



## A journey across the world for nano(carbon)materials

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In this talk, I would like to share my ongoing journey to learn about nano(carbon)materials and their application development. I will attempt to map changes in different aspects of my journey i.e., scientific training, career progression and geographic locations with changes in the nanocarbon world itself, through the eras of Fullerenes, Carbon Nanotubes (CNTs) and Graphene. My journey began with my fascination for Fullerenes as an undergraduate chemistry student in India through lectures and books. This fascination provided impetus to learn more practically about the worlds of nanotechnology/carbons through graduate studies. My first stop in practical training was at Sheffield, United Kingdom (UK) as a Masters student to train in assembling, manipulating and characterizing molecular entities for lab-on-chip applications. At the next stop of my training through doctoral studies at Cambridge, UK - I had the opportunity to further scale-up the first-hand-experience of designing macroassemblies from nanometric entities for realworld applications. At Cambridge, I focused on assembling CNTs continuously into kilometer-long wires and macroscale sheets exhibiting electrical, thermal and mechanical performances rivalling polymers and metals with industrialization potential [selected publications, 1-3]. The possibility of mass-producing and commercializing new high-performance materials for actual products steered me toward more applied research environments. I joined the National Institute of Advanced Industrial Science and Technology (AIST), Japan – an institution dedicated to bridging academic and industrial research. At AIST through postdoctoral training and as Japan Society for the Promotion of Science (JSPS) fellow and Staff research scientist, I concentrated on material development of metal-nanocarbon composites for high-conductivity applications [selected publications, 4-8]. Here, the challenge was to harmonize well-established metal industry with commercially upcoming nanocarbon materials. With the strengthening of my inclination for materials research in realworld products, I joined Power Conversion Technology Laboratory, Huawei Nuremberg Research in October-2021. I now focus on a variety of materials including nanocarbons (like CNTs and graphene) to improve performances of existing and upcoming power electronic devices (power modules, inverters, etc.) for energy/automotive applications.

My journey through the nanocarbon world in India, UK, Japan and Germany has molded me to work with team-mates from and live in societies of different cultures. During this process, I have had the chance to observe and understand viewpoints – mine and others' - emanating from cultural, social and situational habits/reactions. The key lesson for me from my journey so far is: constructive outcomes in any realm (academia/industry/anywhere else) are possible only when power is used mindfully and responsibly. And when concerted and conscious effort is made to identify, focus and build on common ground, with awareness of tradeoffs, despite differences with mutual respect and tolerance.

### References

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