

Soundararaj Annamalai

Nanomagnetism and Microscopy Laboratory, Department of Physics,
Indian Institute of Technology (IIT) Hyderabad, India.

Email: soundarphy@gmail.com
ph13p0002@iith.ac.in

Mobile [+91 8328663932](tel:+918328663932)
[+91 9010339661](tel:+919010339661)

Research Interest

- ✪ Growth and optimization of magnetic thin films and nanostructures of transition metal, and intermetallic alloys for various functional properties.
- ✪ Development of sensors and devices for high quality low power consumable device with scalable technology.

Education

2013 - May 2020

Doctor of Philosophy (Ph. D.) in physics

Indian Institute of Technology (IIT) Hyderabad, India.

Thesis title: Structural and magnetic properties of electrochemically tuned magnetic thin films.

Advisor: Dr. Jyoti Ranjan Mohanty

<https://www.iith.ac.in/~jmohanty/>

Grade/GCPA: 7.5/10

2010-2012

Master of Science (M. Sc.) in Physics

Department of Nuclear Physics and Theoretical Physics

University of Madras (Guindy campus), Chennai, India.

Project title: Effect of annealing on the structural and optical properties of chemical bath deposited CdS thin films.

Grade/GCPA: 6.5/10

2007-2010

Bachelor of Science (B. Sc.) in Physics

Department of Physics, Periyar university, Salem, Tamilnadu, India.

Grade/GCPA: 80%

Achievements & Awards

- ✪ Recipient of full travel grant from Indian Institute of Technology (IIT), Hyderabad for attending Joint MMM-Intermag 2019 held at Washington D.C. USA.
- ✪ Excellence in research award from Indian Institute of Technology (IIT), Hyderabad for the years of 2017 and 2018.

- ✪ Travel grant to attend International conference on magnetism and magnetic materials (ICMAGMA-2017), Hyderabad, Telangana, India.
- ✪ Travel grant to attend International conference on magnetism and magnetic materials (ICMAGMA-2015), VIT Vellore, Tamilnadu, India.
- ✪ Qualified Graduate Aptitude Test in Engineering (GATE), secured with all India rank (AIR-118), in 2012.
- ✪ Recipient of Indian Academy of Science summer research fellowship (IASc-INSA-NASI) at Indian Institute of Technology, Kanpur in 2011 during my M.Sc. (Project title: Synthesis and characterization of YCo_2B_2 and $LiFeAs$ superconductors).

Publications

1. Magnetic property of electrodeposited nano-crystalline CoFe thin films

Soundararaj. A and J. Mohanty, AIP Conference Proceedings, (1731), 080060 (2016).

2. Magnetic properties of electrodeposited FePd alloy thin films

Soundararaj. A and J. Mohanty, AIP conference Proceedings (1832), 080066 (2017).

3. Enhancement of magnetic and surface properties in magneto-pulse electrodeposited Fe-Pd alloy thin films at various deposition potential

Soundararaj Annamalai, Arout J Chelvane and J Mohanty, Materials Research Express 6, 066110 (2019).

4. Impact of deposition potential on structural and magnetic properties of nano-crystalline CoFe alloy thin films

Soundararaj. A and J. Mohanty, Surf. eng. appl. electrochem. 56, 2, pp. 159-165 (2020).

5. Effect of Dimethyl amino borane (DMAB) on the structural and magnetic properties of CoFe thin films (Under manuscript preparation)

Soundararaj. A and J. Mohanty

Research Experience:

IIT Hyderabad, Telangana, India

2013-2020

Ph. D., Dept., of Physics

Dissertation: Structural and magnetic properties of electrochemically tuned magnetic thin films

Advisor: Dr. Jyoti Ranjan Mohanty (<https://www.iith.ac.in/~jmohanty/>)

Our research work mainly involved in activities like

- ✪ Synthesis of various metal and alloy thin films and nanostructures (CoFe, FePd, CoFeB) and study of their structural and magnetic properties.
- ✪ Controlling the crystalline structure of deposited materials and tunable composition in alloys by controlling electrochemical parameters.
- ✪ Electrochemical etching of Aluminum to form nanostructures (Nano porous Alumina (AAO) templates).

Experimental Tools Used / Handled

Electrochemical Workstation (PGSTAT), Physical deposition techniques (DC sputtering, e-beam evaporation), UHV system (In-situ MOKE, Annealing.), Arc melting, Grazing incidence X-ray diffractometer (GIXRD), Vibrating sample magnetometer (VSM), Magneto Optical Kerr Effect (MOKE), Optical profilometer, Projection lithography, Atomic / Magnetic Force Microscopy (AFM / MFM)

Software's known

Origin, Nanoscope (AFM/MFM), Nova (Electrochemical workstation), Clewin (Mask Design-Lithography)

Teaching Assistance and Research Guidance / Collaboration

Served as a Teaching Assistant (TA) from (2013-2017) for Engineering Physics (PH-1031) laboratory course at Undergraduate level (B. Tech) at Indian Institute of Technology (IIT), Hyderabad.

Research guidance

Assisted one student for M. Sc. thesis in the year of 2013, currently pursuing Ph. D. in Osaka university, Japan.

Research Collaboration

✪ Dr. Dileep Kumar Gupta

UGC-DAE Consortium for scientific research (UGC-DAE-CSR), Indore, Madhya Pradesh, India.

✪ Dr. J. Arout Chelvane

Defence metallurgical research laboratory(DMRL), Hyderabad, Telangana, India.

✪ Dr. Sanjeev Kumar

National center for compositional characterization of materials (NCCCM), Secunderabad, Telangana, India.

✪ Dr. S. Angappane

Center for nano and soft mater sciences(CeNS), Bengaluru, Karnataka, India.

Presentations Given at National and International Conferences

1. Poster presentation entitled “Magneto-electrodeposition of FePd alloy thin films” at “Joint MMM-Intermag 2019”, held during January 14th-18th January, 2019 at Wardman park Marriott, Washington DC. USA.
2. Poster presentation entitled as “Structural and magnetic properties of CoFeB thin films” at DAE-BRNS Symposium on Two decades of ion beam analysis at 3MV Tandatron, held during 23th-24th march, 2017 at National center for compositional characterization of materials (NCCCM), Hyderabad, India (Second best poster award).
3. Poster presentation entitled “Structural and Magnetic properties of CoFeB Thin Films” at International Conference on Magnetic Materials and Applications (ICMAGMA 2017), held during 1st – 3rd February, 2017 at Leonia International Centre for Exhibitions and Conventions, Hyderabad, India.

4. Poster presentation entitled “Structural and Magnetic properties of FePd alloy thin films” at Solid State Physics Symposium (DAE-SSPS 2016), held during 26th – 30th December, 2016 at KIIT University, Bhubaneswar, India.
5. Poster presentation entitled “Magnetic properties of Electrodeposited FePd alloy thin films” at National conference on study of matter using intense radiation sources and under extreme conditions, held during 3th-6th November, 2016 at UGC-DAE-Consortium for scientific research, Indore, Madhya Pradesh, India.
6. Poster presentation entitled “Structural and Magnetic properties of nano-crystalline CoFe alloy thin films” at Solid State Physics Symposium (DAE-SSPS 2015), held during 20th – 25th December, 2015 at Amity University, Noida, India.
7. Poster presentation entitled “Magnetic properties of nano-crystalline CoFe alloy thin films” at International Conference on Magnetic Materials and Applications (ICMAGMA 2015), held during 2nd – 4th December, 2015 at VIT University, Tamil Nadu, India.

References

1. Dr. Jyoti Ranjan Mohanty

(Ph.D. Supervisor)

Associate Professor

Department of Physics

Indian Institute of Technology Hyderabad

Kandi, Sangareddy-502 285 Telangana, India.

Email: jmohanty@phy.iith.ac.in

Phone: +91 8985297072

2. Dr. Surendra Kumar Martha

(Doctoral committee member)

Associate professor

Department of Chemistry

Indian Institute of Technology Hyderabad

Kandi, Sangareddy-502 285, Telangana, India.

Email: martha@chy.iith.ac.in

Phone: +91-402301-7089

3. Dr. Suryanarayana Jammalamadaka

(Doctoral committee member)

Associate Professor

Department of Physics

Indian Institute of Technology Hyderabad

Kandi, Sangareddy –502 285 Telangana, India.

Email: surya@phy.iith.ac.in

Phone: +91 9676212499

4. Dr. Chandrasekhar Murapaka

Assistant professor

Department of Materials Science and

Metallurgical Engineering

Indian Institute of Technology Hyderabad

Kandi, Sangareddy –502 285 Telangana, India.

Email: mchandrasekhar@msme.iith.ac.in

Phone: +91 6301063482

Declaration

I hereby declare that the above mentioned information is correct up to my knowledge.

Soundararaj Annamalai