

Delhi Babu Prabhu

Scientist E
Centre for Automotive Energy Materials (CAEM)
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EDUCATION AND CAREER

Oct 2022 – till date	Scientist ‘E’, CAEM, ARCI
Oct 2018 – Sep 2022	Scientist ‘D’, CAEM, ARCI
July 2014 – Sep 2018	Scientist ‘C’, CAEM, ARCI
May 2012 – June 2014	Scientist (Contract), CAEM, ARCI
Oct 2010 – Mar 2012	Post Doctoral Fellow Magnetic Materials Centre National Institute of Materials Science Japan 305 0047
Jan 2009 – Sep 2010	Research Associate Department of Materials Engineering Indian Institute of Science Bangalore 560 012
Mar 2002 – Dec 2008	Research Scholar (Ph.D) Materials Science Centre, Department of Nuclear Physics University of Madras, Chennai, India
Sep 1999 - June 2001	Masters Degree in Physics, Materials Science Centre, Department of Nuclear Physics University of Madras, Chennai, India
July 1996 - June 1999	Undergraduate in Physics, Loyola College, Chennai, India (Affiliated to University of Madras, India)

Skills: Technical

- **Materials Preparation and Processing**
 - Jetmilling technique (powder micronizing technology)
 - Rapid solidification processing (melt spinning, suction and injection casting)

- High Vacuum and UHV melting units
- Arc melting
- Induction melting
- Quartz tube vacuum sealing
- Ball milling, Jet milling
- Soft chemical methods for synthesis of oxides and metallic nanoparticles
- **Characterization Techniques Handled**
 - FEG-Scanning Electron Microscope (Merlin Compact, Zeiss)
 - BH Loop Tracer for Hard and Soft Magnetic Materials (Laboratorio Eletrofisico, Italy)
 - Pulse magnetizer (Laboratorio Eletrofisico, Italy)
 - Magnetic In-Field Press (Tamakawa, Japan)
 - Coercimeter (Laboratorio Eletrofisico, Italy)
 - Transmission Electron Microscopy (Tecnai20)
 - Scanning Electron Microscope (Carl Zeiss CrossBeam 1540EsB, Quanta)
 - X- Ray Diffractometer (Huber, Seifert ,JEOL JDX 8030, Panalytical XpertPro powder, Rigaku diffractomers).
 - Differential scanning calorimeters (Perkin elmer DSC-7 and Mettler Toledo 823e instruments)
 - Thermogravimetric analyzer (Perkin elmer TGA-7, Netzsch STA 409 and TA Q500 TGA)
 - SQUID VSM (Quantum Design)
 - Vibrating Sample Magnetometer (EG&G Parc, Model 4500 and Microsense EZ9)
 - Mössbauer Spectrometer (Wiessel, Germany and Nucleonix India)

Research Experience

Doctoral Thesis Title: “Magnetic and Electrical Properties of Nanocrystalline Magnetic Materials”

Summary of the Thesis

The thesis main focus is on the effect of Al substitution in enhancing the soft magnetic properties of the nanocrystalline soft magnetic materials namely FINEMET, NANOPERM and HITPERM. We have concluded from our results that Al is though dia-magnetic has an effect on the crystallization process where in it is found to enhance the number of crystallites and refine the grain size resulting in better soft magnetic properties due to better averaging effect of the random anisotropy. The nature of exchange interaction in these alloys has also been explored and has been found to be of the Heisenberg type involving the next nearest neighbours.

The thesis has also one chapter on ferrites where we have explored the effect of grain size on the magnetic and electrical properties of CuFe_2O_4 and from these results determined that the tetragonal to cubic phase transition temperature decreases with grain size.

The thesis also discusses the design and construction of the indigenously built inert gas melt spinning unit which was used for the synthesis of all the amorphous alloys used in the thesis.

Other research interest: Synthesis and characterization of metallic and alloy magnetic nanoparticles with controlled grain size using environmental friendly soft chemical routes, synthesis and characterization of magnetic oxides in the nano domain with potential bio medical applications, exploring magnetic ion doped oxides for DMS applications, magnetic characterization of exchange spring magnets like NdFeB and magnetic and crystallization behaviour of rapidly quenched Fe based metallic alloys.

Current Research: Synthesis and microstructural characterization of ultra-high coercive hard magnetic materials for industrial application. Preparation of high coercive sintered SmFeN and Dy free NdFeB magnets using Spark Plasma Sintering.

Synthesis and microstructural characterization of Fe-P for motors in automotive applications.

Instruments Installed and Fabricated:

- Design and setting up of indigenously built Vacuum Melt Spinning unit
- Design and setting up of indigenously built Vacuum Injection Casting unit
- Design and setting up of in-house high temperature Seebeck coefficient measurement set up.
- Installation and commissioning of Nucleonix Mössbauer spectrometer
- Installation and commissioning of Heuttiger TIG 20/300 induction furnace
- Installation and commissioning of 10 kg Vacuum Induction Melting furnace

Additional Skills Acquired

- 3 dimensional atom probe analysis using PoSAP software.
- Operation and maintenance of Vacuum systems.
- Operation and handling of low temperature cryostats.
- Vacuum sealing of quartz tubes for vacuum annealing purposes.
- Well versed in Mössbauer spectrum fitting routines [Bent program (fitting crystalline spectrum), Windows (fitting amorphous spectrum) and Le-caer (fitting crystalline and amorphous spectrum simultaneously)]

Fellowships / Scholarships

- Selected for Visiting Student Research Program (VSRP) of Tata Institute of Fundamental Research, India from May 2000 to July 2000
- Project Fellow in the DRDO project “Nanocrystalline Soft Magnetic Materials For High Temperature Applications” – July 2001 to March 2004
- Senior Research Fellow of the Council of Scientific and Industrial Research, India April 2006 to till date
- “Indian Institute of Science Research Associateship” of the Indian Institute of Science, Bangalore 1st April 2009 to 31st September 2010.

Awards and Honors

- **First prize** in the State level PG Technical Seminar competition conducted by Indian Spectrophysics Association
- **Best paper presentation** award in the National Seminar on Advances in Materials Science held at Manonmaniam Sundaranar University, Tirunelveli, 2006
- **Best paper presentation** award in the 20th Student Annual Symposium held at Indian Institute of Science, Bangalore 12, January 2007.
- **Best Micrograph** award in the 23rd Student Annual Symposium held at Indian Institute of Science, Bangalore 21-22, January 2010.
- **Best Poster** award in the International Conference on Multifunctional Nanomaterials and Nanocomposites held at Bharathiar University, Coimbatore 4-5 February 2010.
- **Second Best Paper** award in 24th International Soft Magnetic Materials (SMM) Conference in Ponzan, Poland 4-7 September 2019
- **Best poster** award in Symposium on Science Technology and Applications of Rare Earths (STAR 2019), BARC Mumbai, 5-7 December 2019
- **Best Paper** award in Symposium on Science Technology and Applications of Rare Earths (STAR 2022), Sri Venkateswara University, 22-23 September 2022

Professional Contribution

- ❖ **Member Board of Studies**, Department of Physics, Women Christian College
- ❖ **Member Board of Studies**, Vel Tech Rangarajan Dr. Sagunthala R & D Inst. of Sci. and Tech., Chennai
- ❖ **Reviewer** for Journal of Alloys and Compounds
- ❖ **Reviewer** for Journal of Materials Science
- ❖ **Reviewer** for IEEE Transacation of Magnetics
- ❖ **Reviewer** for Scientific Reports
- ❖ **Reviewer** for Journal of Magnetism and Magnetic Materials

Skills: Computer Related

Platforms	: Windows
Programming	: Fortran
Packages	: MS Office, Microcal Origin, Adobe Photoshop, Peakfit, XRDA, Traces, X-pert Pro, Mössbauer fitting routines namely Bent, Windows, Le-caer programmes,

Patents

1. Patent application titled “Post calcination modification of morphology and improvement of coercivity in high energy milled strontium hexaferrite powders” Patent Application Number: 202111003235 dt. 23rd January 2021

2. Patent application titled "A method of producing strontium hexaferrite powders having high coercivity suitable for bonded magnets" Patent Application Number: 202111008252, dt. 26 February 2021

List of Publications

Research works Accepted/published

- 1) Digital and analog resistive switching in Lu-doped piezoelectric BiFeO₃ film
HN Mohanty, AK Jena, SK Mishra, R Gautam, **D Prabhu**, S Sahoo, J Mohanty
Materials Science and Engineering: B **294** (2023) 116535
- 2) Microstructure evolution and phase analysis of Sm₆₀Ni₄₀ alloy
G Vijayaragavan, **D Prabhu**, MB Ponnuchamy, KRSP Meher, R Gautam, M Saha, K G Pradeep, R Gopalan
Journal of Magnetism and Magnetic Materials 566 (2023) 170323
- 3) Enhancing the coercivity of Nd-Cu-diffused Nd-Fe-B permanent magnets by Nb-assisted grain boundary pinning
MB Siva Kumar, **D Prabhu**, M Sadhasivam, B Manjusha, N Chandrasekaran, K G Pradeep, G Sundararajan, R Gopalan
Materials Research Letters **10** (2022), 780-787
- 4) Investigation of perpendicular magnetic anisotropy in CoFeMnSi based heterostructures
L Saravanan, V Mishra, L Pandey, NK Gupta, N Kumar, R Gopalan, **D Prabhu**, H A Therese S Chaudhary
Journal of Magnetism and Magnetic Materials **561** (2022), 169693
- 5) Correlation between milling-induced strain, microstructure, and magnetic properties in anisotropic SrFe₁₂O₁₉ powders
PSV Mocherla, V Ramya, D Kar, D Prabhu, R Gopalan
Ceramics International **48** (2022), 26669-26677
- 6) Revealing the Localization of NiAl-Type Nano-Scale B₂ Precipitates Within the BCC Phase of Ni Alloyed Low-Density FeMnAlC Steel
M Saha, MB Ponnuchamy, M Sadhasivam, C Mahata, G Vijayaragavan, N Chandrasekaran, **D Prabhu**, Krushna Kumbhar, K G Pradeep
Journal of Metals **74** (2022), 3181-3190
- 7) Influence of post-synthesis NaCl flux treatment on the magnetic properties of jet-milled SrFe₁₂O₁₉ powders
PSV Mocherla, P Ganesan, **D Prabhu**, NY Hebalkar, R Gopalan, UV Varadaraju,
Journal of the American Ceramic Society **105** (2022), 1116-1126
- 8) Magnetic nanoparticle-decorated graphene oxide-chitosan composite as an efficient nanocarrier for protein delivery
A Rebekah, S Sivaselvam, C Viswanathan, **D Prabhu**, R Gautam, N. Ponpandian
Colloids and Surfaces A **610** (2021) 125913

- 9) Magnetic properties of $\text{Sm}_2+\alpha\text{Fe}_{17}\text{N}_x$ powders prepared from bulk and strip-cast alloys
DA Kolodkin, AG Popov, AV Protasov, VS Gaviko, DY Vasilenko, S Kavita, **D. Prabhu**, R. Gopalan
Journal of Magnetism and Magnetic Materials **518** (2021) 167416.
- 10) Effect of recovery and recrystallization on microstructure and magnetic properties of Fe-0.4 P rolled sheets
R Gautam, R Rani, **D Prabhu**, V Chandrasekaran, T Sasaki, K Hono, ...
Materialia **13** (2020) 100863
- 11) Tailoring the morphology and size of perovskite BiFeO_3 nanostructures for enhanced magnetic and electrical properties
KP Remya, **D Prabhu**, RJ Joseyphus, AC Bose, C Viswanathan, ...
Materials & Design, (2020) 108694
- 12) Influence of nanoprecipitates, solid solution and grain size on the magnetic and electrical properties of Fe-P-Si alloys
R Gautam, **D Prabhu**, V Chandrasekaran, R Gopalan, G Sundararajan
Journal of Magnetism and Magnetic Materials **493** (2020) 165743
- 13) Effect of solid solution treatment and nitrogenation on magnetic properties of $\text{Sm}_2+\alpha\text{Fe}_{17}\text{N}_x$ powders
D Kolodkin, A Popov, A Protasov, V Gaviko, S Kavita, **D Prabhu**, R. Gopalan
Journal of Physics: Conference Series **1389** (1), (2019) 012125
- 14) $\text{Mn}_2\text{V}_0.5\text{Co}_0.5\text{Z}$ (Z= Ga, Al) Heusler alloys: High TC compensated P-type ferrimagnetism in arc melted bulk and N-type ferrimagnetism in melt-spun ribbons
PV Midhunlal, JA Chelvane, **D Prabhu**, R Gopalan, NH Kumar
Journal of Magnetism and Magnetic Materials **489** (2019) 165298
- 15) Effect of Annealing on Perpendicular Magnetic Anisotropy and Low Saturation Magnetization of $\text{MgO}/\text{Co}_2\text{FeAl}/\text{Mo}$ Trilayer Films
L Saravanan, IP Kokila, MM Raja, **D Prabhu**, HA Therese
Journal of Superconductivity and Novel Magnetism **32** (7) (2019) 1967
- 16) Microstructure and Magnetic Properties of Anisotropic Strontium Hexaferrite Powders
AR Dilipan, AK Srinithi, R Gautam, U Gowtham, **D Prabhu**, V. Chandrasekaran, R. Gopalan
IEEE Transactions on Magnetics **55** (8), (2019) 1-5
- 17) The effect of milling time on the evolution of nanostructure, thermal stability, and magnetocaloric properties of $(\text{Ni}_{0.50}\text{Fe}_{0.50})_{70}\text{B}_{17}\text{Si}_{7}\text{Ti}_4$
KS Anand, PP Jana, **D Prabhu**, J Das
Journal of Alloys and Compounds **772**, (2019) 157-163
- 18) Effect of Cobalt substitution on the multiferroic characteristics of ferroelectric potassium sodium niobate ($\text{K}_{0.5}\text{Na}_{0.5}\text{NbO}_3$) ceramics
K. Shalini, **D. Prabhu**, N. V. Giridharan
Applied Physics A **124** (2018) 866

- 19) Robust Perpendicular Magnetic Anisotropy in MgO/Co₂FeAl/MgO Stacks Induced by MgO over Layer and Annealing Temperature
S Lakshmanan, MR Muthuvel, **D Prabhu**, H Annal Therese
Physica Status Solidi (a) **215** (2018) 1800316
- 20) Impact of MgO thickness on the perpendicular magnetic anisotropy of Mo/Co₂FeAl/MgO/Mo multilayers with improved annealing stability
L Saravanan, **D Prabhu**, V Pandiyarasan, H Ikeda, HA Therese
Materials Research Bulletin **107** (2018) 118
- 21) The effect of milling time on the evolution of nanostructure thermal stability and magnetocaloric properties of (Ni_{0.5}Fe_{0.5})_{70.5}B_{17.7}Si_{7.8}Ti₄
K.S.Anand, P.P.Jana, **D.Prabhu**, J.Das
Journal of Alloys and Compounds **772** (2018) 157
- 22) High temperature magnetic studies on Bi_{1-x}Ca_xFe_{1-y}Ti_yO_{3-δ} nanoparticles: Observation of Hopkinson-like effect above T_N
PSV Mocherla, **D Prabhu**, MB Sahana, NY Hebalkar, R Gopalan, ...
Journal of Applied Physics **124** (2018) 073904
- 23) Perpendicular magnetic anisotropy in Mo/Co₂FeAl_{0.5}Si_{0.5}/MgO/Mo multilayers with optimal Mo buffer layer thickness L. Saravanan, M. Manivel Raja, **D. Prabhu**, V. Pandiyarasan, H. Ikeda, H.A. Therese
Journal of Magnetism and Magnetic Materials **454** (2018) 267–273
- 24) Near total magnetic moment compensation with high Curie temperature in Mn₂V_{0.5}Co_{0.5}Z (Z = Ga,Al) Heusler alloys
P V Midhunlal, J Arout Chelvane, U M Arjun Krishnan, **D Prabhu**, R Gopalan and N Harish Kumar
J. Phys. D: Appl. Phys. **51** (2018) 075002
- 25) Influence of sputtering power on structural and magnetic properties of as-deposited, annealed and ERTA CoFe₂Si films; A comparative study
L. Saravanan, M. Manivel Raja, **D. Prabhu**, H.A. Therese
Physica B: Condensed Matter **531** (2018) 180–184
- 26) Effect of thickness on tuning the perpendicular coercivity of Ta/CoFeB/Ta trilayer
L. Saravanan, M. Manivel Raja, **D. Prabhu**, H. A. Therese
J Mat. Sci: Mater Electron **29** (2018) 336.
- 27) Role of Cu layer thickness on the magnetic anisotropy of pulsed electrodeposited Ni/Cu/Ni tri-layer"
K. Dhanapal, **D. Prabhu**, R. Gopalan, V. Narayanan, A. Stephen
Materials Research Express **4** (2017) 075040.
- 28) Thermal stability and magnetic properties of MgFe₂O₄@ZnO nanoparticles
S. Mallesh, **D. Prabhu**, and V. Srinivas
AIP Advances **7** (2017) 056103; doi: 10.1063/1.4975355

- 29) Effect of Si addition on AC and DC magnetic properties of (Fe-P)-Si alloy
Ravi Gautam, **D. Prabhu**, V. Chandrasekaran, R. Gopalan, and G. Sundararajan
AIP Advances **6** (2016) 055921
- 30) Exchange spring magnetic behavior in BaFe₁₂O₁₉/Fe₃O₄ nanocomposites
K.P. Remya, **D. Prabhu**, S. Amirthapandian, C. Viswanathan, N. Ponpandian,
Journal of Magnetism and Magnetic Materials **406** (2016) 233
- 31) Effect of iron on the enhancement of magnetic properties for cobalt based soft magnetic metallic glasses.
Medha Veligatta, Shravan Katakam, Santanu Das, Narendra Dahotre, R. Gopalan, **D. Prabhu**, Aravindha Babu, Haein Choi-Yim, Sundeep Mukherjee
Met. and Mat. Trans. **46A** (2015) 1019
- 32) On the temperature dependent magnetic properties of as-spun Mn-Bi ribbons
S. Kavita, U.M.R. Seelam, **D. Prabhu**, R. Gopalan
Journal of Magnetism and Magnetic Materials **377** (2015) 485
- 33) AC magnetic properties and core loss behaviour of FeP soft magnetic sheets
S. Manna, **D. Prabhu**, V. Srinivas, R. Gopalan
IEEE Transactions on Magnetics **50** (2014) 2008604
- 34) Facile in situ growth of Fe₃O₄ nanoparticles on hydroxyapatite nanorods for pH dependent adsorption and controlled release of proteins
G. Bharath, **D. Prabhu**, D. Mangalaraj, C. Viswanathan and N. Ponpandian
RSC Adv., **4** (2014) 50510
- 35) Mn²⁺ ion influenced optical and photocatalytic behaviour of Mn–ZnS quantum dots prepared by a microwave assisted technique
S. Joicy, R. Saravanan, **D. Prabhu**, N. Ponpandian and P. Thangadurai
RSC Adv., **4** (2014) 44592
- 36) High saturation magnetization in Fe-0.4 wt.% P alloy processed by a two-step heat treatment
S. B. Chandrasekhar, D. Prabhu, M. Gopinath, V. Chandrasekaran, M. Ramakrishna, V. Uma and R. Gopalan
Journal of Magnetism and Magnetic Materials **345** (2013) 239.
- 37) Coercivity enhancement of rapidly solidified Nd-Fe-B magnet powders
H. Sepehri-Amin, D. Prabhu, M. Hayashi, T. Ohkubo, K. Hioki, A. Hattori and K. Hono
Scripta Materialia **68** (2013) 167.
- 38) Enhanced coercivity of spark plasma sintered Zn-bonded Sm-Fe-N magnet
D. Prabhu, H. Sepehri-Amin, C.L. Mendis, T. Ohkubo, K. Hono and S. Sugimoto
Scripta Materialia **67** (2012) 153.
- 39) Effect of addition of aluminum on the evolution of microstructure in HITPERM class Fe₄₄Co₄₄Zr₇B₄Cu₁ alloy
D. Prabhu, R. Veerababu, R. Balamuralikrishnan, A. Narayanasamy, K. Chattopadhyay
Materials Science Engineering B **177** (2012) 791.

- 40) Grain size effect on the phase transformation temperature of nanostructured CuFe_2O_4
 D. Prabhu^a, A. Narayanasamy^{b,*}, K. Shinoda^c, B. Jeyadeven^c, J-M. Greneche^d and
 K. Chattopadhyay^a
Journal of Applied Physics **109** (2011) 013532
- 41) Magnetic, electric and dielectric properties of FeCo alloy nanoparticles dispersed in
 amorphous matrix
 E. Thirumal, D. Prabhu, K. Chattopadhyay, V. Ravichandran
Physica status solidi (a), **207** (2010) 2505
- 42) Synthesis, Magnetic and Electrical Properties of Fe-containing SiO_2 nanocomposite
 E. Thirumal, **D. Prabhu** and V. Ravichandran,
Journal of Alloys and Compounds **502** (2010) 169
- 43) Effect of Aluminum on the hyperfine field and crystallization behaviour of NANOPERM
 alloy
D. Prabhu, A. Narayanasamy and K. Chattopadhyay,
Hyperfine Interactions **183** (2008) 7.
- 44) Magnetic properties of amorphous $\text{Fe}_{73.5}\text{Cu}_1\text{Mo}_3\text{Si}_{12.5}\text{Al}_1\text{B}_9$ alloy
D. Prabhu, K. Ganesan, A. Narayanasamy, K. Chattopadhyay, and N. Ponpandian
Materials Science and Engineering A **449–451** (2007) 452
- 45) Exchange field penetration in $\text{Fe}_{73.5}\text{Cu}_1\text{Mo}_3\text{Si}_{12.5}\text{Al}_1\text{B}_9$ alloy
D. Prabhu, A. Narayanasamy, K. Ganesan, N. Ponpandian and K. Chattopadhyay
Journal of Alloys and Compounds **438** (2007) 15.
- 46) Effect of Al substitution on the magnetic properties of amorphous $\text{Fe}_{73.5}\text{Cu}_1\text{Mo}_3\text{Si}_{13.5-x}\text{Al}_x\text{B}_9$
 alloy
D. Prabhu, A. Narayanasamy and K. Chattopadhyay
Journal of Non Crystalline Solids **353** (2007) 1577
- 47) Critical phenomena in FINEMET alloy
 N. Ponpandian, A. Narayanasamy, **D. Prabhu**, K. Ganesan, M. Manivel Raja, K.
 Chattopadhyay
Journal of Magnetism and Magnetic Materials **296** (2006) 67
- 48) Dipolar and exchange couplings in $\text{Nd}_2\text{Fe}_{14}\text{B}/\alpha\text{-Fe}$ ribbons
 R. Justin Joseyphus, A. Narayanasamy, **D. Prabhu**, L. K. Varga, B. Jeyadevan, C. N.
 Chinnasamy, K. Tohji, and N. Ponpandian
Physica Status Solidi (c) **1** (2004) 3489

Research work presented in the International/National Conferences and Workshops Attended

- 1) **Oral** presentation of the paper entitled “Magnetic properties of amorphous
 $\text{Fe}_{73.5}\text{Cu}_1\text{Mo}_3\text{Si}_{12.5}\text{Al}_1\text{B}_9$ alloy”

- D. Prabhu**, K. Ganesan, A. Narayansamy, N. Ponpandian and K. Chattopadhyay
12th International Conference on Rapidly Quenched and Metastable Materials, Jeju, Korea,
August 21-26, 2005
- 2) **Oral** presentation of the paper entitled “Effect of Al substitution on the magnetic properties of FINEMET alloy”
D. Prabhu, A. Narayansamy and K. Chattopadhyay, National Seminar on Advances in
Materials Science, Manonmaniam Sundaranar University, Tirunelveli. March 27-28, 2006.
 - 3) Attended the National Workshop on “Measurement & Characterization of Magnetic
Materials” 20-21st April 2006 conducted by the Magnetics Society of India and Saha Institute
of Physics at Saha Institute of Physics, Kolkatta
 - 4) **Poster** presentation of the paper entitled “Exchange Field Penetration in
 $\text{Fe}_{73.5}\text{Cu}_1\text{Mo}_3\text{Si}_{12.5}\text{Al}_1\text{B}_9$ Alloy”
D. Prabhu, A. Narayanasamy, K. Ganesan, N. Ponpandian and K. Chattopadhyay
8th International Conference on Nanostructured Materials - 2006
Indian Institute of Science, Bangalore 560 012, 21st – 25th August 2006
 - 5) **Poster** presentation of the paper entitled “Magnetic Properties of $\text{Fe}_{73.5}\text{Cu}_1\text{Mo}_3\text{Si}_{13.5-x}\text{Al}_x\text{B}_9$ (x
 $= 0, 1, 3 \text{ \& } 5$) Alloy”
D. Prabhu, A. Narayanasamy, and K. Chattopadhyay
8th International Conference on Nanostructured Materials -2006
Indian Institute of Science, Bangalore 560 012, 21st – 25th August 2006
 - 6) **Poster** presentation of the paper entitled “Magnetic and Crystallization Studies on
 $\text{Fe}_{43}\text{Co}_{43}\text{X}_2\text{Zr}_7\text{B}_4\text{Cu}_1$ ($\text{X}=\text{Al, V, Ni}$)”
D. Prabhu, A. Narayanasamy, K. Chattopadhyay
International Conference on Nanoscience and Nanotechnology – 2006
University of Madras, Chennai 600 025, 26th -28th August 2006
 - 7) **Oral** presentation of the paper entitled “Probing the amorphous phase magnetic
transition in $\text{Fe}_{73.5}\text{Cu}_1\text{Mo}_3\text{Si}_{12.5}\text{Al}_1\text{B}_9$ alloy”
D. Prabhu, A. Narayanasamy, K. Chattopadhyay
20th Annual Student Symposium, Indian Institute of Science, Bangalore 560 012, 4-5th
January 2007
 - 8) Attended the International Workshop on Bulk Metallic Glasses: Science and Technology 12-
16th January 2007, Department of Materials Engineering, Indian Institute of Science,
Bangalore, India
 - 9) **Oral** presentation of the paper entitled “Magnetic and Crystallization Behaviour of Rapidly
Quenched $\text{Fe}_{73.5}\text{Si}_{13.5-x}\text{Al}_x\text{Mo}_3\text{B}_9\text{Cu}_1$ Alloys”
D. Prabhu, A. Narayanasamy, S. Chithra, K. Chattopadhyay
International Conference on Nanomaterials, Communication and Broadcasting Systems –
2007, Sastra University, Thanjavur - 613 402, 9th -10th February 2007
 - 10) **Poster** presentation of the paper entitled “Effect of Al on the Magnetic and Crystallization
Behaviour of NANOPERM Alloys”

D. Prabhu, A. Narayanasamy, K. Chattopadhyay
Diamond Jubilee Symposium on Advances in Materials Engineering
Indian Institute of Science, Bangalore 560 012, 4-6th July 2007

11) **Poster** presentation of the paper entitled “Magnetic Properties of the Nanocrystalline FINEMET Alloy”

D. Prabhu, K. Ganesan, N. Ponpandian, A. Narayanasamy and K. Chattopadhyay
Symposium on Advances in Materials Engineering
Indian Institute of Science, Bangalore 560 012, 4-6th July 2007

12) **Poster** presentation of the paper entitled “Effect of Al on the Hyperfine Field of Amorphous and Crystalline FINEMET Alloys”

D. Prabhu, A. Narayanasamy, K. Chattopadhyay
International Conference on Applications in Mossbauer Effect – ICAME 2007
Indian Institute of Technology, Kanpur, 14th - 19th October 2007

13) **Oral** presentation of the paper entitled “Effect of Aluminum on the Hyperfine field and Crystallization behaviour of NANOPERM Alloy”

D. Prabhu, A. Narayanasamy, K. Chattopadhyay
International Conference on Applications in Mossbauer Effect – ICAME 2007
Indian Institute of Technology, Kanpur, 14th - 19th October 2007

14) **Poster** presentation of the paper entitled “Structural and Magnetic Studies of Nanocrystalline $\text{Ni}_x\text{Fe}_{100-x}$ Alloy Synthesized by a Novel Chemical Route”

E. Thirumal, **D. Prabhu**, G. Dhanalakshmi, V. Ravichandran and K. Chattopadhyay
International Conference Magnetic Materials & their Applications for 21st Century [MMA21]
National Physical Laboratory, New Delhi, 21st – 23rd October 2008

15) **Poster** presentation of the paper entitled “Superparamagnetic Nanoparticles as MRI Contrast Agents”

R. Priya, S. Rajesh Kumar, D. Mangalaraj, N. Ponpandian, R. Justin and **D. Prabhu**
International Conference Magnetic Materials & their Applications for 21st Century [MMA21]
National Physical Laboratory, New Delhi, 21st – 23rd October 2008

16) **Oral** presentation of the paper entitled “Effect of post sinter annealing on magnetic properties of bulk $\text{Sm}_2\text{Fe}_{17}\text{N}_3$ sintered magnets”

D. Prabhu, H. Sepehri-Amin, C. L. Mendis, T. Ohkubo, K. Hono, S. Sugimoto
The 35th Annual Conference on Magnetic in Japan, Niigata Convention Centre, Niigata,
27th – 30th September 2011

17) **Oral** Presentation “Enhancement of coercivity in rapidly quenched Nd-Fe-B powders by the Nd-Cu diffusion process”

S. Hossein, **D. Prabhu**, M. Hayashi, T. Ohkubo, K. Hioki, A. Hattori, K. Hono
ICAUMS 2012, Nara Prefectural New Public Hall, Nara, Japan, 2nd-5th October 2012.4

18) **Poster** presentation “Thematic Unit of Excellence on “Nanomaterials based technologies for Automotive Applications”

D. Prabhu, D. Sivaprahasam, S. B. Chandrasekar, T. Rajappa and R. Gopalan
The 5th Bangalore Nano, The Lalit Ashok, Bangalore, 5th – 7th December 2012.

- 19) **Poster** presentation “Temperature dependent magnetic properties study of as-spun MnBi ribbons”
S. Kavita, **D. Prabhu**, R. Gopalan, S. Uma Maheswara Rao and K. Hono
58th Annual Conference on MMM, Denver, Colorado, USA, 4th-8th November 2013
- 20) **Poster** presentation “High saturation magnetization in Fe-P soft magnetic alloy achieved by two step heat treatment”
D. Prabhu, S. B. Chandrasekar, V. Chandrasekaran, R. Gopalan and K. Hono
58th Annual Conference on MMM, Denver, Colorado, USA, 4th-8th November 2013
- 21) **Oral** presentation “Development of Fe-P alloy with high saturation induction for automotive applications”
D. Prabhu, Ravi Gautam S. B. Chandrasekar, V. Chandrasekaran and R. Gopalan
NMD-ATM 2013, IIT (BHU), Varanasi, India, 12th - 15th November 2013
- 22) **Oral** presentation “High Coercivity and temperature dependent magnetic properties of as-spun MnBi ribbons”
S. Kavita, **D. Prabhu**, R. Gopalan, S. Uma Maheswara Rao and K. Hono
MagMa 2013, Department of Physics, IIT Guwahati, 05th – 07th December 2013.
- 23) **Invited Talk** “Microstructural Engineering of Magnetic Materials” International Conference on Magnetic Materials and Applications (ICMAGMA 2014) Department of Physics, Pondicherry University, Pondicherry, 15-17th September 2014.
- 24) **Poster presentation** “**Synthesis of high Coercivity SrFe₁₂O₁₉ Powders**” R. Rajashekar, Ravi Gautam, D. Prabhu, R. Gopalan, International Conference on Magnetic Materials and Applications (ICMAGMA 2014) Department of Physics, Pondicherry University, Pondicherry, 15-17th September 2014.
- 25) **Poster** presentation “Evolution and growth of LTP MnBi in Mn-Bi system”
V.V.Ramakrishna, S.Kavita, D.Siva Prahasam, D. Prabhu, Ravi Gautam and R.Gopalan
International Conference on Magnetic Materials and Applications (ICMAGMA 2014)
Department of Physics, Pondicherry University, Pondicherry, 15-17th September 2014.
- 26) **Invited** Talk given in Indo – Belarus Joint Workshop, “Nanomaterials and Technologies”, Hotel IBIS, Gurugaon (NCR Delhi) 16 -17 Nov, 2015
- 27) **Oral** presentation “A new soft magnetic (Fe-P)-Si alloy with low core loss and high magnetic induction”, 2016 Joint MMM-Intermag Conference San Diego, California January 11-15, 2016
- 28) **Poster** presentation of the paper entitled “Nanomaterials Based Technologies for Automotive Applications” 8th Bangalore India Nano, Bangalore, March 3-5 2016,
- 29) **Invited** Talk “Introduction to Magnetism” in Summer Training Program in Physics, Tamil Nadu Academy of Sciences, University of Madras, Chennai 28th May 2016

- 30) **Invited talk** “Macro Changes Nano Modifications” in Workshop on Characterization of Materials for Advanced Applications (WCMAA-2016), Department of Physics (NDT), National Institute of Technology, Tiruchirappalli 620 015, 6th August 2016
- 31) **Invited talk** “Harder Hard Magnetic Materials” in National Conference on Materials for Sustainable Energy (NCMSE-16), The Department of Physics, Bharathidasan Institute of Technology (BIT) Campus, Anna University, Tiruchirappalli- 620024 26th August, 2016.
- 32) **Invited talk** “Fe-P based soft magnetic materials – “Potential alternate to Si steel” in International conference on magnetism and Magnetic Materials, Magnetic Society of India, 2nd February 2017
- 33) **Poster** presentation entitled “Magnetic and microstructural studies on powder extruded soft magnetic Fe-P alloy”, International conference on magnetism and Magnetic Materials, Magnetic Society of India, Hyderabad, 1-3rd February 2017
- 34) **Poster** presentation entitled “Effect of stoichiometry on the magnetic properties of Strontium Hexaferrite prepared via Solid State Route” International conference on magnetism and Magnetic Materials, Magnetic Society of India, Hyderabad, 1-3rd February 2017
- 35) **Poster** presentation entitled “Effect of rare earth dopants (La, Sm) on the magnetic and electrical properties of BiFeO₃ nanostructures: A comparative study, International conference on magnetism and Magnetic Materials, Magnetic Society of India, Hyderabad, 1-3rd February 2017
- 36) **Poster** presentation entitled “Magnetic Graphene/Chitosan nanocomposite for the removal of 2-Naphthol from aqueous solution- Adsorption and kinetic studies”, International conference on magnetism and Magnetic Materials, Magnetic Society of India, Hyderabad, 1-3rd February 2017
- 37) **Poster** presentation of the paper entitled “Nanomaterials Based Technologies for Automotive Applications” 9th Bangalore India Nano, Bangalore, December 7-8 2017,
- 38) **Invited Talk** entitled “Unveiling some “truths” in magnetic materials through 3DAP”, in Advanced Characterization Workshop on 3D Atom Tomography, IIT, Delhi, 18-19th Dec 2017
- 39) **Invited Talk** entitled “Magnetic Materials an Indispensable component of Energy” in National Seminar on Renewable Energy (NSRE-2018) at Valliammal College of Engineering, Chennai 10th March 2018.
- 40) **Invited talk** entitled “Characterizing magnetic materials through 3DAP” in Workshop on Atom Probe Tomography, ARCI, Hyderabad 7th September 2018.

- 41) **Poster presentation** “Influence of microstructure on the magnetic properties of Fe-P based soft magnetic alloy” in 24th Soft Magnetic Materials Conference, Poznan Poland 4-7th September 2019
- 42) **Poster presentation** “New soft magnetic material for automotive and electric vehicle application an alternate to Si steel” in NuGen Mobility Summit, Manesar, 27-29th November 2019.
- 43) **Oral presentation** “The effect of post sinter annealing on Zn bonded Sm-Fe-N magnets” in Science, Technology & Application of Rare Earths (STAR – 2019); DAE Convention Centre, Anushaktinagar, Mumbai, December 5-7, 2019
- 44) **Poster presentation** “Microstructural investigation of Ce-La-Fe-B permanent magnet” in Science, Technology & Application of Rare Earths (STAR – 2019); DAE Convention Centre, Anushaktinagar, Mumbai, December 5-7, 2019
- 45) **Poster presentation** “Development of low melting alloys for consolidation of isotropic Sm-Fe-N powders” in Science, Technology & Application of Rare Earths (STAR – 2019); DAE Convention Centre, Anushaktinagar, Mumbai, December 5-7, 2019
- 46) **Keynote address** “Magnetism and magnetic materials – An indispensable component” in National Conference on Recent Trends in Advanced Materials (NCRTAMR 2020) at Bharath Institute of Higher Education, Chennai 21 February 2020
- 47) **Invited talk** “Nano engineered magnets” in Nano Enabled Devices and Products internship program (online) University of Madras, Chennai, 17th December 2020.
- 48) **Invited talk** “Nanomagnetism” in "Advanced Nano-Enabled Devices and Products" internship program at University of Madras, Chennai, 5th January 2022
- 49) **Invited talk** “Nano Engineered Magnets” in “Five days International Faculty Development Programme on Smart Materials for New Technology” organized by St. Mary’s College, Thoothukudi on 21st February, 2022
- 50) **Invited talk** “Coercivity enhancement through grain boundary engineering in Nd-Fe-B magnets’ in NMD-ATM 2022, organized by DMRL, Hyderabad 13-16th November 2022.
- 51) **Invited talk** “Microstructural modifications in permanent magnets” in National symposium – INPHYNITT 2023 organized by NIT Trichy on 7th March 2023.
- 52) **Invited talk** “Primer to magnetism and magnetic materials” in Internship programme on "Advanced Nanomaterials for Energy", sponsored by Entrepreneurship and Career Hub, Rashtriya Uchchar Shiksha Abhiyan (RUSA 2.0), University of Madras, on 12th June, 2023

Extracurricular Activities

- Oration
- Reading (special interest in autobiographies and biographies)
- Photography
- Cricket, Badminton

Personal

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