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## PHOTOVOLTAIC PEROVSKITES

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**H**alide perovskites are the centre of many recent studies in areas as diverse as chemistry, physics, chemical engineering, materials science and nanotechnologies. They are materials to develop photovoltaic technology for solar energy. To this end, I will briefly discuss the recent research progress in this field and introduce some newly modelled hypothetical  $BMY_3$  perovskite compounds in 3D that display band structures, octahedral tilting, materials properties, electronic structures and stabilities that are analogous with the most studied methylammonium lead triiodide solar cell semiconductor. Various featured aspects of these materials such as Rashba splitting, as well as the importance of hydrogen-, halogen- and other noncovalent bonding interactions will be discussed to demonstrate how important are they for the design of such highly valued functional materials. A brief discussion will be provided on factors that influence the degradation of these materials.

### Biography

Pradeep R Varadwaj completed his PhD in 2008 from Saha Institute of Nuclear Physics (Jadavpur University, Kolkata, INDIA). Okayama National University (JAPAN) has conferred on him a DSc degree in the mid of 2011. He has travelled many countries such as Japan, Canada, Taiwan and South Africa for his Postdoctoral studies. He was a recipient of several of prestigious fellowships, of which the notable ones are JSPS (JAPAN) and Quebec Merit Scholarships (Canada) for foreigners. He is serving as a Senior Research Professor in the Department of Chemical System of the University of Tokyo, Japan since September 2015. His areas of expertise are spectroscopy, noncovalent interactions and materials science. His current research is centred on the theoretical investigations diverse chemical compounds, essential for the fundamental understanding of their chemistry; particularly on the modelling of halide perovskite solar cells. He has published more than 40 papers in reputed journals and has been serving as a reviewer for many journals of international repute.

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