

Functional materials for electronics and optoelectronics

by

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Abstract

Functional materials, such as 2D materials and semiconductor thin films, have been subject of intensive studies in recent years owing to their promising applications in next-generation of high-performance electronics and optoelectronics. I will present the engineering of a series of novel 2D metal chalcogenide nanomaterials via Li interaction and subsequent liquid exfoliation of layered bulk crystals and the demonstration of their various proof-of-concept applications. Thereafter, I will present tellurium-based materials for high-performance electronics and optoelectronics, including Te nanoflakes for short-wave infrared (SWIR) photodetectors, evaporated $\text{Se}_x\text{Te}_{1-x}$ thin films with tunable bandgaps for SWIR photodetectors and focal plane arrays, and evaporated Te thin films for *p*-type field effect transistors, circuits, flexible electronics and monolithic 3D electronics. Finally, I will discuss the future research directions based on my current research achievements.

Biography



Chaoliang Tan is a Postdoctoral Research Fellow at Nanyang Technological University in Singapore. He received his Ph.D. degree in Materials Science from Nanyang Technological University in Singapore in June, 2016. After working as a Research Fellow in the same institute for one year, he then worked as a Postdoc Research Fellow in Department of Electrical Engineering and Computer Sciences at University of California-Berkeley for two years (Sept, 2017-Sept-2019). His current research is focusing on functional materials for next-generation of wafer-scale electronics (transistors and circuits) and optoelectronics (infrared photodetectors and imaging sensor systems). He has performed research in other fields including engineering of 2D materials and demonstration of their various applications. He has authored or co-authored over 90 SCI papers with total citations over 11,800 and a H-index of 51. He is the recipient of several prestigious awards including MSE Doctorate Research Excellence Award (2016, Nanyang Technological University), Best Post Award (2016, International Conference on Electronic Materials, Singapore) and Chinese Government Award for Outstanding Self-financed Students Abroad (2015). He has been listed as the Highly Cited Researcher (Clarivate Analytics) both in 2018 and 2019. He also served as a Reviewer of many journals including Nat. Commun., J. Am. Chem. Soc., Adv. Mater., Adv. Funct. Mater., Small, ChemSusChem, Adv. Mater. Technol., and so on.

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**** ALL ARE WELCOME ****