

Leadership in Research Projects (Completed or under Progress)

1. **Principal Investigator**, # MIT-11109,11110, Remediation of Water Produced in Resource Extraction (2012- Aug 2014).
2. **Principal Investigator**, # MIT-13104,11105, Remediation of Water Produced in Resource Extraction (2014 Sep - Aug 2017).
3. **Principal Investigator Bilateral (ARAMCO-KFUPM-KAIST) project funded by Aramco** Carbon Dioxide Conversion Into Value-Added Hydrocarbons Over Highly Active and Economic Catalysts In Photochemical and/Or Electrochemical Reduction Process Enhanced By Photo-Catalysis (under approval).
4. **Principal Investigator Internal project # Rg1311-1 & Rg1311-2**, Synthesis of nanoalloys and nanocomposites using pulsed laser ablation in liquids (May 2013-Sep 2016).
5. **Co- Investigator Internal project # Rg 1221-1 & Rg 1221-2**, Effects of Pulsed Nd:YAG Laser fluence on the Structural properties and Valence States of Transition Metal Ions in Phosphate Glasses (Sep2012-december 2014).
6. **Co- Investigator Internal project # Rg1201-1 & Rg1201-2**, Comparison of Detection Sensitivities of Prompt Gamma-Ray Neutron Activation Analysis and Laser Induced Breakdown Spectroscopy Techniques for Analysis of Toxic Elements Ag, Br, Cd, Cr, Cl, Gd, Hg, Ni and V in Liquid and Solid Samples(Nov,2011-June 2015)
7. **Co-Investigator NSTP (National Science and Technology Plan) Project #10— NAN1387**, Development of highly efficient visible-light-driven mesoporous nanostructured materials for photocatalytic applications (sept 2011-sept 2013).
8. **Co-Investigator NSTP (National Science and Technology Plan) Project # 10— NAN1386**, Lanthanide-doped Oxide Nanoparticles Multi-modal Molecular Imaging Agents (sept 2011-sept 2013).
9. **Co-Investigator, NSTP (National Science and Technology Plan)** Synthesis of Nano Structured Composites and Their Application in Elimination of Methyl Tertiary Butyl Ether (MTBE) From Water (Sept 2012-Jan 2014).
10. **Co-Investigator , Internal project # Rg 1103-1 & Rg 1103-2** Synthesis and Optical Characterizations of Hybrid Nano-Structures Using Advanced Laser based Techniques (March 2011-April 2014).
11. **Principal Investigator, Internal project # Rg1011-1 & Rg1011-2**, Photo-catalytic conversion of carbon dioxide into methanol using nanocatalysts (Oct 2010-March 2013)
12. **Principal Investigator, SABIC# 090023** Pulsed Laser Ablation for Synthesis of Nanostructured ZnO and ZnO₂ (March 2009-september 2010 , completed).
13. **Principal Investigator, NSTP (National Science and Technology Plan) Project # 08- NAN93-4**; Applications Of Nanoscale Materials (Metal Oxides) Using Laser Induced Photo-Catalytic Process (Sep 2009 – Oct2011).
14. **Co-investigator**, MIT-10110 Design and manufacturing part III (march 2010-2011).
15. **Co-investigator**, MIT-10109 PV water pumping-part IV III (Feb 2012-Feb. 2014).
16. **Principal investigator, Distinguished professorship award, IN100038, (2010-till date) and IN131001.**
17. **Co-Investigator, IN# 101022** Nanocomposite materials co-polymers organomodified clay (may 2011-- may 2014).

18. **Co- Investigator NSTP (National Science and Technology Plan) Project # 08-ADV-704**, Advanced bioinert ceramic filter materials with geaded macro-micro-nano porous structure manufactured using microwavw and laser cintering porcess.
19. **Co-Investigator, KACST # DRP-4-25** Development of Technologies For Deep Desulfurization of Fuel Oils (May 2010, June 2013)
20. **Principal Investigator, KACST # 28-40** Disinfection of Contaminated Water by Laser Induced Photo-catalysis Process using Semiconductor Catalysts. (Jan 2009- Jan2011).
21. **Principal Investigator, Core Center of Corrosion #CR-1-2010** Development of Laser Induced Breakdown Spectrometer for the Determination of Chloride and Sulfate Concentration in Concrete Structures for Assessment of Reinforcement Corrosion (January 2010- december 2012).
22. **Co-Investigator, FT# 100034** Laser nanomaterials Phenol Detection (may 2011- 2012- January 2012).
23. **Co-Investigator, SABIC# 090020** (March 2009- October 2010) Removal Of Methyl Tertiary Butyl Ether (MTBE) From Water Using Laser Based Photo-Oxidation Process.
24. **Co-Investigator, Internal project # IN080427** Identifying the Causes of Saudi Arabia Low Voltage Cables Outages by Applying Explicit Measures and Laser Induced Breakdown Spectroscopy (LIBS) (January 2009-Novemebr 2010).
25. **Co-Investigator, Internal project # IN090025** (April 2009-april 2012)Laser Approach to Metal Nanoalloys, Its Optimization & Search for Novel Alloy Nanostructures materials .
26. **Principal Investigator, Sabic project # SABIC - 07004** (2007-2009)
Laser induced photo-catalytical removal of phenol for waste water treatment .
27. **Co-Investigator, internal project# In-080401** (2008-2011).
Development of LIBS spectrometer for various applications (2008-2011).
28. **Principal Investigator, Sabic project # SABIC - 2005/11**
Laser Sensor For Detection Of Ozone (started on Oct 2005, ended May 2007).
29. **Principal Investigator, Sabic project # SABIC - 2002/01**
Photocatalytic Conversion Of Methane into Methanol Using Laser, (duration 18 working months, started on 1.2..2003, ended date: 3.11.2004).
30. **Principal Investigator, Sabic project # 2000/ft-14**
In situ detection of SF₆ leaks in power systems using laser, (duration 18 months, started on 1.12.2000, completed on 31.12.2002).
31. **Co-Investigator, Sabic project # 2000/SA-12**
Methane cracking for production of higher hydrocarbons and hydrogen using selective laser excitation process, (duration 18 months, started on 1.10.2000, completed on 31.12.2002).
32. **Co-Investigator,, Sabic project # 2000/SA-11**
Laser photolysis–glow discharge hybrid system for regeneration of ‘coked’ zeolite catalysts, (duration 18 months, started on 1.10.2000; completed on 31.12.2002).
33. **Principal Investigator, internal project RI PN# 12063**
Development of laser based remote sensors for environmental studies, (duration 24 months, start date on 1.9.2002, ending date 31.10.2005, project on hold since April 2004 due to shortage of manpower).
34. **Principal Investigator, Client Funded Project# SQ 2419**

Monitoring of Volatile Organic Compounds Pollutants (Total Organic Carbon, Benzene, Styrene and Naphthalene) using electromagnetic radiation absorption and photoacoustic detection technique" at Saudi Petrochemical Complex Yanbu (YANPET). (three months duration, project completed successfully in 1996).

35. Principal Investigator, Client Funded Project# SQ 2489

Monitoring of air pollutants (Total Organic Carbon, NO₂, NO, SO₂ CO₂, CO) in and around the premises of Bitumat plant at Damman". (One-month duration, project completed successfully in 1997).

36. Principal Investigator, Client Funded Project# SQ 2378

Calibration of a Radiometer Model RX 1000 using UV radiations generated from frequency doubled YAG pumped dye laser" for Arabian Metal Company, Damman (project completed successfully in 1996).

37. Co-Investigator,, RI Project #12043. (Five years duration, 1992-1997).

Investigation of Laser Excited Alkaline Earth Metal Atoms".

38. Principal Investigator, CAPS Project (1995- to date).

Development of an Environmental Research Facility for the atmospheric pollution monitoring, leak detection across pipelines and for the trace gas analysis based on the photoacoustic (PA) techniques using lasers.

39. Principal Investigator, CAPS Project (1999-to date).

Development of LIDAR (light detection and ranging) system for remote sensing of environment and leak detection across the oil/gas pipelines.

Proposals, Technical Discussion Papers and Reports

1. Development of Improved Dye Sensitized Solar Cells with Nanostructured Pure, Doped and Composite Semiconducting Materials submitted to NSTIP(2014).
2. Synthesis of Crystalline Semiconductor Nanostructures using Pulsed Laser Ablation Technique, submitted to NSTIP 9th cycle(2013).
3. Carbon Dioxide Conversion Into Value-Added Hydrocarbons Over Highly Active and Economic Catalysts In Photochemical And/Or Electrochemical Reduction Process Enhanced By Photo-Catalysis Trilateral joint proposal with KAIST-ARAMCO-KFUPM (2012).
4. Laser induced photocatalytic removal of organic pollutants from water using nano structured metal oxides, Joint proposal with National University Singapore & KFUPM (2012)
5. Comparison of Detection Sensitivities of Prompt Gamma-Ray Neutron Activation Analysis and Laser Induced Breakdown Spectroscopy Techniques for Analysis of Toxic Elements Ag, Br, Cd, Cr, Cl, Gd, Hg, Ni and V in Liquid and Solid Samples submitted to DSR,KFUPM (2012).
6. Development of highly efficient visible-light-driven mesoporous nanostructured materials for photocatalytic applications, submitted to NSTIP (2013)
7. Lanthanide-doped Oxide Nanoparticles Multi-modal Molecular Imaging Agents submitted to NSTIP (2011).
8. Synthesis of Nano Structured Composites and Their Application in Elimination of Methyl Tertiary Butyl Ether (MTBE) From Water, submitted to NSTIP(2011).

9. Synthesis and Optical Characterizations of Hybrid Nano-Structures Using Advanced Laser based Techniques, submitted to DSR, KFUPM(2011).
10. Photo-catalytic conversion of carbon dioxide into methanol using nanocatalysts submitted to DSR, KFUPM (2010).
11. M. A. Gondal, M. A. Ali, and M.A.Dastager (Feb, 2012), CO₂ Conversion into Hydrocarbons using Nano-Structured multi-metallic Catalysts, submitted under 6th National Plan for Science and Technology Innovation (NPSTI) General Secretariat Riyadh.
12. M. A. Gondal, M. A. Ali, and M.A.Dastager (2011), Synthesis of n- and f-doped TiO₂ photo-catalyst for hydrogen production under visible light irradiation, submitted under 5th National Plan for Science and Technology Innovation (NPSTI) General Secretariat Riyadh.
13. A. A.Isab, M.A. Gondal, M. I. Wazeer, S.Altuwaijri(2011), Comparative study of self synthesized nano structured and micro structured gold complexes as anticancer agents, submitted under 5th National Plan for Science and Technology Innovation (NPSTI) General Secretariat Riyadh.
14. M.H. masoudi, M.A. Gondal, J.Pola (2011), Laser gas-phase deposition of unique Ge/C and Te/C nanocomposites, submitted under 5th National Plan for Science and Technology Innovation (NPSTI) General Secretariat Riyadh.
15. M.A. Gondal, M.A. Ali, Z.H. Yamani and M.A.Dastager (2011), Synthesis of nano-structured metal oxides films using Pulsed Laser Deposition Technique for various applications in waste water treatment and CO₂ conversion into chemicals, submitted under 4th National Plan for Science and Technology Innovation (NPSTI) General Secretariat Riyadh.
16. A.J. Alzharani, M. Akram, M. A Gondal and N. Aqeeli 2009) Applications of Nano-Particulated Amphotericin-B, Fluconazole and thymoquinone Candida Albicans and Candida Bioflim, submitted to KACST.
17. M. H. Shwehdi, M. A. Gondal A. Mashat M. Hashem T. R. Sheltami E. Williams, Lidar-Tracking and Electrification of Dust-Lofting Gust Fronts in Saudi Arabia submitted to National Plan for Science and Technology Innovation (NPSTI) General Secretariat Riyadh .
18. M. A. Gondal N. Aqeeli, , Z.H.Yamani (KFUPM) and team form MIT (2009), Waste Water Treatment by Using Novel Materials (Nanophoto-Catalysts) and Lasers, submitted to Center of Excellence MIT and KFUPM Collaboration.
19. M.N. Siddiqui, K. Hooshani and M.A. Gondal (2009) Development of Technologies For Deep Desulfurization of Fuel Oils, submitted to KACST.
20. Z. Seddigi, M.A. Gondal, A. Baqabas and S. Fadal (2009) Removal of organic pollutants from water using Hetrogenous photocatalysis Technique submitted to KACST.
21. M.A. Gondal, Z.H. Yamani (2008) Pulsed Laser Ablation for Synthesis of Nanostructured ZnO and ZnO₂ submitted to University Research Committee, KFUPM.
22. M.N. Siddiqui and M.A. Gondal (2008) Removal Of Methyl Tertiary Butyl Ether (MTBE) From Water Using Laser Based Photo-Oxidation Process, submitted to University Research Committee, KFUPM.
23. M.A. Gondal, Z.H. Yamani, Z. Ahmad, T. Louai, N. Siddiqui, S. Al-Quraishi (2008) Applications of Nanoscale Materials Using Laser Induced Photo-Catalytic Process:

- (Purification Of Air & Water, Corrosion Inhibition) submitted to KACST and Center of Excellence and Technology
24. M.H. Shwehdi and M. A. Gondal, Proposal # IP 2008/35 entitled: Identifying the Causes of Saudi Arabia Low Voltage Cables Outages by Applying Explicit Measures and Laser Induced Breakdown Spectroscopy (LIBS) to DSR
 25. M.A. Gondal, Z.H. Yamani, A. Khaleel (2008) Disinfection of Contaminated Water by Laser Induced Photo-catalysis Process using Semiconductor Catalysts, submitted to KACST (approved).
 26. M.A. Gondal, Z.H. Yamani, N.Siddiqui and J. Pola (2007) Decomposition Technology For Low Concentration Nitrous Oxide using Lasers, Nine Sigma, USA.
 27. Al-Jalal, M. A. Gondal, E. Heghazi, Khan, et al (2007), Establishment of Center of excellence for lasers and their applications submitted to Ministry of Higher Education Riyadh.
 28. H.M. Masoudi, M. A. Gondal, E. Heghazi, J. Pola and M. A. Alodan (2006) Laser Approach to Metal Nanoalloys, Its Optimization & Search for Novel Alloy Nanostructures materials submitted to KACST and University Research Committee
 29. Z. H. Yamani and M. A. Gondal (2006) Development of laser induced breakdown spectrometer for trace element analysis, Proposal submitted to URC for Internal funded project.
 30. M. A. Gondal, Z. H. Yamani, Al_Arfaj, M. Nazeer (2006), Laser induced photocatalytic degeradation of phenol using semiconductor catalysts, submitted to URC for SABIC grants.
 31. S. M. Fortia, A. J. Al- Saati, **M.A. Gondal** and M. Schwehdi, Investigation of Noise and Air Pollution Effect on Urban Developments in Saudi Arabia, submitted to KACST(2004)
 32. M. A. Gondal, Z. H. Yamani (2004), Laser Sensor for Detection of Ozone, submitted to URC for SABIC grants.
 33. M. A. Gondal, Al_Arfaj, Z. H. Yamani, A. Mubarik and Dastageer (2004), Laser desulfurization of crude oil, Proposal# Caps 2229, Saudi Aramco (1.83 millions Riyal)
 34. M. A. Gondal, Al_Arfaj, Z. H. Yamani and A. Hameed (2003), Laser induced conversion of CH₄ into high value hydrocarbons using photolysis and photo-catalysis processes, Proposal # AT-23-17 submitted to KACST for General Research Grants.
 35. M. A. Gondal, Al_Arfaj, Z.H. Yamani, A.Mubarik and A. Hameed (2002) Photocatalytic Conversion Of Methane into Methanol Using Laser, Proposal # Sabic 2002/01 submitted to URC for SABIC Grant (accepted and project has started on 16.12.2002 and completed 30.6.2005).
 36. Gondal, M. A., M. Schwehdi, A. Baig (2000), In situ detection of SF₆ leaks in power systems using laser, Proposal# 55 submitted to URC for SABIC Grant (accepted and project has started on 1.10.2000 and will end by 31.8.2002)
 37. Al_Arfaj, M.A. Gondal, Z.H. Yamani and A. Ali (2000), Methane cracking for production of higher hydrocarbons and hydrogen using selective laser excitation process, Proposal # 50 submitted to URC for SABIC Grant (accepted and project has started on 1.10.2000)

38. M.A. Khan, M. A. Gondal, M. S. Hussain and A. Baig (2000), Laser photolysis–glow discharge hybrid system for regeneration of ‘coked’ zeolite catalysts, Proposal# 58 submitted to URC for SABIC Grant (accepted and project has started on 1.10.2000).
39. Gondal, M. A., F. F. Al-Adel, S.M.A. Durrani and I. A. Bakhatiari (1998), Development of laser based remote sensors for environmental studies, Proposal # PN12063 submitted as internal project to RI (accepted and project start date 1. 9.2000).
40. Gondal, M. A., M. H. Masoudi, S.M.A. Durrani and I. A. Bakhatiari (1998), Laser remote monitoring of industrial pollution; Proposal # 32069 submitted as external project to KACST (project not approved and encouraged to resubmit).
41. Gondal, M. A., Al-Arfaj, S.M.A. Durrani and I. A. Bakhatiari (1998),
42. Remote analysis of environmental trace elements in soil and aqueous solutions using laser induced breakdown spectroscopy (LIBS), Proposal # ms-4-17, submitted to KACST.
43. Khan, M.A., Gondal, M. A. , S. Al-Kabi, Y. Nassar, A.K. Azad, A. Baig (1998),
44. Laser-based techniques for non-contact inspection of concrete, Proposal # 32067 submitted as external project to KACST. .
45. M.A. Gondal (1995). Photoacoustic trace gas analysis using CO₂ and Nd: YAG laser, Proposal # WS412 PR, Deutsche Akademisch Austausch Dienst, Bonn, Germany (project approved and was financed for one month visit to Germany).
46. Khan, M.A., Gondal, M. A. and M.H. Rais. (1991). Investigation of some laser-excited alkaline earth metal atoms. Proposal # 12043, RI, KFUPM
47. M. A. Gondal, Laser production of high value hydrocarbons and high value organic products from petrol residue; Technical Discussion Paper # TM/CAPS/01/03 submitted to Saudi-Aramco.
48. M. A. Gondal, Laser Desulfurization Of Crude Oil; Technical Discussion Paper # TM/CAPS/02/03 submitted to Saudi-Aramco.
49. M.A. Gondal, R. A. Nassar, Development of novel method for removal of sulfate reducing bacteria (srb) and control of norm Technical Discussion Paper # TM/CAPS/01/04 submitted to Environmental Section, Saudi-Aramco.
50. M. A. Gondal, Photocatalytic conversion of methane, Technical discussion paper # TM/CAPS/09/01 submitted to SABIC and Saudi-Aramco.
51. M. A. Gondal, Methane Cracking for production of higher hydrocarbons and hydrogen using selective laser excitation process. Technical discussion paper # TM/CAPS/02/00 submitted to Saudi-Aramco, SABIC, Petrochemica.
52. M. A. Gondal ,In situ detection of SF₆ leaks in power systems using laser. Technical discussion paper # TM/CAPS /01/00 submitted to Saudi-Aramco, SABIC, SCECO East, SCECO West and SCECO Central
53. M. A. Gondal, Laser remote monitoring of industrial pollutants and atmospheric gases. Technical discussion paper # TM/CAPS/03/00) submitted to different companies such as Saudi-Aramco, SABIC, SCECO, MEPA, Petrochemica, National Environmental Preservation Company (BeeA’h).
54. M. A. Gondal, Al_Arfaj, Z.H. Yamani, A.Mubarik and A. Hammed (2004) Two semi-annual and Final Reports of project #SABIC 2002/01 Photocatalytic Conversion Of Methane into Methanol Using Laser, submitted to URC for SABIC .

55. Gondal, M. A., M. Schwehdi, A. Baig (2002), Final & two semi-annual Reports of project #FT 2000/14, In situ detection of SF₆ leaks in power systems using laser, Proposal# 55 submitted to URC for SABIC
56. Al_Arfaj, M.A. Gondal, Z.H. Yamani and A. Ali (2002), Final & two semi-annual Reports of project #SABIC 2000/12 Methane cracking for production of higher hydrocarbons and hydrogen using selective laser excitation process, submitted to URC for SABIC
57. M.A. Khan, M. A. Gondal, M. S. Hussain and A. Baig (2002), Final & two semi-annual Reports of project #SABIC 2000/11 Laser photolysis–glow discharge hybrid system for regeneration of ‘coked’ zeolite catalysts, submitted to URC for SABIC Grant
58. Gondal, M. A., Aftab Ahmad (1997). Final Report: Project # SQ 2489, Detection of air pollutants at Bitumat plant, Dammam
59. Gondal, M. A., Aftab Ahmad (1996). Final Report: Project# SQ 2419 Monitoring of toxic volatile organic compounds at Yanbu Petrochemical Complex (YanPet) under SABIC.
60. Gondal, M. A. and E. Heghazi (1996). Final Report: Project #SQ 2378 , "Calibration of a Radiometer Model RX 1000 using UV radiations generated from frequency doubled YAG pumped dye laser"
61. M.A. Gondal (1995). Final Report on Photoacoustic trace gas analysis using CO₂ and Nd: YAG laser, WS412 PR, Deutsche Akademisch Austausch Dienst, Bonn, Germany (project approved and was financed for one month visit to Germany)
62. Khan, M.A., Gondal, M. A. and M.H. Rais. (1995). Investigation of some laser-excited alkaline earth metal atoms. Semi-Annual Report #5, Project No. 12043, RI, KFUPM.
63. Khan, M.A., Gondal, M. A. and M.H. Rais. (1994). Investigation of some laser-excited alkaline earth metal atoms. Semi-Annual Report #4, Project No. 12043, RI, KFUPM.
64. Khan, M.A., Gondal, M. A. and M.H. Rais. (1994). Investigation of some laser-excited alkaline earth metal atoms. Semi-Annual Report #3, Project No. 12043, RI, KFUPM.
65. Khan, M.A., Gondal, M. A. and M.H. Rais. (1993). Investigation of some laser-excited alkaline earth metal atoms. Semi-Annual Report #2, Project No. 12043, RI, KFUPM.
66. Khan, M.A., Gondal, M. A. and M.H. Rais. (1993). Investigation of some laser-excited alkaline earth metal atoms. Semi-Annual Report #1, Project No. 12043, RI, KFUPM.
67. M.A. Gondal, A. Majeed and M. Tahir. (1991). Theoretical and experimental aspects of Nd: YAG laser. Final Report LS-IR-5. Post Graduate Center for Electro-Optics, Tripoli.
68. M.A. Gondal, S. Shahdin and J. Shebani. (1986). Development of new lasing media for CO₂ laser based on electrochemical transformation (ECTO) of organic compounds. Final Report LS-IR-3. Post Graduate Center for Electro-Optics, Tripoli.
69. Shahdin, S. and Gondal, M. A. . (1985). Development and operation of heat pipes for generation of vapors up to 900°C. Final Report LS-IR-1. Post Graduate Center for Electro-Optics, Tripoli.
70. Shahdin, S., Gondal, M. A. and F.M. Mansouri. (1985). Development of software for calibration and analysis of spectra using an optical multichannel analyzer. Final Report LS-IR-2. Post Graduate Center for Electro-Optics, Tripoli.

Research Leadership and Development of Laboratories

I have developed excellent research leadership skills, which is evidenced through patents, number of publications, quality of publications, research proposals, and science citations and applied research projects. Three of my recently published papers have been listed in top 25 as cited by Science Direct. In spite of my heavy commitment to my basic research area of atomic and molecular spectroscopy and teaching activities, I managed to keep my research active to cover diversified fields by developing the laser applications in various engineering and scientific problems as per needs of the community at large and the Kingdom in particular and in synchronization with the SNTP (Strategic National Technology Plan) laid down by ministry of higher education and KACST.

I have published around 350 scientific papers in international refereed journals and conferences such as Applied Optics, J. Physics B, Optics Communications, Chemical Physics Letters, J. Molecular Spectroscopy, Applied Phys B, Spectroscopy Letters, Laser & Optics in Engineering, Nanotechnology, Applied Surface Science, Science of Advanced Materials, J. Hazardous Materials, J. Nanoparticle Research, Talanta, Applied Catalysis, J. Molecular Catalysis, Catalysis Communication and Conferences of high repute such as Conference on Lasers and Electro-optics (CLEO) and Quantum Electronics and Laser Science Conference, Colloquium Spectroscopicum Internationale, International Quantum Electronics Conference (IQEC) and other regional conferences. Three Patents on my latest inventions have been published by US patent office. My research work has been cited in various international journals and got over 392 citations.

I have interacted and shared my knowledge (through seminars) with the scientific community at KFUPM, other universities of the Kingdom and even at the international forums like International Center for Theoretical Physics (ICTP), Trieste Italy, European, American, Australian, Brazilian and Middle East Universities. I have floated many original and innovative ideas for different research projects, which have been tested experimentally and accepted for publications in journals. I have not only worked in my major field of Physics but also contributed reasonably well to interdisciplinary fields such as Nanotechnology, Material Science, Chemistry, Electrical & Mechanical Engineering and Environmental Science, Earth Science (Geology), Civil Engineering, Petrochemical & Refining and Petroleum Engineering. I have collaborated with scientists from these departments (e.g. Chemistry, Electrical, Mechanical, Earth Sciences, Civil, CRP and PE).

I have submitted many Research proposals and numerous technical discussion papers (ideas) to Saudi-Aramco, SABIC, Saudi Electric Company, BeeA'h, Bitumat, KACST, and to other local industries/organizations in the Kingdom. I have managed, co-coordinated and supervised and completed 13 research projects in the above mentioned areas of basic and applied nature funded internally and externally by clients. I have compiled many Scientific/ Technical reports regarding these projects.

I have participated in reviewing many research papers for various international journals like Applied Optics, Sensor and actuators, Laser and Optics in Engineering Optical and Quantum Electronics, Energy and Fuels, Talanta, Analytical Chemistry, J. Hazardous Materials, E.J. Physics, Applied Spectroscopy, Asian Journal of Spectroscopy etc and for KACST and KFUPM proposals.

I have been on different occasions external examiner for Master and Ph. D. students from King AbdulAziz University, Jeddah and Victoria University, Melbourne Australia, King Saud

University Riyadh, National University of Science and Technology (NUST), Pakistan. I supervised Nine PH.D students. I have been supervisor/co-supervisor for master and senior projects from physics department, mechanical engineering, electrical engineering and chemistry department. I have taught different physics courses as outlined in the CV. My professional and community services covers different activities like teaching, co-ordination and participation in many committees, organizing exhibition, short course and supervising senior projects.

Based on accomplishments in the research, teaching, marketing and other activities, my annual performance evaluation for the last 14 years have been rated as "OUTSTANDING" and I have been awarded Distinguished Professorship award from 2009/2010 which is only awarded to three professors in whole KFUPM. In addition, I have been awarded many national and international awards such as Prince Mohammed Bin Fahd Best Team Award for Excellence in Research in 1995. the Distinguished (Best) Researcher award by KFUPM for the year 2005-2006 based on my research publications and research projects. I am also one of the recipient of the Best Research Paper award, instituted by the British Mechanical Engineers in 2007. Also awarded the Best Paper Award on "Detection of Ozone using Fourth Harmonic of Nd:YAG Laser at 1st International Conference & Exhibition on Laboratory Technology, Manama Bahrain (Oct 20-22, 2008). I was also awarded the best project award among many contenders for year 2008/2009 by KFUPM. Three of my patents on my latest inventions have been published by US patent office. Due to my research profiles, I have been selected as a member Editorial Boards of Eight Journals, AJSE, J. Sensors & Instrum, Int J.Spectroscopy, Int. J.Photoenergy, J.Eng, j. Env.& E. Sci, J.App. Sci, Eng & Tech, Pak. J. Anal. Chem. & Environ. Apart from these distinctions, I have collaborations (Research Projects & Thesis Co-Supervisions) with Chemists, Geologists Chemical Engineers, Mechanical Engineers, and Electrical, Civil and Petroleum Engineers and Material Scientists at KFUPM, and International Institution like Nanjing university China, MIT, USA, National University Singapore, KAUST, IST, and NUST Pakistan.

Laboratory Development Activities:

Worked on the development of the following laboratories :

- **Developed an Environmental Lab for monitoring of Atmospheric Pollution** and for trace gas analysis using **self-developed photoacoustic spectrometer** at Physics Department, KFUPM. The sensitivity achieved with this system is very high ~ pptV and this system has been tested for analysis of gases emitted from the automobile exhaust and also for detection of leaks. A project entitled "in situ detection of SF₆ leaks in power systems using laser" funded by SABIC UR grant was completed and also Saudi Electric Company and one Korean company specialized in Electrical Testing Equipment showed strong interest in the development of a mobile system for detection of leaks in switchgears high power electrical systems.
- **Laser Induced Break Down Spectrometer (LIBS)** was developed at Physics Department, KFUPM and applied for detection of carcinogenic and poisonous contaminants in food and cosmetic products, oil slicks, paints, oil residue samples, oil slicks, iron slag, industrial waste, plastic waste, volcanic eruptions, old mines samples, drinking water,

geological rocks and other solid samples. Completed many projects funded through the Deanship of University and KACST.

- **Development of a LIDAR** (light detection and ranging) system for remote monitoring of environment and for other applications in the field of Petroleum industry at Physics Department, KFUPM. A prototype system at Lab scale was built using second harmonic of Nd: YAG laser and a telescope having an eight-inch collecting mirror. The telescope has been replaced recently with commercial unit having 16 inch dia collecting mirror. The range resolved study of some pollutants i.e. SO₂, NO₂ has been studied in the differential absorption mode in the laboratory environment. The system has been also tested for the analysis of clouds up to the range of 13 km. Two papers were published which got some international recognition in terms of science citations.
- A **Doppler LIDAR** was developed using ring dye laser and was applied for the remote monitoring of polluted liquid and gaseous discharges.
- **Synthesis of Nano Materials** using “Pulsed Laser Ablation Process” and chemical methods (sol-gel, precipitation etc) for various applications in the field of environment, water purification, fuel cells, sensors, petrochemicals and hydrogen production, carbon management by reduction of CO₂ into value added products like methanol, conversion of green house gases like methane into methanol, removal of heavy metals from water, disinfection of water.
- Synthesis of **Super Hydrophobic, Hydrophilic and Oleophobic surfaces** for oil water separation and self cleaning surfaces using Layer by Layer (LBL) coating, spin coating and cost effective pressurized spray coating techniques developed at KFUPM.
- Developed facility for **Dye Sensitized Solar Cells (DSSC)** fabrication at KFUPM.
- Worked on the development of a setup for laser methane cracking using UV laser for Generation of Higher Hydrocarbons (gaseous phase) and Hydrogen under SABIC/URC project funding scheme.
- Worked on the development of a setup for Photocatalysis Conversion of Methane and CO₂ into methanol, production of hydrogen, wastewater treatment and disinfection of bacteria in water using solar and UV laser under SABIC/URC, NSTIP, KACST projects funding.
- Participated in ongoing project on development of a facility for “Regeneration of coated zeolite (catalyst) using a laser photolysis - glow discharge hybrid system” under SABIC/URC project funding scheme.
- Participated in the project for development of facility for non-destructive testing of materials using laser-generated ultrasound.
- Working on Development of New Tunable Laser Sources in the UV and visible region based on Stimulated Raman Scattering process for LIDAR System.

- Working and completed project on Laser Desulfurization of Crude Oil and proposal has been submitted to Saudi Aramco. A patent has been issued
- Completed a joint research five year approved internal project # 12043 on "Investigation of Laser Excited Alkaline Earth Metal Atoms".
- Working as principal investigator /task leader on various projects of applied nature in joint collaboration with academic departments and RI centers. Designed and developed various experiments to carry out the applied research projects. Most of the research work has been published in refereed journals, conference proceedings as well as in project reports.
- Completed many projects (long term and short term) of basic and applied nature funded externally and internally by KFUPM as listed in under project section.
- Was invited to deliver key note speeches /talks/ Lectures on international and national forums as mentioned earlier under seminars etc.
- Have been advisor/ co-advisor / member for 9 Ph.D and 14 M.S. thesis students
- Supervised many senior, capstone and Co-op projects in collaboration with faculty members from other departments like EE, ME, Chem and parent department of Physics.