ACKNOWLEDGEMENT

A lot of people have influenced this work, and therefore I would like to thank them.

First of all, I am extremely indebted to my research supervisors Professor (Dr.) Sandesh R. Jadkar and Dr. Jaydeep V. Sali. They showed me the way and gave complete freedom to think and explore. They motivated me at right instances and supported to the optimum amount, which kept me going. It was a great honor and pleasure to work with them in a friendlier environment, than I expected. This Ph. D. dissertation is an outcome of their diligent efforts.

I would also like to extend my heart warming regards to the present and former Head(s) of the Department of Physics, Prof. S. I. Patil, Prof. P. B Vidyasagar, Prof. V. N Bhoraskar, Prof. V. B. Asgekar, Prof. D. S Joag along with the Director, School of Energy Studies Prof. S. V. Ghaisas for permitting me to use facilities at their respective departments.

My colleagues at Department of Physics, North Maharashtra University: Prof. P. P Patil, Dr. R. B. Gore, Dr. S. T. Bendre, Dr. (Ms.) Vandana Shinde, Dr. P. G. Chavan, Dr. V. R. Huse for all their help and support.

My special thanks to Dr. N. P. Lalla, Dr. V. Ganesan and Dr. S. R. Barman from UGC-DAE-CSR Indore and Dr. C. Selvaraju and Dr. Senthil Kumar from National Centre for Ultrafast Processes, Chennai.

I am indebted to research colleagues at Pune University, Dr. (Ms.) Vaishali Waman, Dr. Tushar Salve, Dr. Ranjeet Hawaldar, Dr. Adinath Funde, Mr. Mahesh Kamble; at North Maharashtra University, Mr. Ganesh Lonkar, Ms. Mrunal Mahajan, Mr. Mahindra Patil and Mr. Marathe Sir for scientific discussions and all the support during the experimental work and for unrelenting encouragement. I am thankful to all my M. Sc. students especially Mr. Amol, Mr. Hitesh, Mr. Vikram and Mr. Tushar. I am thankful to Dr. B. R. Sankapal and his students Mr. Deepak Salunkhe, Dr. Ravindra Ladhe, Mr. Gajare Sir, Dr. Prashant Baviskar and Mrs. Pratibha Nikam for creating pleasant work environment.
My colleagues from NMU: Prof. D. K. Gautam; Prof. A. M. Mahajan and his research students Mr. Anil(2) and Yogesh; Prof. D. S. Patil and his students; Dr. B. L. Chaudhary and his students Mr. Deepak and Mr. Jayesh; Dr. D. S. Dalal.

Prof. L. A. Patil and his students from Pratap College, Amalner;

Supporting Staff at NMU: Mr. S. R. Chaudhary, Mr. Pramod Patil, Mr. Kishore Patil, Mr. Kailash Sonawane, Mr. Ravindra, Mr. Kalyan, Mr. Dhole, Mr. Champalal, Mr. Borse, Mr. Sopan, Mr. Devram, Mr. Bharat.

Special thanks to my family: Father, Mother, Manoj and Sangeeta for their love and motivation.

My wife Gauri, and sons Bittu and Ballu for their love, motivation and support, every time when it was required. Thanks for the time I needed to spend with you, but I spent it for this work. You played a vital role.

I am sure that I have not named many more persons who have helped me during the course of my work. Forgive me!! Thanks to all of them.

Thank you God !!

Without your will and permission nothing can happen.

Sanjay Sanatan Ghosh