

## DEAN M. ASLAM

Job: ECE Department, Michigan State University, E. Lansing, MI 48824; Phone: 517-353-6329;  
Fax: 517-353-1980; E-Mail: aslam@egr.msu.edu

### 1. EDUCATION

**Ph.D. (Dr. rer. nat.)** 1983, Electrical-Engineering, Aachen Technical University (RWTH), Germany. **Thesis Title:** "Annealing Behavior of Electron and Hole Traps in SiO<sub>2</sub> of MOS Devices". Advisor: Pieter Balk

**M.S. (Dipl. Phy.)** 1979, Physics, RWTH Aachen, Germany. **Thesis Title:** "Temperature Dependence of Mobility and Concentration of Electrons in Ion-Implanted Si-MOSFETs". Advisor: Pieter Balk

→ **PROFESSIONAL EXPERIENCE: See section 8**

### 2. RESEARCH AREAS AND RESEARCHERS

#### 2.1 Research Areas

(i) **IC-compatible micro/nano technologies of poly-carbon materials:**

1. carbon nanotubes (CNT); adsorbant layers, sensors, field emission.
2. polycrystalline-diamond (poly-C); piezoresistive sensors, MEMS, temperature-sensors, microheaters.
3. Field emission electroluminescence in CNT and poly-C.

(ii) **Wireless Integrated MicroSystems (WIMS):**

1. Poly-C Technology for WIMS; position sensors, MEMS packaging, RFMEMS resonators, coatings.
2. CNT for micro gas chromatography ( $\mu$ GC); preconcentrator channels
3. WIMS robots, embedded systems.

#### 2.2 Researchers:

**Current:** 4 Ph.D., 5 UG, 4 High School

**Grad./supervised 1992-02:** 8 Ph.D., 4 M.S., 14 High School, 4 postdocs

### 3. RESEARCH/EDUCATION COLLABORATIONS

#### 3.1 Industrial

**Current (2002- ):** Collaborations in nanotechnology with *Ardesta/Discera, Ann Arbor, MI.*

**Past (1987-96):** Collaborative research with industry has resulted in a number of joint patents, publications, cash and in-kind funding, and in interaction of MSU graduate students with the scientists from industry. My students and I have used lab facilities in the departments of physics and sensors & actuators in Ford Scientific Research Laboratories (FSRL) in Dearborn, Michigan (Drs. B. Artz, S. McCarthy, E.M. Logothetis, M. Tamor and L. Rimai). This interaction has resulted in new results in diamond sensors, field emission displays and microelectromechanical systems. A collaborative interaction with Dr. M. Olinger of Smiths industries led to patents and publications in accelerometers.

#### 3.2 Inter-disciplinary

**Current:** NSF ERC-related collaborations in WIMS are underway with Professors Najafi, Zellers and Wise of University of Michigan.

**Past:** Over the past 10 years, collaborations with MSU faculty from departments of physics (superconductors, sensors), chemistry (sensors), mechanical engineering (thermal conductivity, microrobots, temperature sensors), and computer science (microrobot) has resulted in publications, patents and joint funding.

#### 3.3 K-16 Education Program:

**Elementary School to Ph.D.: Interesting Concept in education and research**

*WIMS devices/toys (e.g. WIMS robot) are used to provide a research-oriented learning environment for pre-college students. The program involves establishing WIMS labs at MSU and at schools assisted by MSU grad students. An interaction with school teachers and parents is in progress. Remote sessions are provided to schools through live internet-based video by MSU faculty.*

#### **Summer Courses and Workshops**

- *4-week courses on WIMS, developed under my supervision, were offered to pre-college students in Summers of 2000 and 2001 through MSU Diversity Programs Office.*
- *1-day workshop on WIMS education was offered to science teachers at OHS.*
- *I chaired two 2-day science teacher workshops at University of Michigan and MSU in June 2001 and 2002, respectively.*

#### **Presentations in K-16 Groups**

- *Over 25 presentations to K-16 Institutions/technology-centers in Michigan during 2000 – 2004.*
- *A number of presentations to other groups including parents.*

## **4. RESEARCH INNOVATIONS**

### **1990 - Recent**

1. *Application of diamond sensors and MEMS technologies in wireless integrated Microsystems (WIMS).*
2. *Implementation of the concept "Elementary School to Ph.D." in K-12 education at Okemos High School (located near MSU) and other schools in Lansing area.*
3. *Field emission induced light emission from poly-diamond and carbon nanotubes.*
4. *Developed diamond MEMS technology compatible with Si microfabrication process.*
5. *Used Spindt process to fabricate evaporated Si field emitters for displays.*
6. *Measured an intra-grain piezoresistive gauge factor of above 4,000 in poly-diamond in 1998.*
7. *Demonstrated gated diamond field emission display in 1995.*
8. *A Michigan State and Ford team headed by Dean Aslam was the first to measure piezoresistivity in vapor-deposited p-type diamond in 1990.*

## **5. PATENTS**

1. Patent # 4,912,087; "Rapid Thermal Annealing of Superconductor Oxide Precursor Films on Si and SiO<sub>2</sub> Substrates," **M. Aslam**, E.M. Logothetis, R.E. Soltis, Ford Motor Co., March 1990.
2. Patent # 4,943,558; "Preparation of Superconducting Oxide Films Using Pre-oxygen Nitrogen Anneal," R.E. Soltis, E.M. Logothetis, **M. Aslam**, Ford Motor Co., July 1990.
3. Patent # 5,413,668; "Method for Making Mechanical Devices and Micro-Electromechanical Systems", **M. Aslam**, M.A. Tamor, Ford Motor Company, May 1995.
4. Patent # 5,424,241; "Force Detecting Sensor and Method of Making..", **M. Aslam**, M. Olinger, J. Page, Smiths Industries, June, 1995.
5. Patent # 5,474,808; "Method of Seeding Diamond", **M. Aslam**, Michigan State University, December, 1995.
6. Patent # 5,488,350; "Diamond Film Structures and Methods Related to Same", "**M. Aslam** and Jim Beck, Michigan State University, January, 1996.
7. Patent # 5,526,703; "Detecting Sensor and Method of Making --", **M. Aslam**, M. Olinger, J. Page, Smiths Industries, June, 1996.
8. Patent #6,082,200; **D.M. Aslam** and S. Sahli, "Ultra-High Sensitivity Intra-grain Piezoresistive CVD Diamond Sensors", Michigan State University, 2000.
9. Patent Pending: "Ultra-Miniature Optical Pressure Sensing System", Takeo Sawatari, Alex Klooster, Dean M. Alsam, Yuping Lin, and James Marks , Sentec Corporation, 2003.
10. Patent disclosures in progress;

- a) Aslam/Mukherjee/Tummala, MSU, 2000.
- b) Aslam/Najafi, MSU/UM, 2002.
- c) Aslam/Haddock, MSU/Ardesta, 2002.
- d) Zellers/Aslam, UM/MSU, 2002.

## 6. PUBLICATIONS

### 6.1 In Progress

1. Y. Tang et al.....
2. D.M. Aslam and G. Dangi, "Smart Robotic Foot", submitted to ....., 2003.

### 6.2 Refereed Journal Articles

1. N. Supelveda-Alanastro and D. M. Aslam, "Technology of Poly-C RFMEMS Resonators", appears in *Microelectronic Engineering*, 2004.
2. X. Zhu, **D. M. Aslam**, Y. Tang, B. Stark, and K. Najafi, "All Diamond Packaging For Wireless Integrated Micro-Systems Using Ultra-Fast Diamond Growth," *IEEE Journal of Micro Electro Mechanical Systems (JMEMS)*, April 2004.
3. U. Kim and **D.M. Aslam**, "Field emission electroluminescence on diamond and carbon nanotube films", *J. Vac. Sci. Technol.* **B 21**(4), 1291-1296 (2003).
4. U. Kim and **D.M. Aslam**, "Field emission electroluminescence on diamond and carbon nanotube films", *Virtual J. Nanoscale Sci. Technol.*, June 30, 2003.; <http://ojs.aip.org/getabs/servlet/GetabsServlet?prog=normal&id=VIRT01000007000026000052000001&idtype=cvips&gifs=Yes>
5. S. Guillaudeu, X. Zhu and **D.M. Aslam**, "Fabrication of 2- $\mu$ m Wide Poly-crystalline Diamond Channels Using Silicon Molds for Micro-fluidic Applications", *Diamond & Rel. Mat.*, 12, 65-69 (2003).
6. L Tummala, R. Mukherjee, N. Xi, **D.M. Aslam**, H. Dulimarta, J. Xiao, M. Minor and G. Dangi, "Climbing the Walls", *IEEE Robot. Autom. Magazine*, vol. 9, 10-19 (2002).
7. U. Kim, R. Pcionek, **D.M. Aslam** and D. Tománek, "Synthesis of high-density carbon nanotube films by microwave plasma chemical vapor deposition", *Diamond & Related Materials* (10), pp. 1947-1951 (2001).
8. Abu-Ageel, **D.M. Aslam**, R. Ager, L. Rimai, "The Seebeck coefficient of monocrystalline alpha-SiC and polycrystalline beta-SiC measured at 300-533 K", *Semicond. Sci. Technol.*, 15, 32-33 (2000).
9. S. Hong and **D.M. Aslam**, "Poly-Diamond Gated Field Emitter Display Cells", *IEEE Trans. Electron Dev.*, vol. 46(4), 787-791(1999).
10. S. Sahli and **D.M. Aslam**, "Ultra-high Sensitivity Intra-Grain Poly-Diamond Piezoresistors", *Sensors and Actuators: A*, vol. 71/3, 193-197(1998).
11. S.J. Kwon, Y.H. Shin, **D.M. Aslam** and J.D. Lee, "Field emission properties of polycrystalline diamond film prepared by microwave-assisted plasma chemical vapor deposition", *J. Vac. Sci. Technol. B* 16(2), 712-714(1998).
12. D.S. Hong and **D.M. Aslam**, "Technology and Characterization of Diamond Field Emitter Structures", *IEEE Trans. Electron Dev.*, vol. 45(4), 977-985(1998).
13. N. Abu-Ageel, **D. M. Aslam** and L. Rimai, "Temperature-dependence of conductivity and Hall concentration of poly-SiC deposited on fused silica by laser ablation", *J. Vac Sci. Technol. B*16(1), 142-146(1998).
14. S. Sahli and **D.M. Aslam**, "Piezoresistive pressure sensors using p-type poly-crystalline diamond films", *Sensors and Actuators A* vol 69/1, 27-32(1998).
15. S. Sahli and **D. M. Aslam**, "Nonuniform Conduction in B-Doped Chemical Vapor Deposited Diamond Studied by Inter- and Intra-grain Measurements", *Appl. Phys. Lett.* 70 (16), 2129-2131(1997).

16. G. Yang, **D.M. Aslam** and J. McGrath, "The Characterization of Single Structure Diamond Heater and Temperature Sensor", *Diamond and Related Materials* 6, 394-397 (1997).
17. S. Sahli and **D. M. Aslam**, "Effect of Post-Deposition Anneal on the Resistivity of P-Type Polycrystalline Diamond Films", *Appl. Phys. Lett.*, **69**(14), 2051-2052(1996).
18. G. Yang and **D.M. Aslam**, "Single-Structure Heater and Temperature Sensor Using a p-Type Polycrystalline Diamond Resistor", *IEEE Electron Dev. Lett.* **17**(5), 250-252 (1996).
19. S. Bhargava, H.D. Bist, S. Sahli and **M. Aslam**, H.B. Tripathi, "Diamond polytypes in the chemical vapor deposited diamond films", *Appl. Phys. Lett.*, **67**(12), 1706-1708 (1995).
20. S. Herr, J. Beck, J. McGrath, S. Sahli and **M. Aslam**, "An optimized Experimental Method for Measuring Thermal Conductivity of Thin, Boron-doped Diamond Films", *Rev. Sci. Instrum.*, **66**(10), 4967-4971(1995).
21. G.S. Yang, **M. Aslam**, K.P. Kuo, D.K. Reinhard and J. Asmussen, "Effect of Ultra-High Nucleation Density on Diamond Growth at Different Growth Rates and Temperatures", *J. Vac. Sci. Technol. B*, vol. 13, 1030-1036(1995).
22. G.S. Yang and **M. Aslam**, "Ultra-High Nucleation for Growth Smooth Diamond Films", *Appl. Phys. Lett.*, **66** (3), 311-313(1995).
23. D.S. Hong and **M. Aslam**, "Field Emission From p-Type Polycrystalline Diamond Films", *J. Vac. Sci. Technol.*, **B 13**(2), 427-430(1995).
24. **M. Aslam**, G.S. Yang and A. Masood, "Boron-Doped Vapor-Deposited Diamond Temperature Microsensors", *Sensors and Actuators A*, vol. 45 (2), pp. 131-138, 1994.
25. I. Taher, **M. Aslam**, M. Tamor, "Piezoresistive Microsensors using p-type CVD Diamond Films", *Sensors and Actuators A*, vol. 45 (1), 35-43, 1994.
26. H.D. Bist, S. Bhargava, T.S. Little, J.K. Gardner, Jr., J.R. Durig, S. Sahli and **M. Aslam**, "Fourier Transform Raman Spectroscopy and Scanning Electron Microscopic Studies of Chemical Vapor Deposited Diamond Films", *J. Raman Spect.*, **25**, 67-73 (1994).
27. S. Tseng, R. Zapp, **M. Aslam** and G. Brown, "Miniaturization of the Instrumented Sphere Using Smart Logic", *Appl. Engin. Agriculture*, vol. 10(4), 567-72, 1994.
28. D.S. Hong, **M. Aslam**, M. Olinger and M. Feldmann, "Simulations of Fabricated Field Emitter Structures", *J. Vac. Sci. Technol. B* 12(2), 764-769(1994).
29. S. Bhargava, H.D. Bist, H. Joshi, J.R. Durig and **M. Aslam**, "Micro-Raman Analysis of Thin-Film Diamond Temperature Sensors", *J. Raman Spect.*, **24**, 419-422(1993).
30. L. Rimai, R. Ager, J. Hangas, C. Peters, E.M. Logothetis, N. Abu-Ageel and **M. Aslam**, "Pulsed Laser Deposition of SiC on Fused Silica and Sapphire Substrates", *J. Appl. Phys.*, **73**, 8242-8249(1993).
31. C. Pawlowski, **M. Aslam**, and L. Rimai, "Laser Ablation Deposition of  $\text{YBa}_2\text{Cu}_3\text{O}_{7-x}$  Thin Films Using a Microwave Plasma Disk Reactor Oxygen Source", *J. Appl. Phys.*, **74**, 6430-6431, 1993.
32. **M. Aslam**, P. Klimecky, G. Myers, H. Busta, L. Cathey, R. Elder and B. Artz, "Triode Characteristics and Vacuum Considerations of Evaporated Si Microdevices", *J. Vac. Sci. Technol.*, **B 11**(2), 422-425(1993).
33. G. Myers, **M. Aslam**, P. Klimecky, L. Cathey, R. Elder and B. Artz, "Si Cold Cathodes Using Electron Beam Evaporation", *J. Vac. Sci. Technol.*, **B**, 11(3), 642-646(1993).
34. **M. Aslam**, B. Artz, T. J. Pratter, and S. Kaberline, "A Comparison of Cleaning Procedures for Removing Potassium from Si Wafers Exposed to KOH", *IEEE Trans. Electron Dev.*, **40**, 292-295(1993).
35. A. Masood, **M. Aslam**, M.A. Tamor, T.J. Potter, "Synthesis and Characterization of CVD Diamond", *Appl. Phys. Lett.*, **61**, 1832-1834(1992).

36. **M. Aslam**, I. Taher, A. Masood, M.A. Tamor and T.J. Potter, "Piezoresistivity in CVD Diamond", *Appl. Phys. Lett.*, 60, 2923-2925(1992).
37. A. Masood, **M. Aslam**, M. Tamor, T. Potter, "Patterning of CVD Diamond Films on Si, Si<sub>3</sub>N<sub>4</sub> and SiO<sub>2</sub>", *J. Electrochem. Soc.* 138, L67-67(1991).
38. **M. Aslam**, R.E. Soltis, E.M. Logothetis, and D. Chase, "Technology of Superconducting Films on Si, SiO<sub>2</sub>, and Si<sub>3</sub>N<sub>4</sub> Substrates for Vacuum Microelectronics", *IEEE Trans. Electron Devices*, ED-36, 2693-2696(1989).
39. R. Soltis Re, Donlon Wt, Shinozaki S, Ager Rm, Peters Cr, Logothetis Fm, Aslam M, Wenger Le, Chen Jt, Nelson R, "Properties Of Bisrcacuo Films Prepared By Rf Triode Sputtering", *Physica C*, 162: 649-650, Part 1 (1989)
40. **M. Aslam**, R.E. Soltis, E.M. Logothetis, R. Ager, M. Mikkor, W. Win, J.T. Chen and L.E. Wenger "Rapid Thermal Annealing Behavior of YBaCuO Films on Si and SiO<sub>2</sub> Substrates", *Appl. Phys. Lett.* 53, 153-155 (1988).
41. **M. Aslam**, "Electron Mobility in B-implanted Si Inversion Layers of MOSFETs", *IEEE Trans. Electron Devices*, ED-35, 1563-1564 (1988)
42. **M. Aslam**, "Common Origin for Electron and Hole Traps in MOS. Devices", *IEEE Trans. Electron Devices*, vol. ED-34, No. 12, pp. 2535-2539, 1987.
43. **M. Aslam**, "Electron Self-Trapping in SiO<sub>2</sub>", *J. Appl. Phys.*, 62, 159-162(1987).
44. Do Thanh, **M. Aslam** and P. Balk, "Defect Structure and Generation of Interface States in MOS System", *Solid Stat. Electron*, 29, 829-840 (1986).
45. M. Offenbergl, T. Johannson, **M. Aslam** and P. Balk, "Electron Traps in B<sup>+</sup> - Implanted SiO<sub>2</sub>", *Physica*, 129b, 240-244(1985).
46. **M. Aslam**, R. Singh, and Balk, "Nature of Electron and Hole Traps in MOS Systems with Poly-Si Electrode", *Phys. Status Solidi*, vol. 84, pp. 659-668, 1984.
47. **M. Aslam**, P. Balk and D.R. Young, "High Temperature Annealing Behavior of Electron Traps in Thermal SiO<sub>2</sub>", *Solid Stat. Electron.*, 27, 709-719 (1984).
48. **M. Aslam** and P. Balk, "Insulating Films on Semiconductors", *Electrochem. Soc. Ext. Abst.* 1983, 103(1983).

### 6.3 Publications in Reviewed Conf. Proceedings

49. N. Supelveda-Alancastro and D.M. Aslam, "Polycrystalline Diamond Technology for RFMEMS Resonators", *Proceedings of Micro and Nano Engineering 2003*, Cambridge, UK, Sept. 2003.
50. M. Baur and D.M. Aslam, "A Suction-Cup Based Miniature Climber Robot with Smart Feet", *Proc. SCI 2003 (7<sup>th</sup> Multiconference on Systemics, Cynetics and Informatics)*, Orlando, Florida (2003).
51. X. Zhu, S. Guillaudeu, **D. M. Aslam**, Ungsik Kim, Brian Stark, and Khalil Najafi, "All Diamond Packaging For Wireless Integrated Micro-Systems Using Ultra-Fast Diamond Growth," *Proceedings of the 16th IEEE International Conference on Micro Electro Mechanical Systems (MEMS 2003)*, pp. 658-661, Kyoto, Japan, January 2003.
52. Edward T. Zellers, K. D. Wise, K. Najafi, **D.M. Aslam**, R. B. Brown, Q. Y. Cai, J. Driscoll, M. Flynn, J. Giachino, R. Gordenker, M. D. Hsieh, C. T.-C. Nguyen, P. Bergstrom, J. Drelich, C. Friedrich, E. Gamble, M. Kaviany, C. J. Lu, A. Matzger, M. Oborny, S. Pang, J. Potkay, R. Sacks, W.-C. Tian, W. Steinecker, J. Whiting, Q. Zhong, "Determinations of Complex Vapor Mixtures in Ambient Air with a Wireless Microanalytical System: Vision, Progress, and Homeland Security Applications," *Technical Digest of the IEEE Conference on Technologies for Homeland Security*, November 13-14, 2002, Waltham MA, IEEE, Boston, pp. 92-95, 2002.
53. **D. M. Aslam**, K. Najafi, K. D. Wise and T. Zellers, "Poly-Carbon Nano- And Micro-Technologies For Wireless Integrated Micro-Systems", *Proc. COMS 2002*, Ypsilanti, MI, 2002.

54. Y. Tang, S. Sahli, **D. M. Aslam**, D. Merriam, and K. D. Wise, "Poly-diamond inter- and intra-grain piezoresistive position sensor design for WIMS", Proc. AICHE Annual Conference on Sensors, Indianapolis, 2002.
55. K. D. Wise, K. Najafi, **D. M. Aslam**, R. B. Brown, J. M. Giachino, L. C. McAfee, C. T.-C. Nguyen, R. O. Warrington, and E. T. Zellers, "Wireless Integrated MicroSystems (WIMS): The Coming Revolution in the Remote Gathering of Information," (Session Invited Keynote), *Digest SensorsExpo*, Chicago, pp. 175-182, June 2001.
56. V. Papageorgiou, **D.M. Aslam**, K. Najafi, "IC-Compatible Technology of Diamond MEMS", SID Symposium, University of Michigan, Ann Arbor, Eds. K.D. Wise and B. Donofrio, 1999.
57. R. Lal Tummala', R. Mukherjee', **D. M. Aslam**, Ning Xi', S. Mahadevan, and J. Weng, " Reconfigurable Adaptable Micro-robot", Proceedings IEEE Conf. on Systems, Man and Cybernetics (Tokyo, Japan), IEEE Cat # 99CH37028C, pp. IV-687 - IV-691, 1999.
58. D.M. Aslam, "Intra-grain Diamond Piezoresistive Sensors", SID Symposium, University of Michigan, Ann Arbor, Eds. K.D. Wise and B. Donofrio, 1999.
59. D. Hong, **D.M. Aslam**, T. Grimm, L. Garbini and S. Bandy, "Field Emission from Carbon Implanted Polycrystalline Diamond Film", Technical Digest, Proc. International Vacuum Microelectronics Conference, Kyongju, South Korea, p 117-122, 1997.
60. D. Hong and D.M. Aslam, "Simulation Study of Microtip Field Emitter Arrays in Triode Configuration", Technical Digest, Proc. International Vacuum Microelectronics Conference, Kyongju, South Korea, p 336-340, 1997.
61. S.J. Kwon, D.M. Aslam, Y. Li, Y.H. Shin and J.D. Lee, "Low Voltage Emission Characteristics of the Undoped Polycrystalline Diamond Field Emitter by MPCVD", Technical Digest, Proc. International Vacuum Microelectronics Conference, Kyongju, South Korea, p 475-479, 1997.
62. Y. Li, D.M. Aslam and S.J. Kwon, "Field Emission from Undoped Polycrystalline Diamond Deposited by MPCVD at 520-665 C", Technical Digest, Proc. International Vacuum Microelectronics Conference, Kyongju, South Korea, p 509-512, 1997.
63. M. Aslam and D. Hong, "Fabrication and Optimization of Diamond Field Emitter Display Cell in Triode Mode", Proceeding of SID Symposium on Vehicle Displays, Eds. R.L. Donofrio, pp. ?-? (1997).
64. M. Aslam and D. Hong, "Field emission display technology", Proceeding of SID Symposium on Vehicle Displays, Eds. R.L. Donofrio and A. Gosh, pp. 39-45(1996).
65. S. Sahli, X. Hou and M. Aslam, "Piezoresistive Gauge Factor of Polycrystalline Diamond Measured at Different Fields and Temperatures", *Applications Of Diamond Films And Related Materials: 3rd Int. Conf.*, eds. Feldman et al., NIST Special Publ. # 885, 95 - 98(1995).
66. S. Sahli, X. Hou and M. Aslam, "Effect of Grain Size and Temperature on the Field-Dependence of Resistivity of B-Doped Diamond", *Applications Of Diamond Films And Related Materials: 3rd Int. Conf.*, eds. Feldman et al., NIST Special Publ. # 885, 103 - 106(1995).
67. G.S. Yang and M. Aslam, "CVD Diamond Resistor as Heater and Temperature Sensor", *Applications Of Diamond Films And Related Materials: 3rd Int. Conf.*, eds. Feldman et al., NIST Special Publ. # 885, 125 - 128(1995).
68. D. Hong and M. Aslam, "Fabrication and Characterization of Diamond Field Emitter Diode with Built-in Anode", *Applications Of Diamond Films And Related Materials: 3rd Int. Conf.*, eds. Feldman et al., NIST Special Publ. # 885, 49 - 52(1995).
69. S. Sahli and M. Aslam, "Pressure Microsensors Using P-Type Diamond Films", Technical Digest: 8th Int. Conf. Solid-State Sensor & Actu., Stockholm (Sweden), Vol. 2, 592-595 (1995).

70. M. Aslam and D. Schulz, "Technology of Diamond Microelectromechanical Systems", Technical Digest: 8th Int. Conf. Solid-State Sensor & Actu., Stockholm (Sweden), Vol. 2, 222-224 (1995).
71. D. Hong and M. Aslam, "Design and Fabrication of Diamond Field Emitter Structures", Technical Digest: 8th Int. Vacuum Microelectronics Conf., Portland (Oregon), 320-324 (1995).
72. D. Hong and M. Aslam, "Diamond Field Emitter Triode Display Cells", Technical Digest: 8th Int. Vacuum Microelectronics Conf., Portland (Oregon), 330-334 (1995).
73. D. Hong and M. Aslam, "Diamond Field Emitter Pressure Sensor", Technical Digest: 8th Int. Vacuum Microelectronics Conf., Portland (Oregon), 335-339 (1995).
74. D.S. Hong and **M. Aslam**, "Field Emission From p-Type Polycrystalline Diamond Films", Proc. ICNDST-4, MYU K.K. Scientific Publishing Division, Tokyo, Japan, 1994.
75. G.S. Yang, **M. Aslam**, M. Ulczynski and D.K. Reinhard, "Ultra-High Nucleation Density for Diamond Film Growth at 470 and 900 C", Proc. ICNDST-4, MYU K.K. Scientific Publishing Division, Tokyo, Japan, 1994.
76. S. Sahli, X. Hou and M. Aslam, "Current Bias Stressing of p-type Diamond Films at Different Temperatures", Proceed. High Temp. Elect. Conf., North Carolina, 1994.
77. G.W. Yang and M. Aslam, "Ultra High Nucleation Density for Diamond Temperature Sensors", Proceed. High Temp. Elect. Conf., North Carolina, 1994.
78. S. Herr, J. Beck, J. McGrath, S. Sahli and **M. Aslam**, "Method Measuring Doped Diamond Film Thermal Conductivity Using Infrared Thermography", Proc. of SPIE, Diamond-Film Semiconductors, vol. 2151, eds. M.A. Tamor and **M. Aslam**, Los Angeles, 1994.
79. **M. Aslam**, A. Masood, M. Tamor, "CVD Diamond Temperature Sensors", Proc. of SPIE, Diamond-Film Semiconductors, vol. 2151, eds. Tamor and Aslam, Los Angeles, 1994.
80. Abu-Ageel, **M. Aslam**, L. Rimai, "Electrical Characterization of Polycrystalline SiC Thin Films Deposited on Fused Silica Substrates by Laser Ablation, Proceedings of Int. Conf. on SiC and Related Materials, Washington DC, 1993..
81. **M. Aslam**, I. Taher, M.A. Tamor, R. Elder, "CVD Diamond Piezoresistive Sensors", Technical Digest, 7th Int. Conf. Solid-State Sensors and Actuators (Proc. Transducer 93), Yokohama, Japan, 718(1993).
82. L. Rimai, R. Ager, J. Hansas, C. Peters, E.M. Logothetis, N. Abu-Ageel and **M. Aslam**, "Laser Deposited SiC on Fused Silica and Sapphire Substrates", Proceeding of Materials Research Society, 1992.
83. **M. Aslam**, A. Masood, R. Fredericks, M.A. tamor, "Diamond Temperature Sensor Array for Harsh Aerospace Environments", Proceeding of SPIE on Sensors and Sensor Systems for Guidance and Navigation II, vol. 1694, 184(1992).
84. I. Taher, **M. Aslam**, A.H. Meitzler, and G.S. Saloka, Proc. Sensors Expo'90 (Chicago), Helmers Publishing, 1990.
85. R. Soltis, E. M. Logothetis, D. W. Hoffman, J.W. Hansas, Shinozaki, **M. Aslam**, L.E. Wenger, and J.T. Chen, "Deposition of YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7</sub> Films on Sapphire by RF Triode Sputtering", Science and Technology of Thin Film Superconductors 2, R.D. McConnell and R. Noufi (Eds.), Plenum Press, New York, 1990.
86. R. Soltis, W.T. Donlon, S. Shinozaki, R.M. Ager, C.R. Peters, E.M. Logothetis, **M. Aslam**, L.E. Wenger, J.T. Chen, and R. Nelson, "Properties of BiSrCaCuO Films by RF Triode Sputtering", Proceedings of International Conference on Materials and Mechanisms of HTSC, Stanford, 1989.
87. **M. Aslam**, "Nature of Instabilities in VLSI and VHSIC", Published in proceedings of Royal Aeronaut. Soc. Conference, Karachi/Pakistan (1985).

88. **M. Aslam** and P. Balk, "Processing Dependence and Structure of Hole Traps in SiO<sub>2</sub>", Insulating Films on Semiconductors, eds. V.J. Verwey and Wolters, North Holland Publishing Co. (1983).

#### 6.4 Book Chapters, Encyclopedia Articles

1. D.M. Aslam, "Electroluminescence in Diamond", in Handbook of Electroluminescent Materials", edited by D. R. Vij, Institute of Physics Publishing, U.K. (2004).
2. D.M. Aslam, "Optical Properties of Diamond", Encyclopedia of Optics, Elsevier Publ., 2004.
3. **M. Aslam** and P. Balk, "Processing Dependence and Structure of Hole Traps in SiO<sub>2</sub>", Insulating Films on Semiconductors, eds. V.J. Verwey and Wolters, North Holland Publishing Co. (1983).

#### 6.5 Conference Chair/Co-Chair, Session-Chair, Short Course, etc.

1. **Chaired** Sci Teacher Workshop at Michigan State University "Elementary School to Ph.D.", June 2002.
2. **Chaired** Sci Teacher Workshop at University of Michigan on "Elementary School to Ph.D.", June 2001.
3. **Short Course:** "WIMS for precollege students", July 2000, Sponsored by Diversity Programs Office at Michigan State University, 2000.
4. **Short Course:** "Diamond Sensors and MEMS", IEEE Int. Conf. on Solid State Sensors and Actuators (Transducers'97), Chicago, 1997.
5. **Poster Session Co-Chair:** 3rd Int. Conf. on Applications of Diamond Films And Related Materials, Gaithersburg, Washington D.C.; Co-chair of Poster Session II.
6. **Co-Chair:** SPIE Conference on "Diamond Film Semiconductors" (vol. 2151), Los Angeles, CA, 1994; co-chaired by M.A. Tamor and M. Aslam, 1994.

#### 6.6 Invited Conference Papers and Keynote Papers

1. E. T. Zellers, .... **D. M. Aslam** and Yang Lu, "Materials and Processing Challenges Related to the Fabrication of a MEMS Micro Gas Chromatograph," Symposium on Materials, Mechanisms, and Systems for Chemical and Biological Detection and Remediation, Materials Research Society Meeting, San Francisco, CA, April 12-16th, 2004.
2. **D. M. Aslam** and K. D. Wise, "Micro and Nano Technologies in K-12", Sensors Expo conference, Session Keynote, June 4, Chicago, 2003.
3. **D. M. Aslam**, K. Najafi, K. D. Wise and T. Zellers, "Poly-Carbon Nano- And Micro-Technologies For Wireless Integrated Micro-Systems", Proc. COMS 2002, Ypsilanti, MI.
4. K. D. Wise, K. Najafi, **D. M. Aslam**, R. B. Brown, J. M. Giachino, L. C. McAfee, C. T.-C. Nguyen, R. O. Warrington, and E. T. Zellers, "Wireless Integrated MicroSystems (WIMS): The Coming Revolution in the Remote Gathering of Information," (Session Invited Keynote), *Digest SensorsExpo*, Chicago, pp. 175-182, June 2001.
5. D.M. **Aslam**, "Intra-grain Diamond Piezoresistive Sensors", SID Symposium, University of Michigan, Ann Arbor, 1999.
6. **M. Aslam**, "On-Chip Microdevices and Microtubes", APSENA 1994 Conf., Oakland University, Rochester Hills, MI, 1994.
7. M.A. Tamor and **M. Aslam**, "Diamond Microsensors", 3rd International Conf. on New Diamond Science and Technol. & Diamond 92, Heidelberg, Germany, 1992.
8. **M. Aslam**, "Technology Si Vacuum Microtubes for Microsensors", AMSE Conf., MSU, East Lansing, MI, 1992.

9. **M. Aslam**, "Micromachined On-chip Vacuum Tubes", CFMR Industrial Meeting, MSU, 1992.
10. **M. Aslam**, "Diamond Piezoresistive Devices", ISHM Workshop on Diamond and Diamond-like Films, Breckenridge, Colorado, 1992.
11. **M. Aslam**, "Piezoresistive Pressure Sensors", CFMR Industrial Symposium, East Lansing, MI, 1991.
12. **M. Aslam**, "New and Conventional Materials for VLSI Devices", Meeting of Detroit Chapter of ASM International, Farmington Hills, MI, U.S.A. (1990).

### 6.7 Oral/Poster Conference Presentations

1. M. Baur and D.M. Aslam, Robotics Conf., Orlando, Florida, 2003.
2. X. Zhu and D. Aslam, MEMS 2003. Japan, 2003.
3. Y. Tang, S. Sahli, **D. M. Aslam**, D. Merriam, and K. D. Wise, "Poly-diamond inter- and intra-grain piezoresistive position sensor design for WIMS", AICHE Annual Conference on Sensors, Indianapolis, 2002.
4. D.M. Aslam et al., "Micro- and Nano-Technologies for WIMS", COMS 2000, Ypsilanti, MI, 2002.
5. U. Kim and D.M. Aslam, "Field Emission Electro-Luminescence on Diamond and Carbon Nanotube Films", SID symposium, Detroit, MI, 2001.
6. Kim, Aslam, SID Symposium, 2000.
7. R. Lal Tummala', R. Mukherjee', **D. M. Aslam**, Ning Xi', S. Mahadevan, and J. Weng, "Reconfigurable Adaptable Micro-robot", IEEE Conf. on Systems, Man and Cybernetics, Tokyo, Japan, 1999.
8. V. Papageorgiou, D.M. Aslam and K. Najafi, "Diamond MEMS", SID Symposium, University of Michigan, 1999.
9. U. Kim and D.M. Aslam and S. Kwon, "Field Emission Mapping", ,IVMC 98, Asheville, NC, 1998.
10. C. Loellner, U. Kim and D.M. Aslam and S. Kwon, "Field Emission Testing System", ,IVMC 98, Asheville, NC, 1998
11. D. Hong and D.M. Aslam, "Field emission Displays", SID 97, U of Michigan, 1997.
12. D. Hong and D.M. Aslam, "Simulation of FE structures", IVMC 97, South Korea, 1997.
13. D. Hong, D.M. Aslam, T. Grimm and S. Bandy, "Ion Implanted FE structures", IVMC 97, South Korea, 1997.
14. Y. Li, D.M. Aslam and S. Kwon, "Field Emission From Low Temperature Diamond", , IVMC 97, South Korea, 1997.
15. S. Kwon, D.M. Aslam, Y. Li and Y. Lee, "Field Emission From MPCVD Films", , IVMC 97, South Korea, 1997.
16. D.M. Aslam, Y. Li and W. McColl, "Field emission from Diamond deposited at low temperature", Diamond'97, UK, 1997.
17. D. Hong and D. M. Aslam, "Fabrication and Optimization of Diamond Field Emission DisplayCell in Triode Modes", Diamond '96, Tours, France.
18. S. Sahli and D. M. Aslam, "Effect of Annealing Resistivity", Diamond '96, Tours, France, 1996.
19. S. Sahli and D. M. Aslam, "Inter- and Intra-grain Conduction in Polycrystalline Diamond", Diamond '96, Tours, France, 1996.
20. G.S. Yang and D. M. Aslam', "Diamond Temperature Sensors and Heaters", Diamond '96, Tours, France, 1996.
21. D. Hong and D. M. Aslam, "Diamond Field Emitters", IVMC 96, Saint Petersburg, Russia, 1996.
22. D. Hong and D. M. Aslam, "Diamond Field Emitter Displays", IVMC 96, Saint Petersburg, Russia, 1996.
23. M. Aslam and D. Hong, "Diamond Field Emitter display Technology", SID Symposium on Vehicle Displays, Ypsilanti, MI, 1996.
24. S. Sahli and M. Aslam, "Pressure Sensors", Transducers 95, Stockholm, Sweden, 1995.
25. M. Aslam and D. Schulz, "Technology of Diamond Microelectromechanical Systems", Transducers 95, Stockholm, Sweden, 1995.
26. S. Sahli and M. Aslam, "Pressure Dependence of Piezoresistance", Applied Diamond Conference, Gaithersburg, USA, 1995.
27. S. Sahli, X. Hou and M. Aslam, "CBS...", Applied Diamond Conference, Gaithersburg, USA, 1995.
28. G.S. Yang and M. Aslam, "Temperature Sensors and Heaters", Applied Diamond Conference, Gaithersburg, USA, 1995.
29. D. Hong and M. Aslam, "Diamond Field Emitters", Applied Diamond Conference, Gaithersburg, USA, 1995.
30. D. Hong and M. Aslam, "Diamond Field Emitter Study", IVMC 95, Portland, USA, 1995.
31. D. Hong and M. Aslam, "Diamond Field Emitter Pressure Sensor", IVMC 95, Portland, USA, 1995.
32. D. Hong and M. Aslam, "Diamond Field Emitter Displays", IVMC 95, Portland, USA, 1995.
33. S. Sahli and M. Aslam, "Pressure Dependence of Resistance", CFMR Symposium, MSU, E. Lansing, 1995.
34. S. Sahli, X. Hou and M. Aslam, "", CFMR Symposium, MSU, E. Lansing, 1995.
35. M.D. Jaeger, B. Golding, M. Thorpe, K. Shirai and M. Aslam, "Electrical Contacts to 3D Diamond Microcrystals", Bull. A.P.S. **40**, 221(1995).
36. S. Sahli and M. Aslam, "Pressure Dependence of Piezoresistance", CFMR Symposium, 1994.
37. S. Sahli, X. Hou, M. Aslam and B. Golding, "CBS Measurements", CFMR Symposium, 1994.
38. G.S. Yang and M. Aslam, "Ultra-High Nucleation Diamond Films for Thermistors", CFMR Symposium, 1994.
39. D.S. Hong and M. Aslam, "Diamond Cold Emitters", Diamond Technology Workshop, WSU, Troy MI, 1994.

40. G.S. Yang and M. Aslam, "Ultra-High Nucleation Density for Diamond Growth", Diamond Technology Workshop, WSU, Troy, MI, 1994.
41. Abu-Ageel, **M. Aslam**, L. Rimai, "Electrical Characterization of Polycrystalline SiC Thin Films Deposited on Fused Silica Substrates by Laser Ablation", Diamond Technology Workshop, WSU, Troy, MI, 1994.
42. Herr, J. Beck, J. McGrath, S. Sahli and **M. Aslam**, "Estimation of Diamond Film Thermal Conductivity Using Optimal Design Techniques", Sixth Inverse Problems in Engineering Seminar and Workshop, Cincinnati, 1994.
43. D.S. Hong and **M. Aslam**, ICNDST-4 (4th Int. Conf. New Diamond Sci. & Technol.), Kobe, Japan, 1994.
44. Yang, **M. Aslam** et al., ICNDST-4 (4th Int. Conf. New Diamond Sci. & Technol.), Kobe, Japan, 1994.
45. D.S. Hong and **M. Aslam**, "Field Emission From p-Type Polycrystalline Diamond Films", IVMC'94, Grenoble, France, 1994.
46. S. Sahli, X. Hou and **M. Aslam**, "Current Bias Stressing of p-type Diamond Films at Different Temperatures", High Temp. Elect. Conf., North Carolina, 1994.
47. G.S. Yang and **M. Aslam**, "Ultra High Nucleation Density for Diamond Temperature Sensors", High Temp. Elect. Conf., North Carolina, 1994.
48. Feldmann, M. Olinger and **M. Aslam**, "Analysis of New Cold Cathode Microelectrometer Using a Novel Corrugated Anode", Position Location and Navigation Symposium (PLANS'94), 1994.
49. Herr, J. Beck, J. McGrath, S. Sahli and **M. Aslam**, "Method Measuring Doped Diamond Film Thermal Conductivity Using Infrared Thermography", SPIE Int. Conf. on Diamond Film Semiconductors, Los Angeles, 1994.
50. **M. Aslam**, A. Masood, M. Tamor, "CVD Diamond Temperature Sensors", SPIE Int. Conf. on Diamond Film Semiconductors, Los Angeles, 1994.
51. Abu-Ageel, **M. Aslam**, L. Rimai, "Electrical Characterization of Polycrystalline SiC Thin Films Deposited on Fused Silica Substrates by Laser Ablation", Int. Conf. on SiC and Related Materials, Washington DC, 1993..
52. Taher, **M. Aslam**, M.A. Tamor, "CVD Microstructures for Sensor Applications", 2nd Int. Conf. on Application of Diamond Films and Related Materials", Tokyo, Japan, 1993.
53. D.S. Hong, **M. Aslam**, M. Olinger and M. Feldmann, "Simulations of Fabricated Field Emitter Structures", International Conference on Vacuum Microelectronic, Rhode Island, USA, 1993.
54. **M. Aslam**, I. Taher, M.A. Tampur, R. Elder, "CVD Diamond Piezoresistive Sensors", Transducer 93, Int. Conference on Solid -State Sensors and Actuators, Yokohama, Japan, 1993.
55. Taher, **M. Aslam**, M.A. Tamor, "CVD Polycrystalline Diamond Structures For Micromechanical Sensor Applications", Diamond Workshop, Madison, Wisconsin, USA, 1993.
56. Taher, **M. Aslam**, M.A. Tamor, "Doping Dependence of Piezoresistive Effect in Diamond", CFMR Symposium, MSU, 1993.
57. Rimai, R. Ager, J. Hangas, C. Peters, E.M. Logothetis, N. Abu-Ageel and **M. Aslam**, "Laser Deposited SiC on Fused Silica and Sapphire Substrates", MRS Meeting, Boston, 1992.
58. **Aslam**, G. Myers, P. Klimecky, L. Cathey, R. Elder and B. Artz, "Characterization of Evaporated Si Cold Emitters", 5th International Conference on Vacuum Microelectronics, Vienna, Austria, 1992.
59. **Aslam**, I. Taher, A. Masood, M. Tamor, "CVD Diamond Piezoresistive Sensors", 3rd International Conf. on New Diamond Science and Technol. & Diamond 92, Heidelberg, Germany, 1992.
60. Masood, **M. Aslam**, I. Taher, M. Tamor, T.J. Potter, C. Evans, T. Curtis and J. Ledford, "Diamond Piezoresistive Sensors for High Temperatures", CFMR Industry Symposium, East Lansing, MI, 1992.
61. klimecky, **M. Aslam**, G. Myers, R.E. Elder and B. Artz, " Current-Voltage Characteristics of Micromachined Si Vacuum Diodes", CFMR Industry Symposium, East Lansing, MI, 1992.
62. Pawlowski, **M. Aslam**, L. Rimai and W.P. Pratt, "In-Situ Laser Deposition of YBa<sub>2</sub>Cu<sub>3</sub>O<sub>x</sub> Films Using Microwave Plasma Disk Reactor Oxygen Source", CFMR Industry Symposium, East Lansing, MI, 1992.
63. Zapp, H. Tseng, **M. Aslam** and G. Brown, "Smart Logic Design for Instrumented Sphere Miniaturization", International Meeting of American Society of Agricultural Engineers, Sharlott, North Carolina, 1992.
64. **Aslam**, A. Masood, R.J. Fredricks, M.A. Tamor, "Thin Film Diamond Temp. Sensor Array for Harsh Aerospace Env.", SPIE Conf., Orlando, FL, 1992.
65. Masood, **M. Aslam**, M.A. Tamor and T.J. Potter, "Electrical Characterization of Boron Doped Diamond Film Resistors Synthesized by Hot-Filament CVD", 3rd Annual Diamond Workshop, Wayne State Uni., Detroit, MI, 1992.
66. **Aslam**, I. Taher, A. Masood, M.A. Tamor and T.J. Potter, "Homoepitaxial and Polycrystalline CVD-Diamond Films for Piezoresistive Devices", 3rd Annual Diamond Workshop, Wayne State Uni., Detroit, MI, 1992.
67. Masood, **M. Aslam**, M.A. Tamor and T.J. Potter, "Boron-doping and Electrical Characterization of Thin Diamond Films for Device Applications", ISDRS 91, Charlottesville, Virginia, 1991.
68. **Aslam**, I. Taher, A. Masood, M.A. Tamor and T.J. Potter, "Technology and Characterization of CVD-Diamond Piezoresistive Devices", ISDRS 91, Charlottesville, Virginia, 1991.
69. Tseng, **M. Aslam**, H.R. Zapp and G. Brown, "Multipip Housing for Instru. Sphere Miniaturization", American Society of Ag. Engineers Meeting, Chicago, IL, 1991.
70. Myers, **M. Aslam**, L. Cathey, R.E. Elder and B. Artz, "Fabrication of Silicon Cold-Cathodes by Electron Beam Evaporation", Technical Digest, 4th International Vacuum Microelectronics Conference, Nagahama, Japan, 1991.
71. Taher, **M. Aslam**, A.H. Meitzler, and G. sloka, "Resistance-vs-Strain Nonlinearity for Ion-Implanted, Junction-Isolated Piezoresistors", Sensors-Expo 90, Chicago, IL, U.S.A.(1990).

72. **Aslam**, B. Artz, T. J. Pratter, and S. Kaberline, "A Study of Micromachining-related Cross Contamination Pertaining to Hybrid Vacuum Microelectronic Devices," 3rd International Conference on Vacuum Microelectronics, Monterey, CA, U.S.A.(1990).
73. Pawlowski, **M. Aslam**, L. Rimai, W.P. Pratt, "In-Situ Deposition of YBaCuO Films by Laser Deposition Using MPDR Oxygen Source", CFMR/Industry Symposium, Michigan State University, East Lansing, MI, U.S.A.(1991).
74. Pawlowski, **M. Aslam**, C. Nelson, W.P. Pratt, P. Vaishnav, E.M. Logothetis, and R. Soltis, "In Situ Deposition of YBaCuO Films by Laser Deposition", Fourth Annual CFMR/Industry Symposium, Michigan State University, East Lansing, MI, U.S.A.(1990).
75. Soltis, E. M. Logothetis, D. W. Hoffman, J.W. Hargas, Shinozaki, **M. Aslam**, L.E. Wenger, and J.T. Chen, "Deposition of YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7</sub> Films on Sapphire by RF Triode Sputtering", International Conference on Science and Technology of Thin Film Superconductors, Denver, Colorado(1990).
76. Soltis, W.T. Donlon, S. Shinozaki, R.M. Ager, C.R. Peters, E.M. Logothetis, **M. Aslam**, L.E. Wenger, J.T. Chen, and R. Nelson, "Properties of BiSrCaCuO Films by RF Triode Sputtering", International Conference on Materials and Mechanisms of HTSC, Stanford University, Stanford, CA, U.S.A (1989).
77. R.E.Soltis, S.Shinozki, R.Ager, E.M.Logothetis, **M.Asalam**, L.E.Wenger and J.T.Chen, "R F Triode Sputter Deposition of Superconducting BiCaSrCuO Films", American Physical Soc. Meeting St.Louis, Mo, U.S.A. (1989).
78. **Aslam**, "Performance-limiting defects in VLSI devices", CM/ESD Conference, Dearborn, MI, U.S.A. (1989).
79. Soltis, S. Shinozaki, R.M. Ager, R.E. Chase, E.M. Logothetis, **M.Asalam**, R.Nelson, M.Gorbett, J.T.Chen and L.E.Wenger "Superconducting YBaCuO Films on Si and SiO<sub>2</sub> and SiO<sub>2</sub>/Si Without Buffer Layers", Conf. on Science and Technology of Thin Film Superconductors, Colorado Springs, Colorado, U.S.A.(1988).
80. Soltis, **M. Aslam**, S. Shinozaki, R. Ager, E.M. Logothetis, J.T. Chen, and L.E. Wenger, "Rapid Thermal Annealing of YBaCuO Films on Si and SiO<sub>2</sub> Substrates", International Materials Research Society Symposia, Boston, Massachusetts, U.S.A., (1988).
81. **Aslam**, R.E. Soltis, E.M. Logothetis, J.T. Chen and L.E. Wenger "Technology of Superconducting Films on Si, SiO<sub>2</sub> and Si<sub>3</sub>N<sub>4</sub>", IEEE Vacuum Microelectronics Conference, Williamsburg, Virginia, U.S.A., (1988).
82. **Aslam**, R.E. Soltis, E.M. Logothetis, R. Ager, M. Mikkor, W. Win, J.T. Chen and L.E. Wenger, "Rapid Thermal Annealing of YBaCuO Films and Si and SiO<sub>2</sub> Substrates", American Ceramic Society Meeting, Cincinnati, Ohio, U.S.A. (1988).
83. **Aslam**, "Electron Mobility in Boron Implanted Si Inversion Layers", Portland International Conference on Silicon Technology, Portland, Oregon, U.S.A., (1987).
84. **Aslam**, "Nature of Instabilities in VLSI and VHSIC", Royal Aeronaut. Soc. Conf., Karachi, Pakistan, (1985).
85. Offenber, **M. Aslam**, T. Johannson and P. Balk, "Electron Traps in B -Implanted SiO<sub>2</sub> ", ESSDERC 84, Lille, France (1984).
86. **Aslam** and P. Balk, "Structural Relationship Between Electron and Hole Traps in Thermal SiO<sub>2</sub> Films", 1983 IEEE Semiconductor Interface Specialists Conference, Fort Lauderdale, U.S.A., (1983).
87. Do Thanh, **M. Aslam** and P. Balk, "Processing Dependence and Generation of Interface States in MOS- Structure Upon Electron and Hole Injection," ESSDERC 83, Canterbury, U.K., (1983).
88. **Aslam** and P. Balk, "Processing Dependence and Nature of Hole Traps in SiO<sub>2</sub>", INFOS '83, Eindhoven, Holland, (1983).
89. **Aslam**, R. Singh, and P. Balk, "Electronen-Selftrapping in SiO<sub>2</sub> von MOS-Strukturen", German Physical Society Conference, Freudenstadt, Germany (1983).
90. **M. Aslam**, M. Maier, D.R. Young, and P. Balk, "Effect of High Temperature Annealing on Electron Traps in SiO<sub>2</sub>", ESSDERC and Symposium 82, Munich, Germany, (1982).

## 6.8 Invited Seminars

1. "Carbon-based Micro and Nano Technologies for WIMS", University of Michigan, Ann Arbor, MI, 2002.
2. "Diamond Sensor Technologies" Delphi Automotive, Warren, MI, 2000.
3. "Technology of poly-diamond: FED, sensors and MEMS", CMP seminar, Physics Dept, MSU, 2000.
4. "Diamond sensors", MSU Cyclotron Center, 1999.
5. "IC-compatible Diamond Films Technology for Automotive Sensors", Delco Electronics, Kokomo, IN, 1998.
6. "IC-compatible Diamond Films Technology for Field Emission Displays and Sensors", OIS, Northville, MI, 1998.
7. "Poly- and Microcrystalline Diamond Films Technology for Field Emission Displays", Display Technology and Manufacturing Center, University of Michigan, Ann Arbor, MI, 1997.
8. "Fabrication and Optimization of Triode Field Emission Displays Cells", SID Detroit Chapter Seminar, Michigan State University, E. Lansing, MI, 1997.
9. "Diamond Film Technology for Field Emission Displays", University of Michigan, Ann Arbor, MI, 1996.
10. "On-Chip Si Vacuum Microtubes", Wayne State University, Detroit, MI, 1992.
11. "Trapping Centers in MOS Devices with Al, Poly-Si or YBaCuO Gates", Electrical Engineering and Systems Science, Michigan State University, East Lansing, Michigan, U.S.A. (1988).
12. "Trapping Centers in MOS Devices with Al, Poly-Si or YBaCuO Gates", Microelectronics Center of North Carolina, Research Triangle Park, North Carolina, U.S.A. (1988).
13. "Common Origin for VLSI/ULSI Instabilities Related to Charge Trapping in SiO<sub>2</sub>", Ford Scientific Research Laboratories, Dearborn, Michigan, U.S.A. (1987).
14. "Device Aspects of Optical Fibre Communication Systems", Avionics Engineering, PAF College of Aeronautical Engineering, Karachi, Pakistan (1985).

15. "Common Origin for Electron and Hole Traps in SiO<sub>2</sub> of MOS-Structures", ESAT Laboratory, Katholieke University Leuven, Heverlee, Belgium (1984).
16. "Structure of Electron and Hole Traps in Thermal SiO<sub>2</sub>", Department of Electrical and Computer Engineering, Wayne State University, Detroit, Michigan, U.S.A. (1983).
17. "Annealing Behavior of Electron and Hole Traps in SiO<sub>2</sub> of MOS- Structures", Institute of Solid State Physics, Technical University, Munich, Germany (1983).
18. "High Temperature Annealing Behavior of Trapping Sites in SiO<sub>2</sub>", Siemens Research Laboratories, Munich, Germany (1983).

## 6.9 Technical Reports

1. **M. Aslam**, G.S. Yang, A. Masood and R. Fredrick, "Diamond Film Temperature and Heat Flux Sensors", NASA Technical Report, 1995.
2. I. Taher, **M. Aslam**, M. Tamor, "CVD Diamond Films Strain Sensors", Ford Technical Memorandum, 1994.
3. **M. Aslam** and S.L. McCarthy, "Etching Behavior of Ambient Oxides in Si", Ford Technical Memorandum, SRM-87-14, 1987.
4. Do Thanh and **M. Aslam**, "Generation of Interface States in MOS Structures Upon Electron and Hole Injection", Jahresbericht 1982-83, Halbleitertechnik, Technical University, Aachen, Germany.
5. **M. Aslam** and R. Singh, "Annealing Behavior of Electron and Hole Traps in Polysilicon-SiO<sub>2</sub>-Si Structures", Jahresbericht 1982-83, Halbleitertechnik, Technical University, Aachen, Germany.
6. **M. Aslam**, "Common Origin for Electron and Hole Traps in SiO<sub>2</sub>", Jahresbericht, 1982-83, Halbleitertechnik, Technical University, Aachen, Germany.
7. **M. Aslam**, "Annealing Behavior of Electron Traps in SiO<sub>2</sub>", Jahresbericht 1981, Halbleitertechnik, Technical University, Aachen, Germany.

## 7. RESEARCH FUNDING

### 7.1 Current Funding

1. NSF ERC, "Wireless Integrated Microsystems", 24 Co-PIs, 2000-2010, **\$ 35,000,000** (Dean Aslam's *share is approximately* \$200,000 per year; MSU's share is approx. \$390,000 per year), Co-PI, MSU-PI and WIMS Associate Director.
2. NSF Equipment Grant, "Microfabrication equipment", 2001-04, multi-investigator, **\$ 300,000, Co-PI.**
3. Ovid-Elsie Schools; Okemos Community Education, Woodcreek Magnet Elementary School, "MiCRoSYSTEMS<sup>2</sup> for K-12 Education", 2003 – 04, **\$ 14,000, PI**

### 7.2 Past Funding

1. DARPA, "Reconfigurable Adaptable Microrobot", 6 PIs, 1998-2002, **\$1,430,355**, (Dean Aslam's *share is approximately* \$81,686 per year for first 3 years), **Co-PI.**
2. Terastore, "Carbon nanotubes", 2000-01, 2 PIs, **\$ 19,000**, (my share is \$ 19,000), **PI.**
3. NASA, "Carbon Nanotubes", 1999-00, 3 PIs. **\$ 20,000** (my share is \$ 6,666), **Co-PI.**
4. NSF MRSEC, "Sensor Materials", 1994-97, \$ 230,000, **Co-PI.**
5. Norton, "Poly-C Films", 1993?, \$ 20,000, **PI.**
6. C&J Ind, "Poly-C Structures", 1992?, \$ 68,000, **PI**
7. NASA Langeley, "Poly-C Temperature Sensors", 1992-?, \$ 100,000, **PI.**
8. Ford Sci. Labs., "Poly-C Technology and SiC films", 1990-94, \$ 75,000, **PI.**
9. USDA, "Minaturization of Instrumented Sphere", 1989-90?, \$ 5,000, **PI.**
10. Chrysler Corporation, "MOS Relays", 1988-90, \$ 34,000, **PI.**

## 8. PROFESSIONAL EXPERIENCE

### 8.1 Teaching/Research

<i>Associate Professor</i>	1988-	Electrical Engineering, Michigan State University, E. Lansing, MI, 48824.
<i>Assistant Professor</i>	1986-88	Elect. and Computer Engineering, Wayne State University, Detroit, MI 48202.
<i>Summer Assignment</i>	1987	Ford Scientific Research Laboratories, Dearborn, Michigan.
<i>Squadron Leader</i>	1984-86	Avionics Engineering Dept., PAF CAE, Karachi, Pakistan.
<i>Post Doc. Position</i>	1983-84	Electrical Engineering, Technical University (RWTH) Aachen.
<i>DAAD Fellow</i>	1975-83	RWTH Aachen, Germany.
<i>Flight Lieutenant</i>	1974-75	H & S Department, PAF College of Aeronautical Engineering, Karachi.
<i>Lecturer</i>	1970-74	Physics Department, Panjab University, Lahore, Pakistan.

<sup>2</sup> For details click on K-Ph.D. on the following website: [www.egr.msu.edu/~aslam](http://www.egr.msu.edu/~aslam)

## 8.2 Research Administration

2000 – Present Associate Director, NSF Engineering Research Center (ERC) for WIMS  
2000 – Present Member Executive Committee, WIMS ERC  
2000 – Present Member Administrative Committee, WIMS ERC

## 8.3 Industrial

1987 - 93 One day per week, Scientific Research Laboratories, Ford Motor Co., Dearborn, MI.

## 8.4 Technological

1987 - Present Microsensor and micromachining technologies, IC-compatible diamond film technology for microsensors, MEMS and field emission displays.  
1976 - 1984 MOSFET fabrication technologies and MOS characterization, RWTH Aachen .

## 8.5 Laboratory Development

**Micro and Nano Technology Lab (MANTL)**, Michigan State University (2000-present).  
*Microfabrication Laboratory* (cleanroom), Michigan State University (with D.K. Reinhard).  
*Microsensor Laboratory*, Michigan State University (C-V/I-V, field-emitter/microsensor characterization, etc.).  
*Microdevice Fabrication Laboratory* (class 100 cleanroom), designed at Wayne State University (1986-88).  
*MOS Characterization Laboratory*, Department of Semiconductor Engineering, RWTH Aachen, Germany, 1980.

## 9. PROFESSIONAL CONSULTING

Summer 2000 Terastore, nanotubes.  
1994 - 1995 Sentec Corporation, Walled Lake , MI; Diamond Optical Structures.  
1992 - 1993 Smiths Industries, Grand Rapids, MI; cold emitter accelerometer.  
1992 - 1993 Ford Motor Company, Dearborn, MI; diamond electronic devices.

## 10. FELLOWSHIPS AND HONORS

DAAD (German Academic Exchange Service) Fellowship 1975-83.  
Pakistan Government Scholarship 1963-69.  
Senior Member of IEEE and Member of American Vacuum Society.  
Reviewer and Panelist for NSF, IEEE Electron Device Letters, IEEE Trans. Electron Dev., Applied Physics Letters, J. Vacuum Science & Technology, J. of Applied Physics, Diamond and Related Materials, etc..

## 11. PERSONAL

US citizen

Married: one child

Laguages other than English: *German, Urdu, Panjabi*

