



## Interfacial Modification in Nanocomposites to Tailor Functionalities

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### Abstract:

The talk will concentrate on various approaches being used to engineer materials at the nanoscale for various applications in future technologies. In particular, the case of clay, carbon nanostructures (e.g. nanotubes, graphene), metal oxides, bionanomaterials (cellulose, starch, and chitin) will be used to highlight the challenges and progress. Several polymer systems will be considered such as rubbers, thermoplastics, thermosets and their blends for the fabrication of functional polymer nanocomposites. The interfacial activity of nanomaterials in compatibilising binary polymer blends will also be discussed. Various self-assembled architectures of hybrid nanostructures can be made using relatively simple processes. Some of these structures offer an excellent opportunity to probe novel nanoscale behavior and can impart unusual macroscopic end properties. I will talk about various applications of these materials, taking into account their multifunctional properties. Some of the promising applications of clay, metal oxides, nano cellulose, chitin, carbon nanomaterials, and their hybrids will be reviewed. Finally, the effect of dewetting up on solvent rinsing on nanoscale thin films will also be discussed.

### Biography:

Professor Sabu Thomas is currently Vice Chancellor of Mahatma Gandhi University. He is also a full professor of Polymer Science and Engineering at the School of Chemical Sciences of Mahatma Gandhi University, Kottayam, Kerala, India and the Founder Director and Professor of the International and Interuniversity Centre for Nanoscience and Nanotechnology.

### Publication of speakers:

1. Gusain, Abhay & Thankappan, Aparna & Thomas, Sabu. (2020). Roll-to-roll printing of polymer and perovskite solar cells: compatible materials and processes. *Journal of Materials Science*. 55. 10.1007/s10853-020-04883-1.



2. Zarrintaj, Payam & Zangene, Ehsan & Manouchehri, Saeed & Mohammadi Amirabad, Leila & Baheiraei, Nafiseh & Hadjighasem, Mahmoud & Farokhi, Mehdi & Ganjali, Mohammad & Walker, Brian & Paran, S.M.R. & Mozafari, Masoud & Thomas, Sabu & Annabi, Nasim. (2020). Conductive biomaterials as nerve conduits: Recent advances and future challenges. *Applied Materials Today*. 20. 100784. 10.1016/j.apmt.2020.100784.
3. K, Bicy & P, Anu & Kalarikkal, Nandakumar & Stephen, Arul & G, Geethamma & Rouxel, Didier & Thomas, Sabu. (2020). Effects of nanofillers on morphology and surface wetting of microporous polypropylene composite membranes. *Materials Chemistry and Physics*. 123742. 10.1016/j.matchemphys.2020.123742.
4. V, Raji & Pal, Kaushik & Zaheer, Tean & Kalarikkal, Nandakumar & Thomas, Sabu & Souza, Fernando & SI, Asiya. (2020). Gold nanoparticles against respiratory diseases: oncogenic and viral pathogens review. *Therapeutic Delivery*. 11. 10.4155/tde-2020-0071.
5. Hafusa, Akhina & Ramya, Koduvayur A. & Nair, M. & Saiter-Fourcin, Allisson & Garda, Marie-Rose & Deshpande, Abhijit & Kalarikkal, Nandakumar & Thomas, Sabu. (2020). Influence of reduced graphene oxide on flow behaviour, glass transition temperature and secondary crystallinity of plasticized poly(vinyl chloride). *RSC Advances*. 10. 29247-29256. 10.1039/D0RA04560H.

### Webinar on Nano-Engineering and Its Applications

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