

## **Ge<sub>1-x</sub>Sn<sub>x</sub>Alloy: An emerging material for Electronics, Photonics and Plasmonics**

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**Abstract:** Ge<sub>1-x</sub>Sn<sub>x</sub> alloy shows direct gap for  $x > 0.08$ , under no strain, under strain and under suitable strain and alloy composition. The lower  $\Gamma$  valley in direct gap has low electron effective mass and hence higher mobility than in Ge. Growth of alloy on Si has led to high mobility FET, TFET and other electronic devices. Lasers and photodetectors exploiting direct gap make possible CMOS compatible monolithic electronics-photonics integration. Current research focusses on the use of GeSn alloy to realize plasmonic devices of sub-wavelength size. The talk will discuss the properties of the alloy, its device and system operations along with the work of the author's group.

**Author's CV:** Prasanta Kumar Basu (b1946), B.Sc. (Physics), B.Tech, M.Tech, and Ph.D., retired from RPE/CU in 2011, and then worked as UGC BSR Faculty Fellow, Visiting Professors at IIT KGP and National Chung Cheng University (NCCU), Taiwan, and thereafter as an Investigator in an Indo-Taiwan project. In his long career as teacher, researcher, and administrator, he had nearly 140 journal papers, 4 books and 2 book chapters all from international publishing houses. He guided and is still guiding more than 20 Ph.D. students. He worked as a post doc in Belgium, as an Alexander von Humboldt fellow in Germany, first INSA Research fellow, visiting professors in TIFR, McMaster University, Canada, NCCU and INSA-Royal Society Exchange professor in UK. Currently, he is engaged in joint research and book writing with faculties of RPE, NIT Delhi, and NCCU- Taiwan.