ACKNOWLEDGEMENT

I express my deep sense of gratitude to Prof. S. Natarajan, Department of Physics, College of Engineering, Anna University, Madras, for his inspiring and invaluable guidance and constant encouragement throughout the period of my research.

I am deeply grateful to Dr. K. Govinda Rajan and Dr. Mohammad Yousuf, MSL, Indira Gandhi Centre for Atomic Research, Kalpakkam, for the excellent training which I have received in the field of High Pressure, especially the study of quasicrystals and their affectionate attitude has given me a sense of confidence and security. I am particularly grateful to Mr. P. Ch. Sahu, MSL, for his kind help and constant encouragement.

It is with great pleasure, I like to express my deep sense of gratitude to Prof. G. V. Subba Rao, MSRC, IIT, Madras, for his kind help and useful discussions on the superconducting compounds and for providing the samples.

I would like to thank Dr. P. Ramasamy, Head, Department of Physics, for his kind help and encouragement.

I would like to thank Dr. R. Asokamani, Dr. K. Subramanian, Dr. G. N. S. Prasad, Mr. M. Rajagopalan, Mr. T. S. Subbaraman and Mr. G. Ganapathy for their kind help and encouragement.

I take this opportunity to thank Dr. V. S. Raghunathan and Dr. G. Ananthakrishna, IGCAR, for illuminating discussions on quasicrystals.
I sincerly thank

__ Dr. P.Rodriguez, Head, Metallurgy programme, IGCAR, who allowed me to MSL;
__ Dr. G.Venkatraman, Director, DRDO, Hyderabad, for the discussions on quasicrystals;
__ Dr. S.K.Sikka, Neutron Physics Division, BARC, Bombay, for the useful discussions on high pressure XRD;
__ Prof. T.Nagarajan, Dept. of Nuclear Physics, University of Madras, for his encouragement;
__ Dr. U.V.Verada Raju, Messers S.Natarajan and K.A.Thomas, MSRC. IIT, Madras, for their kind help;
__ Dr. J.Janaki, MSL, IGCAR, for the discussions on phosphide compounds;
__ Messers K.Sivakumar, V.Sundararajan, G.Subramoniam, S.Ganesan, S.Mathi Jaya, S.Selladurai and K.Chinnakali for providing friendly atmosphere and healthy environment;
__ Messers R.Barathan, P.Parameswaran, N.V.Chandra Shekar and M.Sekar, MSL, for their hospitality during my stay at IGCAR;
__ Mr. Thomas Kutty and Mr. T.Edwin, MSL, for their painstaking efforts in preparing sketches and tracings.

I am grateful to Anna University and the Department of Science and Technology, Govt. of India, for the financial support during the investigation.

I am grateful to my parents who sacrificed a lot in my upbringing.