

## Acknowledgements

I owe earnest gratitude to my Ph.D. Thesis Supervisor, *Professor Mahesh Kumar*, for providing me an opportunity to work under his guidance. I am also thankful to him for giving many bright ideas and valuable suggestions over the entire period of my research work. His precious advice, encouragement, continuous support, availability, and personal interest throughout my Ph.D. journey helped me to work with enthusiasm.

The journey of my Ph.D. work has become very interesting with the support of *Dr. Thirumaleshwara N. Bhat* and *Dr. Sudhiranjan Tripathy* (IMRE, A\*STAR, Singapore) due to fruitful collaboration for GaN Technology with inspiring discussions and providing AlGaIn/GaN wafers and my sincere thanks extended to *Professor Qiquan Qiao* (South Dakota State University, Brookings, South Dakota) for collaborative research work for *MoS<sub>2</sub> preparation*.

I am also obliged to the Committee Members of My Ph.D., *Professor Shree Prakash Tiwari*, *Professor Satyajit Sahu*, and *Professor Arpit Khandelwal*, for providing relevant ideas during the research work.

It was always a great feel to execute my Ph.D. work in the *Microelectronics and Microfabrication* laboratory at IIT Jodhpur, where I always got supported and appreciated by my lab mates *Dr. Saravanan Rajamani*, *Vijendra Singh Bhati*, *Rahul Kumar*, *Neeraj Goel*, *Parveen*, *Ishan Varun*, *Ajay Mahato*, and *Vivek Raghuvanshi* as in my own family. Also, the support from every member of the Department of Electrical Engineering and other office staff of IIT Jodhpur is highly appreciated.

My special thanks to the *Visvesvaraya Ph.D. Scheme for Electronics and IT, Ph.D. Media Lab Asia, MeitY, Government of India*, for providing funding support in the Ph.D. duration. I am also thankful to *Dr. Ghanapriya Singh* of NIT Uttarakhand to inspire and encourage me for the Ph.D.

It is my genuine pleasure to acknowledge and express my heartiest gratitude to my family, especially my parents, sister, wife *Swati Nigam*, in-laws, and friends *Dr. Jitesh Agrawal* and *Harsh Mathur* for the patience, support, and love with which they ushered on me, and for bearing with me even when I was not spending time with them. I pay respects to my *parents* for all their *love, sacrifices, and blessing*.

*Adarsh Nigam*  
Ph.D. Student

