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**Short Biography**

Thuc-Quyen Nguyen is the Director of the Center for Polymers and Organic Solids and professor in the Department of Chemistry & Biochemistry at the University of California, Santa Barbara. Nguyen received her B.S. (1997), M.S. (1998), and Ph.D. (2001) degrees in Physical Chemistry from the University of California, Los Angeles under the guidance of Professor Benjamin Schwartz. From 2001-2004, she was a postdoc in the Department of Chemistry and the Nanocenter at Columbia University working with Nobel Laureate Louis Brus and Professor Colin Nuckolls on molecular self-assembly, nanoscale characterization and devices. She also spent time at IBM Research Center at T. J. Watson (Yorktown Heights, NY) working with Richard Martel and Phaedon Avouris on molecular electronics. She joined the faculty of the Chemistry and Biochemistry Department at UCSB in 2004.

Her research interests are organic semiconductors, bioelectronics, device physics of organic solar cells, ratchets, transistors, and photodetectors, and sustainability.

She is co-authored over 315 publications and 3 book chapters that received over 40,000 citations (H-index: 103) and gave over 330 plenary/keynote/invited talks at national and international conferences, universities, and companies. Recognition for her research includes 2005 Office of Naval Research Young Investigator Award, 2006 National Science Foundation CAREER Award, 2008 Camille Dreyfus Teacher Scholar Award, 2009 Alfred Sloan Research Fellows, 2010 National Science Foundation American Competitiveness and Innovation Fellows, 2015 Alexander von Humboldt Senior Research Award, 2016 Fellow of the Royal Society of Chemistry, 2019 Hall of Fame - Advanced Materials, 2019 Beaufort Visiting Scholar, St John's College (Cambridge University), 2015-2019 World's Most Influential Scientific Minds; Top 1% Highly Cited Researchers in Materials Science by Thomson Reuters and Clarivate Analytics, 2019 Fellow of the American Association for the Advancement of Science (AAAS), 2023 Wilhelm Exner Medal from Austria, 2023 Fellow of the US National Academy of Inventors, 2023 de Gennes Prize in Materials Chemistry from the Royal Society of Chemistry, 2023 Elected Member of the US National Academy of Engineering, French National Centre for Scientific Research (CNRS) Chimie Ambassador in Chemical Sciences, 2024 Fellow of the European Academy of Sciences, and 2025 ACS Henry H. Storch Award in Energy Chemistry.

# The Role of Organic Photovoltaics in Transition to Renewable Energy

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According to International Energy Outlook 2021 published by Energy Information Administration (EIA), global energy consumption will be double by 2050. The global increase in energy consumption and the dependence on fossil fuels for energy generation have led to climate change. Therefore, finding alternative energy sources is an urgent and pressing problem. Sunlight is by far the most abundant source of energy on Earth and, if harvested, can address the energy demands in the future. Organic photovoltaics (OPVs) potentially can offer low cost, large area, flexible, light-weight, clean, and quiet energy sources for indoor and outdoor applications. OPVs are light-weight (1,000 times thinner than silicon PVs) and semitransparent and can be designed into various size, shape, and color, and blocking UV light. They can be wrapped around the exteriors of buildings or coat glass windows and greenhouses to generate energy, which are not possible with conventional silicon panels. Furthermore, OPVs are far more environmentally friendly to produce via solution processing methods at room temperature such as printing, roll-to-roll coating, spraying, etc. Thus, OPVs are ideal solutions for zero energy skyscraper and high-rise buildings to reduce the carbon footprint. In this talk, I will discuss the role of OPVs in transition to renewable energy and the current progress and challenges.