İ. BURÇ MISIRLIOĞLU
CURRICULUM VITAE

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Academic Positions

Sabancı University Faculty of Engineering and Natural Sciences, January 2020-Present
Professor in Materials Science and Nano Engineering Program.

Sabancı University Faculty of Engineering and Natural Sciences, May 2014 – January 2020
Associate Professor in Materials Science and Nano Engineering Program.

Sabancı University Faculty of Engineering and Natural Sciences, September 2008 - May 2014
Assistant Professor in Materials Science and Nano Engineering Program.

Massachusetts Institute of Technology, November 2007- August 2008
Post-doctoral associate in the Department of Nuclear Science & Engineering, position funded by the U.S. Department of Energy.

Max Planck Institute of Microstructure Physics, October 2006-November 2007
Post-doctoral researcher under the sponsorship of the Alexander von Humboldt Foundation.

Education

Ph.D. in Materials Science and Engineering, University of Connecticut, July 2006.
Thesis title: Stress Relaxation and Phase Transformations in Ferroelectric Heterostructures.

M.Sc. in Materials Science, Istanbul Technical University, July 2001.
Thesis title: Microstructural and Chemical Deactivation Mechanisms of Catalytic Converters for Gasoline Engines.

B.Sc. in Metallurgical Engineering, Istanbul Technical University, February 1998**.**
Senior year project: An experimental approach to increase the ductility of Al-Si die cast alloys via grain refinement.

Awards and Honors *(in reverse chronological order)*

Science Academy, Young Scientist Program Award (BAGEP), 2014.

The Scientific and Technological Research Council of Turkey (TÜBİTAK), Young Investigator Incentive Award in Engineering, 2013.

Middle Eastern Technical University (ODTÜ) Prof. Mustafa Parlar Incentive for Research Award, 2012.

Turkish Academy of Sciences Young Investigator Award (TÜBA GEBİP), 2011.

Outstanding graduate thesis award of School of Engineering, University of Connecticut, 2006.

Alexander von Humboldt Fellow at the Max Planck Institute of Microstructure Physics (October 2006 – October 2007).

Outstanding Graduate Student at the Materials Science and Engineering Department, University of Connecticut (2005).

ASM Hartford (CT) Chapter Speaking Contest First Prize Award (2005).

Academic Service at Sabancı University

Seminar coordinator and organizer of the Materials Science and Engineering Program between 2008 and 2012.

Coordinator for the Materials Science and Nano Engineering Program Ph.D. qualification exam since 2008 (Offered at the end of each Fall and Spring Semesters).

Coordinator and lead lecturer of the "Material Characterization Methods" module in the Nanotechnology Master of Engineering Program in Fall of 2013 (8 week lecture, 3 hours a week).

Lecturer of "Materials Science and Nanotechnology" in Summer School for High School Students (2 week lecture in Summer of 2016, 4 weeks in Summer of 2017 and 2018).

European Credit Transfer System (ECTS) accreditation representative for the Materials Science and Engineering Program between 2012 and 2017.

Member of the Faculty of Engineering and Natural Sciences Award committee since 2015.

Other

Management Committee Member of the European COST action "Single and Multi phase ferroics in restricted geometries (SIMUFER)", 2012-2014.

Students/Researchers Supervised

Ludwig Geske (Feigl as of 2007), Ph. D 2008, co-advised at the Max Planck Institute of Microstructure Physics. Thesis topic: Formation of elastic domains and their contribution to properties in $PbZr_xTi_{1-x}O_3$ multilayers. Now research scientist at Ecole Polytechnique Federale de Lausanne, Switzerland.

Hale Nur Çöloğlu, M. Sc. 2011, Sabancı University. Thesis topic: Formation of electrical domains in ferroelectric thin films with depletion charges. Now project engineer at National Nanotechnology Research Center (UNAM), Bilkent University, Ankara, Turkey.

Özgün Kocabıyık, B.Sc. 2011, Sabancı University, Senior year project: Sythesis and characterization of magnetofluids for actuated flow in microchannels. Now Ph.D candidate at Ecole Polytechnique Federale de Lausanne (EPFL), Lausanne, Switzerland.

Hamidreza Khassaf, M. Sc. 2012, Sabancı University. Thesis topic: Effect of A-site doping on leakage current behavior of sol-gel synthesized $BiFeO_3$ thin films. Obtained his Ph.D. at the University of Connecticut (successfully passed the qualify), CT, USA, now post-doc at Brown University, RI, USA.

Mohammadreza Khodabakhsh, M. Sc. 2014, Sabancı University. Thesis topic: Strong dependence of phase transition behavior of sol-gel synthesized $BiFeO_3$ on ionic radii of A-site dopants. Now Ph.D. student at Koç University, Materials Science Program, Istanbul, Turkey.

Omid Mohammadmoradi, M. Sc. 2017, Sabancı University. Thesis topic: $Ba_{1-x}Sr_xTiO_3$ thin films as ferroelectric Schottky diodes: Experimental observation of strong resistive switching and its thermodynamic analysis. Now Ph.D. student at Sabancı University, İstanbul, Turkey, co-advised with Prof. Gözde İnce.

Canhan Şen, successfully defended his Ph.D., Sabancı University, in September of 2018. Canhan worked on spin dependent carrier density control at ferroelectric-ferromagnetic semiconductor interfaces that get attention for low power spintronic transistor applications.

Wael Ali Saeed Abdulaimi, Ph.D. candidate, Sabancı University, as of Spring of 2018 (co-advised with Prof. Özge Akbulut). Wael's research focuses on electroresistance of vortex type magnetic ordering in nanodisks.

Can Akaoğlu, Ph.D. candidate, Sabancı University, as of Summer of 2018 (co-advised with Prof. Özge Akbulut). Can's research focuses on micromagnetic simulation of magnetism and magnetoelectric coupling in layered nanostructures. Can left for a Ph.D. position at University of Manchester in Fall of 2019.

Onur Zırhlı, Ph.D. candidate, as of Spring 2019 (co-advised with Prof. Ozan Akdoğan of Bahçeşehir Univ.). Onur is working on synthesis of $Fe_{16}N_2$, a magnetic nitride with theoretical moment matching that of rare earth metals in addition to construction of a Magneto-optical Kerr Effect (MOKE) setup at Sabancı in L003, a lab under my and Prof. Akdoğan's supervision.

Post-docs

Dr. M. Barış Okatan (2019-2020), funded by the US Air Force of Scientific Research (US AFOSR). Dr. Okatan is now a faculty member in Materials Science and Engineering Program of İzmir Institute of Technology.

Dr. Özlem Karahan (together with Prof. Kürşat Şendur, 2016-2019), left for a researcher position at MIT under a Fulbright scholarship.

Dr. Mohsen Janipour (together with Prof. Kürşat Şendur, 2016-2018), now Alexander von Humboldt Research Fellow in Bielefield, Germany.

Dr. Merve Ertaş Uslu, funded by a TUBITAK 1003 project (together with Prof. Kürşat Şendur, 2016-2018), now post-doc at Duquesne University, PA, USA.

Dr. Ozan Akdoğan (2015-2017) under sponsorship of TUBITAK for returning scientists, now Associate Professor of Physics at Bahçeşehir University, Istanbul.

Dr. Nilay Akdoğan (2015-2017) under sponsorship of TUBITAK for returning scientists, now Assistant Professor of Physics at Piri Reis University, Istanbul.

Projects & Funding History *(at Sabancı University, in reverse chronological order, amounts given in USD)*

Co-PI, (with Prof. Ebru Alkoy of Gebze Technical University, Gebze, Turkey) titled "Investigation of the effect of crystallographic anisotropy and defects on the electrocaloric response of stress-free relaxor ferroelectric plates by experimental and analytical techniques" granted by the United States Air Force Office of Scientific Research (USAF AFOSR) in May of 2018 (budget: 210000 USD for 3 years), active as of July of 2018.

PI, TUBITAK 1001 Project, active as of October of 2017: "Control of magnetic orientation and electroresistance of nano structures with vortex magnetism", (total budget granted: 120000 USD).

PI, TUBITAK 1001 Project, active as of April 2017: "Development of a non-destructive and low power read-out ferroelectric memory using a multilayered approach", (total budget granted: 120000 USD).

Co-PI, TUBITAK 1003 Project, active as of March 2016 "Smart composite panels for efficient heat insulation around the year" in cooperation with industrial partners, granted in late 2015 (total budget granted: 1000000 USD).

PI, under European COST action project titled SIMUFER (Single and Multiphase Ferroics in Restricted Geometries) granted in January 13, 2014 for a duration of 30 months, (total budget granted: 180000 USD): "Submicron Ba,Sr,TiO_3 thin films for second harmonic generation and dependence of their functionality on electrical boundary conditions".

PI, funded collaboration with Prof. Arkadi P. Levanyuk (2-4 months duration in 2010, 2012, 2013, funded by The Scientific and Technological Research Council of Turkey and Sabancı University, 20000 USD): Phase transition behavior of ferroelectric-paraelectric superlattices, study of single and multidomain stabilities near and far below the transition temperature.

PI, Young Investigator Research Award (2011 May-2014 May, granted by the Turkish Academy of Sciences, 36000 USD): Study of the properties of ferroelectric thin films within the wide bandgap semiconductor consideration and ferroelectric-paraelectric superlattices for high density charge storage and tunable device applications.

PI, Research Project (Completed in 2012, funded by TUBITAK, 180000 USD): Wet method fabrication and characterization of multiferroic $BiFeO_3$ thin films.

Dr. Mısırlıoğlu has several other consultancy duties in a number of other projects such as detection of magnetic structure of a new FeN alloy using the MOKE setup constructed at Sabancı Univ., study of phase co-existence in clamped thin film structures undergoing structural symmetry breaking transitions and alike.

Previous Work Experience (1999-2006)

Research associate, Spring and Summer of 2006, University of Connecticut, USA.

Research Assistant, 2001-2006, Department of Materials Science & Engineering, University of Connecticut, CT, USA.

Webmaster, 2001-2004, Department of Materials Science & Engineering, University of Connecticut, CT, USA.

Research Assistant, 1999-2001, Materials Science Division, Istanbul Technical University, Istanbul, Turkey.

Research Interests

Synthesis and growth of functional oxides in both bulk and thin film form via chemical and plasma sputtering methods followed by structural, electrical and thermodynamic characterization to correlate the physical properties such as transition temperatures to powder size, film thickness and microstructure. Microstructural methods include XRD, Raman Spectroscopy, Scanning and Transmission Electron Microscopy methods.

Dielectric, semiconducting and optical properties of ferroelectric oxides. Tailoring of ferroelectrics in design of low power consuming non-volatile, non-destructive read-out memories and switch elements in integrated circuits as well as active components in pyroelectric sensors and high density capacitors.

Materials modeling and simulation, electrodynamics of materials, application of numerical methods in continuum media and complex analytical formulations with no definite exact solutions. Micromagnetics and Monte-Carlo methods to study phase transitions in homogeneous and inhomogeneous systems.

Physical and electrical properties of artificially fabricated multilayer oxides/superlattices, size and defect effects in these systems, experimental studies of structure-property relationship in superlattices, prediction and design of new properties in these materials.

Thermodynamics of phase transformations in bulk and thin film structures as well as solid solutions and alloys, application of the Landau-Ginzburg theory of phase transitions to solids. Effect of elasticity and elastic instability on the inhomogeneous nature of phase transitions and evolution of the order parameter of the transition under various elastic and electrical boundary conditions.

Reviewing and Editorial activities (2008-Recent)

Reviewed articles for Thin Solid Films, Journal of Materials Science, Journal of Materials Research, Applied Physics Letters, Journal of Applied Physics, Materials Chemistry and Physics, IEEE Transactions on Electron Devices, ACS Applied Materials & Interfaces, Scripta Materialia, IEEE Transactions on Ultrasonics, Ferroelectrics and Frequency Control, Acta Materialia, Physica Status Solidi A, Scientific Reports, Journal of Alloys and Compounds, ACS Applied Electronic Materials, Physical Review Letters.

Editorial Board Member of the journal Scientific Reports (Nature Publishing Group) since July 2016.

List of Publications

(*69 SCI publications as of 24.08.2020, 1018 citations, 893 times cited by others, h index of 17 in Web of Science, 72 publications in Scopus with 1034 citations and h-index of 18, 1375 citations and h index of 21 in Google Scholar)*

Ongoing work (Activity initiated in Spring-Summer of 2019, submission of the work anticipated in 2020)

"Effects of energy of interphase boundary in theory of two-phase states at phase transitions in clamped systems", A. P. Levanyuk, S. A. Minyukov, M. B. Okatan and I. B. Misirlioglu, invited contribution for the special issue "Domains and Domain Walls in Ferroic Materials" in Journal of Applied Physics.

"Anisotropy of the electrocaloric effect in $PbMnO_3$-$PbTiO_3$ solid solutions", M. B. Okatan, I. B. Misirlioglu, E. M. Alkoy and S. Alkoy, under preparation.

"Landau, Ginzburg, Devonshire and other", A. P. Levanyuk, M. B. Okatan and I. B. Misirlioglu, invited paper for 50th Anniversary of Ferroelectrics.

Submitted (in 2020)

"Control of chirality of magnetic nanostructures via electrodynamic coupling of time varying electric field pulses", W. A. S. Aldulaimi, C. Akaoglu, M. B. Okatan, K. Sendur and I. B. Misirlioglu.

Journal Articles (in reverse chronological order)

1. E. M. Alkoy, M. B. Okatan, E. Aydin, Y. Kilic, I. B. Misirlioglu and S. Alkoy, "Effect of Anisotropy on the Electrical and Electrocaloric Properties of 0.90Pb(Mg1/3Nb2/3)O3-0.10PbTiO3 Relaxor Ceramics", Journal of Applied Physics, 128, 084102 (2020).

2. O. Zirhli, N. G. Akdogan, Y. N. Odeh, I. B. Misirlioglu, E. Devlin and O. Akdogan, "Fabrication and Characterization of $Fe_{16}N_2$ Micro-Flake Powders and their Extrusion Based 3D printing into Permanent Magnet Form", Advanced Engineering Materials, 2000311 (2020).

3. M. E. Uslu, I. B. Misirlioglu and K. Sendur, "Crossover of Spectral Reflectance Lineshapes in Ge-doped VO2 Thin Films", Optical Materials, 104, 109890 (2020).

4. A. K. Sadaghiani, H. Rajabnia, S. Celik, H. Noh, H. J. Kwak, M. Nejatpour, H. S. Park, H. Y. Acar, I. B. Misirlioglu, M. R. Özdemir and A. Kosar, "Pool boiling heat transfer of ferrofluids on structured hydrophilic and hydrophobic surfaces: The effect of magnetic field", International Journal of Thermal Sciences, 155, 106420 (2020).

5. P. Erkoc, Y. N. Odeh, N. Alrifai, O. Zirhli, N. G. Akdogan, B. Yildiz, I. B. Misirlioglu and O. Akdogan, "Photocurable pentaerythritol triacrylate/lithium phenyl-2,4,6-trimethylbenzoylphosphinate-based ink for extrusion-based 3D printing of magneto-responsive materials", Journal of Applied Polymer Science, e49043 (2020).

6. A. K. Sadaghiani, R. Altay, H. Noh, H. J. Kwak, K. Sendur, I. B. Misirlioglu, H. S. Park and A. Kosar, "Effects of bubble coalescence on pool boiling heat transfer and critical heat flux - A parametric study based on artificial cavity geometry and surface wettability", International Journal of Heat and Mass Transfer, 147, 118952 (2020).

7. M. Janipour, I. B. Misirlioglu and K. Sendur, "A theoretical treatment of THz resonances in semiconductor GaAs p-n junctions", Materials, 12, 15, 2412 (2019).

8. M. E. Uslu, R. A. Yalcin, I. B. Misirlioglu and K. Sendur, "Morphology induced spectral reflectance lineshapes in VO_2 thin films", Journal of Applied Physics, 125, 22, 223103 (2019).

9. C. Sen, W. A. S. Aldulaimi, O. M. Moradi and I. B. Misirlioglu, "Loss of spin polarization in ferromagnet/ferroelectric tunnel junctions due to screening effects", Journal of Physics D: Applied Physics, 52, 015305 (2019).

10. M. E. Uslu, I. B. Misirlioglu and K. Sendur, "Selective IR reflectivity in highly textured phase change VO_2 thin films grown via oxidation of metallic V films on substrates" OSA Optical Materials Express, 8, 8 (2018).

11. O. Mohammadmoradi, C. Sen, G. A. Boni, L. Pintilie and I. B. Misirlioglu, "Strong composition dependence of resistive switching in Ba1-xSrxTiO3 thin films on semiconducting substrates and its thermodynamic analysis", Acta Materialia, 148, 1-13 (2018).

12. A. P. Levanyuk, S. Minyukov and I. B. Misirlioglu, "Loss of elastic stability and formation of inhomogeneous states at phase transitions in thin films on substrates", in press, Ferroelectrics, 2018.

13. E. S. Kocaman, E. Akay, C. Yilmaz, G. Bektas, H. Türkmen, I. B. Misirlioglu and M. Yildiz, "Monitoring damage state of fiber reinforced composites using a fiber Bragg grating network combined with temperature measurements", MDPI Materials, 10, 32 (2017).

14. I. B. Misirlioglu and S. P. Alpay, "Compositionally Graded Ferroelectric Stacks as Wide Bandgap Semiconductors: Domain Stabilities, Dielectric Properties and Origin of Low Loss", Acta Materialia 122, 266 (2017).

15. A. P. Levanyuk, S. Minyukov and I. B. Misirlioglu, "Negative bulk modulus and loss of elastic stability near tricritical transitions in thin films on substrates", in the 500th Special Issue of Ferroelectrics (2016).

16. M. Janipur, I. B. Misirlioglu and K. Sendur, "Tunable surface plasmon and phonon polariton interactions for moderately doped semiconductor surfaces", Scientific Reports 6, 34071 (2016).

17. I. B. Misirlioglu and K. Sendur, "Ferroelectric/semiconductor/tunnel-junction stacks for non-destructive and low power read-out memory", IEEE Transactions on Electron Devices 63, 2374 (2016).

18. A. P. Levanyuk, I. B. Misirlioglu, "Strong influence of non-ideality of electrodes on stability of single domain state in ferroelectric-paraelectric superlattices", Journal of Applied Physics 119, 024109 (2016).

19. I. B. Misirlioglu, M. Yildiz and K. Sendur, "Domain control of carrier density in a ferroelectric-semiconductor interface", Scientific Reports, 5, 14740 (2015).

20. I. B. Misirlioglu, C. Sen, M. T. Kesim and S. P. Alpay, "Low voltage ferroelectric-paraelectric superlattices as gate materials for field effect transistors", online in 50th Anniversary Issue of Journal of Materials Science (2015).

21. Y. Espinal, M. T. Kesim, I. B. Misirlioglu, S. Trolier-McKinstry, J. V. Mantese, and S. P. Alpay, "Pyroelectric and Dielectric Properties of Ferroelectric Films with Interposed Dielectric Buffer Layers", Applied Physics Letters 105, 232905 (2014).

22. I. B. Misirlioglu, M. T. Kesim and S. P. Alpay, "Layer thickness and period as design parameters to tailor pyroelectric properties in ferroelectric superlattices", Applied Physics Letters 105, 172905 (2014).

23. I. B. Misirlioglu and M. Yildiz, "Carrier accumulation near electrodes in ferroelectric films due to polarization boundary conditions", Journal of Applied Physics 116, 024102 (2014).

24. M. Khodabakhsh, C. Sen, H. Khassaf, M. A. Gulgun and I. B. Misirlioglu, "Strong smearing and disappearance of phase transitions into polar phases due to inhomogeneous lattice strains induced by A-site doping in $Bi_{1-x}A_xFeO_3$ (A: La, Sm, Gd)", Journal of Alloys and Compounds, 604, 117 (2014).

25. I. B. Misirlioglu, M. T. Kesim and S. P. Alpay, "Strong dependence of the dielectric properties on electrical boundary conditions and interfaces in ferroelectric superlattices", Applied Physics Letters 104, 022906 (2014).

26. M. T. Kesim, M. W. Cole, J. Zhang, I. B. Misirlioglu and S. P. Alpay, "Tailoring Dielectric Properties of Ferroelectric-Dielectric Multilayers", Applied Physics Letters 104, 022901 (2014).

27. I. B. Misirlioglu and M. Yildiz, "Very large dielectric response from ferroelectric nanocapacitor films due to collective surface and strain relaxation effects", Journal of Applied Physics, 114, 194101 (2013).

28. A. P. Levanyuk and I. B. Misirlioglu, "Phase transitions in ferroelectric-paraelectric superlattices: Single domain state stability", Applied Physics Letters, 103, 192906 (2013).

29. I. B. Misirlioglu and M. Yildiz, "Dielectric response of fully and partially depleted ferroelectric thin films and inversion of the thickness effect", Journal of Physics D, 46, 125301 (2013).

30. A. P. Levanyuk, I. B. Misirlioglu, E. Mishina and A. Sigov, "Effects of depolarizing field in perforated film of two-axial ferroelectric", Physics of the Solid State, 54, 2243, (2012).

31. E. Kurtoglu, A. Bilgin, M. Sesen, I. B. Misirlioglu, M. Yıldız, H. F. Y. Acar and A. Kosar, "Ferrofluid actuation with varying magnetic fields for micropumping applications", Microfluidics and Nanofluidics, DOI 10.1007/s10404-012-1008-5, (2012).

32. H. Khassaf, C. Dragoi, I. Pintilie, I. B. Misirlioglu and L. Pintilie, "Potential barrier increase due to Gd doping of $BiFeO_3$ layers in Nb:$SrTiO_3$-$BiFeO_3$-Pt structures displaying diode-like behavior", Applied Physics Letters, 100, 252903, (2012).

33. J. Zhang, I. B. Misirlioglu, G. A. Rosetti and S. P. Alpay, Electrocaloric properties of epitaxial strontium titanate films, Applied Physics Letters, 100, 222909, (2012).

34. I. B. Misirlioglu, H. N. Cologlu and M. Yildiz, "Thickness driven stabilization of saw tooth-type domains in ferroelectric films with depletion charge", Journal of Applied Physics, 111, 064105 (2012).

35. I. B. Misirlioglu and M. Yildiz, "Polarization retention and switching in ferroelectric nano capacitors with defects on tensile substrates", Solid State Electronics, 67, 38 (2012).

36. A. P. Levanyuk and I. B. Misirlioglu, "Phase transitions in ferroelectric-paraelectric superlattices", Journal of Applied Physics, 110, 114109 (2011).

37. I. B. Misirlioglu, M. B. Okatan and S. P. Alpay, "Effect of asymmetrical interface charges on the hysteresis and domain configurations of ferroelectric thin films", Integrated Ferroelectrics, 126, 142 (2011).

38. M. B. Okatan, I. B. Misirlioglu, S. P. Alpay, "Contribution of space charges to the polarization of ferroelectric superlattices and its effect on dielectric properties", Physical Review B, 82, 094115 (2010).

39. I. B. Misirlioglu, M. B. Okatan and S. P. Alpay, "Asymmetric hysteresis loops and smearing of the dielectric anomaly at the transition temperature due to space charges in ferroelectric thin films", Journal of Applied Physics, 108, 034105 (2010).

40. I. B. Misirlioglu, L. Pintilie, M. Alexe and D. Hesse, "Influence of long-range dipolar interactions on the phase stability and hysteresis shapes of ferroelectric and antiferroelectric multilayers", DOI 10.1007/s10853-009-3451-6, special issue of Journal of Materials Science on Ferroelectrics, (2009).

41. I. B. Misirlioglu, "Stability of a ferroelectric phase with electrical domains in multilayers", Applied Physics Letters, 94, 172907 (2009).

42. L. Geske, I. B. Misirlioglu, I Vrejoiu, M. Alexe and D. Hesse, "Impact of misfit relaxation and a-domain formation on the electrical properties of tetragonal Pb $Zr_{0.4}$ $Ti_{0.6}O_3$ / Pb $Zr_{0.2}$ $Ti_{0.8}O_3$ thin film heterostructures: Experiment and theoretical approach", Journal of Applied Physics, 105, 061607 (2009).

43. G. Akcay, I. B. Misirlioglu and S. P. Alpay, "Phase transformation characteristics of Barium Strontium Titanate films on anisotropic substrates with (110)//(001) epitaxy", Integrated Ferroelectrics, 101, 29 (2009).

44. I. B. Misirlioglu, G. Akcay and S. P. Alpay, "Low-temperature monoclinic phase in epitaxial (001) Barium Titanate on (001) cubic substrates", Integrated Ferroelectrics, 101, 4 (2009).

45. L. C. Zhang, A.L. Vasiliev, I. B. Misirlioglu, S. P. Alpay, M. Aindow, and R. Ramesh, "Cation ordering in epitaxial lead zirconate titanate films" Applied Physics Letters, 93, 262903 (2008).

46. K. Boldyreva, L. Pintilie, A. Lotnyk, I. B. Misirlioglu, M. Alexe, D. Hesse, "Ferroelectric/Antiferroelectric Pb(Zr0.8Ti0.2)O3/PbZrO3 epitaxial multilayers: Growth and thickness-dependent properties", Ferroelectrics, 370, 140 (2008).

47. I. B. Misirlioglu, L. Pintilie, K. Boldyreva, M. Alexe and D. Hesse, "Antiferroelectric hysteresis loops with two exchange constants using the two dimensional Ising model", Applied Physics Letters, 91, 202905 (2007).

48. K. Boldyreva, L. Pintilie, A. Lotynk, I. B. Misirlioglu, M. Alexe and D. Hesse, "Thickness driven antiferroelectric-to-ferroelectric phase transition of thin PbZrO3 layers in PbZrO3/PbZr0.8Ti0.2O3 multilayers", Applied Physics Letters, 91, 122915 (2007).

49. I. B. Misirlioglu, M. Alexe, L. Pintilie and D. Hesse, "Space charge contribution to the apparent enhancement of polarization in ferroelectric bilayers and multilayers", Applied Physics Letters, 91, 022911 (2007).

50. S. P. Alpay, I. B. Misirlioglu and V. Nagarajan, "Comment on "Simulation of interface dislocations effect on polarization distribution of ferroelectric thin films", Applied Physics Letters, 88, 092903 (2007).

51. G. Akcay, I. B. Misirlioglu and S. P. Alpay "Dielectric and pyroelectric properties of Barium Strontium Titanate films on orthorhombic substrates with (110)//(100) epitaxy", Journal of Applied Physics, 101, 104110 (2007).

52. I. B. Misirlioglu, G. Akcay, S. Zhong and S. P. Alpay, "Interface effects in ferroelectric bilayers and heterostructures", Journal of Applied Physics, (101), 036107 (2007).

53. G. Akcay, I. B. Misirlioglu, S. P. Alpay, "Response to comment on "Dielectric tunability of ferroelectric thin films on anisotropic substrates" [Appl. Phys. Lett. 90, 036101 (2007)] ", Applied Physics Letters, 90, 036102 (2006).

54. I. B. Misirlioglu, G. Akcay and S. P. Alpay, "Polarization variations due to different dislocation configurations in ferroelectric heterostructures", Integrated Ferroelectrics, 83, 67(2006).

55. G. Akcay, I. B. Misirlioglu, S. P. Alpay, "Dielectric tunability of ferroelectric thin films on anisotropic substrates", Applied Physics Letters, 89, 042903 (2006).

56. I. B. Misirlioglu and S. P. Alpay, Feizhou He and B. O. Wells, "Stress induced monoclinic phase in epitaxial BaTiO3 on MgO", Journal of Applied Physics, 99, 104103 (2006).

57. I. B. Misirlioglu, M. Aindow, S. P. Alpay, and V. Nagarajan, "Thermodynamic and electrostatic analysis of threading dislocations in epitaxial ferroelectric films", Applied Physics Letters, 88, 102906 (2006).

58. I. B. Misirlioglu, A. L. Vasiliev, M. Aindow and S. P. Alpay, "Defect microstructures in epitaxial PbZr0.2Ti0.8O3 films grown on (001)SrTiO3 by pulsed laser deposition", Journal of Materials Science, 41, 697 (2006).

59. V. Nagarajan, C. L. Jia , H. Kohlstedt, R. Waser, I. B. Misirlioglu, S. P. Alpay and R. Ramesh, "Misfit dislocations in nanoscale ferroelectric heterostructures", Applied Physics Letters, 86, 192910 (2005).

60. I. B. Misirlioglu, A. L. Vasiliev, M. Aindow, S. P. Alpay, "Strong degradation of physical properties and formation of a dead layer in ferroelectric films due to interfacial dislocations", Integrated Ferroelectrics, 71, 67 (2005).

61. S. P. Alpay, I. B. Misirlioglu, V. Nagarajan, R. Ramesh, "Can interface dislocations degrade ferroelectric properties?", Applied Physics Letters, 85, 2044 (2004).

62. S. P. Alpay, I. B. Misirlioglu, A. Sharma, Z.-G. Ban, "Structural characteristics of ferroelectric phase transformations in single-domain epitaxial films", Journal of Applied Physics, 95, 8118 (2004).

63. I. B. Misirlioglu, A. L. Vasiliev, M. Aindow, S. P. Alpay, R. Ramesh, "Threading dislocation generation in epitaxial (Ba, Sr)TiO3 films grown on (001) LaAlO3 by pulsed laser deposition", Applied Physics Letters, 84, 1742 (2004).

64. J. V. Mantese, N. W. Schubring, A. L. Micheli, M. P. Thompson, R. Naik, G. W. Auner, I. B. Misirlioglu and S. P. Alpay, "Stress-induced polarization-graded ferroelectrics", Applied Physics Letters, 81, 1068 (2002).

Publications in Conference Proceedings (Refereed)

1. M. Janipour, I. B. Misirlioglu and K. Sendur, "Voltage Control of Surface Plasmon and Phonon Interactions in Doped Semiconductor-Dielectric Interfaces", in the proceedings of SPIE Meeting on Physics and Simulation of Optoelectronic Devices, San Francisco, USA, January 2017.

2. I. B. Misirlioglu and M. Yildiz, "Dielectric response of fully and partially depleted ferroelectric films", in the proceedings of IEEE, International Symposia for Applications of Ferroelectrics and Piezo Force Microscopy Meeting in Prague, Czech Republic, 2013.

3. I. B. Misirlioglu and M. Yildiz, "Stabilization and thickness dependence of depletion charge induced domains in ferroelectric nano capacitors", in the proceedings of IEEE, International Symposia for Applications of Ferroelectrics and Piezo Force Microscopy Meeting in Vancouver, Canada, 2011.

4. I. B. Misirlioglu, H. N. Cologlu and M. Yildiz, "Coupling of defect fields to domains and phase transition characteristics of ferroelectric thin films with charged defects", in the proceedings of Materials Research Society Fall 2010 Meeting, Boston, USA, 2010.

5. S. P. Alpay, Z.-G. Ban, I. B. Misirlioglu, and A. Sharma, "Effect of internal stresses on the phase transformation characteristics and physical properties of epitaxial ferroelectric films", in Proceedings of the 204th Electrochemical Society Meeting, Symposium on Epitaxial Growth of Functional Oxides.

6. I. B. Misirlioglu, A. L. Vasiliev, M. Aindow, R. Ramesh, and S. P. Alpay, "A Transmission Electron Microscopy study of dislocation substructures in PLD-grown epitaxial films of (Ba,Sr)TiO3 on (001) LaAlO3", in Proceedings of 2003 MRS Fall Meeting, Symposium C, Ferroelectric Thin Films XII, Volume 784, Boston, USA, 2003.

7. J.V. Mantese, N. W. Schubring, A. L. Micheli, M. P. Thompson, R. Naik, G. W. Auner, I. B. Misirlioglu, Z.-G. Ban, and S. P. Alpay, "Hysteresis offset in stress induced polarization-graded ferroelectrics," in *Ferroelectric Thin Films XI*, edited by S. Aggarwal, S. Hoffmann, M. Shimizu, D. Y. Kaufman, and S. R. Gilbert, (Mater. Res. Soc. Symp. Proc. 748, Warrendale, PA, 2003), pp. U12.20.1.

Talks and Oral Presentations *(* Presenter when multiple authors present, given in reverse chronological order)*

A. P. Levanyuk, S. A. Minyukov, M. B. Okatan and I. B. Misirlioglu*, "Two-phase states and elastic instabilities in partially clamped crystals with symmetry breaking first order transitions in free state", Fundamentals Physics of Ferroelectrics and Related Materials, Silver Spring MD, USA, January 2020.

I. B. Misirlioglu, invited talk, "Functionality from ferroelectric superlattices: Designing a phase transition and its implications for applications", 4th IWMP Workshop at National Institute of Materials Physics, Magurele, Romania, May 2019.

I. B. Misirlioglu*, C. Sen, W. A. S. Aldulaimi and O. M. Moradi, "Loss of Spin Polarization of Tunneling Currents in Magnetoresistive Ferromagnet/Ferroelectric Junctions", 2019 American Physical Society March Meeting in Boston, USA, 2019.

I. B. Misirlioglu*, C. Sen, W. A. S. Aldulaimi and O. M. Moradi, "Spin Mixing and Loss of Spin Polarization During Tunneling in Ferromagnet/Ferroelectric Junctions - Is a Strong Ferroelectric Polarization Desirable?", at the Materials Research Society Fall Meeting in Boston, USA, November 2018.

I. B. Misirlioglu, O. M. Moradi*, C. Sen, A. Boni and L. Pintilie, "Strong composition dependence of resistive switching in Ba,Sr,TiO_3 films on semiconducting substrates and its thermodynamic analysis ", at the European Materials Research Society Meeting in Strasbourg, France, June 2018.

E. M. Alkoy, I. B. Misirlioglu, "Electrocaloric effect in stress-free textured relaxor ferroelectric slabs", project introductory presentation at the Program Review Meeting of U. S. Air Force Office of Scientific Research, Niceville, FL, USA, May 2018.

M. Ertas*, I. B. Misirlioglu and K. Sendur, "Investigation of the optical effect of stable VO_2 thin films for smart materials applications", oral talk in American Physical Society March Meeting, 2018, Los Angeles, CA, USA, 2018.

I. B. Misirlioglu*, O. M. Moradi, C. Sen, A. Boni and L. Pintilie, "Polarization direction dependence of leakage currents: A new non-destructive route for read out of polarization in ferroelectric thin films?", at the ACERS Electronic and Advanced Materials Conference in Orlando, FL, USA, January 2018.

I. B. Misirlioglu*, O. M. Moradi, C. Sen, A. Boni and L. Pintilie, invited talk "Tailoring polarization direction dependence of leakage currents for non-destructive read out of polarization in ferroelectric thin films", at the ElektroseramikTR workshop in Gebze Technical University, İzmit, Turkey, November 2017.

A. P. Levanyuk*, S. Minyukov and I. B. Misirlioglu, invited talk "Loss of elastic stability and formation of inhomogeneous states at phase transitions in thin films on substrates", at the International Meeting on Ferroelectricity, in San Antonio, Texas, USA, September 2017.

I. B. Misirlioglu, invited talk for weekly seminar, "Tailoring ferroelectricity in thin films for low-power and fast read-out memory applications" at Koc University, İstanbul, Turkey, February 2017.

O. M. Moradi*, C. Sen, O. Akdogan and I. B. Misirlioglu, "Dependence of Impedance Characteristics of Ba,Sr,TiO_3 Ferroelectric Thin Films on Electrode Type", accepted for oral presentation at 2016 MRS Fall Meeting in Boston (could not be delivered due to visa problems of the presenting author).

I. B. Misirlioglu, O. M. Moradi* and K. Sendur, "A new ferroelectric/semiconductor/tunnel-junction stack for non-destructive and low power read-out memory", accepted for oral presentation at 2016 Materials Research Society Fall Meeting in Boston (could not be delivered due to visa problems of the presenting author).

I. B. Misirlioglu, "Dielectric-Semiconductor interfaces: What happens when you replace the dielectric with a ferroelectric?", invited talk at Asian Meeting on Ferroelectricity 2016 Meeting, University of New Delhi, India (could not be delivered due to travel restriction following 15th of July 2016 coup attempt).

M. T. Kesim*, I. B. Misirlioglu, J. V. Mantese and S. P. Alpay, "Manipulation of Carrier Density near Ferroelectric/Semiconductor Interfaces", oral presentation at the American Physical Society 2016 March Meeting, Baltimore, MD, USA, 2016.

I. B. Misirlioglu, "Tailoring ferroelectricity for energy efficient field effect transistors: Domain driven mechanism", invited talk at the American Ceramic Society Meeting on Electronic Materials and Applications 2016 Meeting, Orlando, FL, USA, January 2016.

I. B. Misirlioglu, C. Sen*, O. Moradi, M. T. Kesim and S. P. Alpay, "Polar phase stability in ferroelectric thin films and superlattices interfacing semiconductor heterojunctions in field effect transistors and tunnel junctions" oral presentation at Materials Research Society Fall Meeting in Boston, USA, November 2015.

I. B. Misirlioglu*, M. Yildiz and K. Sendur "Domain control of carrier density at a ferroelectric-semiconductor interface", oral presentation at 57th Electronic Materials Conference of Materials Research Society, 24-26 June 2015, The Ohio State University, Ohio, USA, June 2015.

I. B. Misirlioglu*, M. Yildiz and K. Sendur "Ferroelectric thin films with semiconductor electrodes: Implications for polarization switching, dielectric properties and carrier density control via domains", oral presentation at IEEE International Symposium on Applications of Ferroelectric (ISAF), International Symposium on Integrated Functionalities (ISIF), and Piezoresponse Force Microscopy Workshop, Singapore, May 2015.

I. B. Misirlioglu, invited talk, "Interface controlled properties of ferroelectric thin films: Structural defects, carriers and phase transitions", Department of Physics, Istanbul Technical University, Istanbul, Turkey, December 2014.

I. B. Misirlioglu, oral presentation, "Effect of the interface character on the stability of ferroelectricity in a semiconductor film", Science & Applications of Thin Films Conference & Exhibition, Izmir Institute of Technology, Izmir, Turkey, September 2014.

I. B. Misirlioglu*, A. P. Levanyuk, M. T. Kesim, S. P. Alpay, invited talk, "Ferroelectric-paraelectric superlattices for charge retention and solid state memories: Implications of theoretical results for device design.", Electroceramics XIV Conference, Bucharest, Romania, June 2014.

I. B. Misirlioglu, oral presentation, "Phase transitions and dielectric properties of ferroelectric thin films with misfit dislocations and impurities", International Semiconductor Science & Technology Conference, Istanbul, Turkey, January 2014.

I. B. Misirlioglu, invited speaker, "Phase transitions and dielectric properties of ferroelectric thin films with competing surface and strain-relaxing defect effects", Thermec, Las Vegas, NV, USA, 2013.

A. P. Levanyuk*, I. B. Misirlioglu, invited talk, "Phase transitions in paraelectric-ferroelectric superlattices: Limit of multidomain-single domain stability", 4th International Conference from Nanoparticles and Nanomaterials to Nanodevices and Nanosystems, Corfu, Greece, June 2013.

I. B. Misirlioglu, invited speaker, "Defect and interface effects in ferroelectric thin films", at the Single and Multiphase Ferroics in Reduced Dimensions (SIMUFER) COST action meeting, ISTEC, Faenza, Italy April 2013.

A. P. Levanyuk, I. B. Misirlioglu*, "Dramatic effect of the near-electrode layer configurations on the phase transition characteristics of ferroelectric-paraelectric superstructures", oral presentation at the American Physical Society March Meeting in Boston, USA, 2012.

I. B. Misirlioglu, invited speaker, "Defect and interfaces in ferroelectric thin films", Department of Mechanical Engineering, Koç University, İstanbul, Turkey, December 2011.

I. B. Misirlioglu, invited speaker, "Defect and interfaces in ferroelectric thin films", Department of Physics, Bilkent University, Ankara, Turkey, December 2011.

A. P. Levanyuk, I. B. Misirlioglu*, "Dependence of phase transitions on boundary conditions at the oxide-electrode interfaces in ferroelectric-paraelectric superstructures", European Meeting on Ferroelectricity, Bordeaux, France, 2011.

I. B. Misirlioglu, talk at the Turkish Academy of Sciences Meeting for Young Investigator awardees, "Dependence of phase transition characteristics of ferroelectric thin films on the interface boundary conditions", Izmir, September 2011.

I. B. Misirlioglu, invited speaker "Coupling of defect fields to domains and phase transition characteristics of ferroelectric thin films with charged defects", International Workshop on Piezoelectric Materials and Applications in Actuators, Antalya, Turkey, October 2010.

I. B. Misirlioglu, key speaker "Effect of Asymmetrical Interface Charges on the Hysteresis and Domain Configurations of Ferroelectric Thin Films", International Symposia for Integrated Ferroelectrics, San Juan, Puerto Rico, USA, June 2010.

I. B. Misirlioglu, invited speaker "Defect and Interface Driven Alterations of Phase Transitions in Perovskite Type Ferroelectric Thin Films", Romanian Conference on Advanced Materials, Braşov, Romania, August 2009.

I. B. Misirlioglu, V. Sharma, J. Fricano, B. Yildiz, "Reversible Solid Oxide Electrocatalytic Cells for Co-Generation of Hydrogen / Syn-Gas and Electricity", at 42nd Western Regional Meeting 2008, American Chemical Society Materials for Renewable Energy Applications Las Vegas, Nevada, September 2008.

Several presentations at the Max Planck Institute of Microstructure Physics during meetings of the functional oxides group and Experimental Department 2.

I. B. Misirlioglu, "Interface driven degradation in $PbZr_{1-x}Ti_xO_3$ superlattices" International Symposium on Integrated Ferroelectrics, poster session, Bordeaux, France 2007.

I. B. Misirlioglu, "Ferroelectric Heterostructures: Functional Components for New Generation Device Technologies", invited talk at Sabanci University, Istanbul, Turkey, 2007.

I. B. Misirlioglu, "Ferroelectric Heterostructures: Functional Components for New Generation Device Technologies", selected abstract for presentation at the Alexander von Humboldt Foundation Meeting, Bonn, Germany, 2007.

I. B. Misirlioglu*, S. P. Alpay, A. Vasiliev, M. Aindow, "A Challenge Awaiting Nano-Scale Device Engineering: Suppression of Ferroelectricity in Ultrathin Epitaxial Ferroelectric Thin Films", ASM Hartford Chapter Meeting, Storrs, CT, 2005.

I. B. Misirlioglu*, S. P. Alpay, A. Vasiliev, M. Aindow, V. Nagarajan and R. Ramesh, "Influence of Dislocations on the Physical Properties of Ferroelectric Thin Films", poster session in Materials Research Society Fall 2004 Meeting, Boston, MA, 2004.

I. B. Misirlioglu*, S. P. Alpay, A. Vasiliev and M. Aindow "Role of Dislocations on the Physical Properties of Epitaxial Ferroelectric Thin Films", Connecticut Microelectronic and Optoelectronic Consortium, University of Connecticut, CT, 2004.

I. B. Misirlioglu*, A. L. Vasiliev, M. Aindow R. Ramesh and S. P. Alpay, "A Transmission Electron Microscopy Study of Dislocation Substructures in PLD-grown Epitaxial Films of (Ba,Sr)TiO3 on (001) LaAlO3", Materials Research Society Fall 2003 Meeting, Boston, MA, 2003.

I. B. Misirlioglu*, N. Magdefrau, , A. Vasiliev, M. Aindow, S. P. Alpay, R. Ramesh, "Dislocation Structures in Epitaxial Barium Strontium Titanate Thin Films", American Ceramic Society, 105th Annual Meeting, Nashville, TN, 2003.

Teaching

At Sabanci University:

Materials Thermodynamics (Graduate Course, every Fall since 2015)
Structure and Properties of Materials (Graduate course, every Fall, 2008-2014, 2019)
Introduction to Electron Microscopy (Graduate course, every Spring, 2009-2019)
Mechanical Properties of Materials (Undergraduate and graduate course, Spring 2009-2011, 2013-2018, 2020)

Principles of X-ray diffraction characterization (5 week undergraduate lecture, 2008-2014)
Science of Nature (Freshman University course with focus on physical chemistry, Spring 2013, 2014, 2017-2019)
Materials Science and Nanotechnology (2016, 2017, 2018 Sabancı University Summer School for High School Students, requested by the President's Office for 2019 also)

Before employment at Sabancı University:

Helped Ph.D. students with the evaluation and interpretation of experimental data at the Max Planck Institute of Microstructure Physics.

Teaching assistant for 'Introduction to Materials Science and Engineering' in Spring 2005 at the University of Connecticut.

Extensively took part in demonstrations of advanced materials during Outreach Meetings of the Institute of Materials Science at the University of Connecticut between 2003 and 2006.

Volunteered to give talks on principles of ferroelectric, piezoelectric and superconductor materials to high school students and teachers in the summer of 2005 at the University of Connecticut.

Demonstrations of microanalysis and surface analysis at Istanbul Technical University in 2000 and 2001.

Professional Memberships

Alexander von Humboldt Network,
American Ceramic Society,
American Physical Society,
Materials Research Society

References

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