Networking and Brokerage Event

Horizon Europe

MSCA Staff Exchanges Call 2026

- **Title your area/expertise to make a flash presentation** (edit)

16 February 2026

- TITLE of talk: **EMERGING PHOTOVOLTAICS**
- Name of presenter: **Dr JAI PRAKASH TIWARI**
- Name of Organisation: **CSIR –NATIONAL PHYSICAL LABORATORY, NEW DELHI-110012**
- Country: **INDIA**
- Your contact details: tiwarijp@nplindia.org
- Your web URL: https://www.nplindia.in

TOPIC TO BE ADDRESSED

EMERGING PHOTOVOLTAICS INCLUDES SOLAR CELLS

- ORGANIC SOLAR CELLS
- PEROVSKITE SOLAR CELLS
  SILICON-PEROVSKITE TANDEM SOLAR CELLS
  PEROVSKITE-PEROVSKITE TANDEM SOLAR CELLS
- PEROVSKITE-ORGANIC SOLAR CELLS
- SILICON-PEROVSKITE COMBINATIONAL SOLAR CELLS

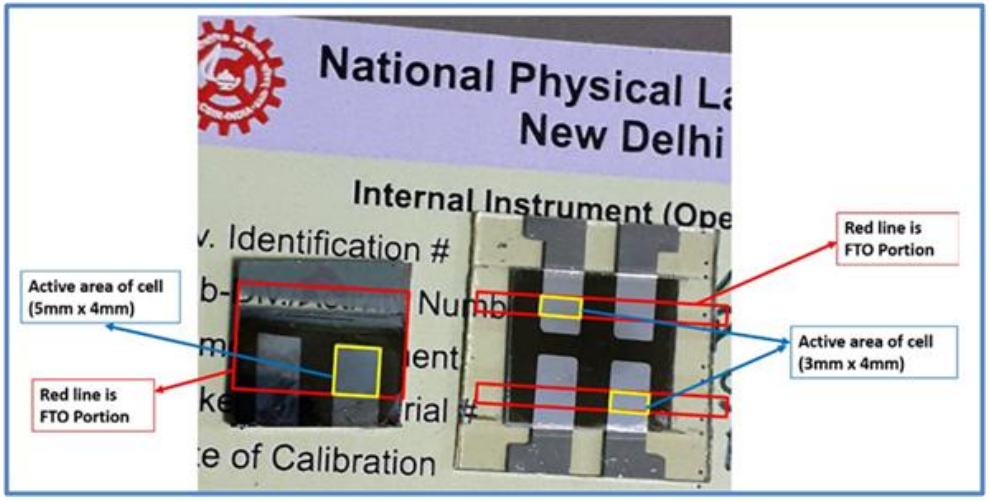
THESE SOLAR CELLS INCLUDE THE RESEARCH ON

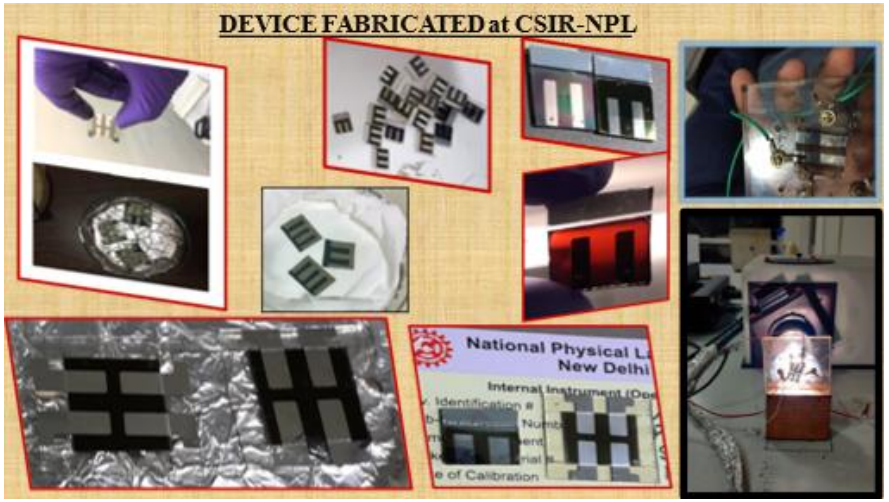
- DEVICE DESIGNING ENGINEERING
- HARD AND FLEXIBLE SUBSTRATE DEVICE FABRICATION
- INTERFACE ENGINEERING
- MORPHOLOGICAL ENGINEERING
- SCALING
- DEGRADATION PREVENTION ENGINEERING

DEVELOPING MATERIALS AND DEVICES FOR EMERGING PHOTOVOLTAICS

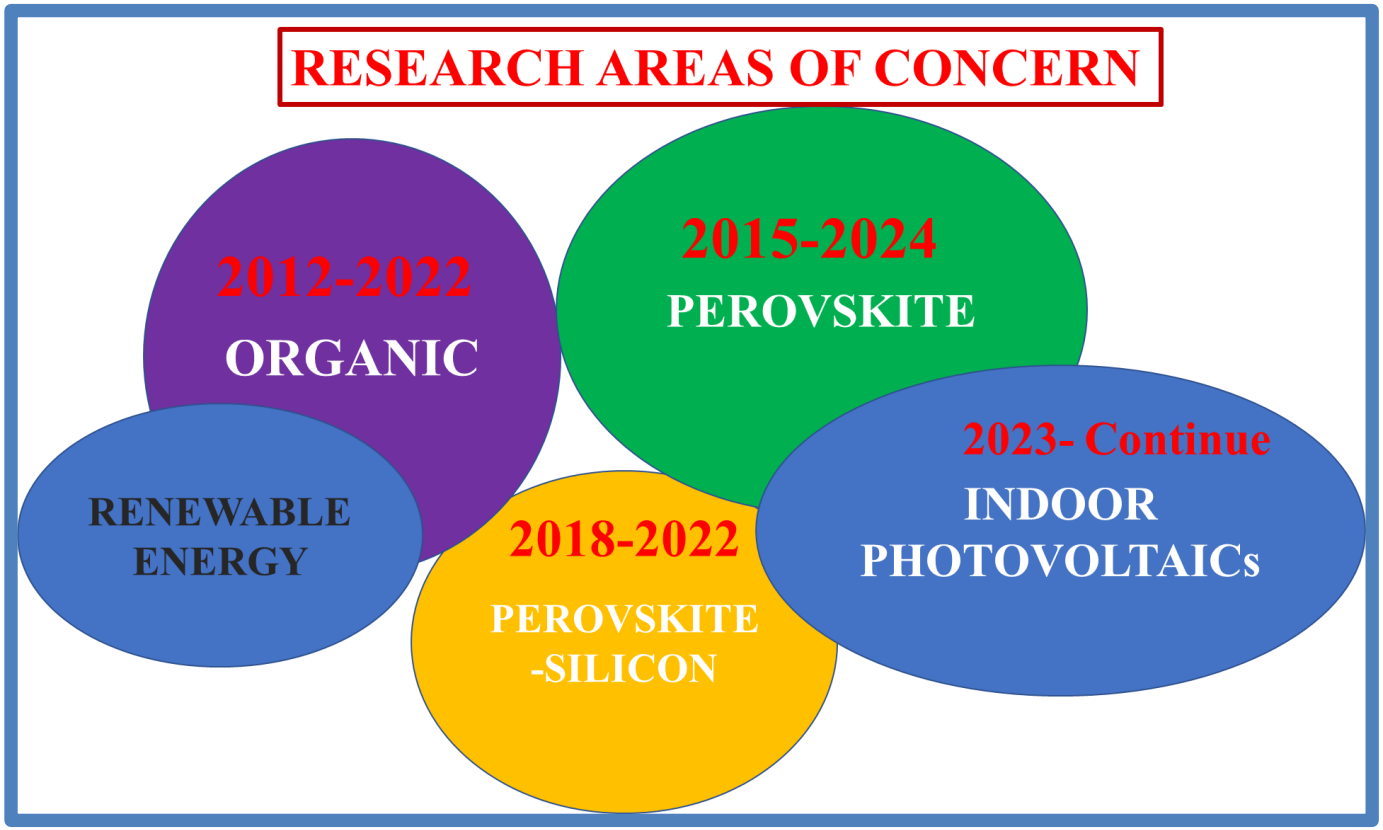
SPECIFIC CONTRIBUTION TO THE TOPIC

- **ACS Appl. Energy Mater.. 2024, 7,10212−10229.**
- J.P. Tiwari. Outlook and Future Directions for Indoor Photovoltaics: Modern Societal Needs and Challenges. ***Energy & Fuels* 2025, *39* (21), 9623-9640.**
- Mohit Singh, J.P. Tiwari. Tailoring of the Band Gap of MA3Bi2I9 through Doping at A as well as X Sites (of ABX3 Structure): Futuristic Material for Multijunction Solar Cells. ***ACS Applied Energy Materials* 2025, *8* (10), 6264-6269.**
- Aleena Kulsum Abbasi and J. P. Tiwari, Silicon−PerovskiteTandemSolarCells: AnAlternativetothe Market-DominatedSilicon-BasedSolarCellTechnology, **ACS Appl. Mater. Interfaces 2025, 17, 51552−51577.**
- J.P.Tiwari, Flexible Perovskite Solar Cells**:** A Futuristic IoTs Powering Solar Cell Technology, Short Review, **Small Methods 2025, 9, 2400624**





SPECIFIC CONTRIBUTION TO THE TOPIC



EXPERIENCE -14 years in the area of solar energy

J. P. Tiwari completed his Ph.D. in Materials Science from the Indian Institute of Technology, Kanpur (IIT-K) India in June 2006. During his PhD, he visited Germany for a short time. Before his P.hD., did his M.Sc. and M. Tech. from Banaras Hindu University (B.H.U). Presently he is at the post of Principal Scientist working in the area of solar cell fabrication and materials development at the National Physical Laboratory (NPL), New Delhi India. His major research interest lies in the area of energy conversion devices and materials.

PROJECT DESCRIPTION (In Brief)

The present world's energy crisis can be solved by harnessing the energy radiation available from the sun. Several research activities have recently increased in the area of Photovoltaics. The competence of solar photovoltaics is checked through its levelized price of electricity, stability and efficiency. The emerging energy photovoltaics should have a lifetime of ~20-25 years to supersede silicon-based solar cell technology. None of the emerging photovoltaics, such as OSCs, PSCs, DSSCs, and Tandems, have life time of 20-25 years in ambient atmosphere, and these devices are in urgent need of experimental exploitation for their proper commercialisation. The strategies adapted are the device design, interfacial engineering, and compositional engineering.

Hence, the project would concentrate on the device fabrication, its characterisation, establishing standards and stability, and finally move towards module fabrication and industrialization. A summary of the working area is presented below