

# Magnetic resonance properties of all solution-processed Iron Garnet thin films



Thesis submitted in the partial fulfillment for the  
Award of Degree

**Doctor of Philosophy**

By

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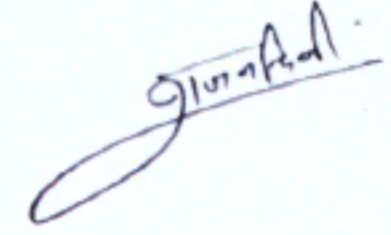
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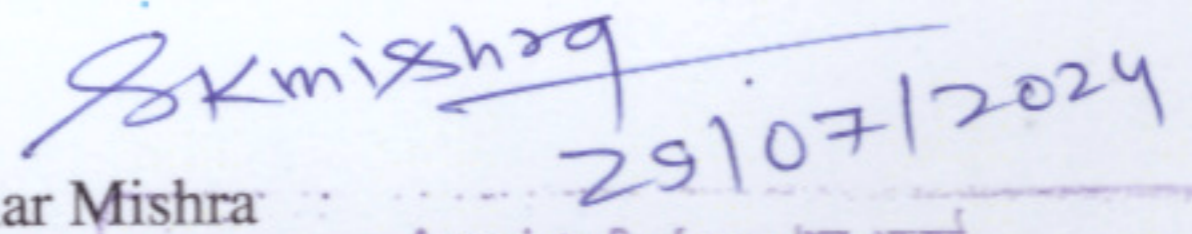


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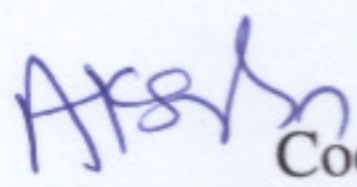
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## Acknowledgements

First of all, I am very thankful to Balaji and Lord Shiva for their constant blessings and mental support that helped me overcome all the odds. I am also grateful to the holy city Kashi for its positive vibrations and spiritual driving force. It is a great honor to acknowledge the moral & scientific support, encouragement, and guidance that I have received from different research groups and several individuals at various places and institutions during the completion of my Ph.D. thesis. Without their advice, guidance, and friendship, this work would have indeed suffered. I believe success is a collective phenomenon that you achieve with the help of many individuals. Here I am gone; name those who helped me achieve my doctorate degree successfully. I am very grateful to my Ph.D. supervisor Dr. Shrawan Kumar Mishra, for his constant efforts and for being the person who supported me in this complete Ph.D. journey. Sir, you have helped me grow independently and taught me how to work as a team member. You have also provided me opportunities to develop my technical skills, and I sincerely hope to continue learning from you. I am thankful to my lab members Dr. Shyam Babu, Raman, Nidhi, and Niti, and Simran for their moral support. Specially, I would like to thank Pawan for his suggestions. I am also appreciative of M.Tech. students (Shantanu, Rohit, Akash, and Rakesh, Arkapravo, Abhas, and Omkar) of the Quantum Lab, School of Materials Science and Technology, IIT (BHU) for their stimulating discussions and teaching me the balance between research and life.

I am thankful of the Dr. V. R. Reddy, Dr. R. J Choudhary, and Prof. S. Bhunia for experimental facility of UGC-DAE CSR, Indore and RRCAT, Indore. I am also thankful toward Dr. R. Rawat for his honest advice to have something in backup for the thesis. I

am also grateful of Rathore sir, and Anil sir, engineers of UGC-DAE CSR indore for the experiments perform by them. I am thankful to Shivam and Rijul sir my co-authors for the nice feedback on the article. I would like to show gratitude towards Dr. B. Bhoi for the fruitful discussions.

I express my sincere indebtedness to Dr. E. G. Rini and Dr. Y. Choyal with deepest regards and profound respect for inspiring me for research. I also wish to express my indebtedness to Dr. Vasant Sathe, Scientist, UGC-DAE CSR, Indore, for supervising me during my M.Sc. dissertation, which builds a foundation in the arena of science.

I specially acknowledged the support of the SMST and CIF (Central Instrumental Facility), IIT BHU, Varanasi, and all its Techn. & Non-Techn. staff who have worked day and night to make this research work successful. I would also like to acknowledge all the faculty members Prof. D. Pandey, Prof. R. Prakash, Prof. P. Maiti, Dr. (Mrs.) C. Rath, Dr. A. K. Singh, Dr. C. Upadhyay, Dr. B. N. Pal, Dr. S. Singh, Dr. A. K. Mishra, Dr. N. Kumar, Dr. R. Kumar, and Dr. A. Kumar of SMST, IIT (BHU), for their direct and indirect guidance. Without the facilities, equipment, and raw materials provided by SMST, this thesis work would have remained a dream. I also wish to thank the authority of INSPIRE fellowship, Department of Science and Technology, India, for providing me with the necessary permission and financial assistance for conducting this thesis work. In SMST, I have honestly enjoyed the company of Nisha, Aakansha, Priya ma'am, Priyanka, Neha, Sapna, Urvashi, Pooja ma'am, Rajnikant, Prince, Anuraag, Vipin, Sunayana, and Rajlakshmi who always been present with me to accomplish my degree fruitfully. I am also thankful to Sanjay sir for introducing this institute to me.

I am thankful towards Pravin for always motivating me and believing in my potentials. I also like to thank my friends Varsha, Shubhangi, Vivek, Saroj ma'am, Kamakshi ma'am,

Noshin, Asmita, and Ankit for listening to me and constantly encouraging me throughout my Ph.D. tenure.

I would also like to thank my research progress evaluation committee (RPEC) members, Dr. Shrawan Kumar Mishra (Chairman & Supervisor), Dr. Sandip Chatterjee (External Expert, Dept. of Physics, IIT (BHU)), Dr. Bholu Nath Pal (Internal Expert) not only for their time and extreme patience but also for their thoughtful comments and suggestions. Thank you!

In the end, I would like to thank my mothers Mrs Saroj Sharma and late Alka Sharma and my brother Vasudev for their constant love, support and always stand stiff for me. I am also grateful to my father Mr. Chandrashekhhar Sharma, my sister Divyanjali Sharma, my masi Mrs. Champa Jangir and my mamiji Mrs. Nirmala Jangir and Mrs. Sapna Jangir for there support in this endeavour. I would like to express my thank to all my extend family for there constant support and believing in me to achieve my dreams.

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## List of Abbreviations

<b>YIG</b>	Yttrium Iron Garnet
<b>TmIG</b>	Thulium Iron garnet
<b>GGG</b>	Gadolinium Gallium Garnet
<b>FMR</b>	Ferromagnetic Resonance
<b>XRD</b>	X-ray Diffraction
<b>XPS</b>	X-ray Photoelectron Spectroscopy
<b>AFM</b>	Atomic Force Microscopy
<b>SEM</b>	Scanning Electron Microscopy
<b>MPMS</b>	Magnetic Property Measurement System
<b>SQUID</b>	Superconducting Quantum Interference Device
<b>VSM</b>	Vibrating Sample Magnetometry
<b>JCPDS</b>	Joint committee on powder diffraction standards
<b>FCC</b>	Field Cooled Cooling

<b>XRR</b>	X-ray Reflectivity
<b>FMI</b>	Ferromagnetic Insulators
<b>PLD</b>	Pulsed laser Deposition
<b>LPE</b>	Liquid Phase Epitaxy
<b>GIXRD</b>	Grazing Incident X-ray Diffraction
<b>FCW</b>	Field Cooled Warming
<b>SOC</b>	Spin-orbit Coupling
<b>PMA</b>	Perpendicular Magnetic Anisotropy
<b>MOKE</b>	Magneto-optic Kerr Effect

## **List of Symbols**

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$\text{\AA}$	Angstrom
$\lambda$	Wavelength
$nm$	Nanometer
$\mu m$	Micrometer
$M_{eff}$	Effective Magnetization
$M_S$	Saturation Magnetization
$K_U$	Uniaxial Anisotropy Constant
$K_S$	Shape Anisotropy Constant
$K_\sigma$	Stress-induced Magnetic Anisotropy
$H_U$	Magnetic Anisotropy Field
$\sigma$	Stress
$\Delta\varepsilon$	Lattice Mismatch
(hkl)	Miller indices
$\alpha$	Gilbert's Damping parameter
$\Delta H_0$	Inhomogeneous Dissipation factor
$\gamma$	Gyromagnetic ratio