

Dr. Bhavana Nandkumar Joshi

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Objective:

Want to work in a creative and challenging environment not only with positive thinking but by positive doing as well and to serve the need of organization in time with perfection, contribution and implementation of quality ideas for an organization where I could get ample scope of learning things finally contributing in growth of the institution I work for.

Current Position: Working as **Research Professor** at Department of Mechanical Engineering, Korea University, Seoul, South Korea since **April 2015 to till date**.

● Education:

- **Ph.D. Electronics** from Department of Electronics, North Maharashtra University, Jalgaon in **2010** with thesis entitled “Growth and Characterization of Low-k dielectric thin films for VLSI Applications”
- **M.Sc. Physics** with specialization **Materials Science and Fiber optics and Lasers** from School of Physical Sciences, Swami Ramanand Teerth Marathwada University Nanded in **2004** with **66.20%**
- **B.Sc.** with subjects Physics, Chemistry and Computer Application from Yeshwant Mahavidyalay, Nanded affiliated to Swami Ramanand Teerth Marathwada University Nanded in **2002** with **63.90%**

● Additional certification:

Completed one year **Training Course in Science Journalism** in **2015** with A grade conducted by Indian Science Communication Society and National Council for science and Technology Communication DST, India

● Research Interest:

- ❖ Deposition and characterization of oxide based thin films (SiO_2 , TiO_2 , ZnO , SnO_2).
- ❖ Applications of oxide thin films for Lithium ion battery, Water splitting photovoltaic, Photocatalysis and Electronics.

● PUBLICATIONS:

Journals: 40

SCI/SCIE Published-35;

Non SCI Published -05

Conferences: Published-35

National: Attended/presented papers/published in proceedings:14

International: Attended/presented papers/ published in proceedings: 21

● **List of papers in published in Journals:**

SCI/SCIE journals

- 1) Hyun Yoon, Min-woo Kim, Hayong Kim, Do-Yeon Kim, Seongpil An, Jong-Gun Lee, **Bhavana N. Joshi**, Hong Seok Jo, Jeehoon Choi, Salem S. Al-Deyab, Alexander L. Yarin, Sam S. Yoon, "Efficient heat removal via thorny devil nanofiber, silver nanowire, and graphene nanotextured surfaces" International Journal of Heat and Mass Transfer, 101 (2016) 198-204 (IF~2.383)
- 2) Seongpil An, Ji Sun Lee, **Bhavana N. Joshi**, Hong Seok Jo, Kirill Titov, Jong-San Chang, Chul-Ho Jun, Salem Al-Deyab, Young Kyu Hwang, Jin-Chong Tan, Sam S. Yoon, "Freestanding nanofiber mats of zeolitic imidazolate framework-7 via one-step scalable electrospinning", Journal of Applied Polymer Science, 133, (32) (2016) 43788 (1-8) (IF~1.77)
- 3) Jong-Gun Lee, Do-Yeon Kim, **Bhavana Joshi**, Jong-Hyuk Lee, Tae-Kyu Lee, Jang-soo Kim, Dae-ho Yang, Woo-Young Kim, Salem S. Al-Deyab, Sam S. Yoon, "Electrically insulative performances of ceramic and clay films deposited via supersonic spraying", Journal of Thermal Spray Technology, 25 (4) (2016) 763-769 (IF~1.43)
- 4) **Joshi Bhavana**¹, An Seongpil¹, Jo Hong Seok, Song Kyo Yong, Park Hyun Goo, Hwang, Sunwoo; Yoon, Woo Young; Al-Deyab, Salem; Yoon, Sam S. S. Yoon , "Flexible, Freestanding, and Binder-free SnO_x-ZnO/Carbon Nanofiber Composites for Lithium Ion Battery Anodes" Applied Materials & Interfaces, 8, (2016) 9446-9453 (IF~6.723)
- 5) Do Yeon Kim[†], **Bhavana N. Joshi**[†], Jong Gun Lee, Jong Hyuk Lee, Young Kyu Hwang, Jong-San Chang, Salem Al-Deyab, Jin-Chong Tan, Sam S. Yoon, "Scalable Supersonic Cold Spraying for Zeolitic Metal-Organic Framework Thin Films", Chemical Engineering Journal 295 (2016) 49-56 (IF~4.32)
- 6) Do-Yeon Kim, Jong-gun Lee, **Bhavana Joshi**, Jong-hyuk Lee, Salem S. Al-Deyab, Alexander Yarin, Sam S. Yoon, "Supersonically sprayed thermal barrier layers using clay micro-particles, Applied Clay Sciences 120 (2016) 142-146 (IF~3.84)
- 7) Min Wook Lee, Seongpil An, Kyo Yong Song, **Bhavana N. Joshi**, Hong Seok Jo, Salem S. Al-Deyab, Sam S. Yoon, Alexander L. Yarin "Polyacrylonitrile Nanofibers with Added Zeolitic Imidazolate Frameworks (ZIF-7) to Enhance Mechanical and Thermal Stability" Journal of Applied Physics 118 (2015) 245307 (IF~2.183)
- 8) **Bhavana Joshi**[†], Hyun Yoon[†], Hayong Kim, Min-woo Kim, Mukund G. Mali, Salem S. Al-Deyab, Sam S. Yoon, "Heterojunction photoanodes for solar water splitting using chemical-bath-deposited In₂O₃ micro-cubes and electro-sprayed Bi₂WO₆ textured nanopillars", RSC Advances, 5 (2015) 85989-85328(IF~3.84)
- 9) Mukund G. Mali, Hyun Yoon, **Bhavana N. Joshi**, Hyunwoong Park, Salem S. Al-Deyab, Dong Chan Lim, SeJinAhn, Carlo Nervi, and Sam S. Yoon "Enhanced Photoelectrochemical Solar Water Splitting Using a 2 Platinum-Decorated

- CIGS/CdS/ZnO Photocathode” ACS Applied Materials & Interfaces, 7, 21619-21625 (2015) (IF~6.723)
- 10) Mukund G. Mali, Hyun Yoon, Hayong Kim, **Bhavana Joshi**, Salem S. Al-Deyab, Sam S. Yoon “Chemical-bath-deposited indium oxide microcubes for solar water splitting” ChemPhysChem 16 (2015) 3450-3457 (IF~3.419)
 - 11) Do-Yeon Kim, Jong-Gun Lee, **Bhavana N. Joshi**, Sanjay S. Latthe, Salem S. Al-Deyab and Sam S. Yoon, “Self-cleaning superhydrophobic films by supersonic-spraying polytetrafluoroethylene–titania nanoparticles” Journal of Materials Chemistry A, 3, (2015), 3975 (IF~6.626)
 - 12) Pritee M. Raotole, Pankaj Koinkar, **Bhavana Joshi**, S. R. Patil “Corrosion protective poly(aniline-co-o-anisidine) coatings on mild steel”, Journal of Coating Technology research, 12(4) (2015) 757-766 (IF~1.298)
 - 13) **Bhavana Joshi**¹, Hyun Yoon¹, Seung-Heon Na, Sam S. Yoon, “Enhanced Photocatalytic Performance of Graphene-ZnO Nanoplatelet Composite Thin Films by Electrostatic Spray Deposition” Ceramic International, 40(2) (2014) 3647-3654 (IF~2.605)
 - 14) Do-Yeon Kim¹, **Bhavana N Joshi**¹, Jung-Jae Park, Jong-Gun Lee, You-Hong Cha, Sam Yoon “Enhanced Conversion Efficiency of Dye-sensitized Solar Cell using Graphene-TiO₂ Films by Supersonic Aerosol Deposition” Ceramic International, Ceramic International, 40(2014) 11089-11097 (IF~2.605)
 - 15) Seongpil An¹, **Bhavana N. Joshi**¹, Min Wook Lee, Na Young Kim, Sam S. Yoon, “Electrospun graphene-ZnO nanofiber mats for photocatalysis applications” Applied Surface Science, 294 (2014) 24-28 (IF~2.711)
 - 16) Hyun Yoon¹, **Bhavana Joshi**¹, Seung-Heon Na, Sam S. Yoon, “Photodegradation of methylene blue of niobium-doped zinc oxide thin films produced by electrostatic spray deposition” Ceramic International, 40(5) (2014) 7567-7571 (IF~2.605)
 - 17) Yogesh S. Mhaisagar, **Bhavana N. Joshi**, Ashok M. Mahajan “Mechanical properties of surface modified silica low-k thin films”, Microelectronic Engineering 114 (2014) 112-116 (IF~1.197)
 - 18) Seongpil An, Min Wook Lee, **Bhavana Joshi**, Ayeong Jo, Jinho Jung and Sam Yoon “Water Purification and Toxicity Control of Chlorophenols by 3D Nanofiber Membranes Decorated with Photocatalytic Titania Nanoparticles” Ceramic International, 40(2) (2014) 3305-3313 (IF~2.605)
 - 19) **Bhavana N. Joshi** and A. M. Mahajan “Monomer Methylmethacrylate (MMA) Incorporated Hybrid Low-k Thin Films”, Electronic Material Letters, 9(6) (2013) 723-728 (IF~1.98)
 - 20) **Bhavana N. Joshi**, Hyun Yoon, Maikel F.A.M. van Hest, Sam S. Yoon, “Niobium-Doped Titania Photocatalyst Film Prepared via a Nonaqueous Sol-Gel Method”, Journal of American Ceramic Society, 96(8) (2013) 2623-2627 (IF~2.6)
 - 21) **Bhavana N. Joshi**, Hyun Yoon, Sam S. Yoon “Structural, Optical and Electrical Properties of Tin Oxide Thin Films by Electrostatic Spray Deposition” Journal of Electrostatics, 71 (2013) 48-52 (IF~0.863)
 - 22) Lee Min Wook, An Seongpil, **Joshi Bhavana**, Latthe Sanjay, Yoon Sam, “Highly efficient wettability control via 3D suspension of titania nanoparticles with polystyrene nanofibers” Applied Materials & Interfaces 5 (2013) 1232-1239 (IF~6.723)
 - 23) Yiyun Zhang, Min Wook Lee, Seongpil An, Suman Sinha-Ray, Shahrzad Khansari, **Bhavana Joshi**, Seungkwon Hong, Joo-Hyun Hong, Jae-Jin Kim “Antibacterial

- activity of photocatalytic electrospun titania nanofiber mats and solution-blown soy protein nanofiber mats decorated with silver nanoparticles” *Catalysis Communications* 34 (2013) 35-40 (IF~3.699)
- 24) **B N Joshi**, H Yoon, HY Kim, JH Oh, TY Seong, SC James, SS Yoon, “Effect of Zinc Acetate Concentration on Structural, Optical and Electrical Properties of ZnO Thin Films Deposited by Electrostatic Spray on ITO Substrate”, *Journal of The Electrochemical Society*, 159 (8) (2012), H716-H721 (IF~3.26)
 - 25) H. Yoon, **B N Joshi**, SH Na, SC James, SS Yoon, “Antibacterial Activity and Photocatalysis of Electrospayed Titania Films”, *Journal of The Electrochemical Society*, 159(11), (2012), H823-H827 (IF~3.26)
 - 26) Yogesh S. Mhaisagar, **Bhavana N. Joshi** and A.M. Mahajan, “Surface texture modification of spin coated SiO₂ xerogel thin films by TMCS Silylation” *Bulletin of material Science*, 35 (2) (2012), 151-155 (IF~0.88)
 - 27) Hyun Yoon, Ji Hoon Woo, **Bhavana Joshi**, Young Min Ra, Sam S. Yoon, Ho Young Kim, SeJin Ahn, Jae Ho Yun, Jihye Gwak, Kyung Hoon Yoon, and Scott C. James, “CuInSe₂ (CIS) Thin Film Solar Cells by Electrostatic Spray Deposition” *Journal of The Electrochemical Society*, 159 (4) (2012) H444-H449 (IF~3.26)
 - 28) **Bhavana N. Joshi**, Yogesh S. Mhaisagar and Ashok M. Mahajan, “Analysis of interconnect capacitance for sub nano CMOS technology using the low dielectric material”, *Microelectronics Reliability*, 51 (2011) 953-958 (IF~1.433)
 - 29) Pravin M. Tirmali, Anil G. Kahirnar, **Bhavana N. Joshi** and Ashok M. Mahajan, “Structural and electrical characteristics of RF-sputtered HfO₂ high-k based MOS capacitors”, *Solid State Electronics* 62 (2011) 44-47 (IF~1.504)
 - 30) **Bhavana N. Joshi** and A. M. Mahajan “Deposition Characterization of Low-k Hybrid Thin Films Using Methyl Methacrylate for ULSI Applications”, *Materials science and engineering B*, 168 (2010) 182-185 (IF~2.16)
 - 31) **Bhavana N. Joshi** and A.M. Mahajan, “Sol gel deposited SiO₂ and hybrid low dielectric constant thin films” *Material Science in Semiconductor processing*, 13(1) (2010) 41-45 (IF~1.955)
 - 32) **Bhavana N. Joshi**, M.A. More and A.M. Mahajan, “Growth and characterization of MMA/SiO₂ hybrid low-k thin films for interlayer dielectric applications” *Bulletin of Material Science*, 33(3) (2010) 197-201 (IF~0.88)
 - 33) **Bhavana N. Joshi**, Yogesh S. Mhaisagar and A.M. Mahajan, “Surface modification of porous SiO₂ thin film by chemical treatment” *Optoelectronics and Advanced Materials-Rapid communications*, 4(9) (2010), 1304-1306 (IF~0.4)
 - 34) **Bhavana N. Joshi** and A.M. Mahajan, “Synthesis and analysis of low-k material for intermetal dielectric applications in VLSP”, *Journal of Optoelectronics and Advanced Materials*, 10(2), (2008) 422-426 (IF~0.457)
 - 35) **B. N. Joshi** and A. M. Mahajan, “Growth and Characterization of Porous SiO₂ Thin Films for Interlayer Dielectrics Applications in ULSI”, *Optoelectronics and Advanced Materials-Rapid communications*, 1(12) (2007), 659-662 (IF~0.4)

Non SCI journals

- 36) Edmund P Samuel, Ulhas Sonawane, **Bhavana N. Joshi**, D. S. Patil “Investigation of Diverse Characteristics of Strained III-V Nitride Quantum Well”, *International Journal of Engineering and technical Research (IJTER)*, 2(9) (2014) 372-375

- 37) Y.S. Mhaisagar, **B.N. Joshi**, A.M. Mahajan, “Deposition and surface modification of low-k thin films for ILD application in ULSI circuits”, J. Nano- Electron. Phys. 3(1), (2011) 106-110.
- 38) Yogesh S. Mhaisagar, **Bhavana N. Joshi**, Preeti Jain, and A. M. Mahajan “Deposition of Porous SiO₂ thin films for enzyme immobilization in biosensor application”, Bio-nano Frontiers special issue on Advancement in nanoscience for different technologies (2010) 151-154 .
- 39) A. Sonanvane, **B. N. Joshi** and A.M. Mahajan, “Analysis of capacitance across interconnects of low-k dielectric used in a deep sub-micron CMOS technology”, Progress In Electromagnetics Research Letters,1 (2008) 189-196.
- 40) A. M. Mahajan, J. P. Bange, **B. N. Joshi** and D.K. Gautam, “Growth of SiO₂ films for microelectronics applications: Experimental and analytical study of the process parameters”, African Physical Review Special Issue (Microelectronics): 0028, (2008) 58-60.

Note: † or ¹ Equal Contribution

List of papers in International/ National Conferences:

- 1) Young Min Ra, Hyun Yoon, **Bhavana Joshi**, Seung-Heon Na, Sam S. Yoon “Solution/Particle type Thin Film Coating via Electrostatic Spray Deposition” presented in Global Photovoltaic Conference (GPVC 2012) held at Bexco, Busan, South Korea during November 19-21, 2012 abstract published on pp.249.
- 2) **Bhavana N. Joshi**, Hyun Yoon and Sam S. Yoon “Effect of Solvents on Structural, Optical and Electrical Properties of Tin Oxide Thin Films Fabricated by Electrostatic Spray Deposition” accepted in International conference on Electronic materials and Nanotechnology for Green Environment (**ENGE-2012**) held in Jeju, South Korea during Sep. 16-19, 2012
- 3) **Bhavana N. Joshi**, Yogesh Mhaisagar and A. M. Mahajan, “Electrical characterization of hybrid low dielectric thin films for ILD applications” Accepted for International workshop on the Physics of Semiconductor Devices (IWPSD 2011) held at IIT Kanpur during 19th -22nd Dec. 2011.
- 4) Yogesh S. Mahisagar, Renuka Kawishwar, **Bhavana N. Joshi**, and A.M. Mahajan, “Deposition of porous low-k thin films using Tween 80 porogen for ILD application in ULSI circuits” Accepted for International workshop on the Physics of Semiconductor Devices (IWPSD 2011) held at IIT Kanpur during 19th -22nd Dec. 2011.
- 5) Yogesh S. Mhaisagar, **Bhavana N. Joshi** and A. M. Mahajan, “Deposition and surface modification of low-k thin films for ILD application in ULSI circuits”, Presented in ISSMD 2011 held at The M. S. University of Baroda, Vadodara, during 28 – 30, January- 2011.
- 6) **Bhavana N. Joshi** and A. M. Mahajan, “Electrical characterization of metal-insulator-semiconductor capacitor with low-k hybrid thin films for ULSI applications”, accepted in International Conference on Electronics Engineering and Signal Processing (EESP 2011) held at Maldives during 27th-29th May 2011.

- 7) **Bhavana N. Joshi** and A. M. Mahajan, “Electrical study of low-k hybrid thin films for nanoelectronics applications”, accepted in International Conference on Nanoscience, Nanotechnology and Advanced Materials (NANOS-2010), held at Gitam University, Vishakhapatnam during 17th-19th December 2010 abstract published on pp.190.
- 8) **Bhavana N. Joshi**, Yogesh S. Mhaisagar and A. M. Mahajan, “Fabrication of Low-k MOS capacitor for Nanotechnology”, presented in IAPT RC-8 Annual Convention on Recent trends & Innovations in Laboratory experiment in Physics 2010 held at YeshwantMahavidlyaya, Nanded during 4th -5th October 2010, paper published on pp.41.
- 9) **Bhavana N. Joshi**, Yogesh S. Mhaisagar and A. M. Mahajan, “Fabrication of Al/Hybrid-SiO₂/Si MIS Structure for Interlayer Dielectric Application” presented in national conference on Emerging trends in materials science and communications (ETMSC-2010) held at Department of Physics, Mahatma Gandhi Mahavidyalaya, Ahmedpur, Dist: Latur (MS) during 13th -14th March 2010 paper published on pp.100
- 10) Preeti Jain, Yogesh S. Mhaisagar, **Bhavana N. Joshi** and A. M. Mahajan “Deposition of porous SiO₂ thin film for biomedical applications”, presented in national conference on materials for energy storage and conversion (NCMESC 2010) held at Department of Physics, Shri Venkateshwara University, Tirupati during 23rd -24th Jan. 2010 abstract published on pp 46
- 11) **Bhavana N. Joshi** and A.M. Mahajan, “Effect of spin speed on the properties of spin on low-k thin films for ILD applications in ULSI circuits”, presented in international conference on nanotechnology and biosensors held at Raghu engineering college, Vishkhapatnam, during 20th -21st Jan. 2010 abstract published on pp 15
- 12) Yogesh S. Mhaisagar, **Bhavana N. Joshi** and A. M. Mahajan, “Effect of acid catalyst concentration on properties of low-k thin films”, presented in international conference on biosensors and nanotechnology Raghu engineering college, Vishkhapatnam, during 20th -21st Jan. 2010 abstract published on pp 19
- 13) **Bhavana N. Joshi**, Yogesh S. Mahisagar and A.M. Mahajan, “Effect of Annealing Temperature on Low-k Thin Films and Interconnect Capacitances” presented in international workshop on the Physics of Semiconductor Devices (IWPSD 2009) held at JamiaMilliaIslamia, New Delhiduring 15th- 19th Dec. 2009 abstract book published on pp. 305
- 14) Meenakshi S. Shrimangal, **Bhavana N. Joshi**, Pradnya N. Chavan, Ravi U.Mene, Manjushree M. Bahir, Megha .P. Mahabole and Rajendra.S. Khairnar, “CO₂ gas sensing behavior of ZnO thick films” Accepted for Symposium on Nanomaterials and their Applications (SNMA-2009) held in March 5-6,2009 at Department of Electronic-Science, Fergusson College, Pune
- 15) Pradnya N. Chavan, Manjushree M. Bahir, **Bhavana N. Joshi**, Ravindra U. Mene, Meenakshi S. Shrimangal, Megha P. Mahabole and Rajendra S. Khairnar “Influence of SBF on dielectric properties of nano – hydroxyapatite” Accepted for Symposium on Nanomaterials and their Applications (SNMA-2009) held in March 5-6,2009 at Department of Electronic-Science, Fergusson College, Pune

- 16) Yogesh S. Mhaisagar, **Bhavana N. Joshi** and A. M. Mahajan, "Sol-gel deposited porous SiO₂ films for nanoelectronics applications" paper presented in State level seminar on Recent Advances in nanocrystalline materials and applications (RAINMAA-2009) held at Department of Physics, PSGVP Mandal's, Shri, S.I.Patil Arts, G,B, Patil Science and STSKVS Commerce college Shahada in Feb. 6-7 2009
- 17) Pradnya N. Chavan, Manjushree M. Bahir, **Bhavana N. Joshi**, Ravindra U. Mene, Megha P. Mahabole, Rajendra S. Khairnar, "Growth of calcified tissue on nano ceramic in Stimulated Body Fluid" Presented in inter collegiate Avishkar-2008 held at SantGadge Baba University, Amravati held on 08th-10th Jan. 2009
- 18) **Bhavana N. Joshi**, R.U. Mene, P. N. Chavan, M.M. Bahir, M. P. Mahabole and R. S. Khairnar, "Fe exchanged HAp for CO₂ gas sensing applications", Accepted for International Conference on Transport and Optical Properties of Nanomaterials (ICTOPON-2009) held in January 5-8, 2009, at Allahabad, India
- 19) **Bhavana N. Joshi** and A.M. Mahajan, "Investigation of material and electrical properties of hybrid SiO₂ thin films for nanoelectronics" Accepted for Second International Conference on Frontiers in Nanoscience and Nanotechnology (cochin nano 2009) held during 3-6 Jan 2009 at Department of Physics, Cochin University of Science and Technology, Cochin
- 20) Ravi Mene, **Bhavana N. Joshi**, M. P. Mahabole, R.S. Khairnar, "HAp thick films for CO₂ gas sensing applications" Accepted for Second International Conference on Frontiers in Nanoscience and Nanotechnology (cochin nano 2009) held during 3rd -6th Jan 2009 at Department of Physics, Cochin University of Science and Technology, Cochin
- 21) **Bhavana N. Joshi**, A. M. Mahajan, "Synthesis of low-k hybrid interlayer dielectric films using MMA for ULSI applications", Presented in Second International Symposium on Advanced Materials and Polymers for Aerospace and Defense Applications (SAMPADA 2008) held at YASHADA, Pune during 8th-12th Dec 2008 Published in Abstract book on pp 120
- 22) Pradnya N. Chavan, Manjushree M. Bahir, **Bhavana N. Joshi**, Ravindra U. Mene, Megha P. Mahabole, Rajendra S. Khairnar, "Study of nanobiomaterialHAp in SBF: Formation and growth of apatite" Presented in Second International Symposium on Advanced Materials and Polymers for Aerospace and Defense Applications (SAMPADA 2008) during 8th -12th Dec 2008 at YASHADA, Pune Published in Abstract book on pp 114
- 23) **Bhavana N. Joshi**, A.M. Mahajan, "Synthesis and characterization of hybrid thin films for nanoelectronics technology", Accepted for The 4th international conference on technological advances of thin films and surface coatings held in Singapore during 13th -16th July 2008 abstract published on pp. 179.
- 24) **Bhavana N. Joshi** and A.M. Mahajan, "Influence of interconnect dimensions on electromigration for Cu/Low-k interconnect structure: An analytical study", published in the IEEE proceedings of 15th IPFA-2008, Singapore PP 181-184 978-1-4244-2040-7/08 2008 IEEE held during 7th -9th July 2008

- 25) **Bhavana N. Joshi** and A. M. Mahajan, "Porous SiO₂ thin films for ULSI applications", Presented in 14th International Workshop on the Physics of Semiconductor Devices (IWPSD), held at IIT Mumbai during 16th -19th Dec. 2007 Published in Proceedings on pp 261-263 and Published in Proceedings on pp 261-263, ISBN: 978-1-4244-1728-5.
- 26) Swati Rane, Purnima Kulkarni, **Bhavana N. Joshi** and A.M. Mahajan, "MMA incorporated SiO₂ low dielectric thin films", Presented in International Conference on Advanced Materials and Applications ICAMA-2007 held at Shivaji University, Kolhapur during 15th -17th Nov. 2007, Published in Abstract book on pp29
- 27) **Bhavana N. Joshi**, and A.M. Mahajan, "FTIR Study of MMA incorporated SiO₂ thin films", Accepted for ICAMA-2007 which will be held at Shivaji University, Kolhapur during 15th -17th Nov. 2007, Published in Abstract book on pp 322
- 28) Purnima Kulkarni, Swati Rane, **Bhavana N. Joshi**, and A.M. Mahajan, "Surface modification study of SiO₂ xerogel thin film", Presented in International Conference on Advanced Materials and Applications ICAMA-2007 held at Shivaji University, Kolhapur during 15th -17th Nov. 2007 Published in Abstract book on pp 321
- 29) Avinash Sonawane, **Bhavana Joshi** and A. M. Mahajan, "Improved interconnect parameters: A novel 0.05 μm CMOS technology for future ULSI", National Seminar on The role of material science in electronic industry and information technology – A future Perspective organized by Dyanprassarak Mandal's College of arts, science, commerce ,management studies and Technology, Assagao, Bardez Goa ,2007
- 30) **Bhavana N. Joshi**, Shewta Mahajan, Yogesh Mhaisagar and A.M. Mahajan, "Study of Optical Properties of SiO₂ Xerogel Films Deposited by Spin Coating", Presented in XXXII Optical society of India symposium on Contemporary optics and applications, held at MS university, Vadodra during 1st-3rd March 2007 Abstract published on pp 96-97
- 31) **Bhavana N. Joshi** and A.M. Mahajan, "Study of SiO₂ xerogel thin films deposited by spin coating as interlayer dielectrics in VLSI", Presented in Raman Memorial Seminar-2007 held at North Maharashtra University on 28th Feb. 2007 Abstract Published in abstract book on pp. 12,
- 32) **Bhavana N. Joshi** and A.M. Mahajan, "Effect of chamber pressure on the properties of PECVD grown SiO₂ thin films", Presented in Raman Memorial Seminar-2006 held at North Maharashtra University, on 28th Feb 2006 Abstract Published in abstract book on pp. 09.
- 33) **Bhavana N. Joshi**, Narendra L. Jaware, Savita Firke and A. M. Mahajan, "Growth of Zn_xS_{1-x} thin films as buffer layer in solar cell", Presented in NSIAE- held at Arts, Science and Commerce College, Chopda, 2006 Abstract Published in Souvenir on pp-101.
- 34) **Bhavana N. Joshi**, Savita Firke and A. M. Mahajan, "Preparation and characterization of Cd_xS_{1-x} thin films grown by CBD for absorbers in solar cells", Presented in NASMAT-2006 held at Shivaji University, Kolhapur, Abstract Published in abstract book on pp-114, 2006.

35) **Bhavana N. Joshi** and A. M. Mahajan, "Chalcogenide thin films for photonics applications", Presented in NASMAT-2006 held at Shivaji University, Kolhapur, Abstract Published in abstract book on pp-115 , 2006.

- **Experience:**

- ◆ Characterization techniques:

Ellipsometer, FTIR spectrophotometer (Nicolet 380), UV analyser (Optizen), Capacitance Voltage analyzer (Keithely-590), Semiconductor Characterization system (Keithely-4200, 2400), LCR meter (Quadtech), Hall Set up (HMS 3000), Lithium ion cell tester (WonATech, battery cyclers system), Scanning electron microscope, Atomic force microscope and analysis of its data.

- ◆ Thin films deposition and Synthesis of materials:

Spray Pyrolysis unit, Electrostatic spinning/ spray deposition, Physical Vapor Deposition and spin coating systems for deposition of thin films. Hydrothermal system (Autoclave) and Wet chemical process for synthesis of nanomaterials and Lithium ion cell preparation.

- **Research Experience:**

- ◆ **Research Professor:**

Worked as **Research Professor** at Department of Mechanical Engineering, Korea University, Seoul, South Korea from July 2012 to February 2013.

Summary:- ZnO-graphene composite films, Nb-TiO₂ have been deposited by electrostatic spray deposition and spin coating for photocatalytic applications. The deposited layers have been characterized and optimized to achieve the highest photocatalytic efficiency.

- ◆ **Post-doctoral fellow:**

Worked as **Post-doctoral fellow** under **National Research Foundation (NRF) Post-doctoral fellowship program** from July 2011- June 2012 at Department of Mechanical Engineering, Korea University, Seoul, South Korea.

Summary:- The transparent conducting oxides (TCO) ZnO and SnO₂ have been deposited by electrostatic spray deposition system for window layer application. The deposited TCO layers have been characterized and optimized to achieve the highest conductivity and transparency in order to enhance the efficiency of solar cell.

- ◆ **Senior Research Fellow:**

Worked as **SENIOR RESEARCH FELLOW** on CSIR funded research project entitled "**Surface modification and electrical characterization of low-k thin film for Interlayer dielectric application in Nanoelectronics**", from 26th March 2009- 17th January 2011 at Department of Electronics, North Maharashtra University, Jalgaon .

Summary:-The porous thin films of SiO₂xerogel has been synthesized by sol gel spin coating technique. Further after annealing these films were soaked in HMDS solution for wet chemical surface modification. Such surface modified films are also suitable for low-k ILD applications and biosensing applications where surface modification is an important step before enzyme immobilization in biosensor fabrication. The metal insulator semiconductor structure of these films has been formed by aluminum metal deposition via vacuum thermal evaporation technique for their electrical characterization. Based on these work 7 papers are presented and accepted in international conferences and 3 in national conferences. Four papers are communicated to international journal out of which three are published and one is submitted.

◆ **Project Fellow:**

Worked as **PROJECT FELLOW** on UGC funded major research project entitled “**Synthesis of hydroxyapatite bioceramic nano material and study of its gas sensing and dielectric properties**” from 30th April 2008-31st January 2009 (9 months)at School of Physical sciences, Swami Ramanand Teerth Marathwada University, Nanded.

Summary:-The hydroxyapatite (HAp) nano material has been synthesized by wet chemical method and studied for gas sensing application in pellet form. The HAp has been characterized by XRD. Further, the ion exchange of synthesized HAp by Cobalt, Ferric, Nickel and Sodium ions has been done. The Co doped and Fe doped HAp have been used for CO₂ gas sensing. The results were communicated in national and international conferences.

◆ **Project Fellow:**

Worked as **PROJECT FELLOW** for UGC major research project entitled “**Characterization of dielectric thin films deposited by PECVD system**” from 1st June 2005 to 31st December 2007 (2 years 7 months) at Department of Electronics, North Maharashtra University, Jalgaon.

Summary:- The dielectric thin films like SiO₂ and porous SiO₂ (low dielectric constant) have been deposited by PECVD and Sol gel- spin coating techniques. The deposited films were characterized by FTIR, Ellipsometer and SEM. Based on this work 5 papers have been published in international journals. 3 papers have been presented in national conference and 7 in international conference.

◆ **PG Project: Deposition of SnO₂ thin film by spray pyrolysis**

Summary:- In this project the SnO₂ thin films were deposited using the spray pyrolysis process. The UV spectra of deposited SnO₂ films were studied to determine the bandgap energy of those films, which was found to be 0.5eV.

◆ **UG Project: Transaction of shares through sub-broker**

Summary: In this project a software module is developed to maintain the database of different transactions carried out in day-to-day share market by sub broker. This project is designed using FoxPro package by applying the principles of System Analysis and Design.

● **Teaching Experience:**

- 1) Worked as a contributory teacher in School of Physical Sciences, Swami RamanandTeerthMarathwada University, Nanded from **Jan. -2005 to May- 2005** and taught the subjects Condensed matter physics, Fiber optics and Lasers-II and conducted Practicals on M.Sc. Class
- 2) Worked as a contributory lecturer in Department of Electronics, North Maharashtra University, Jalgaon from **July -2005 to Dec.- 2005** and conducted Practicals on M.Sc. Ist year Class
- 3) Worked as a contributory lecturer in Department of Electronics, North Maharashtra University, Jalgaon from **Aug. -2007 to Dec.- 2007** and taught the subject Semiconductor devices (EL-101) to M.Sc. Ist year.
- 4) Worked as Assistant Professor at Materials Science and Engineering Department, JIT Jimma University Jimma Ethiopia from **Sept 2014 to Jan 2015** conducted lectures on Ph.D. Course work

● **Computer skills:**

Operating systems:-DOS, WINDOS XP, 98, 2008

Languages :-Fortran,C

Software:- M S office, MatLAB, Origin, Endnote

● **Awards:**

- **Research Professor** at Department of Mechanical Engineering, Korea University, Seoul, South Korea during **July 2012 – February 2013.**
- **Postdoctoral fellowship** from **National Research Foundation (NRF), Korea** during **July 2011 to June 2012**
- **Second prize** for oral presentation in national conference on Emerging trends in materials science and communications (ETMSC-2010) for paper entitled “Fabrication of Al/Hybrid-SiO₂/Si MIS Structure for Interlayer Dielectric Application” held at Department of Physics, Mahatma Gandhi Mahavidyalaya, Ahmedpur, Dist: Latur (MS) during 13th -14th March 2010
- **Best presentation** award in International conference on nanotechnology and biosensors (ICNB-2010) for paper entitled “Effect of spin speed on the properties of spin on low-k thin films for ILD applications in ULSI circuits held at Raghu engineering college, Vishkhapatnam, during 20th -21st Jan. 2010
- **Best presentation** award in Raman Memorial Seminar (RMS-2007) for paper entitled “Study of SiO₂xerogel thin films deposited by spin coating as interlayer dielectrics in VLSI” held at North Maharashtra University on 28th Feb-2007.

- **Relevant coursework :**

Semiconductor Physics, Thin film deposition techniques, Thin film characterization techniques, Mathematical methods and Basic physics

- **Strength:**

1. Innate interpersonal skills and team working capability.
2. Excellent verbal and written communication skills.
3. Leadership qualities.
4. High energy level and self-confidence.
5. Hard working and ability to work under pressure.
6. Proficiency at grasping new technical concepts quickly and utilizing the same in a productive manner.
7. Detail oriented with an analytical bent of mind and a positive attitude.

- **Memberships:**

- 1) Life member of Material research society of India (MRSI). Membership No. LMB-1564.
- 2) Life member of Indian Laser Association (ILA) Membership No. 1095.
- 3) Life member of Electron Microscope Society of India (EMSI).
- 4) Life member of Indian Women Scientists' Association (IWSA), Navi Mumbai Chapter.

- **Workshop/meeting and schools attended:**

- 1) Training Program on Thin Film Synthesis and Characterization Techniques attended at Centre for Nanoscience & Nanotechnology, Sathyabama University, Chennai (20th -21st February 2015)
- 2) AUC meeting for ion irradiation fresh proposals held at IUAC, New Delhi 6th - 7th July 2010.
(The presentation for the proposal was appreciated and it has been accepted).
- 3) One day seminar on FTIR imaging system and its applications held at SAIF-CRNTS, IIT Mumbai on 27th Jan. 2010.
- 4) International winter school for graduates (IWSG 2009) held at IIT Mumbai during 30th Nov.- 5th Dec. 2009.
- 5) 2nd INUP workshop on nanofabrication technologies held at IIT Mumbai during 30th -31st May 2009.
- 6) Pre seminar workshops on Sensors (NSPTS-11) Held at Department of Electronics, University of Pune, Pune during 25th-26th Feb. 2006

References:

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2) Dr. Sam S. Yoon
Associate Professor,

Aforesaid information is true to the best of my knowledge and belief.

(Bhavana N. Joshi)