Acknowledgments

Firstly I would like to thank my supervisor Prof Ashoke Sen for his able guidance, sharing his ideas and constant encouragement during my PhD at the Harish Chandra Research Institute. I am thankful to him for his patience during listening to me and clarifying my silly doubts.

I would like to thank Rajesh Gopakumar, Dileep Jatkar and Justin David for very interesting and helpful discussions on many parts of my work.

I would also like to thank other faculty members belonging to different groups who taught me several basic courses and helped me sharpen my basics without which it would have been difficult to grasp any of the advance topics.

I would like to thank my friends in HRI Priyotosh, Shamik, Arjun, Subhditya, Ayan, Girish, Nishita, Shailesh, Bobby, Ipsita, Nabamita, Turbasu, Archana, Tanusree, Soumya, Akitsugu and all my juniors with whom discussing physics and mathematics was always fruitful and interesting.

I would like to thank my family and specially my brother for their relentless support, love, encouragement and belief in me. Finally I would like to thank the people of India for their steady and generous support for the research in fundamental sciences.