DR. SHEIKH A. AKBAR

Professor, Department of Materials Science and Engineering
Founder, NSF Center for Industrial Sensors and Measurements (CISM)
4010 Fontana Laboratory, 140 West 19th Avenue
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Education

*1981-1985***:** Purdue University, West Lafayette, IN, USA
Ph.D. in Materials Engineering (1985)
Topic: Demixing of Materials under a Temperature Gradient, Advisor: Prof. H. Sato
*1980-1981***:** University of Cincinnati, Cincinnati, OH, USA
Ph.D. Student (transferred to Purdue), Research Area: Solid State Physics
*1975-1980***:** University of Sofia, Sofia, Bulgaria
B.S. & M.S. in Solid State Physics (1980)
Thesis: Superionic Conductors, Advisor: Prof. Ivan Z. Kostadinov
*1973-1975***:** University of Dhaka, Dhaka, Bangladesh
B.S.(hons) Student (continued at University of Sofia), Major: Physics

Employment

1999-present: **Professor of Materials Science and Engineering**, The Ohio State University, Columbus, OH. Responsibilities include teaching and research in the areas of thermodynamics, kinetics, modeling electrical behavior of ceramics, solid electrolytes, ceramic sensors, thin-films and nano-structures.

1996-1999: **Director, Center for Industrial Sensors and Measurements (CISM)**. Founding Director of a $1 million/year Center funded by the National Science Foundation (NSF), State of Ohio and a consortium of industries.

1993-1999: **Associate Professor of Materials Science and Engineering**, The Ohio State University, Columbus, OH.

1988-1993: **Assistant Professor of Materials Science and Engineering**, The Ohio State University, Columbus, OH.

Honors and Awards

2023 Alumni Distinguished Teaching Award, highest distinction in teaching at OSU
2023-2024 Visiting Professor, NCE, BUET, Dhaka, Bagnladesh
2020-21, Distinguished Professor, UKM, Kuala Lumpur, Malaysia
2018 - Editor, Sensors and Actuators B, Elsevier, Switzerland
2018 Fellow, The Electrochemical Society (ECS), USA
2017 Distinguished Lecturer, Zhi-Hong International Summer School of Advanced Materials (ISS-AM), Shanghai Jiao Tong University (SJTU), Shanghai, China
2017 Mars G. Fontana Outstanding Teaching Award in MSE, OSU, Columbus, OH
2016 Invited Speaker, NANO KOREA 2016, July 13-15, Ilshan, Korea
2016 Invited Speaker, IMCS 2016, July 10-13, Jeju Island, Korea
2016 Mars G. Fontana Outstanding Teaching Award in MSE, OSU, Columbus, OH
2013-present, Member, International Advisory Board (IAB) of NANOSMAT
2012-14, ICON Professor, University of Malaya, Kuala Lumpur, Malaysia
2012 Outstanding Achievement Award *(international award),* Sensor Division, The Electrochemical Society, USA

2011 Plenary Speaker, ISOEN 2011, Rockefeller Center, New York City, USA
2011 Invited Speaker, Korea University, Seoul, Korea
2011 Visiting Professor, Dalian University of Technology, Dalian, China
2011 Invited Speaker, Saudi Aramco, Dhahran, Saudi Arabia
2010-2018, External Advisory Board Member, Center for Nanotechnology, KFUPM, Dhahran, Saudi Arabia
2010 Invited Speaker, University of Western Australia, Perth, Australia
2010 Invited Speaker, Institute of Superconductivity and Electronics Materials, University of Wollongong, Australia
2010 Visiting Consultant, University of Malaya, Kuala Lumpur, Malaysia
2010 Keynote Speaker, The 5th Annual Meeting of the Saudi Physical Society, Abha, KSA
2009 Keynote Speaker, ISFM 2009, Jinju, Korea
2008 Keynote Speaker, NIMS Annual Symposium, Tsukuba, Japan
2009 Visiting Professor, Chonnam National University, Gwangju, Korea
2009 Visiting Professor, Kyungpook National University, Daegu, Korea
2008 Visiting Professor, King Saud University, Riyadh, KSA
2007 R&D 100 Award on NO_x sensor, *National Award*
2006-2008, Chair, 12th International Meeting on Chemical Sensors (IMCS-12)
2007 Visiting Professor, University of Malaya, Kuala Lumpur, Malaysia
2007 Visiting Professor, Korea University, Seoul, Korea
2006 Visiting Professor, King Fahd University of Petroleum and Minerals, Dahran, KSA
2006 Visiting Professor, Harbin Institute of Technology, Harbin, China
2006 "Our Pride Award", BAFI, USA
2005-2010, Steering Committee Member, 11th IMCS (Italy); 12th IMCS (USA) and 13th IMCS (Australia).
2005, two (2) R&D 100 Awards on O_2 sensor, and CO and CO_2 sensors for fire detection
2005, NASA TGIR (Turning Goal into Reality) Award for fire detection sensors
2004-2005, Steering Committee Member, US-Japan Conference on Sensor Systems
2004, Visiting Professor, KAIST, Daejon, Korea
International Organizing Committee Member, CMCEE (Vancouver, Canada – 2015), ICC3 (Japan- 2010), IMCS-13 (Australia-2009-2010), ICMAT (Singapore – 2007), IMCS-11 (2006 - Italy), AMEC-4 (China – 2005), AMEC-3/ICMAT (Singapore - 2003).
Guest Editor, "Science and Technology of Advanced Materials Applied to Society: Including Collections from the Latest Papers of KRIS 2023"
Guest Editor, "Advanced Functional Nanomaterials for Sensor Applications," Chemosensors (2023)
Guest Editor, "Energy and Environment: Role of Advanced Materials," a special issue published in the Journal of Nanoengineering and Nanomanufacturing (2014)
Guest Editor, "Sensing at the Nano-scale: Chemical and Bio-sensing," a special issue published in Sensors (2012)
Guest Editor, "Nano-structured Ceramics: Opportunities and Challenges," a special issue published by American Scientific Publishers (2011)
Guest Editor, "Chemical Sensors for Pollution Monitoring and Control," Journal of Materials Science, (November, 2003)
Guest Editor, "Chemical and Bio-Ceramics," Journal of Materials Science, (Dec., 2003)
2002 W.E. Cramer Award, American Ceramic Society Central Ohio Section
2002 Tan Chin Tuan Faculty Fellow, Nanyang Technological University, Singapore
2001 Fulrath Award *(national award),* American Ceramic Society, USA

2001 Fellow *(national award),* American Ceramic Society, USA
2000 Invited Speaker, Gordon Conference on Chemical Sensors and Interfacial Design, Ventura Beach, California, Jan. 23-28, 2000
2000 UNDP Consultant, BCSIR, Dhaka, Bangladesh
1999 Outstanding Materials Engineer Award, Purdue University, West Lafayette, IN, USA
1999 Visiting Scholar, Suzuka National College of Engineering, Suzuka, Japan.
1996 Lumley Award, College of Engineering, OSU, USA
1995 UNDP Consultant, BUET, Dhaka, Bangladesh
1993 BFGoodrich Collegiate Inventors Award *(one of three national awards)***,** USA

Other Professional Activities

Member of OSU Senate (2015-2018)
Member of OSU Senate, Honorary Degrees Selection Committee (2015-17)
Member of University Tenure and Promotion Committee, OSU (2015-18)
Member of Technical Steering Committee, Sensors and Controls, US Department of Energy (2000-2008)
Program Committee Chair, US-Japan Conference of Sensors for the 21st Century (2006)
Executive Committee Member, International conference on Chemical Sensors (IMCS) (2006-current)
Member of Steering Committee, International Conference on Engineering Education (ICEE)
Member of International Advisory Board of CIMTEC, World Ceramic Congress and Forum on New Materials
Member of the International Advisory Board, Encyclopedia of Sensors
Member of Technical Steering Committee, Sensors & Controls, Office of Industrial Technology, Department of Energy, USA
Member of International Advisory Board of SPPM 1997, International Conference on Structure, Processing and Properties of Materials, Bangladesh University of Engineering and Technology, Dhaka, Bangladesh.
Editor, Sensors and Actuators B
Editor, Functional Ceramics, Frontiers in Materials
Member of Editorial Board
Ceramics International
Sensor Letters
Journal of Nanoengineering and Nanomanufacturing
Journal of Nanomaterials
Materials Focus
Sensors
Summer Faculty Fellow: NASA Lewis Research Center, Cleveland, OH (1990)
Collateral Faculty: Ohio Aerospace Institute, Cleveland, OH (1990-1994)
Tutorial Speaker: "High-Temperature Superconductors," 41st National Aeronautics and Electronics Conference, Dayton, OH (1989)
Guest Scientist: International Center for Theoretical Physics, Trieste, **Italy** (1980)

Visiting Professor/Consultant

Nanyang Technological University, Singapore
King Fahd University of Petroleum and Minerals (KFUPM), Dahran, Saudi Arabia
King Saud University, Riyadh, Saudi Arabia
Korean Advanced Institute of Science and Technology (KAIST), Daejon, Korea
University of Malaya, Kuala Lumpur, Malaysia

Korea University, Seoul, Korea
Kyungpook National University, Daegu, Korea
Chonnam National University, Gwangju, Korea
Harbin Institute of Technology, Harbin, China
Dalian University of Technology, Dalian, China
BUET, Dhaka, Bangladesh
BCSIR, Dhaka, Bangladesh

Member: Materials Research Society (MRS), American Ceramic Society (ACerS), Electrochemical Society (ECS), ECS Sensor Division, Bangladesh Ceramic Society (BCerS)

Symposia Co-organizer:

American Ceramic Society (ACerS), 1996, 1999, 2001, 2002, 2003, 2004, 2005 and 2007
Electrochemical Society, 2005
TMS/ASM/ACerS, MST 2006
MRS-Singapore, 2006, 2007
AMEC -3 (Singapore – 2003); AMEC -4 (China – 2005)
ICMAT (Singapore – 2007)
IMCS – Chair (2008, USA) Member – Italy (2006), Australia (2010), Korea (2016), Austria (2018), USA (2020); China (2023); Germany (2025)
ICC3 (Japan, 2010)
11th CMCEE (Vancouver, Canada, 2015)
ICC8 (Seoul, Korea, 2020)
ICACC Focused Session 3: Nanostructures and Low-Dimensional Materials for Chemical Sensors (2022, 2023)
CMCEE **Symposium T3.5: Advanced Sensors for Energy, Environment and Health Applications (2024)**

Invited/Keynote Talks at International Meetings: France (1989), Bangladesh (1995, 2000, 2006), India (1999), Italy (1998, 2006), Brazil (1998), Singapore (1998, 2001, 2002, 2007), Czech Republic (1999), Japan (1999, 2002, 2005, 2008), Taiwan (2000), Korea (2000, 2002, 2004, 2007, 2009, 2010, 2011), Norway (2001), China (2005, 2006, 2011, 2017), KFUPM, SA (2002, 2004, 2006), KSU, SA (2007, 2008), Malaysia (2005, 2007, 2010-2014), Australia (2010), Austria (2018), SERI, UKM, Malaysia (2020), e-conf on Phys, Bangladesh (2021), UKM, Malaysia (2021), NANOSYM 2021, PACRIM 14 Vancouver (2021), Materials Summit (2022), 15th National Sensor Conf, China (2023), Alighar Nanotechnology conf, 2022 (India), BUET 2022 (Bangladesh), ICPHMS-2023 (Pakistan), BUET 2023 (Bangladesh), DLUT 2023 Dalian (China)

Popular Media: Columbus Dispatch (December, 1995); WOSU (April, 1996); OSU Research (December 1, 2003); The Hindu (December, 2003); Sensors (January, 2004); Business Week (January 19, 2004); Frost & Sullivan (January, 2004); Ceramic Bulletin (March and August, 2004); Ceramic Industry (August, 2005); Voice of America (May 14, 2006); cover page - Journal of Applied Ceramic Technology (IJACT), 3[3],177-192 (2006); OSU Research (July 31, 2013); OSU Today (August 7, 2013); Ceramic Tech (August, 2013); OnCampus (August 22, 2013); Columbus Dispatch (September 29, 2013); Ceramic Bulletin (October, 2013); IMR Newsletter (May, 2014), MSE (OSU) web-page (December, 2016), MSE/OSU webpage (2023), Faculty Focus/OSU (2023), Ohio Sangbad (2023)

Publications (Total papers: 280+; total citations – 14,100+; h-index - 55)

A. Books and Journals Edited

1. *Chemical Sensors for Hostile Environments*, G.M. Kale, **S.A. Akbar** and M. Liu, Eds., Ceramic Transactions, vol. 130, American Ceramic Society (2002).
2. *Chemical Sensors for Pollution Monitoring* (special section), **S.A. Akbar** and C.O. Park, Guest Editors, J. Mater. Sci., vol. 38, No. 21 (2003).
3. *Chemical and Bio-ceramics* (special section), **S.A. Akbar** and C.O. Park, Guest Editors, J. Mater. Sci., vol. 38, No. 23 (2003).
4. *Chemical Sensors 7 and MEMS/NEMS 7*, P. Hasketh, G. Hunter, **S.A. Akbar**, et al., Eds., ECS Transactions, vol. 3, No. 10 (2006).
5. **S.A. Akbar,** A.M. Azad, J.H. Lee and G.M. Kale, "Nano-structured Oxides: Challenges and Opportunities," Sci. Adv. Mater., 3, 735-738 (2011).
6. **S.A. Akbar**, *Sensing at the Nano-scale: Chemical and Biosensing*, *Sensors* **2012**, *12*, doi:10.3390/s120404962
7. **S.A. Akbar**, A.M. Azad and N. Ali, *A Special Issue on Energy and Environment: Role of Advanced Materials*, J. Nanoeng. Nanomanuf. 4, 77-79 (2014)
8. A. Khosla, S.A. Akbar, J.E. Koehne, P.J. Hesketh, et al., Wearable Sensors and Systems, ECS Transactions, vol. 86, Issues 16 (2018)
9. S.A. Akbar, Q. Drmosh and X. Li, "Editorial: Nano-hetero-structures for Chemical Sensing: Opportunities and Challenges," https://www.frontiersin.org/journals/materials#editorial-board; https://doi.org/10.3389/fmats.2019.00332 (2019).

B. Refereed Journals

10. T. Ishikawa, H. Sato, R. Kikuchi and **S.A. Akbar**, "Demixing of Materials under Chemical Potential Gradients," J. Am. Ceram. Soc**.,** 68, 1-6 (1985).
11. H. Sato, K. Wada, A. Suzuki and **S.A. Akbar**, "Percolation Efficiency and Mixed Alkali Effect," Solid State Ionics, 18&19, 178-182 (1986).
12. **S.A. Akbar**, M. Kaburagi, H. Sato and R. Kikuchi, "Demixing of Oxides under a Temperature Gradient," J. Am. Ceram. Soc., 70, 246-253 (1987).
13. **S.A. Akbar**, M. Kaburagi and H. Sato, "Soret Effect in Solid, II," J. Phys. Chem. Solids, 48, 579-586 (1987).
14. **S.A. Akbar** and I.Z. Kostadinov, "Hopping Conduction in Na-β-Alumina," J. Phys. Chem. Solids, 48, 657-659 (1987).
15. **S.A. Akbar**, "Hopping Conduction in Na-β-Alumina: Temperature Dependence (Technical Note)," J. Phys. Chem. Solids, 49, 585-586 (1988).
16. T. Ishikawa, **S.A. Akbar**, W. Zhu and H. Sato, "Time Evolution of Demixing in Oxides under an Oxygen Potential Gradient," J. Am. Ceram. Soc., 71, 513-521 (1988).
17. H. Sato, **S.A. Akbar** and T. Ishii, "Frequency Dependence of Hopping Conductivity and Mixed Alkali Effect," Solid State Ionics, 28-30, 138-141 (1988).
18. **S.A. Akbar** and H. Sato, "Demixing: a Source of Material Deterioration," J. Phys. Chem. Solids, 50, 729-733 (1989).

19. C.C. Wang, K.S. Goto and **S. A. Akbar**, "Demixing of (Ni,Co)O Under an Oxygen Potential Gradient Using YSZ-Based Galvanic Cell," J. Electrochem. Soc., 138[12], 3673-3677 (1991).
20. S. Mhaisalkar, D.W. Readey and **S.A. Akbar**, "Microwave Dielectric Properties of Doped $BaTi_4O_9$," J. Am. Ceram. Soc., 74 [8], 1894-1898 (1991).
21. S. Mhaisalkar, D.W. Readey, **S.A. Akbar**, P. Dutta, M. Sumner and R. Rokhlin, "Infrared Reflectance Spectra of Doped $BaTi_4O_9$," J. Solid State Chem., 95[2], 275-282 (1991).
22. M. Sturm, Z.A. Chaudhury and **S.A. Akbar**, "Joining of 123 Superconductor," Matrls. Letters, 12, 316-320 (1991).
23. J. Subramanian, **S. A.Akbar** and K. Goto, "Preparation and Properties of Two-Phase Mixed Conductors of β-Alumina and Iron Oxide," J. Electrochem. Soc., 139, 2562-2566 (1992).
24. C.C. Wang and **S.A. Akbar**, "Decomposition of $YBa_2Cu_3O_x$ Superconductor Under Oxygen Potential Gradients Using a YSZ Galvanic Cell," Matrls. Letters, 13 [4&5] 254-260 (1992).
25. **S.A. Akbar**, "The Path Probability Method: An Atomistic Technique of Diffusion," J. Matls. Sci., 27, 3125-3132 (1992).
26. C.C. Wang and **S.A. Akbar**, "Demixing of (Ni,Co)O Under an Oxygen Potential Gradient (II)," J. Electrochem. Soc., 139[9], L77-L78 (1992).
27. A. Azad, S. Mhaisalkar, L. Birkefeld, **S.A. Akbar** and K. Goto, "Behavior of a New ZrO_2-MoO_3 Sensor for CO Detection," J. Electrochem. Soc., 139, 2913-2920 (1992).
28. A.M. Azad, **S.A. Akbar**, S.G. Mhaisalkar L. D. Birkefeld and K.S. Goto, "Solid-State Gas Sensors: A Review," J. Electrochem. Soc., 139[12], 3690-3704 (1992).
29. L.D. Birkefeld, A.M. Azad and **S.A. Akbar**, "Carbon Monoxide and Hydrogen Detection by Anatase Modification of Titanium Dioxide," J. Am. Ceram. Soc., 75, 2964 - 2968 (1992).
30. W. Zhu and **S. A. Akbar**, "Mixed Conduction in β-Alumina Type Materials: A Critical Review," J. Matls. Proc. Tech., 38, 15-27 (1993).
31. A.M. Azad, L.D. Birkefeld, **S.A. Akbar** and M.A. Alim, "Characterization of TiO_2-Based Sensor Materials by Immitance Spectroscopy," J. Am. Ceram. Soc., 77, 481 (1994).
32. C.C. Wang and **S.A. Akbar**, "Diffusion in Ordered Alloys and Intermetallic Compounds," Acta Metall., 41[10], 2807-2813 (1993).
33. **S.A. Akbar**, "A Generalized View of the Correlation Factor in Solid-State Diffusion," J. Appl. Phys., 75[6], 2851-2856 (1994).
34. A.M. Azad, **S.A. Akbar**, L.B. Younkman and M.A. Alim, "High-Temperature Immittance Response in Anatase-Based Gas Sensors," J. Am. Ceram. Soc., 77[12], 3145-3152 (1994).
35. A.M. Azad, S. LaRose and **S.A. Akbar**, "Bismuth Oxide-Based Solid Electrolytes for Fuel Cells," J. Mater. Sci., 29, 4135-4151 (1994).
36. P.K. Dutta, R. Asiaie, **S.A. Akbar** and W. Zhu, "Hydrothermal Synthesis and Dielectric Properties of Tetragonal $BaTiO_3$," Chem. Matter**.,** 6, 1542-1548 (1994).
37. A. M. Azad, **S.A. Akbar** and L.B. Younkman, "Ceramic Sensors for Carbon monoxide and Hydrogen," Interface, 31-34 (December, 1994).

38. C.C. Wang and **S.A. Akbar**, "Determination of Atomistic Parameters and Transport Properties Combining Theory and Experiments of Demixing in (Co,Mg)O," J. Phys. D: Appl. Phys., 28, 120-128 (1995).
39. C.C. Wang, W. H. Chen, V.D. Patton and **S.A. Akbar**, "A Review on Electrical Properties of High-Temperature Materials: Oxides, Borides, Carbides and Nitrides," J. Mater. Sci., 30[7], 1627-1641 (1995).
40. M. Rahman, C.C. Wang, W. Chen, **S.A. Akbar** and C. Mroz, "Electrical Resistivity of Titanium Diboride and Zirconium Diboride," J. Am. Ceram. Soc., 78[5], 1380-82 (1995).
41. V.D. Patton, C.C. Wang, **S.A. Akbar** and M.A. Alim, "The ac Electrical Behavior of Polycrystalline Yttria," J. Appl. Phys**.,** 78[3], 1757-62 (1995).
42. C.C. Wang, V.D. Patton, **S.A. Akbar** and M.A. Alim, "Effect of Zirconia Doping to the Electrical Behavior of Yttria," J. Mater. Res., 11[2], 422-429 (1996).
43. R. Asiaie, W. Zhu, **S.A. Akbar** and P.K. Dutta, "Characterization of Submicron Particles of Tetragonal $BaTiO_3$," Chem. Mater., 8, 226-234 (1996).
44. W. Zhu, C.C. Wang, **S.A. Akbar** and M.A. Alim, "AC Eelectrical Behavior of Hydrothermally Synthesized $BaTiO_3$ Ceramics," Jpn. J. Appl. Phys., 35, 6145-52 (1996).
45. **S.A. Akbar** and C.C. Wang, "High Temperature Sensor Materials," Interface, 41-43, Dec. (1996).
46. C.C. Wang, W.H. Chen, **S.A. Akbar** and M.A. Alim, "High-Temperature ac Electrical Behavior of Polycrystalline Calcium Zirconate," J. Mater. Sci., 32[9] 2305-2312 (1997).
47. W. Zhu, **S.A. Akbar**, R. Asiaie and P.K. Dutta, "Sintering and Dielectric Properties of Hydrothermally Synthesized Cubic and Tetargonal $BaTiO_3$ Powders," Jpn. J. Appl. Phys., 36, 214-221 (1997).
48. **S.A. Akbar** and L.B. Younkman, "Sensing Mechanism of a Titania-Based CO Sensor," J. Electrochem. Soc., 144, 1750-53 (1997).
49. W. Zhu, C.C. Wang and **S.A. Akbar**, "Fast Sintering of Hydrothermally Synthesized $BaTiO_3$ Powders and Their Dielectric Properties," J. Mater. Sci., 32, 4303-4307 (1997).
50. C.C. Wang, **S.A. Akbar**, W. Chen and R.J. Schorr, "High-Temperature Thermistors Based on yttria and calcium zirconate," Sensors and Actuators A, 58, 237-243 (1997).
51. Z.A. Chaudhury, T. Ahmed, G. Newaz, L. Wang and **S.A. Akbar**, "Evaluation of Bond Integrity of a TiO_2-Al_2O_3 Sensor Using Thermal Wave Image Technique," Mater. Lett., 34, 76-80 (1998).
52. W. Zhu, R. Asiaie, P.K. Dutta and **S.A. Akbar**, "Synthesis, Microstructure and Electrical Properties of Hydrothermally Prepared Ferroelectric $BaTiO_3$ Thin Films," J. Electroceramics, 2[1], 21-31 (1998).
53. Y. Chiang, C.C. Wang and **S.A. Akbar**, "Calcium Zirconate for the Monitoring of Hydrocarbons," Sensors and Actuators B, 46[3], 208-212 (1998).
54. C.C. Wang, **S.A. Akbar** and M.J. Madou, "Ceramic Based Resistive Sensors," J. Electroceramics, 2[4], 273-282 (1998).
55. P.I. Gouma, **S.A. Akbar** and M.J. Mills, "Microstructural Characterization of Sensors Based on Electronic Ceramic Materials, JOM, 50[11] (1998).

56. A. Kohli, C.C. Wang and **S.A. Akbar**, "Niobium Pentoxide as a Lean-Range Oxygen Sensor," Sensors and Actuators B, **56**, 121-128 (1999).
57. A. Holt, M. Rahman, **S.A. Akbar**, P. Bulusu and C.C. Wang, "Electrode Attachment, Aging and Thermal-Cycling Characteristics of Yttria-Based Thermistors," Matls. Letter **40**, 213-221 (1999).
58. P.K. Dutta, A. Ginwalla, B. Hogg, B. Patton, B. Chwieroth, Z. Liang, P. Gouma, M. Mills and **S.A. Akbar**, "Interaction of Carbon Monoxide with Anatase Surfaces at High Temperatures: Optimization of a Carbon Monoxide Sensor," J. Phys. Chem. B, **103**, 4412-22 (1999).
59. J.S. Park, S.W. Kim, E.G. Lee, J.Y. Kim, H.G. Lee and **S.A. Akbar**, "CO_2 Gas Sensor Based on Li_2ZrO_3 System," Korean Journal of Mater. Res., **9**, 896-899 (1999).
60. J.S. Park, J.W. Hong, E.G. Lee, J.Y. Kim and **S.A. Akbar**, "High Temperature Electrical Behaviors of Li_2ZrO_3 Thick Films," Jpn. J. Appl. Phys. Let., **39**, L474 - L475 (2000).
61. A. Banerjee and **S.A. Akbar**, "A New Method for Fabrication of Stable and Reproducible Yttria-Based Thermistors," Sensors and Actuators A, **87**, 60-66 (2000).
62. B. Lakshminarayanan, C.C. Wang, **S.A. Akbar** and M.A. Alim, "An In-House Built Thermally Stimulated Current (TSC) Measurement Setup: Strontium Titanate as a Test System," Jpn. J. Appl. Phys., **39**, 4830-4834 (2000).
63. A.K.M.S. Chowdhury, **S.A. Akbar**, S. Kapileshwar and J.R. Schorr, "A Rugged Oxygen Gas Sensor with Solid Reference for High Temperature Applications," J. Electrochem. Soc., **148**, G91-G94 (2001).
64. N. Savage, **S.A. Akbar** and P.K. Dutta, "Titanium Dioxide Based High Temperature Carbon Monoxide Selective Sensor," Sensors and Actuators B, **72**, 239-248 (2001).
65. N. Savage, B. Chwieroth, A. Ginwalla, B.R. Patton, **S.A. Akbar** and P.K. Dutta, "Composite n-p Semiconducting Titanium Oxides as Gas Sensors," Sensors and Actuators B, **79**, 17-27 (2001).
66. C.H. Lee, **S.A. Akbar** and C.O. Park, "Potentiometric CO_2 Gas Sensor with Lithium Phosphorous Oxynitride Electrolyte," Sensors and Actuators B, **80**, 234-242 (2001).
67. A. Singh, J. Jayaram, M. Madou and **S.A. Akbar**, "Pyrolysis of Negative Photoresists to Fabricate Carbon Structures for MEMS and Electrochemical Applications," J. Electrochem. Soc., **149[3]**, E78-E83 (2002).
68. C. Park, **S.A. Akbar** and J. Hwang, "Selective Gas Detection with Catalytic Filter" Materials Chemistry & Physics, **75 (1-3),** 56-60 (2002).
69. N. Szabo, H. Du, **S.A. Akbar,** A. Soliman and P.K. Dutta, "Microporous Zeolite Modified Yttria Stabilized Zirconia (YSZ) Sensors for Nitric Oxide (NO) Determination in Harsh Environments," Sensors and Actuators B, **82**, 142-149 (2002).
70. W. Noh, Y. Shin, J. Kim, W. Lee, K. Hong, **S.A. Akbar** and J. Park, "Effects of NiO addition in WO_3-based gas sensors prepared by thick film process," Solid State Ionics, **152-153**, 827-832 (2002).
71. B. Narayanan, **S.A. Akbar** and P.K. Dutta, "A Phosphate-based Proton Conducting Solid Electrolyte Hydrocarbon Gas Sensor," Sensors and Actuators B, **87**, 480-486 (2002).

72. S. Lim, X. Chen, W. Lu, W. Zhu and **S.A. Akbar**, "Structural and Thermal Analyses on Phase Evolution of Sol-gel (Ba,Sr)TiO_3 Thin Films," Surface and Coatings Technology, **167**, 203-206 (2003).
73. C.O. Park, C. Lee, **S.A. Akbar** and J. Hwang, "The origin of oxygen Dependence in a potentiometric CO_2 sensor with Li-ion conducting electrolytes," Sensors and Actuators B, 88, 53-59 (2003).
74. C. Reddy, P.K. Dutta and **S.A. Akbar**, "Detection of CO in a reducing, hydrous environment using CuBr as electrolyte," Sensors and Actuators B, **92**, 351-355 (2003).
75. C. Reddy, X. Cao, O. Tan, W. Zhu and **S.A. Akbar**, "Selective detection of ethanol vapor using $xTiO_2$-$(1-x)WO_3$-based sensors," Sensors and Actuators B, **94**, 99-102 (2003).
76. **S.A. Akbar**, P.K. Dutta, B.R. Patton and H. Verweij, "A Research Driven Multidisciplinary Program with Industrial Partnership," World Transactions on Engineering and Technology Education, 2[2], 241-244 (2003).
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4. “Studies of ZnO-Based Thick Film Resistors for Gas Sensor Applications,” J.D. Nutakki, University of Pune, Pune, India (1998).
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32. "STRUCTURAL AND DIELECTRIC PROPERTIES OF TRIVALENT IONS (Ho+3, Er+3, AND Ga+3) DOPED CALCIUM COPPER TITANATE ELECTROCERAMICS" by Sukhanidhan Singh, Indian Institute of Technology, Dhanbad, Jharkand, India (2023).
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4. S.A. Akbar, "Smart Materials and Ceramic Sensors**," Central Ohio Technology Expo. and Conf**., Columbus, OH, Feb. 22 (1996).

5. S.A. Akbar, Ceramic Sensors for Hostile Environments: Tests in Automotive Engines," **47th Earthmoving Industry Conf. & Expo**., Peoria, IL, April 16-17 (1996).
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8. S.A. Akbar, "Sensor Materials for High-Temperature Applications," **10th Annual Alabama Materials Conference**, Auburn University, Auburn, AL, September (1996).
9. S.A. Akbar, "Ceramic Sensors for Hostile Environments," International Conf. SENSOR-97, Kharagpur, **India**, December 30, 1997.
10. S.A. Akbar, "Ceramic Sensors," colloquium speaker, **Case Western Reserve University**, **Cleveland**, OH, Feb. 10, 1998.
11. S.A. Akbar, "High Temperature Sensors," colloquium speaker, **Purdue University**, West Lafayette, IN, March 2, 1998.
12. S.A. Akbar, "Ceramic Sensors for Hostile Environment," **American Chemical Society Mtg**. Cleveland, OH, May 24-28, 1998.
13. S.A. Akbar, "CISM and Cearmic Sensors for Industrial Applications," **CIMTEC**, Florence, **Italy,** June 14 - 19, 1998.
14. S.A. Akbar, "Ceramic Sensors for Hostile Environments," **CNR-LAMEL**, Bologna, **Italy,** June 15, 1998.
15. S. A. Akbar, "Interdisciplinary Program in Sensors and Measurements," Intl. Conf. Engineering Education, August 17-20, Rio de Janeiro, **Brazil,** 1998.
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19. S.A. Akbar, "Sensor Materials R&D and Innovative Curriculum Development," Colloquium Speaker, **Wayne State University**, Detroit, MI, February 2, 1999.
20. S.A. Akbar and P.K. Dutta, "Ceramic Gas Sensors: Chemistry at the Gas-Solid Interface," **TMS Annual Meeting**, San Diego, CA, Feb. 28 – March 3, 1999.
21. S.A. Akbar, "Ceramic Sensors R&D Leading to a Novel Curriculum Development**," 1999 Outstanding Materials Engineer Award Talk**, **Purdue University**, April 19, 1999.
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27. S.A. Akbar, “Hostile Environment Sensors,” colloquium speaker, **University of Cincinnati**, Cicinnati, OH, February 18, 2000.
28. S.A. Akbar, P.K. Dutta, Y. Wang, B.R. Patton and M.J. Madou, “Multidisciplinary Curriculum in Sensor Materials,” TMS Annual Meeting, Nashville, TN, March 12-15, 2000.
29. S.A. Akbar, Ceramic Sensors for Industrial Applications: Opportunities and Challenges,” Plenary Lecture, 7th Annual Conference, **Bangladesh Ceramic Society**, Dhaka, Bangladesh, April 6-8, 2000.
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39. S.A. Akbar, “R&D in Sensors Leading to Curriculum Development,” Ceramic Society of Japan Annual Meeting, Osaka, **Japan**, March (2002).
40. S.A. Akbar, “Nano-ceramics and Chemical Sensing,” Science & Technology Center, Taegu, **Korea**, March (2002).
41. S.A. Akbar, “Multidisciplinary Research Leading to an Innovative Curriculum,” American Ceramic Society Annual Meeting, St. Lois, MO, April (2002).
42. S.A. Akbar, “Ceramic Oxides and Nano-structures for Chemical Sensing and Catalysis,” Nayang Technological University, **Singapore**, July 22, 2002.
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50. S.A. Akbar, "From Bulk and Thick-film Sensors to Titania Nano-fingers," CMR, OSU, February 2004.
51. S.A. Akbar, "From Bulk and Thick-film Sensors to Ceramic Nano-structures," Keynote Speaker, ASM/TMS Symposium on Smart and Functional Materials, GE Global Research, May 24-25, 2004.
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54. S.A. Akbar, "Ceramic nano-structures: a platform for Chemical Sensing," KITECH, Chonan, **Korea**, July 26, 2004.
55. S.A. Akbar, "Sensor Arrays and Modeling," Kyungpook National University, Taegu, **Korea**, July 28, 2004.
56. S.A. Akbar, "Ceramic Sensors Leading to Ceramic Nano-structures," TMS Fall Meeting, Columbus, October 2004.
57. S.A. Akbar, Series of Lectures on Ceramic Materials and Nano-structures for Chemical Sensing and Catalysis, Visiting Professor, Korea Advanced Institute Science and Technology (KAIST), Taejon, **Korea**, July 15-30, 2004
58. S.A. Akbar, Workshop on Ceramic Materials and Nano-structures for Chemical Sensing and Catalysis, Visiting Professor, King Fahd University of Minerals and Petroleum, Dhahran, **Saudi Arabia**, December 18-23, 2004.
59. S.A. Akbar. S. Yoo and C. Carney, "Ceramic Nano-structures: Platform for Sensing," Cocoa Beach Meeting, Florida, January 23-28, 2005.
60. S.A. Akbar, "Chemical Sensor Technologies," US-Japan Bilateral Conference Sensor Systems for 21st Century, Tsukuba, **Japan**, Feb 28 – March 3, 2005.
61. S.A. Akbar, "Ceramic Nano-structures; Platforms for Chemical Sensing and Catalysis," Colloquium Speaker, Washington State University, Pullman, Washington, March 10, 2005.
62. S.A. Akbar, "Nano-carving of Ceramics via Gas Phase Reaction," AMEC-4, Hangzhou, **China** (2005).
63. S.A. Akbar, "Gas-phase driven ceramic nano-structures: mechanism and applications," Jiao Tong University, Shanghai, **China** (2006).

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65. S.A. Akbar and H. Lee "TiO_2 thin-films for chemical sensing," IMCS-11, **Italy** (2006).
66. S.A. Akbar, Workshop on Nano-technology, Visiting Professor, King Fahd University of Minerals and Petroleum, Dhahran, **Saudi Arabia**, December 10-20, 2006.
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68. S.A. Akbar, "Ceramic Nano-structures: Platform for Sensing," University of Malaya, **Malaysia**, July 13, 2007.
69. S.A. Akbar, "Ceramic Nano-structures without lithography," Korea University, **Korea**, July 25, 2007.
70. S.A. Akbar, "Ceramic Nano-structures without lithography: platforms for chemical sensing," EACCS-07, **Singapore**, December 3-5, 2007.
71. S.A. Akbar, "Ceramic Nano-structures by surface modification: platforms for chemical sensing," Symposium on sensor materials and technologies for safe and secure society, Tokyo, **Japan**, **Keynote**, March 11-13, 2008.
72. S.A. Akbar, "Ceramic nano-structures by gas-phase reaction: processing, characterization and mechanism," International Symposium on Functional Materials (ISFM2009), **Plenary**, Jinju, **Korea**, June 15-18, 2009.
73. S.A. Akbar, "One dimensional nanostructures of oxides," KAIST, Daejon, **Korea** (2009).
74. S.A. Akbar, "Non-lithographic routes for ceramic nano-structures," KITECH, **Korea** (2009).
75. S.A. Akbar, "Oxide nano-structures for sensing and biomedical applications," Chosun University, Gwangju, **Korea** (2009).
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78. S.A. Akbar, "Ceramic Oxides and Nano-structures," University of Wollongong, **Australia** (2010)
79. S.A. Akbar, "Novel Nano-structured Oxides by Surface Modification and Their Applications," 5th Annual Meeting of the Saudi Physical Society, Abha, **KSA,** Keynote, October (2010)
80. S.A. Akbar, "Poor Man's Nanotechnology: A Materials Approach," University of Malaya, Kuala Lumpur, **Malaysia** (2010)
81. S.A. Akbar, "Nano-structured Oxides by Surface Modification: Platforms for Chemical Sensing and Beyond," ISOEN 2011, Rockefeller Center, New York City, **USA** (2011).
82. S.A. Akbar, "Nano-technology by Materials Design," University of Malaya, Kuala Lumpur, **Malaysia** (2011)
83. S.A. Akbar, "How to Write a Technical Paper?" University of Malaya, Kuala Lumpur, **Malaysia** (2011)
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88. S.A. Akbar, "Nano-structured Oxide Platforms: a Materials Design," Nanyang Technological University (NTU), **Singapore** (2012)
89. S.A. Akbar, "From Ceramic Sensors to Oxide Nano-structures," ECS Sensor Division Outstanding Achievement Award presentation, Honolulu, HI, October (2012).
90. S.A. Akbar, "Nano-structures by Materials Design: Platforms for Chemical Sensing and Beyond," keynote speaker at a workshop at University of Malaya, July 17 & 18, 2013, Kuala Lumpur, Malaysia (2013).
91. S.A. Akbar, "Nano-structured Oxide Platforms for Chemical Sensing and Beyond: A Materials Design," NANOSMAT 2014 USA, May 19-22, Houston, TX (2014).
92. S.A. Akbar, "Nano-materials and Nano-structures: Opportunities and Challenges," UM, Kuala Lumpur, Malaysia, June 26, 2014.
93. S.A. Akbar, "Materials Design of Nano-structured Oxides: Platforms for Chemical Sensing and Biomedical Applications," UM, Kuala Lumpur, Malaysia, June 27, 2014.
94. S.A. Akbar, "Nano-structured Ceramics: Platforms for Chemical Sensing and Biomedical Applications," UKM, Bangi, Malaysia, July 3, 2014.
95. S.A. Akbar, "Mentoring Post-graduate Students: Research Design and Fundamental Basis," UM, Kuala Lumpur, Malaysia, July 14, 2014.
96. S.A. Akbar, "Ceramic Gas Sensors to Oxide Nano-heterostructures: A Materials Design," IMCS 2016, Jeju, Korea (2016).
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98. S.A. Akbar and Derek R. Miller, "Ceramic Gas Sensors to Oxide Nano-heterostructures," ICACC, Daytona Beach, FL, USA (2017).
99. S.A. Akbar, "Nano-structures by Surface Patterning: a Materials Design," Dalian University of Technology, **Dalian, China** (2017).
100. S.A. Akbar, et al., "Nano-heterostructure sensors: opportunities and challenges," IMCS 2018, Vienna, Austria (2018).
101. S.A. Akbar, "Ceramic Nano-heterostructures: a Materials Design – Platform for sensing, catalysis and biomedical applications," West Virginia University (2019).
102. S.A. Akbar, "Oxide Nano-heterostructures: Platform for sensing and biomedical applications," SERI, UKM, Kula Lumpur, Malaysia (November, 2020).
103. S.A. Akbar, "Ceramic Nano-heterostructures: Platform for sensing and biomedical applications," Invited Talk, International e-Conference on Physics – 2021 (February 5-7, 2021).

104. S.A. Akbar, "Nano-heterostructured oxide surfaces by materials design - platforms for sensing and biomedical applications," Keynote Talk, Faculty of Engineering and Built Environment, UKM, Kula Lumpur, Malaysia (April 12, 2021).
105. S.A. Akbar, "Ceramic Nano-heterostructures by Materials Design: Platforms for Sensing and Biomedical Applications," Keynote Speaker, NANOSYM2021, Nanotechnology Malaysia Annual Symposium October 12, 2021.
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107. S.A. Akbar, "Ceramic Nano-heterostructures by Materials Design: Platforms for Sensing Applications – Opportunities and Challenges," Ningbo Materials Conference (2022).
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110. S.A. Akbar, "Ceramic Nano-heterostructures by Materials Design: Platforms for Sensing Applications – Opportunities and Challenges," Materials Summit, August 15, 2022.
111. S.A. Akbar, "Ceramic Nano-heterostructures by Materials Design: Platforms for Sensing Applications – Opportunities and Challenges," Alighar Conference on Nanotechnology, October 1, 2022.
112. S.A. Akbar, "Ceramic Nano-heterostructures by Materials Design: Platforms for Sensing Applications – Opportunities and Challenges," BUET, Dhaka, Bangladesh, December 13, 2022.
113. S.A. Akbar, "Ceramic Nano-heterostructures by Materials Design: Platforms for Sensing Applications – Opportunities and Challenges,"1st International Conference on Physics Horizons and Multidisciplinary Siences-2023 (ICPHMS-2023), Pakistan (2023).
114. S.A. Akbar, "Ceramic Nano-heterostructures by Materials Design: Platforms for Sensing Applications," 15th National Gas Sensors Conference, Nigbo, China (2023).
115. S.A. Akbar, "Ceramic Nano-heterostructures by Materials Design: Platforms for Sensing Applications – Opportunities and Challenges," CARS, DU, Dhaka, Bangladesh, July 11. 2023.
116. S.A. Akbar, "AC Electrical Measurements – Modeling of Electroceramics and Electrochemical Devices," Dalian University of Technology, Dalian, China, December 12, 2023.
117. S.A. Akbar, "Ceramic Nano-heterostructures by Materials Design: Platforms for Sensing Applications – Opportunities and Challenges," Dalian University of Technology, Dalian, China, December 12, 2023.

Current Research Group

Luke Ciccone	M.S.	Next generation high-temperature electrodes for sensing devices
Aidan Kim	Undergrad researcher	Revival of probe station for gas sensing measurements

Nathan Hughes	Undergrad researcher	Hydrothermal synthesis of nano-structured oxides
Calder Lenhart	Undergrad researcher	Setting up sensor testing setup Hydrothermal synthesis of nano-structured oxides

Students Graduated

Name	*Degree*	*Year*	*Thesis Title*
1. S. G. Mhaisalkar	Ph.D.	1990	Dielectric Properties and Characterization of Doped-$BaTi_4O_9$
2. J. S. Subramanian	M.S.	1990	Preparation and Properties of Two-Phase Mixed Conductors of β-Alumina and Iron Oxide
3. Ching C. Wang	Ph.D.	1993	Degradation of Multicomponent Oxides Under Oxygen Potential Gradients
4. Virginia Patton	M.S.	1994	Yttria as a Potential High-Temperature Thermistor Material
5. Lora Younkman	Ph.D.	1995	Development and Characterization of Ceramic-Based Carbon Monoxide Sensors
6. AKM Rahman	M.S.	1995	Potential Electrode/Lead Wire Materials and Associated Joining for High-Temperature Thermistor
7. Weidong Zhu	Ph.D.	1995	Characterization of Chemically Synthesized $BaTiO_3$ in the Forms: Powder, Bulk and Thin Film Ceramics
8. Sylvain LaRose	Ph.D.	1996	Synthesis and Characterization of $Bi_2Al_4O_9$
9. Masataka Yahagi	Ph.D.	1996	Infrared Sensors Based on PbO-doped PZT Ceramics
10. Chris Holt	M.S.	1997	High-Temperature Thermistors for Aerospace Applications
11. Yuh-min Chiang	M.S.	1997	Development of Hydrocarbon Sensors
12. Bala Lakshmi	M.S.	1997	Characterization of Sensor Materials by TSC
13. Liming Wang	Ph.D.	1998	Gas Sensors for Automotive Applications
14. Aseem Kohli	M.S.	1998	Development of O_2 Sensors for Ceramic Kilns
15. P. Thamboon	M.S.	1998	Solid Electrolyte Based NOx Sensors
16. Surya Bulusu	M.S.	1998	Insulation Materials and Lead Wire Attachment Methods for High temperature Thermistors
17. Srabani Banerjee	M.S.	1998	Plan A (non-thesis)
18. Liang Zheng	M.S.	1998	Plan A (non-thesis)
19. Ayan Banerjee	M.S.	1999	Aging Behavior and Lead Wire Attachment Methods for Yttria-based High Temperature Thermistors
20. Badri Narayanan	M.S.	2000	A Novel High Temperature Hydrocarbon Gas Sensor Based on a Proton Conducting Solid Electrolyte
21 Chong-Hoon Lee	M.S.	2000	Potentiometric Type CO_2 Gas Sensor with Lithium Phosphorous Oxynitride Electrolyte
22. Yumin Lu	M.S.	2001	Centrifugal Microfluidic Device and Sharp Electrode Array Based on Novel Hybrid Fabrication Methods
23. John Florkey	M.S.	2001	Fabrication and Characterization of Suspended Transmission Lines
24. Kunal Vaed	M.S.	2001	Fabrication of Miniaturized Ceramic Structures

25. S. Kapileshwar	M.S.	2001	Oxygen Sensor for Ceramic Kiln Monitoring
26. Adnan Merhaba	M.S.	2001	Adhesion and Durability Related Issues in Planar Ceramic Gas Sensors
27. Amit Singh	M.S.	2001	Characterization of Carbon Derived from Pyrolysis of Photoresists
28. Samuel Shian (with K. Sandhage)	M.S.	2003	The Preparation of Near-net-shaped $MgCr_2O_4$-TiO_2 Ceramics via Displacement Reaction Processing and Associated Humidity Sensing Properties
29. Mohammad Hadi (with Prof. Roblin)	M.S.	2004	Fabrication of LTCC Based RF Module for the Measurement of Dielectric Properties of Thin Layer Substrates
30. Chong-hoon Lee	Ph.D.	2004	Study of Reversible Electrode Reaction and Mixed Ionic & Electronic Conduction of Lithium Phosphate Electrolyte for an Electrochemical CO_2 Gas Sensor
31. Sehoon Yoo	Ph.D.	2005	Oriented Arrays of Single Crystal TiO_2 Nanofibers by Gas-phase Etching: Processing & Characterization
32. Carmen Carney	Ph.D.	2006	Nano-structures by Gas-phase Reaction: Growth and Applications
33. Michael Rauscher	Ph.D.	2007	Self-Assembly of Pseudo-Periodic Arrays of Nano-islands on YSZ-(001)
34. Inhee Lee	Ph.D.	2008	Li-Electrolyte Based CO_2 Sensors for a Wide Temperature Range
35. Huyong Lee (with Dregia)	Ph.D.	2009	1-D TiO_2 nano-fibers on Ti and Ti alloys by oxidation under limited supply of oxygen
36. Benjamin Dinan (with Dregia)	Ph.D.	2012	Growth of Titania Nanowires by Thermal Oxidation
37. Mark Andio (with Morris)	Ph.D.	2012	Gas Sensing Based on Nano-structured Oxides
38. Haris Ansari (with Dregia)	Ph.D.	2012	Self-assembled Nano-structures on Ceramic Oxides
39. Junro Yoon (with Dutta)	Ph.D.	2012	A Study of Interface Reaction and Its Effect on $Li_{0.35}La_{0.55}TiO_3$-Li_2CO_3 Potentiometric CO_2 Gas Sensors
40. Aiwen Tan (with Murphy at UM)*	Ph.D.	2015	TiO_2 nanofibers by thermal oxidation and biological cell tests*
41. Tharsika Thabothanayakam (with Haseeb at UM)*	Ph.D.	2015	Synthesis and Characterization of Nano-structured Oxides*
42. Arafat Mahmood (with Haseeb at UM)*	Ph.D.	2016	TiO_2 nanofibers grown by oxidation and gas sensing*
43. Zhiyuan Niu (with Dregia)	Ph.D.	2016	Nanoscale Self Patterning and Engineering of YSZ Surfaces
44. Ge Chen (with S. Dregia)	M.S.	2016	Nanopatterning on metallic/ceramic systems via self-assembly and polymer system via replica molding
45. Derek Miller (with P. Morris)	Ph.D.	2017	Advancing electronic structure characterization of semiconductor oxide nano-heterostructures for gas sensing

46. Soon Ginny (with Prof. Murphy at UM)*	Ph.D.	2018	Surface Modification of Yttria-stabilized Zirconia at Nanoscale for *in vitro* Study
47. Mohamad Al-Hashem (with Morris)	M.S.	2019	Plan A (non-thesis)
48. BuYu Yeh (with Gouma)	M.S.	2019	Plan A (non-thesis)
49. Travis Peters	M.S.	2019	Solid-State Yttria-Stabilized Zirconia Electrochemical Sensors for Extreme Environments
50. Nur Izzati (with Prof. Murphy at UM)*	Ph.D.	2021	Investigation of the influence of self-assembled nanobars on cellular response *in vitro*
51. Janine Walker (with P. Morris)	Ph.D.	2021	Selectivity mechanisms of gas-sensitive hetero-structural semiconducting metal oxides
52. Priyanka Karnati (with P. Morris)	Ph.D.	2021	Design, Fabrication and Characterization of Core-shell Nanowires For Resistive Type Gas Sensing
53. Alex Vaeth	M.S.	2021	Harsh environment sensors for simultaneous measurement of O_2 and temperature
54. Ray Cowen (with Grandinetti)	M.S.	2022	NMR Analysis of the Structural Role of Phosphorus in Aluminosilicate Glasses for Ion Exchange
55. Rushikesh Joshi	M.S.	2023	Plan A (non-thesis)
56. Patricia Loughney (co-advised with Vicky Doan-Nguyen Trigg)	PhD	2023	Si-based Nanocomposite Development: Methods to Understand and Enhance Control on the Nanoscale
57. Luke Ciccone	M.S.	2024	Plan A (non-thesis) - pending

**Co-advised students at University of Malaya, Kuala Lumpur, Malaysia*