

## PREFACE

My journey toward this thesis began in late 2008 after I joined the Department of Physics, Siliguri Institute of Technology as a Junior Research Fellow in a Department of Science and Technology funded research project, under the joint supervision of Dr. Malay Kumar Das and Dr. Banani Adhikari (Das). These six years have been a challenging as well as an enjoyable learning experience as I was fortunate to have got an opportunity to participate in the establishment of a new section of our laboratory from scratch at Siliguri Institute of Technology. Apart from liquid crystals, during this period I could learn about handling many sophisticated instrument and also been equipped with many new softwares. The results of the work performed during these six years (three and half years as a research fellow and two and half years spent as an Assistant Professor at Siliguri Institute of Technology) has been presented in this thesis.

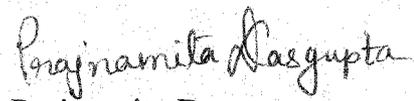
I would like to avail this opportunity to thank all the people who have helped me in doing this work at the Department of Physics, University of North Bengal. I would specially like to thank Prof. Ranjit Paul, Dr. Sukla Paul and my co-workers Dr. Prithwi Dev Roy, Mrs. Samedatta Basak, Mr. Gautam Sarkar, Ms. Anamika Pramanik, Mr. Anish Chakraborty, Mr. Sudipta Kumar Sarkar and Mr. Susanta Chakraborty for their help and support. My heartiest thanks to Dr. Akhileshwar Prasad, my senior co-worker, who helped me a lot in every aspect.

I am sincerely thankful to all of the members of the Department of Physics, University of North Bengal, whose support has helped me in carrying out this work successfully. I am also grateful to all the staffs of University Science and Instrumentation Centre, who have eagerly helped me in fabrication of various items. I would also like to express my thanks to all my colleagues at Siliguri Institute of Technology especially Dr. Arunendu Mondal, Dr. Gautam

Das and our ex-principal Dr. Ankur Ganguly without their cooperation it would not have been possible to complete this work.

I wish to convey my sincere thanks to the Department of Science and Technology, New Delhi, for the award of research fellowship. I would like to acknowledge my indebtedness to my father, mother and my elder sister for their unfailing encouragement, support and sacrifices because some of the time spent in the laboratory were rightfully theirs.

No words will be sufficient to thank Dr. Malay Kumar Das and Dr. Banani Adhikari (Das). Any attempt to do so will only demean what he and she have done for me. I am fortunate to have benefited from their guidance and advice.

  
Prajnamita Dasgupta

Date: 28/10/2014

Place: Raja Rammohunpur