## **ACKNOWLEDGEMENTS**

It is very difficult to name all the sources of inspiration; moreover, words are often too feeble a mode of revealing one's sentiments and feelings of indebtedness. At the outset I would like to take this opportunity to express my deep sense of gratitude to my research supervisor Dr. Prabhakar Singh for his insightful guidance, patience and constant encouragements during my entire research work. Also I would like to extend my deep sense of gratitude to my co-supervisor Prof. S. B. Rai, at Department of Physics, Banaras Hindu University. I have learnt many things about research and various skills from him. His passionate devotion in Physics and relentless curiosity in materials research have been and will always remain a great inspiration for me and my future career.

I express my gratitude to Prof. B. N. Dwivedi, Prof. K. S. Dubey, Prof. O. N. Singh and current Head of the Department Dr. Debaprasad Giri for providing me required facilities of the department. I also wish to thank my RPC members Dr. Sandip Chatterjee, Dr. Debaprasad Giri, and Dr. A. K. Singh for the invaluable inspiration and numerous insightful suggestions during the entire course of this research. I am also grateful to faculty members Dr. R. Prasad, Dr. A. Mohan, Dr. P. C. Pandey Dr. S. Upadhyay for their valuable suggestions and help time to time in my research period. I am also appreciative to Dr. U. N. Singh, Dr. A. Bahadur, Dr. A. K. Tripathi, Dr. S. K. Singh and Dr. S. K. Mishra for their kind encouragements and motivation. I am also thankful to all the technical, non-teaching as well as official staffs of the Department of Physics, IIT (BHU) for their assistance when needed and also for providing me numerous reliefs at times.

I would also take this opportunity to extend my sincere thanks to Dr. R. S. Ningthoujam, Senior Scientist at BARC, Mumbai, for his valuable inputs, insightful comments and constructive criticisms at different stages of my research which were thought-provoking and helped me to focus on my ideas.

In addition, I have been privileged to work with Dr. A. K. Parchur, Dept of Physics, BHU, Varanasi, and Dr. A. A. Ansari, King Abdullah Univ., Saudi Arabia. I heartedly recognize them for their support and valuable suggestions.

It is with sincere gratitude that I wish to thank my Senior labmates Dr. N. K. Singh and Dr. R. K. Singh and colleagues Mr. Raghvendra Pandey, Dr. A. K. Yadav, Mr. Pravin Kumar, Mr. O.N. Verma and Mr. Saurabh Singh of my lab and my departmental research colleagues Mr. Prashant Shahi, Mr. Abhishek Kumar, Mr. B. K. Singh, Mr. K. K Shukla, Mr. Rahul Singh, Mr. D. K. Gupta, and Mr. Abhishek Singh, for the help and their awesome company. Also I want to acknowledge my collegues of Prof Rai's lab Ms. K. Mishra, Ms. Monika Rai, Mr.

Brijesh Kumar Yadav, Mr. R. V. Yadav, Mr. A. Dwivedi, Mr. P. Shahi of Dept .of Physics, BHU and Ms Maheshwary Singh, Dept. of Physics, Dr. H. S. Gour, Central University Sagar who put up with me throughout the whole research process and helped me with personal challenges in particular, during all these years.

I would like to thanks my close friends who have been my classmates too particularly, Mr. Pradeep Gupta, Mr. Ashutosh Kumar Shahi, Dr. Sarvesh Dubey, Mr. Sushil Pratap Singh, Mr. Satish Kumar Singh and Mr. Shailendra Tiwari for their good wishes and many more things in my life.

I feel short of words to express my appreciation, gratitude and indebtedness to my father Sri Om Prakash Singh and mother Smt. Shyamla Singh and my uncle Sri Kripa Shankar Singh for their unbounded love, blessings, encouragement and supports in various ways. I thank them for instilling in me the importance of education and balance in life. I also wish to share my appreciation to my elder brother Mr. Pankaj Kumar Singh and bhabhi Mrs. Baby Singh for their blessings and support. I would also want to share my love and affection to my younger brothers Santosh Singh, Gyanendu Vimal Singh and Dushyant Pratap Singh and my cute nephew Mr. Ayush Kautilya for their kindness, warmth and their lovable company. Furthermore, I heartily thank to my mama Sri Kashi Nath Singh for his support during my entire academics.

I cannot conclude my acknowledgements without expressing my deep feeling of indebtedness to my grandfather Late Jai Nath Singh and grandmother Smt. Ram Pati Singh, without whom I would never make it this far in life.

I would also like to acknowledge the funding agencies UGC, CSIR and MHRD of Government of India, for financial assistance in various forms.

Many others that have been involved also deserve recognition. It is however, not possible to list them all here. Their support in this effort is, however, greatly appreciated but this acknowledgement would be incomplete if the name of great visionary, Pt. Madan Mohan Malviyaji, is not mentioned, who made this divine centre of knowledge —Banaras Hindu University. Deepest regards to him. Last but not least, I wish to thank all my friends and foes and the persons whose names have not been included on this piece of paper for extending their cooperation directly or indirectly.

Finally, I am grateful to Almighty for giving me patience to make this endeavor a success.

Sincerely

(Bheeshma Pratap Singh)