Ranjith Ramadurai

Associate Professor,
Department of Materials Science & Metallurgical Engineering,
Indian Institute of Technology Hyderabad,
Kandi, Sangareddy – 502 285
e-mail : vtcranjith@gmail.com , ranjith@msme.iith.ac.in
Mobile : +91-9494424990

Work experience

3rd Nov 2016 – up to date	**Associate Professor,** Department of Materials Science & Metallurgical Engineering, Indian Institute of Technology Hyderabad
3rd Oct 2017 – 2nd Oct 2020	**Head of Department of Engineering Science (Virtual),** IITH
1st Nov 2011 – 2nd Nov 2016 date	**Assistant Professor,** Department of Materials Science & Metallurgical Engineering, Indian Institute of Technology Hyderabad
23rd May 2011 – 30th Oct 2011	**Visiting Asst. Professor,** Department of Materials Science & Metallurgical Engineering, Indian Institute of Technology Hyderabad

Post-Doctoral Research

May 2009 – April 2011	**Alexander Von Humboldt Fellow** Institute of Electronic Materials and Devices, Leibniz University of Hannover. (Fabrication and studies of Silicon well Resonant Tunnel diodes)
Dec 2006 – April 2009	**Post-doctoral Fellow (CNRS)** **Laboratoire CRISMAT, Ensi-CAEN, France**. (**MACOMUFI** – Manipulating the coupling in multiferroic thin films, EU specific targeted research project)

Education

Aug 2001 – April 2007	**Research Scholar (Ph.D)** Materials Research Center, Indian Institute of Science, Bangalore, India
Aug 1999 - May 2001	**Master of Science in Materials Science**, CEG Campus, Anna University, Chennai, India
July 1996 - April 1999	**Undergraduate in Physics**, **First class (78%),** Sri Pushpam College, Poondi (Affiliated to Barathidasan University, Thiruchirapalli, India)

Awards and Honors

1. Chosen as a **Visiting Faculty** for the year 2020 in **Unit of Catalysis and Solid Chemistry, University of Artois, Lens, France. (if one may consider this as a recognition)**

2. Selected and nominated by "Materials Research Society of India (MRSI)" to attend the **"World Materials Summit"** at Strasbourg, France focusing on **"Next Generation Materials Researchers" with a main theme of "Materials innovation for the global circular economy and sustainable society". 17-22 Nov 2017.**
3. **"MRSI – Medal"** Materials Research Society of India (MRSI) – Medal for young Materials Researcher for the year 2016.
4. **"DAE-BRNS – Young scientist research award"** with research grant starting from **May 2014** for a duration of 36 months.
5. "**Alexander Von Humboldt" - Renewed Research stay to senior researchers** for a duration of 3 months (**May 2014 to July 2014**)
6. "**Excellence in Teaching Award"** for the year **2013** in Indian Institute of Technology Hyderabad. An award given based on the closed feedback of the students.
7. Recipient of **"Alexander Von Humboldt"** Fellowship for a period of 01May 2009 - 30April 2011.
8. **Gold Medal** and **Jayashree Shyam Sundar Endowment** for standing **first** in the first two semesters in M.Sc.

Lindau Meeting of Nobel Laureates

Selected and nominated by **Division of Chemical Sciences, Indian Institute of Science**, Bangalore and **Corporate Technology, SIEMENS, Munich** to attend the 56th Lindau Meeting of Noble Laureates in Chemistry as a SIEMENS nominee from 25th June 2006 to 30th June 2006.

Contribution to ICDD

Structural Refinement carried out in 7 out of 8 compositions of PFN-PSN, in Mr. Bandi Mallehsam's thesis was included in ICDD data base (**I04212, I04213, I04214, I04215, I04217, I04218, I04219**)

Prototypes / Products Developed

1. Development of lead free piezoelectric thin film based vibration energy harvestors (power range of nW to micro Watt and frequency range few Hz to few 100 Hz)

2. Development of flexible piezoelectric hybrid nanocomposites for energy harvesting from fluid and/or gas flow conditions. (in collaboration with Dr. Amit Acharya, EE) - patent filing under progress

3. FERROELECTRIC POLYMER (B-PVDF) FOR CONTROL AND MITIGATION OF MICROBES UNDER SMALL VOLTAGE SIGNALS" - Indian Patent Application No. 202041050666: A ferroelectric polymer fabricated and tested for its anti-microbial behavior (anti-bacterial, anti-viral and anti-fungal). These patches can be utilized on face mask and other PPE for health care workers. (in collaboration with Dr. Aravind. BME, IITH - IITH- IDP 2020)

3. Development of a 3 point bending stage for scanning probe microscope that would facilitate imaging of samples at nanoscale under stressed conditions (part of DST-SERB project - patent filing under progress)

4. Development of a gas sensor prototype and a bulk ceramic based vibration sensors as a part of DISANET – an institute project with Indo-Japan collaboration.

Funded Research Projects

1. **Principal Investigator** - "Investigations on Influence of Cationic Ordering, Anisotropy and Strain in Functional Domains of Multiferroic Relaxor Thin Films and Bulk ceramics for Magneto-Dielectric based Device Applications" – **DST, Fast track project Nov 2013 – Oct 2016 (36 months - Completed) (INR~ 16 Lakhs)**
2. **Principal Investigator** -"Effect of anisotropy on exchange bias of multiferroic oxides with modulated spin structures for novel magnetic field sensor applications" – **DAE, BRNS- young scientist research award, May 2014 – April 2017 (36 months). (INR~ 14.75 Lakhs - completed)**
3. **Principal Investigator –** "Design & fabrication of piezoelectric energy harvester using lead free thin films" **CARS (contract for acquisition of research services) project** from DMRL, Hyderabad. Ongoing **(INR ~ 32 Lakhs). – (April 2018 – 13 Oct 2020) Completed**

4. **Principal Investigator -** "Synthesis of novel multifunctional nano-composites and study the influence of size, shape, strain and organization on functional behavior at nano-scale for magneto-dielectric device applications", **DRDO-ERIPR** program **Ongoing (May 2018 –April 2021 (extended upto Oct2021). (INR~ 37.42 Lakhs) - Ongoing**

5. **Principal Investigator** - "Strain, Microstructure and Defect Induced Effects on Ferroic Domains of Morphotropic Phase Compositions in Lead Free Ferroelectric Thin Films" – **DST, EMR (36 months – Project sanctioned (March 2019 – March 2022) (INR~ 59 Lakhs) – Ongoing**

6. **Principal Investigator –** " Study of Response Control and Mitigation of Bio Organisms/Molecules Under Small Voltage electrical signals on Ferroelectric Polymer and/or Polar Surfaces " **IDP –IITH (24 months – INR 10 Lakhs) – Ongoing (June 2020- May 2022)**

Institute projects: Participation / Co-ordinated

1. **Participation** in DISANET an Indo-Japan collaborative initiative – **It was then (2012) an ongoing institute project**, in which I took part and setup a thin film laboratory for sensor materials development.

2. **Co-ordinated** the theme proposing for "**Center for New Materials/Chemical Process**" for funding under BUILDING INDUSTRIAL RESEARCH & DEVELOPMENT AND COMMON RESEARCH FACILITIES (BIRD-CRF) Scheme – **submitted in April 2016 - UnSuccessful**

3. **Co-ordinated and drafted the proposal as a Co-PI for DST-FIST** program for MSME – FE-SEM was granted under this program and recently I have also been involved in the operation and maintenance of the equipment. **Grant no. SR/FST/ETI-421/2016**

Research students graduated / submitted

1. **Ph.D MS11P1001 Bandi Mallesham**- " Structure, Cation Ordering and Phonon studies of Pb(Fe0.5-xScxNb0.5)O3, a Multiferroic Relaxor : Bulk and Thin Films" – **August 2016 – Completed**

2. **Ph.D MS11P1004 Venkateswara Rao M** "Structural, Electrical, Optical and Magnetic properties of Y1-xBixCrO3 and Nd1-xBixCrO3(x=0 to 0.15) Ceramics" – **August 2016 - Completed**

3. **Ph.D MS12P0004 Kumaraswamy Miriyala** "Texture and Microstructural Influence on Piezoelectric Properties of Na0.5Bi0.5TiO3 Thin Films: A Lead Free Piezoelectric Material – **August 2019 – Completed**

4. Ph.D MS12P1002 **K. Prabahar** "Growth and Characterization of lead free Multiferroic (Ba0. 85Ca0.15) (Zr0.10Ti0.90)O3 - CoFe2O4 Nano Composite Thin Films" – **August 2019 – Completed**

5. **Ph.D MS13P1006 Saj Mohan M M** "Influence of Strain and Anisotropy on Structure of BiFeO3 Epilayers and their Utilization as Interface Driven Heterostructures for Multiferroic Device Applications" – **August 2019 – Completed**

6. **Ph.D EE15resch02014 – Ronit Ganguly –** "Flexible Piezoelectric Polymer (Polyvinylidene Fluoride – PVDF) and Hybrid (PVDF-$BiFeO_3$) nano composites for Sensing and Energy Harvesting applications " **– Co-supervised along with Dr. Amit Acharya, EE –thesis submitted.**

M.Tech student supervision

M.Tech	MS11M03	Ghodke Swapnil Chetan	Completed
M.Tech	MS11M05	M Santhosh Kumar	Completed
M.Tech	MS12M1002	Gottuparthi Vasundara	Completed
M.Tech	MS12M1009	Satyanarayansingh Thakur	Completed
M.Tech	MS13M1006	Mudit Upadhyay	Completed
M.Tech	MS14MTECH11007	Soumen Mandi	Completed
M.Tech	MS15MTECH11002	Hasnat Zamin	Completed
M.Tech	MS16MTECH11006	KARRI SRI NAGA SESHA	Co-Supervised with Dr. Pinaki Completed
M.Tech	MS16MTECH11010	SREENATH M V	Completed
M.Tech	MS17MTECH11009	Bidesh Mahata	Completed

Awards and Honors by group members

1. Mr. Bandi Mallesham, received the **"The Ludo Frevel Crystallography Scholarship"** from International centre for Diffraction Data (ICDD). He was the only Indian among the 10 awardees round the globe for the year 2016. http://www.icdd.com/resources/awards/frevelwinner.htm
2. **"Best Poster Award" - Mr. Sajmohan,** received the Best Poster award in the Second International Conference on Nanostructured Materials and Nanocomposites (ICNM 2014) to be held on **19-21 December 2014**, Kottayam, Kerala, India
3. **"Second Best Poster Award"-Mr. Venkateswara rao** received the second best poster award in Second International Conference on Nanostructured Materials and Nanocomposites (ICNM 2014) to be held on **19-21 December 2014**, Kottayam, Kerala, India
4. **"Best Poste Award" – Mr. Kumaraswamy Miryiyala** received the best poster award in **"International Symposium for Integrated Ferroelectrics" - ISIF-2017 (Delhi).**

Research Facilities built @ IITH with institute / project funds

1. Physical property measurement system, Quantum Design, (model: Dynacool)
2. Electron beam / thermal evaporation unit, (HHV)

3. High Resolution Thin Film X-ray Diffraction unit (Bruker D8-Discover)
4. Pulsed laser ablation laboratory under the Institute initiative of DISANET Project (Indo-Japan collaborative project)
5. Procurement and maintenance of Ultrasonic disc cutter unit
6. Table top sputtering unit
7. Functional properties characterization lab for B.Tech teaching (SMU, FG, CRO etc..)

Facilities built through Project funds

8. Procurement and maintenance of Low and high temperature electrical probe unit that also facilitates specific atmosphere during electrical measurements. (DAE_BRNS- YSRA scheme)(~INR 3L)
9. Procurement and maintenance of high vacuum PLD chamber for lead based compounds (DST – FAST TRACK) (~ INR 11L)
10. Procurement of multi-functional probe for PPMS to measure various functional properties under magnetic field. (~ INR 15L)- DRDO- ERIPR
11. Procurement of needle like vibration simulator for testing and calibration of vibration sensors. – CARS project –DMRL. (~ INR 4.5L)
12. Procurement of electrical probe station unit (10K to 500K) PS100-Lakeshore also capable of measuring electrical properties under illumination (DST-SERB ~ INR 36 L)

Collaboration: National / International

1. Prof. Hidekazu Tanaka, Osaka university, Japan
2. Dr. Wilfrid Prellier, Laboratory of CRISMAT, France
3. IIT Indore, Indore
4. DMRL, Hyderabad
5. IIT Mandi, Himachal Pradesh
6. NIMS, Japan

List of book chapters / published and ongoing

Books / Chapters

1. **Chapter 10-"Piezoelectrics and multifunctional composites" – Dr. Ranjith Ramdurai** and Dr. Vijaynandhini Kannan – "in a book titled "Perovskites and Related Mixed Oxides" Ed. By P. Granger, V.I. Parvulescu, S. Kaliaguine and W. Prellier – Volume I, Wiley-VCH, (2015).

2. **Chapter Title: – "Multiferroics – Perspectives on Strain Structure and Properties"** – Dr. Ranjith Ramadurai and Saj Mohan MM – in a book titled " Advances in Highly Correlated Systems " – River publishers – ***in press.*** (Oct 2020)

3. **Book – "Strain Engineering in Functional Materials"** – Edited by Ranjith Ramadurai (RR) and Saswata Battacharya (SB)- **AIP publishers (American Institute of Physics) – Expected to complete by Feb 2021.** (includes two individual chapters from RR and one co-authored with SB)

Research works published in peer reviewed international journals

Format: (Authors, Title, journal, **volume**, page, **year**)

Scopus details: "Ranjith, Ramadurai" 57206228614 , 57219634735, 57219908134 + Ranjit. R 8453936200 – a merger has been requested (details of profile - "Ranjith, Ramadurai" 57206228614 – 61 publications with h-

index of 15 and citations ~ **671. If all profiles above merged it would end up as h-index 16 and citations ~ 853.**

Google Scholar details: Ranjth Ramadurai https://scholar.google.com/citations?user=NtP7jtYAAAAJ&hl=en
h- index of 17 and total citations of 1047.

1. "Grain to Grain Epitaxy Like Nano Structures of (Ba,Ca)(ZrTi)O3/ CoFe2O4 for Magneto-Electric based devices. ", Prabahar K, Anantha P Bhat, Adiraj S and **Ranjith Ramadurai , Accepted in ACS:Appl. Nano. Matls. (Oct 2020)**

2. "Dielectric Switching Studies of poly-vinylidene fluoride thin films with dominant planar ferroelectric domain configuration for flexible electronic devices ", Ronit Ganguly; Hasnat Zamin; Nishant Saxena; Anbarasu Manivannan; Amit Acharyya; **Ranjith Ramadurai**, IEEE, (TDEI) **Vol 26, No4, 1371, (2019).**

3. "Effect of non- polarization invariants on the exchange bias of tetragonal ⟨001⟩ and rhombohedral ⟨111⟩ orientations of bismuth ferrite epitaxial thin films" MM Sajmohan, R Ranjith, JA Chelvane, Bulletin of Materials Science 42 (5), 208 **(2019)**

4. "Study of Stiffness and flexible sensing performance of poly-vinylidene fluoride (PVDF) a piezo polymer with varying polarization components", R Ganguly, K Rajesh, A Acharyya, R Ramadurai **2019 IEEE 14th Nanotechnology Materials and Devices Conference** (NMDC), 1-5

5. "Realization of Rhombohedral, Mixed and Tetragonal like phases of $BiFeO_3$ and Ferroelectric Domain Engineering Using a Strain Tuning Layer on $LaAlO_3$(001) Substrate" Saj Mohan M M, Soumya Bandyopadhyay, Tushar Jogi, Saswata Bhattacharya, **Ranjith Ramadurai; *J. Appl. Phys.*** 125 **(2019)** 12501. doi:10.1063/1.5054372.

6. "Effect of magnetic field annealing on the magnetostriction and deflection properties of CoFe2O4 thin films grown by PLD " K Prabahar, **R Ranjith**, P Saravanan, A Srinivas**, J. Magn. Magn. Mater**. **475**, 276-281 **(2019)**

7. "Tunable polarization components and electric field induced crystallization in polyvinylidenefluoride: A piezo polymer ", Ronit Ganguly, Soumya Bandyopadhyay, Kumaraswamy Miriyala, Vijayabhaskar Gunasekaran, Saswata Bhattacharya, Amit Acharyya, **Ranjith Ramadurai** ;**Polymer crystallization, 2(1),** e 10027 **(2019)**

8. "Microstructural Influence on Ferroelectric Domain Pattern and Piezoelectric Properties of $Na_{0.5}Bi_{0.5}TiO_3$ Thin Films" Kumaraswamy Miriyala, **Ranjith Ramadurai**, ***Ceram. Int.***, **44** 14556-14562. **(2018)**

9. "The role of B-site substitution on the structural and dielectric properties of samarium orthoferrite polycrystals ",N Ramu, K Meera, **R Ranjith**, R Muralidharan, **Materials Research Express 6 (3**), 036106 **(2018)**

10. "Nanomechanical behavior of Pb (Fe0. 5− xScxNb0. 5) O3 multiferroic ceramics", D Singh, B Mallesham, A Deshinge, K Joshi, **R Ranjith**, V Balakrishnan, **Materials Research Express 5 (11)**, 116303 **(2018)**

11. "Template assisted strain tuning and phase stabilization in epitaxial $BiFeO_3$ thin films, Saj Mohan M. M., **Ranjith Ramadurai**, **AIP Conference Proceedings**. 1942 80040. **(2018)** doi:10.1063/1.5028874.

12. "Tip Induced Surface Defect migration and Conductivity Studies in Tetragonal, Rhombohedral and Mixed Phase epitaxial $BiFeO_3$ Thin Films" Saj Mohan M M, Sreenath M V And **Ranjith Ramadurai**, **MRS Advances**, 3(44), 2713-2718. **(2018)** doi:10.1557/adv.2018.463.

13. "Local Structural Distortion and Interrelated Phonon Mode Studies in Yttrium Chromite' Venkateswara rao Mannepalli, Rajamani Raghunathan, **R.Ranjith**, A.David and W.Prellier **Journal of Materials Research**, **32 (8),** 1541-1547 **(2017)** doi: 10.1557/jmr.2017.5

14. "Structural and Electrical Transport studies in Bi-Substituted Yttrium chromite" Venkateswara rao Mannepalli and **Ranjith Ramadurai**; **Journal of Materials Science: Materials in Electronics, (2017)** (doi: 10.1007/s10854-017-6514-5)

15. "Tunable Ferroelectric domain orientation in polycrystalline and highly oriented $Na_{0.5}Bi_{0.5}TiO_3$ thin films", Kumaraswamy Miriyala and **Ranjith Ramadurai**, **Materials Letters, 178,** 23-26 **(2016)**

16. "A phase-field study of domain dynamics in ferroelectric BCT-BZT system"Soumya Bandyopadhyay, Tushar Jogi, Kumaraswamy Miriyala, Ranjith Ramadurai and Saswata Bhattacharyya **MRS Advances** June 2016, pp 1 - 6 **DOI: 10.1557/adv.2016.384, 23 May 2016**

17. "Microstructural influence on piezoresponse and leakage current behavior of oriented $Na_{0.5}Bi_{0.5}TiO_3$ thin films", Kumaraswamy Miriyala and **Ranjith Ramadurai**, **MRS Advances**, May **2016**, http://dx.doi.org/10.1557/adv.2016.350

18. "Studies on Local Structural Inhomogeneity and Origin of Ferroelectricity in Yttrium chromite Ceramics" , Venkateswara rao Manepalli and **Ranjith Ramadurai**, **MRS Advances, March 2016 - http://dx.doi.org/10.1557/adv.2016.222**

19. "Investigations on Dielectric phase transition behavior of Pb(Fe0.5-xScx)Nb0.5O3 Multiferroic Ceramics" , Bandi Mallesham and **Ranjith Ramadurai**, **MRS Advances, Feb 2016 http://dx.doi.org/10.1557/adv.2016.145**

20. "Effect of Crystal Structure and Cationic Order on Phonon Modes across Ferroelectric Phase Transformation in Pb(Fe0.5-xScxNb0.5)O3 Bulk Ceramics" B. Mallesham, B. Viswanath and **R. Ranjith**, **AIP Advances**, **6**, 015116 **(2016)**

21. E. Bruyer, A. Sayede, A. Ferri, R. Desfeux, R.V.K. Mangalam, **R. Ranjith**, W. Prellier Insight on the ferroelectric properties in a $(BiFeO_3)_2(SrTiO_3)_4$ superlattice from experiment and ab initio calculations **Applied Physics Letters 107, 042904 (2015)**

22. Anbarasu Manivannan, Santhosh Kumar Miana, Kumaraswamy Miriyala, Smriti Sahu & **Ranjith Ramadurai, "**Low power threshold switching characteristics of thin $GeTe_6$ films using conductive atomic force microscopy," **Appl. Phys. Lett., 105,** 243501 **(2014)**

23. B. Mallesham**, R.Ranjith** & M.Manivelraja**, "**Scandium induced structural transformation and B:B cationic ordering in $Pb(Fe_{0.5}Nb_{0.5})O_3$ multiferroic ceramics", **Journal of Appl. Phys.,116,** 034104 **(2014)**.

24. T.Durga Rao, **R.Ranjith** & Saket Asthana, **"**Enhanced magnetization and improved insulating character in Eu substituted BiFeO3", **Journal of Appl. Phys**., **115**, 124110 **(2014)**

25. Karthik Thangavelu, **Ranjith Ramadurai** & Saket Asthana, Evidence for the suppression of intermediate anti-ferroelectric ordering and observation of hardening mechanism in $Na_{1/2}Bi_{1/2}TiO_3$ ceramics through Cobalt substitution", **AIP Advances**, **4**, 017110 (**2014**)

26. Chatla Naga Babu, Paladugu Suresh, Prasenjit Das, Arruri Sathyanarayana, **Ranjith**

Ramadurai, Natarajan Sampath and Ganesan Prabusankar, **Journal of Molecular Structure**, **1062,** 141-146 **(2014).**

Publications prior to joining IITH

27. Ke Xu, **Ramadurai Ranjith**, Apurba Laha, Harish Pala, Andrian P Milanov, Roland A. Fischer, Eberhard Bugiel, Jurgen Feydt, Stefan Irsen, Teodar Toader, Claudia Bock, Detlef Rogalla, H.J. Osten, Ulrich Kunze and Anjana Devi, " Atomic Layer Deposition of Gd_2O_3 and Dy_2O_3: A study of the ALD characteristics and structural and electrical properties", **Chem. Mater., 24**, 651-658 (**2012**)

28. J. Oliveira, J. Agostinho Moreira, A. Almeida, M. R. Chaves, J. M. M. da Silva, J. B. Oliveira, M. A. S´a, P. B. Tavares, **R. Ranjith**, and W. Prellier, "Phase diagram of the orthorhombic, lightly lutetium doped $EuMnO_3$ magnetoelectric system", **Phys. Rev. B**., **84**, 094414 (**2011**)

29. **R.Ranjith**, A.Laha, E.Bugiel, H.J Osten, K.Xu, A. Milanov and Anjana Devi, " Down scaling of defected passivated Gd_2O_3 thin films on p-Si(001) wafers by H_2O assisted atomic layer deposition" **Semi. Sci. & Tech**., **25** 105001**(2010).**

30. Z. Zhang, **R. Ranjith**, W. Prellier, B. Xie, Y. Zhao,L.M Wong, S. Wang, J. Wang,and T. Wu, " Enhanced low field magnetoresistance in $La_{0.7}Sr_{0.3}MnO_3$ nanocrystal/MgO nanotube composites", **Applied Physics Letters, 96** 222501/1 – 222501/3 (**2010**).

31. **R.Ranjith**, U.Lüders and W.Prellier, "Multiferroic studies on $(BiFeO_3)_m(BaTiO_3)_n$ superlattices", **J. Phys. Chem. Of Solids, 71** 1140-1143 (**2010**).

32. J.Agostinho Moreira, A. Almeida, W.S.Ferreira, M.R.Chaves, S.M.F. Vilela, P.B. Tavares, B.Kundys, **R.Ranjith** and W.Prellier, " Effect of the external fields on the polar and dielectric properties of $Eu_{0.8}Y_{0.2}MnO_3$" **Journal of Applied Physics**, **107**, 024108/1 - 024108/7 **(2010)**

33. **R.Ranjith**, Ph.Boullay, A.David, R.V.K. Mangalam, M.B. Lepetit, U.Luders, W.Prellier, A.da Casto, A. Ferri, R.Desfeux, Gy.Vincze , Zs.Radi and C. Aruta, "Constrained Ferroelectric domain orientation in $BiFeO_3$-$SrTiO_3$ heterostructures", **Applied Physics Letters**, **96,** 022902/1 - 022902/3 (**2010**).

34. Andrian P.Milanov, Ke Xu, Apurba Laha, E.Bugiel, **R.Ranjith**, D.Schwendt, H.J.Osten, Haris Parala, R.A.Fischer and Anjana Devi., " Achieving high quality Gd_2O_3 thin films with sharp and abrupt interface on Si(100) by H_2O assisted atomic layer deposition", **J.Amer.Chem.Soc., 132,** 36 - 37(**2010**).

35. Apurba Laha, E.Bugiel, M. Jestremski, **R.Ranjith**, A. Fissel and H.J.Osten, "Encapsulated solid phase epitaxy of Ge quantum well embedded into epitaxial rare earth oxide", **Nanotechnology, 20,** 475604/1 - 475604/7 (**2009**).

36. J.A. Moreira, A. Almeida, W.S. Ferreira, M.R.Chaves, B.Kundys, **R.Ranjith,** W.Prellier, S.M.F. Vilela and P.B. Tavares, "Polar properties of $Eu_{0.6}Y_{0.4}MnO_3$ ceramics and their magnetic field dependence", **Journal of physics: Cond matt**, **21**, 446002/1 - 446002/10 (**2009**)

37. **R.Ranjith**, U.Luders, W.Prellier, A.Da Costa, Ida Dupont and R. Desfeux, "Local Probing of the ferroelectricity in $BiFeO_3$ thin films and $(BiFeO_3)_m(SrTiO_3)_m$ superlattices", **JMMM, 321,** 1710 - 1713 (**2009**).

38. Mahua das, **R.Ranjith**, C.Bittencourt, S.B. Krupanidhi, J.J. Pireaux and S.A.Shivashankar, "Assembly of sol-gel-grown Li_xCoO_2 nanocrystals through electromagnetic irradiation", **Applied Physics – A**, **95**, 523 - 536 (**2008**).

39. Asish K Kundu, **R.Ranjith**, B.Kundys, N.Nguyen, V.Caignaert, V.Pralong, W.Prellier and B.Raveau , "A Multiferroic ceramic with perovksite structure: $(La_{0.5}Bi_{0.5})(Mn_{0.5}Fe_{0.5})O_{3.09}$" **Applied Physics Letters, 93,** 052906/1 - 052906/1 (**2008**).

40. Asish K. Kundu, **R.Ranjith**, V.Pralong, V.Caignaert and B. Raveau, "Magneto-transport and Magneto-dielectric effect in Bi-based Perovskite Manganite" **Journal of Material Chemistry, 18,** 4280 - 4285 (**2008**).

41. **R.Ranjith**, J.Cheah, J.Wang, W.Prellier and T.Wu, "dc Leakage behavior and conduction mechanism in $(BiFeO_3)_m(SrTiO_3)_m$ superlattices", **Applied Physics Letters, 92,** 232905/1 - 232905/3 (**2008**).

42. M. Filippi, B. Kundys, **R. Ranjith**, A. Kundu, and W. Prellier, "Interfacial Contribution to the dielectric response in semiconducting $LaBiMn_{4/3}Co_{2/3}O_6$", **Applied Physics Letters, 92,** 212905/1 - 212905/3 (**2008**).

43. **R.Ranjith**, Asis Kundu, M.Filippi, B.Kundys, W.Prellier, B.Raveau, J. Laverdiere, M.P.Singh and S.Jandl, "Ferromagnetic and Magneto-dielectric studies in ferromagnetic insulating $LaBiMn_{4/3}Co_{2/3}O_6$ epitaxial thin films", **Applied Physics Letters, 92,** 062909/1 - 062909/3 (**2008**).
44. **R. Ranjith**, B. Kundys and W. Prellier, "Periodicity-dependence of the ferroelectric properties in $BiFeO_3/SrTiO_3$ multiferroic superlattices", **Applied Physics Letters, 91,** 222904/1 - 222904/3 (**2007**).

45. **R.Ranjith** and S.B.Krupanidhi, "Antiferroelectric like polarization behavior in compositionally varying $(1-x)Pb(Mg_{1/3}Nb_{2/3})O_3 – (x)\ PbTiO_3$ multilayers", **Applied Physics Letters**, **91**, 082907/1 - 082907/3 (**2007**).

46. Asis Sarkar, **R.Ranjith** and S.B.Krupanidhi, "Non linear dielectric behavior in three-component ferroelectric superlattices", **Journal of Applied Physics, 102,** 024108/1 - 024108/6 (**2007**).

47. Ayan Roychaudri, **R.Ranjith**, S.B.Krupanidhi, R.V.K Mangalam, A.Sundaresan, S.Majumdar and S.K.Ray, "Realization of biferroic properties in $La_{0.6}Sr_{0.4}MnO_3/0.7Pb(Mg_{1/3}Nb_{2/3})O_3$-$0.3PbTiO_3$ epitaxial superlattices", **Journal of Applied Physics**, **101**, 114104/1 - 114104/9 (**2007**).

48. **R.Ranjith**, Ayan Roychaudri, P.Victor and S.B.Krupanidhi, "Role of a template layer over phase formation, microstructure and polarization behavior of a ferroelectric relaxor thin film over platinum substrates", **Journal of Applied Physics, 101,** 104111/1 - 104111/9 (**2007**).

49. Ayan Roychaudri, **R.Ranjith**, S.B.Krupanidhi, R.V.K Mangalam and A.Sundaresan, "Interface dominated biferroic $La_{0.6}Sr_{0.4}MnO_3/0.7Pb(Mg_{1/3}Nb_{2/3})O_3$-$0.3PbTiO_3$ epitaxial superlattices", **Applied Physics Letters**, **90**, 122902/1 - 122902/3 (**2007**).

50. **R.Ranjith**, R.Nikhil and S.B.Krupanidhi, "Interfacial Coupling and their Size Dependence on $PbTiO_3$ – $PbMg_{1/3}Nb_{2/3}O_3$ Multilayers", **Phys. Rev.B**, **74**, 184104/1 - 184104/10 (**2006**).

51. R.Vengadesh Kumara Mangalam, **R.Ranjith**, A.Iyo, A.Sundaresan, S.B.Krupanidhi and C.N.R.Rao, "Ferroelectricity in $Bi_{26-x}M_xO_{40-\delta}$(M=Al and Ga) having γ-Bi_2O_3 related structure," **Solid State Communications, 140,** 42 - 44 (**2006**).

52. **R.Ranjith**, Asis Sarkar, Apurba Laha, S.B.Krupanidhi, A.K.Balamurugan, S.Rajagopalan and A.K.Tyagi. "Dielectric phase transition and polarization studies in stepped and compositionally graded lead magnesium niobate - lead titanate relaxor thin films". **Journal of Applied Physics, 98**, 014105/1 - 014105/7 (**2005**).

53. **R.Ranjith**, Apurba Laha and S.B.Krupanidhi, "Enhanced tunability and phase transition studies in compositionally varying lead magnesium niobate–lead titanate multilayered thin films". **Applied Physics Letters**, **86**, 92902/1 - 92902/3 (**2005**).

54. P.Victor, **R.Ranjith** and S.B.Krupanidhi, "Normal Ferroelectric to relaxor behavior of laser ablated Ca-doped Barium Titanate Thin films" **Journal of Applied Physics**, **94**, 7702 - 7709, (**2003**).

55. P.Victor, **R.Ranjith**, A.K.Tyagi, S.Rajagopalan and S.B.Krupanidhi, "Growth and studies of calcium doped laser ablated barium titanate thin films", **Integrated Ferroelectrics**, Volume **54**, 747-754 (**2003**).

56. Growth and study of BaZrO3 thin films by pulsed excimer laser ablation, Rajasekarakumar, V., Victor, P., **Ranjith, R.**, (...), Tyagi, A.K., Krupanidhi, S.B. 2003 Materials Research Society Symposium - Proceedings
784, pp. 399-404

57. Dielectric studies of laser ablated Ca doped BaTiO3 thin films Victor, P., **Ranjith, R.**, Sarkar, A.,.. Saha, S., Krupanidhi, S.B. 2003 Materials Research Society Symposium - Proceedings
748, pp. 135-140

58. Surojit Gupta, **R.Ranjit**, C.Mitra, Pratap.R and R.Pinto, "Enhanced room temperature Magnetoresistance in $La_{0.7}Sr_{0.3}MnO_3$ – glass composites", **Applied Physics Letters**, **78**, 362 - 364 (**2001**).

Selected Invited talks: Intl. / National conferences – after joining IITH (Dec 2011 onwards)

1. **"Invited Talk"** – "Influence of surface modification on valence band offset formation of ultra-thin Gd2O3 layers deposited on p-Si(111) wafers by molecular beam epitaxy" – International Conference on Thin Films and Applications (ICTFA-2012) **15-17 March 2012** – SASTRA university, Thanjavur, Tamil Nadu

2. **"Invited Talk"** – "Recent Advances in multiferroic relaxors: Bulk and Thin films" – National Conference on Condensed Matter Physics and Applications (CMPA-2012) **Dec 2012.** – Manipal Institute of Technology, Manipal, Karnataka

3. **"Invited Talk"** – "Nano Scale Control on Electrical Transport and Low Power Ovonic Threshold Switching Characteristics of GeTe6 Thin Films using Conductive - Atomic Force Microscope" - Second International Conference on Nanostructured Materials and Nanocomposites (ICNM 2014) to be held on **19-21 December 2014**, Kottayam, Kerala, India.

4. **"Invited Talk**" – "Studies on tunability of polarization components and electric field induced crystallization in polyvinylidenefluoride (PVDF); a piezo polymer", - Ronit Ganguly2, Vijaya Bhaskar2, Kumaraswamy Miriyala1, Soumya Bhandyopadhyay1, Saswata Bhattacharya1, Amit Acharyya2 and Ranjith Ramadurai1 – Compflu – 2016, **12-14 Dec 2016**, Hyderabad, India.

5. **"Invited Talk"** – "Structural tunability and domain orientation effects on ferroelectric polarization and exchange bias in BiFeO3 epitaxial thin films " " International Meeting on Highly Correlated Systems (IMHCS 2017)" **24-26 March 2017**, Kottayam, Kerala, India.

6. **"Invited Talk"** - "Strain Induced Structural Changes in BiFeO3 Epilayers" "International Conference on Nano-Structured Materials and Devices (ICNSMD-2018)", **December 17-20, 2018** at University of Delhi, New Delhi.

7. **"Invited Talk"** – "Tunability of polarization components and electric field induced crystallization in poly-vinylidene fluoride (PVDF); a piezo polymer for flexural sensing and energy harvesting" - 5th International conference on Nano Materials and Nano Composites (5th ICNN-2018)" 8-10 **Feb 2018** at VIT chennai.

8. **"Invited Talk"** – "Strain Induced Structural Changes in BiFeO3 Epilayers" "First Indian Materials Conclave and 30th Materials Research Society of India (MRSI) meeting - 2019", **February 12-15, 2019** at Indian Institute of Science, Bangalore.

9. **"Keynote Talk"** – "Strain Induced effects in Multiferroic thin films", PCFM-2019, GITAM University, Hyderabad campus, **21-22 Feb 2019**

10. **"Invited Talk"-** "Grain to Grain epitaxy like growth of nanostructures for magneto electric devices" "icold-2019- international conference on laser deposition" - organized jointly by IIT Madras and Alva's institute of engineering and technology **27-29 November 2019** at Mangalore, India.
11. **"Invited Talk"** - "Grain to Grain epitaxy like Multiferroic Composites of Lead-Free Ba0.85Ca0.15Zr0.1Ti0.9O3/ CoFe2O4 Through Pulsed Laser Ablation."- "ICFM-2020 - international conference on Functional Materials" - IIT Kharagpur, **6-8 January 2020**, Kharagpur, India.
12. **"Invited Talk"** – "Piezoresponse Force Imaging of Functional domains on Strained BiFeO3 Epilayers" "APMC-12 – Asia Pacific Microscopy Conference" scheduled **3-7 February 2020** at Hyderabad, India.

13. **"Invited Talk"** – "Strain Engineering in Multiferroic Nano Composites of Ba0.85Ca0.15Zr0.1Ti0.9O3/ CoFe2O4 for Magneto-Electric Devices" "Asian Meeting of Applied Physics", **28-29 Nov 2020**. (Online mode) organized by Kyushu University, Japan.

Workshops/conferences: coordinated/organized/Co-chaired

1. **ICCMS** – "Fourth International Congress on Computational Mechanics and Simulation"– Dec2012, part of the organizing committee and convenor of theme : "Computational Materials Science"
2. Part of organizing committee and delivered a Lecture on "Photoelectron Spectroscopy" in the **MSME Departmental TEQIP** workshop on "Advanced Materials Characterization Techniques" – Nov 2012
3. **Co-ordinated and Conducted** TEQIP workshop on "Advanced X-ray Diffraction Studies: Bulk and Thin films" – 4th to 9th July 2016
4. **Organizing Secretary** of "National Conference on Emerging Materials (CEMAT-2016)" 18-19 July 2016, IISc Bangalore.
5. **Co-chair – "Ferroics"** theme in the "International Conference of Young Researchers on Advanced Materials" (**IUMRS-ICYRAM 2016**), **11-15 Dec 2016**, IISc Bangalore.
6. **Co-chair – "Multiferroics" theme in** "First Indian Materials Conclave and 30th Materials Research Society of India (MRSI) meeting - 2019", **February 12-15, 2019** at Indian Institute of Science, Bangalore.
7. **Organizing secretary – "Tactical missile propulsion" -** A two day workshop of AR&DB conducted in IITH - 22-23 Oct 2019.

Selected work presented by students - International /National - conferences

1. Kumaraswamy Miriyala**,** R. Ranjith, Deshpande,A.S "Role of surface defects on optical absorptional features of BiFeO3 nano particles", **2nd International Conference on Advanced Functional Materials (ICAFM), Thiruvananthapuram, Kerala, India, February 19-21,2014.** (**Poster Presentation**)
2. Kumaraswamy Miriyala, Ranjith Ramadurai "Microstructural influence on piezoresponse and leakage current behavior of Na0.5Bi0.5TiO3 Thin Films**", 2016 MRS Spring Meeting & Exhibit held at Phoenix, Arizona, March 28-April 1, 2016.** (**Poster Presentation**)
3. Kumaraswamy Miriyala, R. Ranjith, "Microstructural tuning and its influence on the piezoelectric properties of Sodium Bismuth Titanate thin films, a lead free piezoelectric grown by pulsed laser deposition", **National Conference on Emerging materials (CEMAT-2016) , IISC Bangalore, India, July 18-19 2016.** (**Poster Presentation**)
4. B. Mallesham and R. Ranjith "Investigation of dielectric phase transtion behavior of $Pb(Fe_{0.5-x}Sc_xNb_{0.5})O_3$ multiferroic ceramics" **2015 MRS Fall meeting and Exhibit, Boston, Massachusetts, USA. 29th Nov 2015 – 4th Dec 2015. [poster presentation]**
5. B. Mallesham **and** R. Ranjith, "Structure induced cation ordering in $Pb(Fe,Sc)O_3$: a multifunctional piezo ceramic" **18th International Workshop on The Phyics of Semicoductors Devices, (18th IWPSD), IISc , Banglore, India, 7th Dec-10 th dec, 2015 [poster presentation]**
6. B Mallesham and R. Ranjith, "Structural and Piezoresponse Studies of Polycrystalline and Epitaxial Thin films of Multiferroic $Pb(Fe_{0.5}Nb_{0.5})O_3$", **Conference on Emerging materials (CEMAT-2016), IISC Bangalore, India, 18th july – 19th july, 2016 [poster presentation]**
7. B. Mallesham, R. Ranjith, M. Manivel Raja, "Effect of Sc Substitution on Local ordering, Ferroelectric phase transition temperature (T_{max}) of $Pb(Fe_{0.5}Nb_{0.5})O_3$ multiferroic relaxors" **2nd International Conference on Advanced Functional Materials (ICAFM- 2014), Thiruvananthapuram, Kerala (India), February 19-21, 2014**
8. Vasundhara G, Swapnil ghodke, B. Mallesham and R. Ranjith, "Enhancement of relaxor features in $Na_{0.5}Bi_{0.5}TiO_3$ a lead free piezo-ceramic", **2nd International Conference on Advanced Functional Materials (ICAFM-2014), Thiruvananthapuram, Kerala (India), February 19-21, 2014**

9. Swapnil C Ghodke, Akkisetty Bhaskar & Ranjith R, "Piezoelectric Polymer/Ceramic composite for sensor applications", **Oral Presentation** in International conference on **Advancements in Polymer Materials,** APM 2013, **01-03 March 2013**

Teaching @ IITH

B.Tech

Core courses (credits):

1. MS1050 – Physics of Solids (1)
2. MS1030 – Materials Characterization -I (1)
3. MS1070 – Semiconductor Materials (1)
4. MS2090 – Electronic Materials (1)
5. MS3010 – Magnetic Materials (1)
6. MS3040 – Thin Films (2)
7. MS2060 – Functional Polymers (2 – shared course)
8. MS2011 – Functional characterization of Materials – Lab course (2)

M.Tech courses (credits):

1. MS 5010 – Properties of Materials (3)
2. MS 5011 - Materials Synthesis and Characterization lab (3)
3. MS 5080 – Thin Film Technology (3 - Elective)
4. MS 5310 – Functional Ceramics (3 – Elective UG and PG)
5. MS 5430 – Functional Polymers and Composites (3 – Elective UG and PG shared)
6. IS 5010 – Smart Materials and Transducers (2 shared course)

Core Courses to be taught in the new UG curriculum (2020 onwards)

1. X-ray Diffraction in Solids (3 credits)
2. Physics of Solids (Applied Quantum Mechanics to Materials engineering) (3)
3. Physics of Solids – II (Semiconductors, Phonons and thermal properties) (3) (shared)
4. Functional properties of materials (3)
5. Thin film technology and nano fabrication (3) (shared)

Teaching Learning Center: projects / workshops @ IITH

1. Built a table top model of four circle goniometer – for teaching x-ray diffraction of thin films (ongoing)
2. Built a table top model of Atomic Force microscope – for teaching scanning probe microscopy (ongoing)
3. The list of topics under the theme of Research in higher education workshop/talks (1.5 to 3 hrs)at IITH
   i. Why and how to do Research in Higher education
   ii. How to write a good scientific paper?
   iii. How to Formulate Research proposals / projects?
   iv. How to do budgeting and prepare reports in Research proposals?

4. List of Lectures under "Advanced pedagogy and pedagogic techniques"
   i. Advanced pedagogic techniques – Teaching learning methods - 5 days (1.5 to 3 hrs eachday) detailing active learning instruction strategies (IIT Hyderabad, june 2019)
   ii. Pedagogic Techniqus – Teaching learning methods "Peer Instruction and evaluation techniques" half a day workshop in VJIT, Hyderabad Dec 2018.

iii. "Active Learning instruction strategies"- Webinar of 3 hours orgainzed by Kalasilingam Academy of Research and Education, TN, 17th June 2020.

TEQIP and Outreach activities

1. **"How to write a "good" research paper / review?"** – 3 hour talk on the Research workshop organized by IEEE Hyderabad chapter and IEEE young professionals at IIIT Hyderabad, **26th Aug 2017.**
2. **Coordinated (with Dr. Mudrika K, MSME)** a three day workshop for school children of Telangana and Andhra under **MANAK** (Million Minds Augmenting National Aspiration and Knowledge) executed by **Department of Science & Technology and National Innovation Foundation, India. – 30th Nov – 2nd Dec 2018**
3. **"X-ray Diffraction" -** Conducted a 3 hour workshop as a resource person in a TEQIP workshop organized by Govt.College of Engg., Bargur, TN – **12th Dec 2019**
4. **"Strain engineering in Multiferroics" -** Delivered a TEQIP lecture in a Webinar on nanomaterials theme organized by Nanjil Catholic College of Arts and Science, - **23rd June 2020**.
5. **"Strain Engineering in Magnetoelectric Multiferroics and Nano Composites for Magneto-electric Devices" –** TEQIP lecture on Short Term Course on "Advanced Energy Materials", 12- 16th Oct 2020 – NIT Jalandhar.

Institute activities

1. **Faculty In-Charge** of Accommodation activities of IITH from **20th Sep 2018** upto date.
2. **Head** of Engg. Science (Virtual Dept) - **Oct 2017 to Oct 2020**
3. **Chairman**, Students Cultural Activities, IITHyderabad, from **09 Oct 2015 – 08 Oct 2018**.
4. **Committee member –** Involved in the centralized Equipment committee of IITH to list and facilitate online access for major equipment of the Institute. Constituted on **25 Nov 2016**
5. **Associate chairman**, Students Cultural Activities, IIT Hyderabad, starting from **17 May 2013 to 08 Oct 2015**
6. **Coordinator – Mini projects** as a part of orientation of fresh students for three years **2011-13.**
7. **Served in various committees** of the institute and department in recruitment of staff both for the department of MSME and IITH.
8. **Established and maintained "Day care facility"** in IITH for the past six years.
9. **Currently part of the local management committee(LMC)** of establishing a campus school for the residents of IITH.

Miscellaneous

Research Work during Masters Program (M.Sc) **Jan 2001 - May 2001**
(Indira Gandhi Center for Atomic Research (IGCAR), Kalpakkam, India)

"Characterization of Nickel-Germanium Diffusion couple using SIMS".

Summer Training Program **May 2000 – July 2000**
(Tata Institute of Fundamental Research (TIFR), Mumbai, India)

Selected for the Visiting Student Research Program (VSRP-2000) conducted by TIFR for two months. A research project on laser ablation of $La_{0.7}Ce_{0.3}MnO_3$ thin films was submitted at the end of the program. Simultaneously, worked on CMR studies on Glass composites of $La_{0.7}Sr_{0.3}MnO_3$.

Research work presented in International /National - conferences

1. Poster presentation on "Growth and studies of ultra thin Gd_2O_3 layers and Gd_2O_3/Si/Gd_2O_3 stacking on p-Si(111) wafers by molecular beam epitaxy for resonant tunnel diode applications" **R.Ranjith**, A. Laha, E.Bugiel and H.J. Osten, in **MBE2010** an international conference at Berlin **22 – 26th August 2010**.

2. An **Oral presentation** on "Ferroelectric and scanning probe studies on $BiFeO_3$ and $(BiFeO_3)_m(SrTiO_3)_m$ superlattice structures fabricated by pulsed laser ablation" **R.Ranjith**, W.Prellier, A.De Costa, Ida Dupont and Rachel Desfeux, in **"E-MRS 2008"** an International conference conducted by **European Materials Research Society** at Strasbourg, France. **26th– 30th May 2008**.

3. An **Oral presentation** on "Magneto Capacitance/Magneto dielectric studies on LaBi(Mn(Co/Ni))O6 type perovskites", M.Filippi, B.Kundys, **R.Ranjith**, A.K.Kundu and W. Prellier, in **"E-MRS 2008"** International conference held by **European Materials Research Society** at Strasbourg, France. **26th – 30th May 2008**.

Research work presented in National - conferences

1. An **Oral** Presentation on *"Polarization studies on PT-PMN superlattices"* on a **National Conference on Materials Science (NCMS 2006)** held at Periyar University, Salem on 16 – 17th Feb 2006.

1. *"Size dependent Ferro electric and Antiferroelectric coupling in compositionally varying PMNPT multilayers"*. **R.Ranjith**, Asis Sarkar and S.B.Krupanidhi, **poster presentation** at Functional Meta Materials at Nano Scale – 2005 (**FMN-2005**).

2. An **Invited talk** on *"Pulsed laser ablation grown relaxor based bilayers, multilayers and Superlattice structures for multiferroic applications"* DAE-BRNS **National symposium** on **Pulsed laser ablation** (PLD-2005) on Nov-2005.

3. "Ferroelectric and Impedance spectroscopic studies in Ca doped $BaTiO_3$ thin films" **Poster presentation** on **National Seminar** on Ferroelectrics and Dielectrics (**NSFD- 2002**) held at Indian Institute of Science, Bangalore, India. Dec 2002.

4. An **Oral** Presentation on **Division of Chemical Sciences Day** on *"Artificial Relaxor Ferroelectric Superlattices"* on 28th Jan 2006.

International Schools Attended

1. Attended "**Eurpean school on Multiferroics (ESMF 2008)**" – summer school held at Residencia Universitaria (RESA) campus de Montilivi, Girona, Spain. **1-5th September 2008**.

2. **Attended** the **ICMS-ICMR** International Winter School on "**Physics and Chemistry of Solids**" held at JNCASR, Bangalore, India. December - 2007.

3. "**European School on Multiferroics (ESMF 2007)**" – Participant in summer school held at Grenoble, France, **July-2007**.