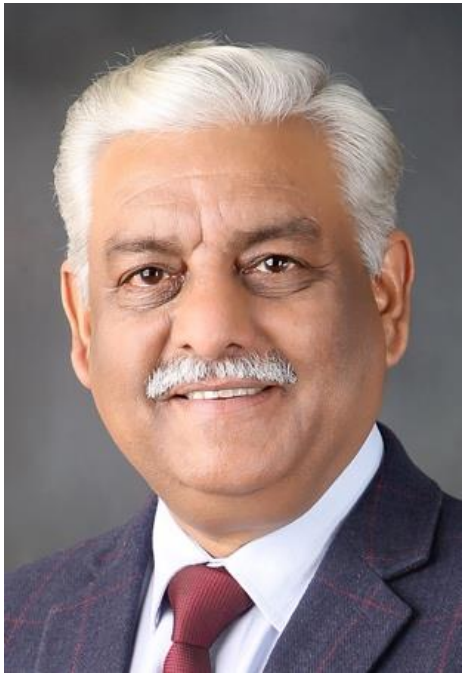
Professor Sukhdev Roy elected Fellow of OPTICA



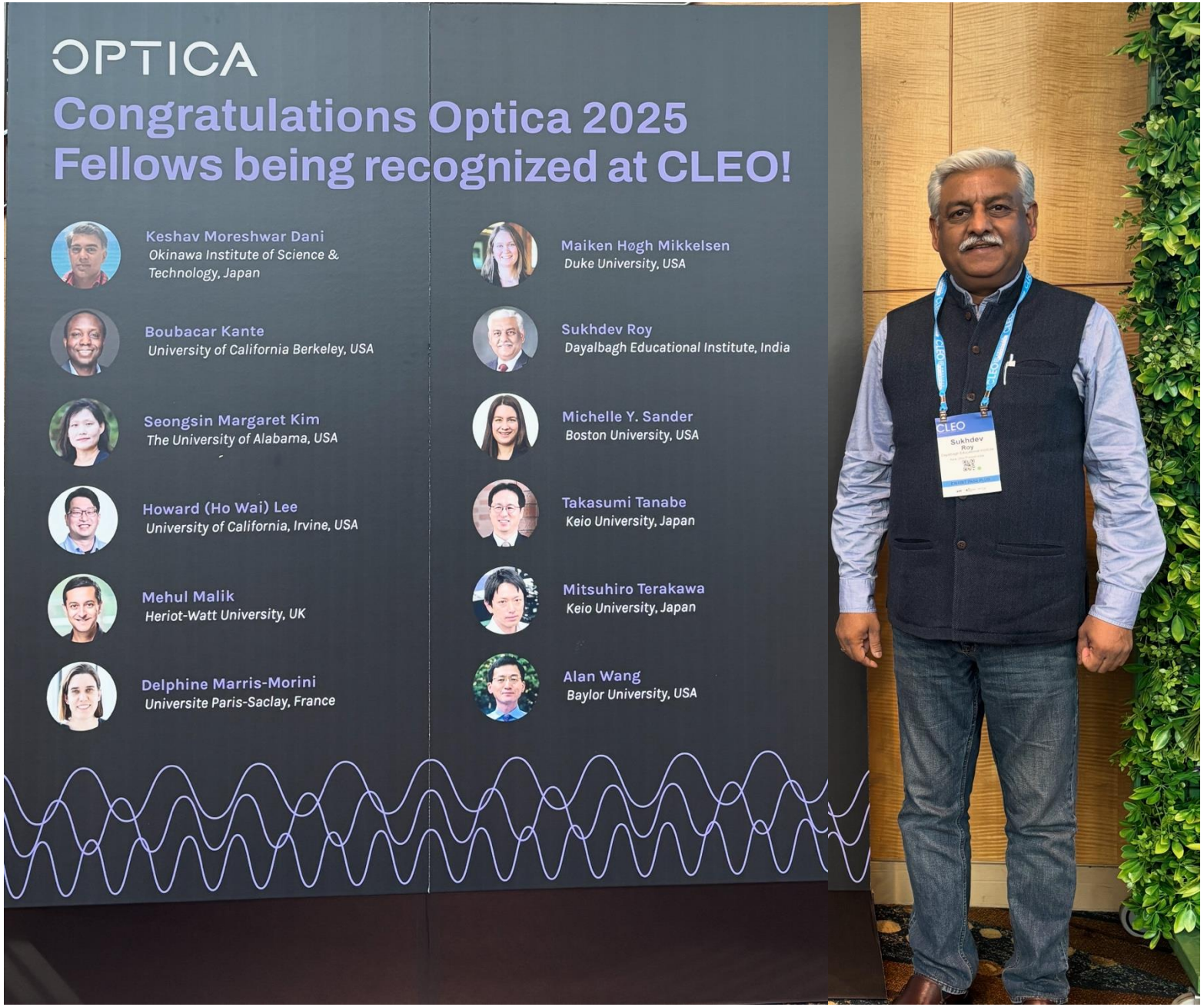
Professor Sukhdev Roy, Head of the Department of Physics and Computer Science, has been elected a Fellow of Optica (formerly the Optical Society of America, USA).

The citation for this prestigious recognition states:

"For significant research contributions in optical switching and computing with proteins, organic molecules, silicon microring resonators, and optogenetic neurons."

https://www.optica.org/get_involved/awards_and_honors/fellow_members/elected_fellows/

He was felicitated at the prestigious OPTICA/IEEE International Conference on Lasers and Electro-Optics (CLEO-2025), held at Long Beach Convention Center, California, USA, from May 4-9, 2025.



Prof. Sukhdev Roy at the Conference on Lasers and Electro-Optics (CLEO-2025), at Long Beach Convention Center, California, USA, on May 6, 2025.

Prof. Sukhdev Roy being congratulated by Prof. James Kafka, President of OPTICA, at the Conference on Lasers and Electro-Optics (CLEO-2025), at Long Beach Convention Center, California, USA, on May 6, 2025.

Prof. Sukhdev Roy (eighth from left) with other Fellows and Prof. James Kafka, President of OPTICA, at the Conference on Lasers and Electro-Optics (CLEO-2025), at Long Beach Convention Center, California, USA, on May 6, 2025.

Major Research Contributions

Professor Sukhdev Roy has made outstanding contributions in Photonics that encompass Fiber and Integrated Optics, Nano-Bio-Photonics, Organic and Silicon Photonics, Optical Computing and Neurophotonics. His novel experimental and theoretical contributions on ultrafast all-optical switching and computing with photosensitive proteins that include the first device applications with plant proteins, open up the fascinating prospect of harnessing the photochromic and photoelectric properties of natural photoreceptors, for energy-efficient, ultrafast and low-cost systems for information processing, sensing and energy conversion.

His research work on their integration with ultrahigh-Q silica microresonators coupled to telecommunication optical fibers, defines a new paradigm in convergence of technologies, by integrating nano and biotechnologies for optical information processing. He has demonstrated ultrafast all-optical femtosecond switching with rhodopsin proteins, cytochromes, graphene-oxide, organometallics and four-port silicon microring resonators, and designed various reversible, reconfigurable and neuromorphic photonic computing circuits. He has also designed low-cost, compact and portable fiber-optic sensors for detecting adulteration in liquid fuels and edible oils.

Prof. Roy has provided novel solutions to fundamental challenges in optogenetics and shown low-power, high-fidelity and high-frequency optogenetic and sono-optogenetic control of neural spiking and human heart cells, for synaptic plasticity, broadband ambient light vision restoration and for designing an optical pacemaker.

International and National Recognition

With over three decades of academic and research experience, Professor Roy's achievements have received international and national recognition. He is a Fellow of SPIE - The International Society for Optics and Photonics (2023), the Indian National Academy of Engineering (2013), the National Academy of Sciences (India) (2016), IETE (India) (2012), and a Distinguished Fellow of the Optical Society of India (2023). He has been listed in Stanford University's coveted Top 2% in the World Ranking of Scientists in Optoelectronics and Photonics (2020-2024).

Prof. Roy has been a Visiting Professor at prestigious Universities that include, Harvard (USA), Waterloo (Canada), Würzburg & Regensburg (Germany), Osaka & Hokkaido (Japan), City University of London & Queen Mary University of London (UK), TIFR, Mumbai & IISc. Bengaluru (India). He has also been an Associate of the International Centre for Theoretical Physics, Trieste, Italy (2011-2014), and is a member of the Global Panel of MIT Technology Review.

He has received many prestigious awards that include the AICTE Career Award for Young Teachers in 2001, the JSPS Invitation Fellowship to Hokkaido University, Japan, in 2004, the H.C. Shah Research Endowment Prize by Sardar Patel University in 2006, the 1st IETE B.B. Sen Memorial Award in 2007, the IETE-Conference on Emerging Optoelectronic Technologies Award in 2012, the IETE-Manorama Rathore Memorial Award in 2016, the Systems Society of India's National Systems Gold Medal in 2016, DEI's Distinguished Alumni Award in 2021, and eight best paper awards in international and national conferences.

Professor Sukhdev Roy was the Guest Editor of the March 2011 Special Issue of IET Circuits, Devices and Systems Journal (UK) on Optical Computing Circuits, Devices and Systems. He is an Associate Editor of IEEE Access and is a member of the Editorial Board of Optics and Photonics Journal. He is a reviewer of reputed journals published by Nature, IEEE, OSA, SPIE, Elsevier, Springer, Wiley, APS, ACS, IOP, and OSI.

He chaired the 8th World Conference on Nanoscience and Nanotechnology, Philadelphia, USA, in 2020. He has delivered more than 100 Invited Talks in India and abroad that include 7 Keynote Addresses and 12 Plenary Talks that include the prestigious the UN International Year of Light Commemorative Keynote Address at the 38th Convocation of the International Council of Academies of Engineering and Technological Sciences (CAETS) in 2015 and Invited Talk at the Annual Meeting of the American Physical Society, at Louisiana, USA, in March 2008.

His impressive research includes over 200 research publications, 11 book chapters, 6 UK design patents on drone technology and supervision of 12 PhD scholars.

Professor Roy is also the Secretary-cum-Convener of the Advisory Committee on Education, Dayalbagh Educational Institutions, a Non-Statutory Body that serves as a Think Tank for consensus building on behalf of DEI.

The Dayalbagh Educational Institute congratulates Professor Sukhdev Roy on receiving this honour that recognizes his outstanding contributions to advancing Optics and Photonics research carried out in the Institute.