

Acknowledgements

I am indebted to many individuals who have provided assistance and support during the period of this research.

First and foremost, I would like to express my sincere gratitude to my supervisor Dr. M. Kailasnath, Professor, International School of Photonics (ISP), for giving me an opportunity to work under his guidance. His inspiration, encouragement, constant support and valuable suggestions have gone a long way in the completion of my work. His extraordinary attention to detail and endless efforts in reviewing this thesis and many manuscripts are highly appreciated.

I would like to thank Prof. V. P. N. Nampoori, Professor Emeritus, International School of Photonics, for his encouragement and constructive remarks in the course of my Ph D studies. His inspiration, encouragement, constant support and valuable suggestions have gone a long way in the completion of my work.

I express my deep and sincere thanks to Prof. P. Radhakrishnan, Professor Emeritus, International School of Photonics, for unselfishly providing time and energy by giving valuable suggestions to the work.

I am extremely indebted to Prof. C. P. G. Vallabhan, Professor Emeritus, International School of Photonics, for his wholehearted support and advice during the work.

I greatly acknowledge, Prof. A. Mujeeb, Director, International School of Photonics, for his valuable support, suggestions, love, caring and encouragement to carry out my Ph. D.

I gratefully thank Prof. V. M. Nandakumaran, Prof. Pramod Gopinath, Dr. Sheenu Thomas, Dr. Reethama Thomas, Dr. Priya, Dr. Saji, Dr. Manu, Mr. Rishad, Mrs. Sreekumari and all other teachers of both ISP and Centre of Excellence in Lasers and Optoelectronic Sciences (CELOS) for the support provided during the years of my Ph D.

Sincere thanks to Dr. Jomon George, Dr. Mothi and Dr. Mahesh Kumar for helpful discussion and technical support.

My special and sincere thanks to Prof. Radhakrishna Prabhu, Professor, Robert Gordon University, Aberdeen, UK, for helping me in doing my work at Scotland and also for his loving concern extended throughout my work at UK.

Sincere thanks go to my colleagues Boni Samuel, Anand V. R., Adrine Correya and students Rasool Saleem and Ananthu Sebastian for the support and encouragement that they have provided in all my activities.

I would like to acknowledge other co-scholars of the ISP, in particular, Mr. Rethesh Raj, Vivek Viswambharan, Pradeep Chandran, Bini Pathrose, Jessy Simon, Vijesh K.R., Remya M, Aleena Kuriakose, Roopa Venkataraj, Sony Udayan, Raj Shah, Ajina C., Anupama V., Priyamvada V.C., Pooja Gitty, Linsal, Bobby Mathews, Bejoy Varghese, Nideep T.K, Dr. Divya Sasi, Dr. Libish T.M, Dr. Aparna Subhashi, Dr. Sr. Rosmin, Dr. Indu Sebastian, Dr. Suneetha Sebastian, Dr. Sithara, Dr. Mathew and for all their support and for creating a very vibrant environment. The group has been a source of friendship as well as good advice and collaboration.

Special thanks to all Lab, library, administrative staff, M.Sc and M.Tech students of the ISP for the assistance extended during the tenure.

I would also like to thank my Pappikunju, Antappan, Saji aliyan, Reji, Biju, Jomon chettan, Jaison, Mini, Jija, Jaya, Jeenamol chechi, Jaimy, Johnson chettan, Reena chechi, Dona mol, Unnikuttan, Prince chettan, Jipsy chechi and all my friends and relatives for their support and love during this time.

I am also grateful to my beloved pappa, mom, Eldhose chettayi, Cinta Chechi, Evin kuttan whose love and encouragement during my Ph.D time.

Sincere thanks to my ever loving wife Princy for her unfailing support and encouragement to complete this research program.

Thanks to the Almighty God

Jaison Peter