnetic fields in laser plasma interactions; ii) experimental demonstration of large distance electron beam transport in the carbon nanotube system; iii) the use of the Doppler effect from the 'critical surface' to map the density dynamics of an expanding plasma cloud, and iv) discovery of a terahertz hydrodynamic mode in a hot laser plasma. The results of his research have significant implications for laboratory testing of astrophysical scenarios like supernova explosions and high energy particle production.



"Prof. Ravindra Kumar's work is a vivid demonstration of the importance and joys of undertaking experimental investigations of nature. His work on plasma physics has a global impact with applications ranging from terrestrial to astrophysical locales. I am particularly pleased that his work has helped me, an astronomer, understand how neutron stars are born."

– Shrinivas Kulkarni

A photograph of Dr. Srinath Raghavan, a man with glasses, wearing a light blue shirt and a brown checkered blazer. He is standing in a library, gesturing with his hands as if speaking. Behind him are wooden bookshelves filled with books. A dark rectangular box with the text 'SOCIAL SCIENCES' is overlaid on the top right of the image.

SOCIAL SCIENCES

SRINATH RAGHAVAN

Senior Fellow, Centre for Policy Research, New Delhi

Dr. Srinath Raghavan is Senior Fellow at the Centre for Policy Research, New Delhi. A B.Sc. in Physics from Madras University and a Ph.D. in War Studies from King's College London, Raghavan's research spans international relations, history, and strategic studies. Prior to his academic career, Raghavan spent six years as an infantry officer in the Indian Army.

His publications include *War and Peace in Modern India: A Strategic History of the Nehru Years* (2010), *1971: A Global History of the*

Creation of Bangladesh (2013), and *India's War: The Making of Modern South Asia, 1939–1945* (2016), as well as several co-edited volumes. Awarded the K. Subrahmanyam Prize for outstanding contribution to Strategic Studies in 2011 as well as several international research grants, including the MacArthur Foundation's Asian Security Initiative at Centre for Policy Research, Raghavan is a regular commentator on international and strategic affairs.

The Infosys Prize 2015 in Social Sciences is awarded to Dr. Srinath Raghavan for outstanding research that synthesizes military history, international politics, and strategic analysis into powerful and imaginative perspectives on India in the global context.

ABOUT RAGHAVAN'S WORK AND ITS IMPACT

Dr. Raghavan's three books have established him as the most significant Indian exponent of military history and strategic studies.

His work is marked by conceptual and historiographical sophistication combined with rigorous and original archival work. His research offers new interpretative arguments – based on empirical material and nuanced readings – on important issues: the relationship between India's domestic policy and the international system, the balance between civilian authority and military power, force and diplomacy in Indian policy, and India's relations with its neighbors. Raghavan's history of the 1971 India-Pakistan War judiciously examines its unfolding in the context of global engagements, and reveals the political choices of regional leaders in new light.

Drawing on the tools of the social sciences and of policy studies, Raghavan also uses his own military experience to impart a practical understanding to his scholarly work. From these elements, he builds a remarkable 'total' analysis that synthesizes international and strategic perspectives with regional and domestic context, thereby opening new directions of research in Indian scholarship.

By his commitment to teaching, policy engagement, and public commentary, Raghavan's research is in turn informing debate and helping to deepen India's strategic thinking at a critical period in the country's history.

CITATION BY THE JURY

Dr. Raghavan's early research focused on India's foreign policy during the Nehru years, analyzing Nehru's use of diplomacy and coercive power. Raghavan examined a series of crises – including refugee influx from Pakistan, and border disputes with China – bringing rigor and nuance to the historical study of India's international relations, a trait that marks all his subsequent work. His second book, on the 1971 India-Pakistan war and the creation of Bangladesh, used archival sources across the world, and international political economy, to locate the 1971 crisis in a context of global strategic, diplomatic and economic causalities. In his third book, on India in the Second World War, all Raghavan's skills are visible, in a tour de force of historical social science analysis. Raghavan has also played a significant role in energizing the study of international relations in India, in mentoring younger scholars, and in contributing to national policy debate and formation.



"Using creativity, Srinath Raghavan has woven different strands of thought and method to shed light on India's military history and statecraft, thereby paving the way for better strategic thinking, as India takes its seat as a newly-emergent global force. It is uncommon in the social sciences to get a major award at such a young age. Congratulations."

– Kaushik Basu

ENGINEERING AND COMPUTER SCIENCE



Pradeep K. Khosla

Jury Chair

Pradeep K. Khosla is the Chancellor, University of California, San Diego, USA. He has received several awards, including the ASEE George Westinghouse Award for Education (1999), SiliconIndia Leadership award for Excellence in Academics and Technology (2000), the W. Wallace McDowell award from IEEE Computer Society (2001), Cyber Education Award from the Business Software Alliance (2007), the ASME Computers in Engineering Lifetime Achievement Award (2009), and the inaugural Pan IIT American Leadership Award for Academic Excellence (2009). He was awarded the Philip and Marsha Dowd Professorship in 1998 at the Carnegie Mellon University, Pittsburgh, USA. He has been elected as Member, National Academy of Engineering, Fellow of the Institute of Electrical and Electronics Engineers (IEEE) and Fellow of the American Association of Artificial Intelligence (AAAI).

Jurors

Rajesh K. Gupta

Professor and Qualcomm Endowed Chair, Department of Computer Science and Engineering, University of California, San Diego, USA

Arun Majumdar

Jay Precourt Provostial Chair Professor, Department of Mechanical Engineering, and Senior Fellow of the Precourt Institute for Energy, Stanford University, USA

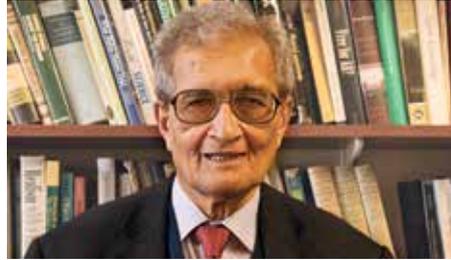
R. A. Mashelkar

National Research Professor, President of Global Research Alliance, India

Venkatesh Narayanamurti

Benjamin Pierce Professor of Technology and Public Policy; Professor of Physics, Harvard University, USA

HUMANITIES



Amartya Sen

Jury Chair

Amartya Sen is Thomas W. Lamont University Professor, and Professor of Economics and Philosophy, at Harvard University. Until 2004, he was the Master of Trinity College, Cambridge. He has served as President of the Econometric Society, the American Economic Association, the Indian Economic Association, and the International Economic Association.

Amartya Sen's awards include Bharat Ratna (India); Commandeur de la Legion d'Honneur (France); the National Humanities Medal (USA); Ordem do Merito Cientifico (Brazil); Honorary Companion of Honour (UK); Aztec Eagle (Mexico); Edinburgh Medal (UK); the George Marshall Award (USA); the Eisenhower Medal (USA); and the Nobel Prize in Economics.

Jurors

Akeel Bilgrami

Johnsonian Professor of Philosophy, Director of the Southern Asian Institute, and Founding Member of the Committee on Global Thought, Columbia University, USA

Dipesh Chakrabarty

Lawrence A. Kimpton Distinguished Service Professor of History and South Asian Languages and Civilizations, University of Chicago, USA

Leila Seth

Retired Chief Justice of Himachal Pradesh, India

Sugata Bose

Gardiner Professor of History and Director of the South Asia Initiative, Harvard University, USA

Homi K. Bhabha

Anne F. Rothenberg Professor of the Humanities, Director of the Mahindra Humanities Center, and Senior Advisor to the President and Provost, Harvard University, USA

LIFE SCIENCES



Inder Verma

Jury Chair

Inder Verma is American Cancer Society Professor (Emeritus) and the first incumbent of the Irwin and Joan Jacobs Chair in Exemplary Life Science, Laboratory of Genetics, Salk Institute for Biological Studies, USA. He is one of the world's leading authorities on the development of viruses for gene therapy vectors. He is a member of the National Academy of Sciences (USA), Institute of Medicine, American Academy for Arts & Sciences, American Philosophical Society, Third World Academy of Sciences, and a foreign associate of the Indian National Academy of Sciences. He has won the NIH Outstanding Investigator Award (1988), the Vilcek Foundation's prize in biomedical science (2008), the Columbia University's Spector Prize (2010), and the 22nd Annual Cancer Research Award of the Pasarow Foundation.

Jurors

K. Christopher Garcia

Professor, Department of Molecular and Cellular Physiology and Department of Structural Biology, and Investigator, Howard Hughes Medical Institute, Stanford University School of Medicine, USA

Fred H. Gage

Professor, Laboratory of Genetics, Vi and John Adler Chair for Research on Age-Related Neurodegenerative Disease, Salk Institute of Biological Studies, USA

Mary-Claire King

American Cancer Society Research Professor, Genetics and Medicine, University of Washington, USA

Mark Groudine

Executive Vice President and Deputy Director, Member, Division of Basic Sciences, Fred Hutchinson Cancer Research Center, and Professor, Radiation Oncology, University of Washington, USA

David Baulcombe

Head of Group, Regius Professor of Botany, Royal Society Research Professor, Department of Plant Sciences, University of Cambridge, UK

MATHEMATICAL SCIENCES



Srinivasa S. R. Varadhan

Jury Chair

Srinivasa S. R. Varadhan is Professor of Mathematics and Frank J. Gould Professor of Science at the Courant Institute of Mathematical Sciences, New York University (NYU), New York, USA. His awards and honors include the National Medal of Science (2010) from US President Barack Obama, the highest honor bestowed by the United States government on scientists, engineers and inventors. He is also the winner of the Abel Prize (2007), the Leroy Steele Prize (1996), the Margaret and Herman Sokol Award of the Faculty of Arts and Sciences, New York University (1995) and the Birkhoff Prize (1994). He also has honorary degrees from the Chennai Mathematical Institute (2008), the Indian Statistical Institute in Kolkata, India (2004) and from Université Pierre et Marie Curie in Paris (2003).

Jurors

Manindra Agrawal

Professor and Dean of Faculty Affairs, Department of Computer Science & Engineering, Indian Institute of Technology, Kanpur, India

Irene Fonseca

Mellon College of Science University Professor of Mathematics, and Director of Center for Nonlinear Analysis, Carnegie Mellon University, USA

Gopal Prasad

Raoul Bott Professor of Mathematics, University of Michigan, USA

Cedric Villani

Professor of Mathematics, Lyon University and Director of the Henri Poincaré Institute, Paris, France

Chandrashekhara Khare

Professor of Mathematics, University of California, Los Angeles, USA

PHYSICAL SCIENCES



Shrinivas Kulkarni

Jury Chair

Shrinivas Kulkarni is the John D. and Catherine T. MacArthur Professor of Astronomy and Planetary Science at the California Institute of Technology (Caltech), Pasadena, USA. His primary interests are the study of compact objects (neutron stars and gamma-ray bursts) and the search for extra-solar planets through interferometric and adaptive techniques. He serves as the Interdisciplinary Scientist for the Space Interferometry Mission (SIM) and is co-Principal Investigator of the Planet Search Key Project (also on SIM). He has been awarded the Alan T. Waterman Prize of the NSF, a fellowship from the David and Lucile Packard Foundation, a Presidential Young Investigator award from the NSF and the Helen B. Warner award of the American Astronomical Society and the Jansky Prize of Associated Universities, Inc. He was also elected a Fellow of the American Academy of Arts and Sciences (1994), Fellow of the Royal Society of London (2001) and Fellow of the National Academy of Sciences (2003).

Jurors

Goverdhan Mehta

National Research Professor and Jubilant-Bhartia Chair Professor, School of Chemistry, University of Hyderabad, India

Richard Zare

Marguerite Blake Wilbur Professor in Natural Science, Stanford University, USA

Spenta Wadia

Distinguished Professor and Director, International Centre for Theoretical Sciences of TIFR, Mumbai, India

Rajaram Nityananda

Professor, Azim Premji University, Bengaluru, India

SOCIAL SCIENCES



Kaushik Basu

Jury Chair

Kaushik Basu is the Chief Economist and Senior Vice President, World Bank and Professor of Economics and the C. Marks Professor of International Studies, Cornell University. He is currently the President of the Human Development and Capabilities Association, and has held advisory posts with the ILO, the World Bank, and the Reserve Bank of India. A Fellow of the Econometric Society, he has published widely in the areas of Development Economics, Industrial Organization, Game Theory and Welfare Economics. His books include *Analytical Development Economics* (1997, MIT Press), *Prelude to Political Economy: A Study of the Social and Political Foundations of Economics* (2000, Oxford University Press), *Of People, Of Places: Sketches from an Economist's Notebook* (1994, Oxford University Press), and *Beyond the Invisible Hand: Groundwork for a New Economics* (2011, Princeton University Press and Penguin). In May 2008, he was awarded the Padma Bhushan by the Government of India.

Jurors

Avinash Dixit

John J. F. Sherrerd '52 University Professor of Economics Emeritus, Princeton University, USA

Sunil Khilnani

Avantha Professor and Director, King's India Institute, UK

Nandini Sundar

Professor of Sociology at the Delhi School of Economics, Delhi University, India

Satish Deshpande

Professor, Department of Sociology, Delhi School of Economics, India

TRUSTEES



S. D. Shibulal

Co-founder, Infosys Limited and
President of the Board of Trustees,
Infosys Science Foundation



Narayana Murthy

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Former Director, Infosys Limited
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Bhavna Mehra

General Manager, Infosys Science
Foundation

LIGHT – ART & SCIENCE PHOTOGRAPHY CONTEST

The Infosys Science Foundation celebrated the International Year of Light and Light-based Technologies 2015 in a unique way, through a contest titled the Light – Art & Science Photography. Light-based innovations and discoveries have led to remarkable advancements for the humankind. Scientists and inventors have won global acclaim; artists have used light to entertain, delight and awaken us. To celebrate this special Year, we invited Infoscions, and their friends and family to participate in this contest by posting photos pertaining to light – frames that evoke a sense of amazement, enlightenment, and those that capture life’s intensity in all its glory. The contest received around 800 entries from around the world. Here are the winners of the contest chosen by an expert jury:



UNDER-17 CATEGORY

Winner: Krisangi Bhargava



18 AND ABOVE CATEGORY

Winner: Wolfgang Amadeusz Schwarzenegger



POPULAR CHOICE AWARD

Winner: Manoj Rana

INFOSYS SCIENCE FOUNDATION

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