

4 AUGUST 2026

🕒 **6:00 PM-8:45 PM (IST)**

📍 **INDIA INTERNATIONAL CENTRE
NEW DELHI**

VENUE: IIC - CONFERENCE ROOM - II

UNESCO – INTERNATIONAL DAY OF LIGHT 2026 CELEBRATION

Workshop on
**“FASCINATING LIGHT AND COLOUR
PHENOMENA IN NATURE”**

KEYNOTE SPEAKER

PROF. JOHN M. DUDLEY

Professor at the Université Marie et Louis Pasteur, France



SPEAKERS

PROF. ZAHID H. KHAN, DR. NAKUL PARASHAR,
PROF. N. RAGHURAM, DR. NITA DILAWAR SHARMA

Organised by

**ZAHEER SCIENCE FOUNDATION
NEW DELHI**

In collaboration with

**INDIA INTERNATIONAL CENTRE
NEW DELHI**

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International Day of Light (IDL): Background, Legacy, and Workshops Organised by Zaheer Science Foundation

Background

Light and light-based technologies had transformed modern society and had profoundly influenced nearly every aspect of human life. Their applications had spanned healthcare, communications, education, entertainment, industry, culture, and scientific research. Entire sectors of the global economy had been driven by optical and photonic technologies. Without light-based innovations, there would have been no solar panels, LED lighting, computer and mobile displays, digital cameras, projectors, magnetic resonance imaging (MRI), X-ray systems, optical fibre communications, or the Internet as we knew it.

Advances in light-based technologies had continued to generate innovative products and processes that improved access to information, strengthened healthcare systems, enhanced energy efficiency, and enriched our daily lives. These technologies had also played a vital role in addressing global challenges and advancing sustainable development in areas such as energy, education, agriculture, environmental protection, and healthcare. Consequently, there had been a growing need to raise public awareness of the importance of light and its applications in science, technology, and society.

Recognizing this significance, the United Nations had proclaimed **2015 as the International Year of Light and Light-based Technologies (IYL 2015)**. The initiative had achieved remarkable global success, with more than 13,000 activities organized across 147 countries and attended by millions of people worldwide.

Building upon this success, the General Conference of UNESCO had established the **International Day of Light (IDL)** as an annual observance beginning in 2018. It had been celebrated each year on **16 May**, a date that commemorated the first successful operation of a laser by the American physicist and engineer **Theodore H. Maiman** on 16 May 1960. Over the past six decades, laser technology had revolutionized medicine, communications, manufacturing, scientific research, and information technology, becoming one of the most influential innovations of the modern era.

Since its inception in 2018, the International Day of Light had been celebrated annually with great enthusiasm across the globe. Typically, around 60–70 countries had participated each year through hundreds of lectures, exhibitions, workshops, outreach activities, and public engagement programmes. For **IDL 2026**, UNESCO had selected the theme:

“Light for a Sustainable Future.”

International Day of Light Celebrations 2022–2025 by Zaheer Science Foundation (ZSF), New Delhi

Since 2022, the **Zaheer Science Foundation (ZSF), New Delhi**, had been actively organizing International Day of Light events through lectures, exhibitions, workshops, and public outreach programmes, either independently or in collaboration with other institutions.

The following International Day of Light (IDL) events had been organized by the Zaheer Science Foundation during 2022–2025:

Year	Event
2022	Online Workshop on “ Disruption of Education during Covid-19 Pandemic ” (30 August 2022).
2023	Launch of Monthly Newsletter on “Science & Society in Media” as part of the IDL 2023 celebrations (17 July 2023).
2024	“ Reflection on Light and Its Significance in Our Lives ” – Lecture delivered by Dr. Zahid H. Khan as part of UNESCO International Day of Light celebrations (16 May 2024).
2024	Exhibition and Panel Discussions on “ Illuminating Traditions: A Journey Through Light in Indian Culture and Heritage ” by Abu Sufiyan, Tales of City, New Delhi (16 May 2024).
2025	Workshop on “ Familiarization with Quantum Science & Technology ” – Part 1 (26 June 2025), in collaboration with India International Centre, New Delhi.
2025	Workshop on “ Familiarization with Quantum Science & Technology ” – Part 2 (26 August 2025), in collaboration with Faculty of Natural Sciences, Jamia Millia Islamia, New Delhi.

The IDL 2025 workshops were organized with the valuable support of **Shanti Foundation International** and **Virtual Studio**. Both workshops were well attended and received enthusiastic participation from students, teachers, researchers, and science enthusiasts. The keynote addresses at both events were delivered by **John M. Dudley**, Professor at the University of Franche-Comté, France, and Chair of the International Day of Light Steering Committee, through his recorded lectures, followed by interactive Q&A sessions.

IDL 2026 Workshop by Zaheer Science Foundation

The theme of the **International Day of Light 2026** was “**Light for a Sustainable Future.**”

To mark this occasion, the **Zaheer Science Foundation, New Delhi**, organized a special event entitled:

“Fascinating Light and Colour Phenomena in Nature”

The event had received approval from the UNESCO International Day of Light programme and was held on **4 August 2026**.

Through this programme, participants explored a variety of captivating optical phenomena observed in nature and gained a deeper appreciation of the science of light and its relevance to our understanding of the natural world. The event engaged students, educators, researchers, and members of the general public, thereby furthering the objectives of the International Day of Light and promoting scientific awareness in society.

The programme covered a range of natural optical phenomena, including changes in the colour of the Sun from dawn to dusk, the blue colour of the sky, the silver lining of clouds, rainbows, the blue colour of the sea, mirages, and the colours of flowers and vegetation. The scientific principles underlying these observations were explained in an accessible manner. In alignment with the **“Light for a Sustainable Future”** theme of IDL 2026, the appreciation and understanding of light in nature were highlighted as essential steps towards deeper environmental awareness. The initiative engaged audiences across age groups, from childhood to adulthood, with the aim of fostering curiosity and a lasting sense of wonder about the natural world.

The workshop was attended by a total of **70 participants**.

Keynote Address by Professor John M. Dudley

On our request, **Professor John M. Dudley**, Professor at the University of Franche-Comté, France, and Chair of the International Day of Light 2026 Steering Committee, had very kindly agreed to deliver his recorded Keynote Address on the topic, **“The Key Enabling Technology of Photonics – A Two-Way Street of Basic Research and Innovation.”**

It was highlighted that photonics was a key enabling technology that drove innovation across multiple areas of societal importance, including communications, healthcare, agriculture, and energy. The potential of photonics in achieving the UN Sustainable Development Goals was recognized internationally through the annual UNESCO International Day of Light, which was held on 16 May, a date commemorating the first demonstration of the laser in 1960.

A significant factor in the selection of this date was that the story of the laser illustrated how both basic and applied research had successfully worked together to yield genuine disruptive applications. The talk presented a general overview of the interplay between basic science and innovation, with examples of how curiosity-driven research had enabled truly transformative technologies, and equally, how practical challenges had in turn stimulated fundamental scientific insights.

The presentation also considered different funding approaches that had been used internationally to support the full spectrum of research, from open-ended discovery to industrial application.

PROGRAMME

IDL2026 Workshop on
“Fascinating Light and Colour Phenomena in Nature”
August 04, 2026
(Venue: India International Centre, Conference Room- II)

INAUGURAL SESSION

6:00 PM – 6:30 PM [IST]

- Welcome Address: **Shri K.N. Shrivastava**, *Director, India International Centre, New Delhi*
- Address by: **Dr. Tabassum Jamal**, *IDL Workshop Chair*
- Address by: **Shri Hasan Jawaid Khan**, *Chairman, ZSF*
- About the Workshop: **Prof. Zahid Husain Khan**, *IDL2026 National Node for India*

6:30 PM – 7:10 PM: Keynote Address and Interactive Q&A Session

6:30 PM – 7:00 PM	Prof John M. Dudley <i>Professor at the Université Marie et Louis Pasteur, France; International Day of Light 2026 Steering Committee Chair</i>	“Photonics as a Key Enabling Technology: A Two-Way Link Between Basic Research and Innovation” (Recorded Lecture)
7:00 PM – 7:10 PM	Interactive Q&A Session	

7:10 PM – 7:15 PM: Vote of Thanks by Dr. Mohammad Rais, Secretary, ZSF

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TECHNICAL SESSION

Chair: Prof. Ravi K. Soni (*Former Professor of Physics, IIT Delhi*)

Thematic Presentations (7:15 PM – 8:35 PM)

Prof. Zahid Husain Khan <i>Zaheer Science Foundation; IDL2026 National Node for India</i>	“Fundamentals of Principles Behind Fascinating Light and Colour Phenomena in Nature, including the Mystery of the Three Blues”
Dr. Nakul Parashar <i>Shanti Foundation International</i>	“Light and Colours of Celestial Bodies and Fascinating Phenomena in the Earth’s Atmosphere”
Prof. N. Raghuram <i>School of Biotechnology, GGS Indraprastha University, New Delhi</i>	“Light and Colours in Flora and Oceanic Fauna”
Dr. Nita Dilawar Sharma <i>National Physical Laboratory, New Delhi</i>	“Some Interesting Optical Phenomena in the Nature Around Us”
Remarks of the Chair	

8:35 PM – 8:45 PM:

Summing Up by Mr. Venkatesh Sharma (*CEO – Virtual Studio (vsworld.com)*)

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(Note: Tea/ Coffee/ Snacks will be served at 5:30-6:00 PM at Terrace Pergola, Near Conference Room- II)

Brief Summary of the Presentations

Prof John M. Dudley

THE KEY ENABLING TECHNOLOGY OF PHOTONICS

A two-way street of basic research and innovation

Summary of the recorded talk by Professor John M. Dudley

Professor John M. Dudley's talk, "The Key Enabling Technology of Photonics: A Two-Way Street of Basic Research and Innovation," presents photonics as both a powerful economic sector and a foundation of modern society. The science and technology of light underpin displays, medicine, lighting, manufacturing, energy, quantum communications, defence, autonomous systems and virtual reality. Photonics revenues and employment continue to grow, yet the sector faces a skills gap. Education, training and public engagement are therefore essential if societies are to use light-based technologies effectively and responsibly.

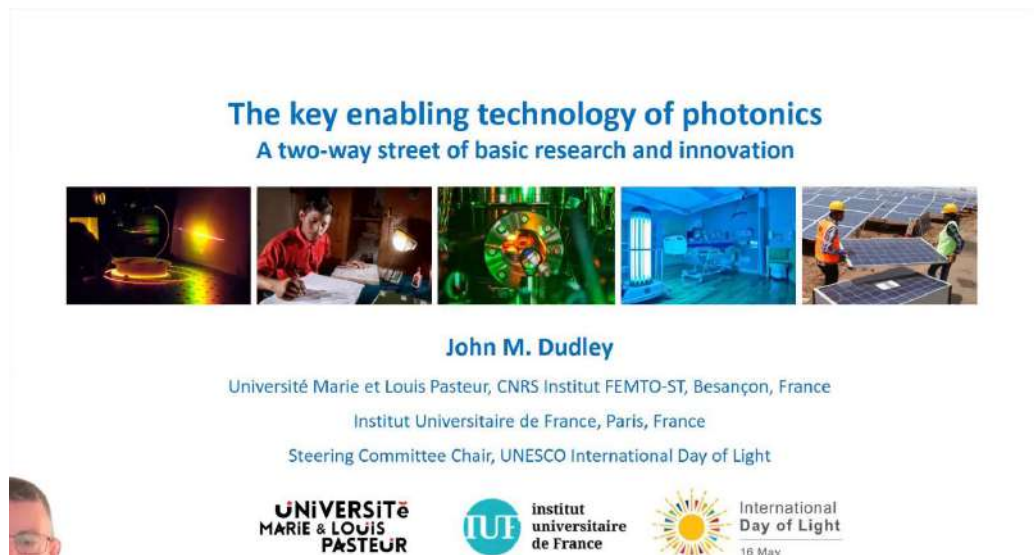


Figure 1. Photonics links fundamental light science with technologies spanning research, health, energy and society.

Dudley connects photonics with sustainable development. Light-based technologies contribute to clean water, agriculture, health, renewable energy, efficient infrastructure, communication and environmental monitoring, and thus support many United Nations Sustainable Development Goals. He places these applications within UNESCO's wider programmes: the International Year of Light, the annual International Day of Light on 16 May, the International Year of Quantum Science and Technology, and the International Decade of Sciences for Sustainable Development. These initiatives show how scientific outreach, culture, education and policy dialogue can build public trust and encourage international cooperation.

The talk's central theme is the relationship between fundamental science and practical innovation. Dudley uses the laser as a striking example. Early maser and laser work was motivated largely by basic questions in spectroscopy and quantum physics; its inventors could not foresee today's vast range of applications. Yet practical needs also stimulated fundamental breakthroughs. The late-nineteenth-century demand for accurate standards for electric lighting led to improved black-body measurements, which helped Max Planck formulate quantum theory. Innovation is therefore not a straight line from laboratory discovery to product: questions arising from technology can transform basic science, while curiosity-driven discoveries can later transform technology.

Dudley reviews changing ways of organising research. Vannevar Bush's post-war "linear model" treated basic research as the pacemaker of technological progress. NASA's Technology Readiness Levels later provided a scale from fundamental principles to operational systems. This model is useful for managing risk, but it exposes a "valley of death" between academic discovery, applied development and deployment, where promising ideas may lack suitable funding or researchers willing to carry them forward. Donald Stokes's quadrant model offers a richer picture by distinguishing pure basic research, use-inspired basic research—exemplified by Pasteur—and application-focused invention, while recognising a two-way flow between them.

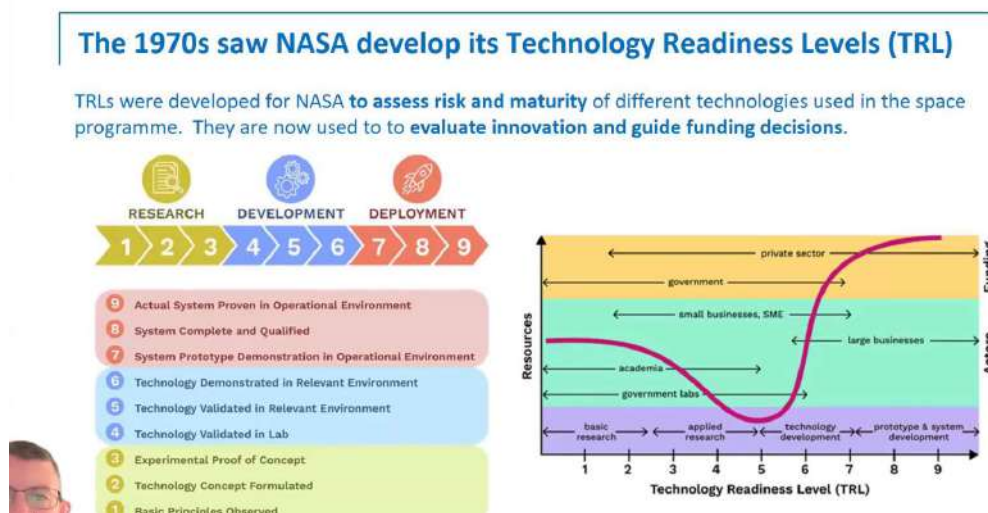


Figure 2. Technology Readiness Levels reveal the difficult transition from basic research to development and deployment.

Source: *Future Needs*, Hensen et al. *REHVA Journal* May 2015.

Current mission-oriented programmes seek to accelerate this flow by setting clear societal goals. Europe's research framework, Mariana Mazzucato's "mission economy," and India's Anusandhan National Research Foundation illustrate efforts to combine foundational grants with ambitious missions. Dudley cautions, however, that mission funding must not weaken the broad research base. India's research expenditure remains about 0.6–0.7% of GDP, with comparatively low private-sector participation, so expanding total investment and strengthening research foundations are crucial.

In conclusion, scientists should understand the policy and funding environment and communicate why long-term research matters. Photonics can integrate naturally into credible mission-led projects, but universities must continue to protect curiosity-driven inquiry and knowledge sovereignty. Major questions attract young people, and the unpredictable discoveries they inspire are indispensable. Sustainable innovation depends on preserving both directions of the street: missions that turn knowledge into solutions, and basic research that creates the knowledge on which future missions will depend.

Prof. Zahid Husain Khan

Fundamentals of Fascinating Light and Colour Phenomena in Nature

Summary of the workshop presentation, including the “Mystery of the Three Blues”

This workshop presentation introduces the science needed to understand some of nature’s most striking displays of light and colour. It begins by asking four linked questions: Where does light come from? How does it interact with matter? How do our eyes perceive colour? Why do the sky, distant mountains and oceans appear blue? Natural sources include the Sun, stars, lightning, fire and bioluminescent organisms, while artificial sources include incandescent lamps, LEDs and lasers. The Sun is emphasized as Earth’s principal source: nuclear fusion in its core releases energy that ultimately reaches us as electromagnetic radiation.

White sunlight contains a continuous range of visible wavelengths. When it enters a prism, the refractive index of glass varies with wavelength, so different colours travel at different speeds and bend through different angles. Violet is deviated most and red least, separating white light into a spectrum—dispersion. Visible light, approximately 380–750 nm, is only a small part of the electromagnetic spectrum, which extends from radio waves to gamma rays. Light itself is an electromagnetic wave consisting of oscillating electric and magnetic fields.

When light meets matter, it may be reflected, refracted or dispersed. It can also undergo interference, diffraction and total internal reflection. These behaviours explain familiar phenomena and technologies: reflections from surfaces, the apparent bending of objects in water, rainbow formation, coloured soap films, diffraction patterns, optical fibres, lasers and modern photonics.

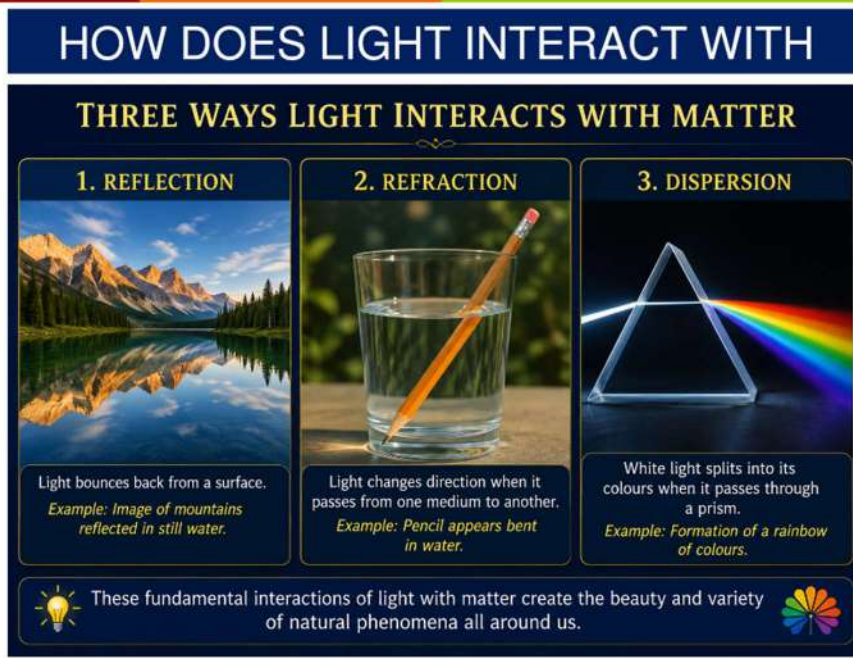


Figure 1. Principal ways in which light interacts with matter: reflection, refraction and dispersion.

Vision occurs when light reflected from an object enters the eye. The cornea and lens focus it on the retina, where rods operate mainly in dim light and cones provide colour vision and fine detail. S-, M- and L-cones respond to overlapping ranges of short, medium and long wavelengths. Their signals are converted into electrical impulses, carried through the optic nerve and interpreted by the brain; therefore, the eye detects light, but the brain constructs the visual experience.

The Northern Lights illustrate a dramatic Sun–Earth interaction. Energetic particles associated with solar activity and coronal mass ejections are guided by Earth’s magnetic field towards polar regions. Collisions with atmospheric oxygen and nitrogen excite these atoms and molecules; their subsequent emission produces green, red, violet and blue auroral light. The exceptionally strong solar storms of 10–11 May 2024 generated auroras far beyond their usual range, including Ladakh.

The final section resolves the “mystery of the three blues.” Rayleigh scattering by tiny atmospheric molecules varies approximately as $1/\lambda^4$, so short-wavelength blue light is scattered far more strongly than red light. Scattered blue light reaches the observer from all directions, making the sky appear blue. Distant mountains look progressively pale blue because their reflected light crosses a longer atmospheric path: contrast and original colour weaken while scattered blue light is added, an effect called atmospheric perspective. Oceans are blue mainly because water absorbs red, orange and yellow wavelengths more strongly, allowing blue light to penetrate farther and be scattered back. The presentation closes by showing how scientific explanation deepens—rather than diminishes—our sense of wonder at nature’s luminous beauty.

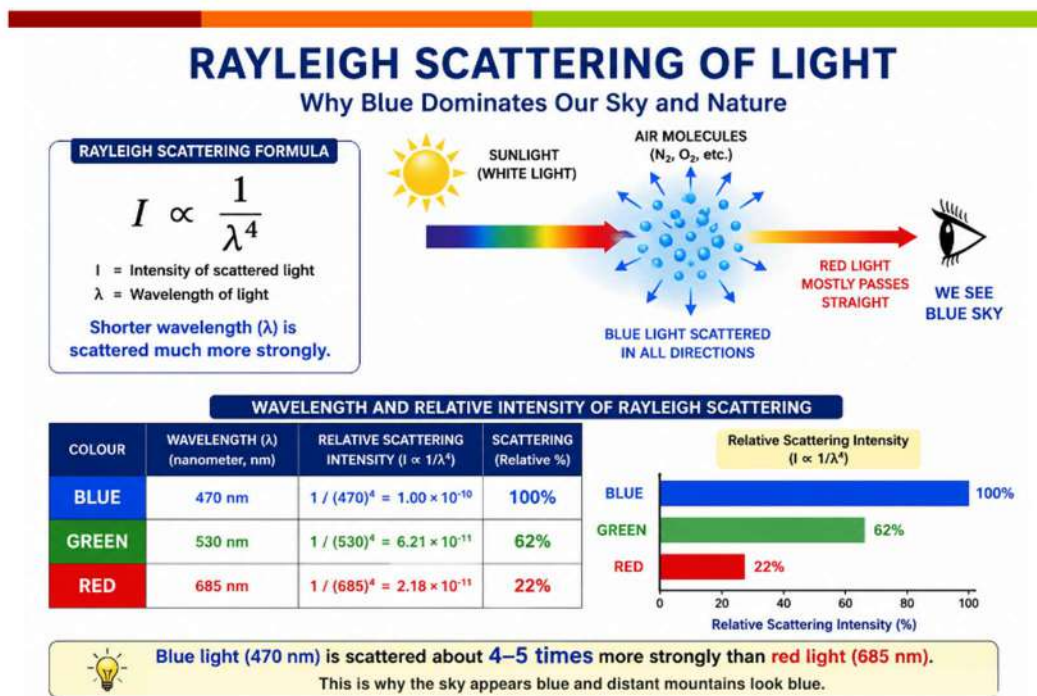


Figure 2. Rayleigh scattering: shorter wavelengths are scattered much more strongly, explaining the blue sky and contributing to the blue appearance of distant mountains.

Source: Light Science – FINAL MASTER workshop presentation

Prof. N. Raghuram

Prof. N. Raghuram's talk dealt with the importance of light in the biological world, focusing on the topic 'Light and Colours in Flora and Oceanic Fauna'. He started with how light matters not only as a source of energy, but also as a source of information and coordination of growth and development. Plants and algae have evolved to harvest different bands of the light spectrum, not only for photosynthesis but also for growth (phototropism), development and flowering and crop yield (photoperiodism), avoiding competition in space and time (eg: shade-loving or sun-loving, long-day or short-day or seasonal plants) or even at the same space and time for coexistence (eg: by different arrangement of leaves to optimize their light needs, called phyllotaxy, or by different vertical or horizontal growth of branches). Pigments such as chlorophylls, carotenoids and xanthophylls mainly serve to harvest specific colours of the light spectrum for photosynthesis, while the unabsorbed light is responsible for the visible colours of leaves, flowers, fruits etc.

Finally, light has a huge role in coordinating gene expression of hundreds or thousands of genes working like a molecular symphony to deliver all the visible effects on plants and environment. Other pigments, such as phytochromes, cryptochromes and UV A/B receptors absorb light as a signal for growth, development, flowering etc., in which the intensity, colour and duration of light plays important roles. The spatial distribution of different sun-loving and shade-loving plants, as well as their canopy architecture have

evolved to optimize the availability of light, while determining the overall landscape in the process. These aspects are also important for agriculture and afforestation. Light also determines the vertical distribution of various algae and aquatic plants in water bodies of various depths, while nutrients determine their relative proportions. Clear water bodies are nutrient-limited and support sparse algal growth, imparting blue or blue-green colour. Nutrient pollution initially causes proliferation of green algae, which are later replaced by brown and red algae due to the declining penetration of light. In marine coasts, this manifests as occasional green tides, brown tides or red tides. The colours of fish and corals are also due to pigments that absorb different parts of the light spectrum, while their population densities are determined by the availability of nutrition along the food chains. Bioluminescence is a fascinating feature of some marine animals in the deeper zones, as they absorb light of lower wavelength and emit it at higher wavelengths. Ultimately, light and its interactions with temperature and nutrients in terrestrial, aquatic and marine ecosystems has major implications for food security, blue economy, and the triple planetary crisis of pollution, climate change and biodiversity integrity, thus impacting most of the sustainable development goals.

Dr. Nita Dilawar Sharma

Optical Phenomena and Colour Formation in Nature

The presentation “**The Journey of Light – from Dawn to Dusk**” explores the fascinating optical phenomena and natural colours observed around us. These effects are produced by the interaction of light with the atmosphere, water, ice crystals, minerals, and biological structures. Major optical mechanisms involved include **refraction, reflection, diffraction, interference, scattering, and dispersion**.

Atmospheric optical phenomena provide some of the most spectacular examples. **Rainbows** are formed when sunlight enters raindrops, undergoes refraction and dispersion, reflects internally, and refracts again as it exits. This separates white sunlight into its component colours. **Halos and sun dogs** are produced when sunlight or moonlight passes through hexagonal ice crystals in high-altitude clouds. A 22° halo appears as a luminous ring around the Sun or Moon, while sun dogs appear as bright spots on either side of the Sun. **Light pillars** result from reflection by flat ice crystals.

The presentation also explains **mirages**, which occur because temperature differences in the atmosphere change air density and cause light rays to bend. An inferior mirage can create the appearance of water on a hot road or desert surface. A more complex phenomenon, the **Fata Morgana**, can make distant objects appear stretched, floating, stacked, or distorted because of atmospheric temperature inversions and ducting. The **Green Flash** is another rare atmospheric effect, occurring briefly as the Sun disappears below the horizon.

Other atmospheric effects include the **Belt of Venus, blood-red lunar eclipses, auroras, and crepuscular rays**. The aurora occurs when energetic particles from the Sun interact with gases in Earth's upper atmosphere, producing colourful glowing curtains. Its colours depend on the atmospheric gas and altitude: oxygen commonly produces green and red, while nitrogen contributes blue and purple shades.

Natural colours are also created by biological structures. **Butterfly wings and peacock feathers** demonstrate structural coloration, where microscopic structures interact with

light through interference and diffraction. This produces intense, shimmering colours that can change with viewing angle. **Iridescence**, seen in butterflies, feathers, soap bubbles, shells, and opals, results from interference of reflected light waves.

Bioluminescence provides another remarkable source of natural light. Fireflies produce light through a chemical reaction involving luciferin, oxygen, ATP, and the enzyme luciferase. Ocean organisms such as dinoflagellates also create glowing displays. Bioluminescence is highly efficient and has inspired applications in medical imaging, biotechnology, environmental monitoring, and energy-efficient technologies.

Finally, the presentation discusses unusual natural colours in **opals, pink lakes, green sand, Blood Falls, blue lava, Rainbow Mountain, and coloured sand dunes**. Opals display their changing colours because millions of microscopic silica spheres diffract and constructively interfere with visible light. Overall, the presentation demonstrates that the extraordinary colours and optical displays found in nature are largely the result of the physical interaction of light with matter, atmosphere, and living structures.

Dr. Nakul Parashar

“Light and Colours of Celestial Bodies and Fascinating Phenomena in the Earth’s Atmosphere” is a visually rich 35-slide science communication presentation that takes the audience on a journey from the fundamentals of light and colour to spectacular phenomena observed on Earth and across the Universe.

The presentation begins by explaining what light is, why we see colours, how sunlight travels through space and Earth’s atmosphere, and how scattering creates phenomena such as the blue sky and red sunsets. It then explores the colours of the Moon, stars and planets, showing how temperature, atmospheric composition, gases, dust and sunlight determine what we observe.

A major section focuses on Earth’s atmospheric and optical wonders, including rainbows, halos, coronas, iridescent clouds, crepuscular rays, auroras, lightning, noctilucent clouds, mirages, the green flash and zodiacal light. The presentation explains these phenomena through concepts such as reflection, refraction, dispersion, scattering and atmospheric interactions.

The later slides broaden the perspective to the Milky Way, light pollution, optical illusions and everyday examples of colour, before connecting light with science, technology, discovery and the future. The concluding message emphasizes that understanding light helps us understand our planet, Universe and place within it, while encouraging curiosity, observation and scientific exploration.

In one sentence:

The presentation uses the beauty of light and colour—from blue skies and rainbows to planetary colours, auroras and galaxies—to make fundamental science accessible, inspiring and relevant to everyday life and our understanding of the Universe.

Brief profile about of the speakers



MR. K.N. SHRIVASTAVA

Mr. K.N. Shrivastava, a retired IAS officer, was appointed Director of the India International Centre (IIC) by its Board of Trustees and assumed office on January 1, 2019. Born on January 1, 1954, in Ghazipur District, Uttar Pradesh, he holds an M.Sc. in Physics from Allahabad University (1973). He began his civil service career in the Indian Forest Service (1976), later joining the Indian Revenue Service, and in 1978, the Indian Administrative Service (Karnataka cadre).

During his distinguished career, he served as District Magistrate in four Karnataka districts—Tumkur, Bangalore, Belgaum, and Uttara Kannada—where he played a key role in maintaining law and order during communal unrest. He held leadership roles in major public sector undertakings, including Chairman & MD of Karnataka Power Transmission Corporation Ltd., MD of Krishna Bhagya Jala Nigam Ltd., and the first MD of Bangalore Metro Rail Corporation Ltd., where he initiated the metro project. He also led Hutti Gold Mines Co. and Bangalore Dairy.

At the national level, Mr. Shrivastava held significant roles in the Ministries of Culture, Civil Aviation, External Affairs, and as Director General of the Archaeological Survey of India. As Secretary, Civil Aviation (2012–2013), he oversaw major airport infrastructure projects across India. Post-retirement, he served as Member of the National Disaster Management Authority and later as Administrative Member, Central Administrative Tribunal (2015–2018).



DR. TABASSUM JAMAL

Dr. Tabassum Jamal has served CSIR-NIScPR (erstwhile CSIR-NISTAD), a premier Science Policy Research Institute under Council of Scientific & Industrial Research, Government of India, for over 30 years. Focusing her research interest in Science, Technology and Innovation Policy, she has undertaken various sponsored research projects and provided inputs in design and development of state S&T Plans, public provisioning of skill development and Entrepreneurship, capacity building in the SME sector. Based on her management & leadership skills she was given additional responsibility to head Business Development Group of the institution. With the given role, she has been instrumental in developing business verticals and knowledge alliance with industrial partnership for capacity building in the area of human resource development and SMEs sector. She has also been a faculty with Academy of Scientific and Innovative Research of CSIR. She has published widely in reputed journals, beside books/ reports and policy bulletins.

Dr. Jamal is former Chairperson of Zaheer Science Foundation (ZSF) New Delhi, a Think Tank established as a non-profit, promoting scientific temperament for nation building. The Foundation has been actively involved in the promotion of scientific research, S&T policy analysis and south-south cooperation through organizing seminars and conferences at national and international level in the past many years. Science Diplomacy to propagate S&T collaborations with developing nations for inclusive development is one focus research area of the foundation.



PROF. DR. ZAHID HUSAIN KHAN

Prof. Dr. Zahid Husain Khan served as Professor of Physics at Jamia Millia Islamia (A Central University), New Delhi, India, from November 1994 until his retirement in January 2015, completing nearly four decades of distinguished service to the University. He obtained his B.Sc. (1967), M.Sc. (1969), M.Phil. (1971), and Ph.D. (1975) degrees in Physics from Aligarh Muslim University, Aligarh, India.

His research interests encompass molecular spectroscopy, laser spectroscopy, optics, photonics, and science education. He has published more than 65 research papers in reputed national and international peer-reviewed journals and has successfully supervised 15 doctoral scholars leading to the award of Ph.D. degrees.

Prof. Khan was awarded prestigious DAAD Fellowships at the Ludwig Maximilian University, Munich (1980–1981) and the Free University of Berlin (1981–1982). In recognition of his outstanding contribution to strengthening Indo-German academic cooperation, he was appointed Honorary DAAD Advisor (2006–2009) by the President of the German Academic Exchange Service (DAAD).

Throughout his academic career, Prof. Khan held several key administrative positions at Jamia Millia Islamia. He served twice as the Registrar of the University and was Chairman of the Standing Committee for the Act, Statutes and Ordinances from 2007 to 2014. He also served as the Honorary Director of the FTK Centre for Information Technology from 1998 to 2014. Recognizing his expertise in higher education and educational technology, the Ministry of Education, Government of India, nominated him to the Standing Committee of the National Mission on Education through Information and Communication Technology (NMEICT), where he participated in its deliberations from 2009 to 2014.

Following the proclamation of 2015 as the International Year of Light and Light-based Technologies (IYL 2015) by the United Nations, UNESCO co-opted Prof. Khan as the National Node for India. Subsequently, after UNESCO established the International Day of Light (IDL) in 2018, he was again entrusted with the responsibility of serving as India's National Node for IDL. Since then, he has played a leading role in promoting public awareness of light science and photonics by organizing numerous national and international outreach programmes, workshops, lectures, exhibitions, and student activities highlighting the importance of light-based technologies for sustainable development.

In recent years, Prof. Khan has coordinated and organized several major International Day of Light celebrations across India in collaboration with universities, research institutions, scientific organizations, and UNESCO partners. He has also actively contributed to the global celebration of the International Year of Quantum Science and Technology (IYQ 2025) through lectures, workshops, and science outreach programmes.

aimed at familiarizing students, teachers, and the general public with the fundamentals and emerging applications of quantum science and technology. His efforts continue to promote scientific temper and public engagement with contemporary developments in optics, photonics, and quantum science.

Prof. Khan has a longstanding commitment to the popularization of science. He has authored numerous articles in leading science magazines, including *Tajassus*, *Urdu Science Monthly*, *Dream 2047*, and *Vigyan Pragati*. He is also the author of two books on technology-enhanced education and online learning, reflecting his continuing interest in educational innovation and the effective use of digital technologies in teaching and learning.

Through his distinguished contributions to research, higher education, university administration, science communication, and international scientific outreach, Prof. Khan has made significant contributions to the advancement of optics, photonics, science education, and the public understanding of science, both nationally and internationally.



PROF. JOHN DUDLEY

John Dudley received B.Sc and Ph.D. from the University of Auckland (New Zealand) in 1987 and 1992. He carried out postdoctoral research at the University of St Andrews in Scotland before taking a lecturing position in 1994 at the University of Auckland. Since 2000, he has been Professor at the Université Marie et Louis Pasteur in France and he also holds a Fundamental Research Chair at the Institut Universitaire de France. His research covers a range of topics in ultrafast and nonlinear optics, and he has published extensively. He is committed to service and outreach, and currently chairs the Steering Committee of the UNESCO International Day of Light. He is a Fellow of the IEEE, Optica, SPIE, EOS and an Honorary Fellow of the Royal Society of New Zealand. He has received leadership and outreach awards from Optica, SPIE, APS and the IOP, and research honors including the CNRS Silver medal, the SPIE Edgerton Award in High Speed Optics, the Optica- R. W. Wood Prize, and the EPS-QEOD Award for Research into the Science of Light.



PROFESSOR RAVI SONI

Professor Ravi Soni completed his PhD at the Indian Institute of Technology (IIT) Delhi and worked as a JSPS postdoctoral fellow at Osaka University. Over a career spanning over four decades at IIT Delhi, Professor Soni has made notable contributions as an educator, researcher, and administrator. His primary research expertise lies in the fields of nanomaterials, photonics, laser processing and spectroscopy. Prof. Soni played a key national role in digital education as the National Coordinator for IIT-PAL (Professor Assisted Learning), an initiative by the Ministry of Human Resource Development (MHRD). In this role, he spearheaded the creation of a widely adopted digital learning platform for senior secondary (Classes XI and XII) science students. In recognition of his contributions to digital education, he was honoured by the President of India in 2017.



DR. NAKUL PARASHAR

Dr. Nakul Parashar is a multifaceted leader whose career spans over three decades at the CXO level across academia, media, publishing, IT, and government. He holds a PhD in Applied Physics from the Delhi College of Engineering, University of Delhi, a Master's in Computer Science from IETE, and an MBA from Symbiosis International University — a rare combination of scientific depth, technical fluency, and business acumen.

He has held roles as CEO, Strategic Business Unit Head, university-level teacher and researcher, and prolific author and publisher, leading teams of more than 1,200 people across four continents at some of the world's leading organizations by revenue, performance, and global ranking. He earns the credit of launching and running four successful startups in the enterprise and research content management domains.

A widely recognized voice in science communication, he has authored more than a dozen nationally awarded popular science books and over 250 articles and research papers, and is an active member of numerous professional bodies in science, technology, graphics, and publishing.

Through his experience, Dr. Parashar is keen on enhancing the quality of education by improving the international ranking of universities globally — augmenting research, collaboration, dual-degree accreditations, and internationalization through faculty, students, and scholars at doctoral and post-doctoral levels, alongside increased grants.

Having built and led organizations at the highest levels, he now channels this experience toward the development sector, serving underprivileged communities — a career defined not just by accomplishment, but by a deepening commitment to using it in service of others.



PROF. N. RAGHURAM

Prof. N. Raghuram is Professor and Founder Head of the **Centre for Sustainable Nitrogen and Nutrient Management** at the University School of Biotechnology, Guru Gobind Singh Indraprastha University (GGSIU), New Delhi. He holds an M.Sc. in Life Sciences, an M.Phil. in Molecular Biology and Genetic Engineering, and a Ph.D. in Plant Molecular Biology.

His research focuses on **functional genomics, molecular biology, plant signal transduction, gene expression, and nitrogen use efficiency**, with particular emphasis on nitrogen metabolism and G-protein signaling in rice and *Arabidopsis*. He also collaborates across disciplines, including computational biology, biomedical sciences, and environmental policy. Prof. Raghuram has published **64 peer-reviewed research articles, 14 books, 32 book chapters**, and several genomic datasets and sequence submissions. His work has received **over 3,300 citations** from researchers in more than 50 countries (h-index 27).

Before joining GGSIU, he served at the University of Mumbai, Jawaharlal Nehru University, the Centre for Science and Environment, and Thapar Corporate R&D Centre. Throughout his career, he has taught undergraduate and postgraduate courses, supervised more than **50 research scholars**, and led numerous research projects and industry consultancies.

Internationally recognized for his leadership in sustainable nutrient management, he served as **Chair of the International Nitrogen Initiative (2019–2022)** and currently contributes to several national and international policy bodies on nitrogen management. He has been **Editor-in-Chief** of the Springer journal *Physiology and Molecular Biology of Plants* since 2006 and has received multiple honors, including the **INSA Teachers Award, Best Teacher Award** from GGSIU, and the **Springer Nature Editorial Excellence Award**.



DR (MS) NITA DILAWAR SHARMA

Presently serving as Chief Scientist at CSIR-National Physical Laboratory New Delhi and heading the Pressure Vacuum and Ultrasonic Metrology activity as well as International Cooperations of NPL with National Metrology Institutes globally. Her areas of expertise include high pressure physics, pressure standards, diamond thin films and Raman spectroscopy.

For the national standards she is responsible for Pneumatic primary and secondary pressure standards, providing apex-level calibration services and consultancy services to Industries and R&D organizations. In High-Pressure Physics she has investigated high pressure induced phase transitions, nanomaterials, and thin films. She has also carried out advanced temperature-dependent Raman spectroscopy using liquid nitrogen or liquid helium systems.

Dr. Nita completed her M.Tech in 1992 and Ph.D from IIT Delhi in 1997 and joined NPL in the same year. She has been a recipient of Young Research Award from International Union of Material Research Scientists for Asia in 1998, CSIR Young scientist award in 2001, Asia-Pacific Metrology Programs Iizuka award for Young scientists in 2004, Asia-Pacific APMP-DEN award in 2025. She has supervised a number of Ph.Ds and M.Tech dissertations, has published about 100 papers in SCI journals and many book chapters. She is also a certified NABL Assessor for ISO 17025:2017 and on the advisory board of UPSC.



DR. MOHD. RAIS

Dr. Rais obtained his Ph.D. from I.I.T. Kanpur in 1991, and started his career from I.I.M. Ahmadabad and subsequently joined CSIR-NISTADS in Feb. 1992. As an expert of Teaching; Academic Administration and Research in the area Science, Technology and Innovation (STI) Policy, Rural Development, and Poverty Alleviation, he has published more than 50 research papers; books; Policy Bulletins. He has more than 30 Years of Teaching; Research; R&D Management and Academic Administration Experience. His

research interests include knowledge management in interdisciplinary domain, Science, Technology and Society (STS) for inclusive and sustainable development; generation of employment and skill development in food processing; value chains; non-farm activities; developing the domain specific technology strategy; stimulating rural innovations by networking of academic institutions, line departments, grass-root local rural institutions, other industry and stakeholder etc.

He was invited as Visiting Fellow by United Nations University (UNU/IIST), Macau. He was Senior Expert with International Board for Soil Research and Management (IBSRAM) /International Water Management Institute (IWMI/CGIAR), Bangkok. He executed research projects sponsored by International Development Research Centre (IDRC); Canadian International Development Agency (CIDA) Canada; World Bank; and United Nations Development Programme (UNDP), etc. He had been Scientist in CSIR since Feb. 1992, and superannuated as Chief Scientist & Head, Business Development Group and Industry Group (BDG&I) in CSIR-NIScPR; and Professor at Academy of Scientific & Innovative Research in December 2022. He was Secretary of ZSF, Delhi from Jan 2023 to June 2026. Since January 2023, he is Governing Council Member of Zaheer Science Foundation (ZSF), Delhi.



MR. VENKATESH SHARMA

Mr. Venkatesh Sharma is the Co-founder of HealThyRam.com and Virtual Studio (vsworld.com), ventures he co-leads with his partner, Sangeeta Sharma. With over three decades of experience in media, broadcasting, and wellness communication, Venkatesh brings a unique combination of technical expertise and holistic wisdom to the table.

A Reiki Master and passionate wellness evangelist, he is dedicated to bridging ancient Indian healing traditions with modern science and digital storytelling. Through HealThyRam.com, Venkatesh is committed to making alternative healing accessible, engaging, and meaningful in the quantum age—offering experiential content, expert consultations, and immersive wellness programs across both physical and digital platforms.

At Virtual Studio, Venkatesh heads technology and marketing, leveraging his extensive background in broadcast and internet technologies. His expertise spans advertising and marketing, film and television production, live streaming, web conferencing, eLearning, interactive VR, rich media solutions, media workflows, and audio-video encoding. Over the years, he has led teams that delivered some of the world's most prestigious and high-profile events, including:

- The Pope's visit to India (1999)
- Former U.S. President Bill Clinton's state visit
- The ICC Cricket World Cups (2003 & 2007), Twenty20 World Cup 2007, and Indian Premier League (IPL)
- Vladimir Putin's visit to India
- Multiple visits of Indian Presidents and Prime Ministers
- Red carpet Bollywood premieres
- Global product launches across automotive, mobile, and fashion industries
- International conferences and brand events

A seasoned communicator, Venkatesh has also hosted numerous shows and conferences, including live match analysis and audio commentary for ICC cricket tournaments. His work reflects a rare synergy of technology, creativity, and wellness—a visionary approach tailored for the interconnected, digital-first world.

