imen

2009 ANNUAL

Institute of Microengineering and Nanoelectronics

Universiti Kebangsaan Malaysia

Contents

Message from the Director of IMEN

I am pleased to present IMEN's Annual report highlighting our activities across the year of 2009. IMEN welcomed a new member on board early this year. Prof. Dr. Ille C. Gebeshuber is an expert in biomimetics and is number ten in the Science & Research category in the ranking of the 333 most important women in Austria. Previously Prof. Gebeshuber was attached to Vienna University of Technology Institut für Allgemeine Physik &Austrian Center of Competence for Tribology. At IMEN, she heads the group working on physics nanotechnology and biomimetics for MEMS applications. She will be a contract visiting professor at IMEN for two years. Through Prof. Gebeshuber, IMEN expands its network to the European nanotechnology R&D scene.

Part of IMEN moved to a new office location at the UKM-MTDC in July 2009 . Previously the administration office occupied the space outside of the MEMS microfabrication clean rooms. Due to the cramped spaces, the University had agreed to relocate the office. The MEMS group technical staff and students remain at the original location to be near the laboratories while the administration staff moved to the new office. I hope the new and comfortable arrangement will motivate our staff to provide more efficient services to our students.

Following IMEN's MoU with Inter-University Semiconductor Research Center and Lembaga Ilmu Pengetahuan Indonesia respectively, we have been conducting inter-workshops with both institutions alternatively organized by IMEN or ISRC/LIPI. This year, it is our turn to visit both institutions for the annual workshops. The 3rd Korea-Malaysia Nanotechnology Workshop on Nanotechnology took place in Gyeongju, Korea from September 23-25. This time the workshop was attended by more than 80 people including postgraduate students from Kyungpook National University.

The IMEN-LIPI Joint Seminar was held from 18-20 August in the beautiful island of Bali. The workshops were inspiring and further reinforce our collaborations with ISRC and LIPI. Year 2010 will see IMEN's turn to be the host. IMEN joined Academy of Sciences Malaysia and Malaysia Nanotechnology Association (MNA) in organizing Nanotech Malaysia 2009. The event held from 27-29 October at the Kuala Lumpur Convention Center had three main activities; conference, exhibition and a forum session. IMEN/UKM organized the conference which was the second Nanotech Malaysia conference. The first one was held back in 2007. We received over 180 papers and 200 participants. I am happy with the response and hope that it will increase with the next conference in the series.

The institute has indeed continued a strong development ever since its inauguration in 2002. Looking back, our staff and students can be proud of the institute's progress in terms of research outputs, facilities and network. Our fabrication facilities host several sophisticated equipments. We have a growing network of micro and nanoelectronics research collaborators including Seoul National University Korea, Kyungpook National University Korea, Sheffield University UK, Tokyo University Japan, National University of Singapore, National Chiao Tung University Taiwan and recently we inked a letter of intent with Dr. Munetaka Oyama from Institute of Nanotechnology, Kyoto Japan for research on quantum dots. Since 2002, we have produced indexed journal publications and conference proceedings.

The institute's achievement and development has been due in no small measure to the contributions by its members and support by the university. I would like to take this opportunity to thank all individuals and UKM for their effort and input and I look forward to present our progress next year.

Prof. Dr. Hj. Burhanuddin Yeop Majlis *J.M.N*
Director, IMEN

Director
Prof. Dr. Burhanuddin Yeop Majlis

Dr. Azman Jalar
(Deputy Director)

Prof. Dr. Burhanuddin
Yeop Majlis
(MEMS & NEMS Technology)

Prof. Dr. Muhamad Mat Salleh
(Organic & Printed Technology)

Prof. Dr. Sahbudin Shaari
(Photonics & Nanophotonics)

Prof. Dr. Masuri Othman
(Micro & Nanoelectronics System)
- Seconded to MIMOS Berhad-

Dr. Azman Jalar
(Microelectronics
Packaging Materials)

Dr. Fatah Bin Awang Mat
(MBE Technology & RF
Intergrated Circuit)

Prof. Emeritus Dato' Dr.
Muhammad Yahaya
(Principal Fellow)

Prof. Dr. Pankaj K. Choudhury
(Principal Fellow)

Prof. Dr. Ille Gebeshuber
(Principal Fellow)

Dr. Dee Chang Fu
(Research Fellow)

Dr. Azrul Azlan Hamzah
(Research Fellow)

Dr. Md. Shabiul Islam
(Research Fellow)

Dr. Akrajas Ali Umar
(Research Fellow)

Dr. Jumril Yunas
(Research Fellow)

Dr. Badariah Bais
(Research Fellow)

Dr. P. Susthitha Menon
(Research Fellow)

Abang Annuar Ehsan
(Research Fellow)

Abdul Rahman Mohmad
(Junior Fellow)

Chin Shin Liang
(Junior Fellow)

Dilla Duryha Berhanuddin
(Junior Fellow)

Prof. Dr. Muhamad Mat Salleh
- Preparation and characterization of thin films for electronics devices, odor and gas sensors.
- Organic light emitting diodes (OLED).
- Electrochromic windows.
- Solar cells.
- Langmuir-Blodgett films.

Prof. Emeritus Dato' Dr. Muhammad Yahaya
- Solid State Physics Energy, Thin Films and Sensor Technology.
- Nanomaterials.
- Solar Cells.
- Energy

Prof. Dr. Ille C. Gebeshuber
- Biomimetics
- Ion-surface-interaction: Sputtering, nanostructure formation, capillary guiding, etc.
- Fusion plasmas: Fusion plasma diagnostics, plasma-wall-interaction, ECR ion source development
- Ultrafast Lasers in Physics: Laser-matter-interaction, Laser Ablation, Medical Applications, Two-Photon-Modification
- Applications of Ultra-short Lasers in Material Science
- Nanotechnology and nanotribology
- Biophysics AFM-imaging of bacteria, blood- and cancer-cells
- Scanning Probe Microscopy

Prof. Dr. Pankaj K. Choudhury
- Optical waveguides of different cross-sectional geometries and/or materials
- Complex mediums
- Thin film optical waveguides fabrication and characterization
- Optical sensors
- Photonic crystals
- Vertical cavity surface emitting lasers

Research

Dr. Jumril Yunas
- Micro and Nano Electro Mechanical Systems (MEMS/NEMS) Devices and Technology
- Micro-Sensors
- RF (Radio Frequency) Devices and Power Electronics Devices
- Optoelectronics Devices.

Dr. Md. Shabiul Islam
- VLSI Design
- Microelectronics
- DSP Hardware Implementation on FPGA using VHDL/DFL.
- FPGA Realization based on Fuzzy Logic (FL) Algorithm
- Embedded system design and interfacing using Micro controller.
- Microprocessor/Micro controller System and Interfacing

Dr. P Susthitha Menon
- Nanophotonics
- Optoelectronics
- III-V Materials
- Optical Communications

MSc. Candidates

Name of Students	Qualifications	Subject	Supervisor
Nur Azrina bt. Dzulkefli	B.Engg. in Electronics from University of Surrey, UK (2005)	Fabrication of glucose actuator microvalve for drug delivery system	Prof. Dr. Burhanuddin Yeop Majlis
Nor Illiani Ramzi	B. Eng. in Microelectronics from Universiti Kebangsaan Malaysia (2007)	Microprobe for wafer testing application	Prof. Dr. Burhanuddin Yeop Majlis
Muhammad Ramdzan bin Buyong	BEngg. (Surrey, UK)	Very low pressure capacitive pressure sensor	Prof. Dr. Burhanuddin Yeop Majlis
Tina Rezaie Matin	BEngg. (Islamic Azad University, Iran)	Biomimetics of nanostructures	Prof. Dr. Ille C. Gebeshuber
Mohd. Hafis Mohd. Ali	BEngg. in Microelectronics (UKM)	On-wafer characterization of 4-port integrated balun using 2-port network analyzer	Prof. Dr. Burhanuddin Yeop Majlis
Mohd. Nizam Abdullah	BSc. from Universiti Teknologi Malaysia	Application of Erbium Doped Fibre in Wavelength Measurement	Prof. Dr. Sahbudin Shaari
Ummi Supya Ismail	B.Eng. from Universiti Putra Malaysia	Transmission of Multichannel Video Signal to 1550nm SMF (CATV)	Prof. Dr. Sahbudin Shaari
Hayati Mohd Aris	BEng. (Hons) from Universiti Kebangsaan Malaysia	The Development of OCDMA AWG Encoder	Prof. Dr. Sahbudin Shaari
Azrin bt. Mohd. Kasim	B.Engg (Hons.) in Microelectronics Engineering from Universiti Kebangsaan Malaysia (2007)	Fiber Ring Laser as Broadband Source	Prof. Dr. Sahbudin Shaari
Syed Mohd. Hamzah Al-Junid b. Syed Abdul Rahman	B.Engg. in Electrical (Electronics) Engineering (1st Class) from Universiti Malaysia Pahang (2006)	Development of Encoder and Decoder Module for Optical Code Division Multiple Access (OCDMA) Systems Based on Arrayed Waveguide Grating (AWGs)	Prof. Dr. Sahbudin Shaari
Zalhan Mohd Yusof	BEngg. (Hons) from Universiti Kebangsaan Malaysia	Polarization State Characteristic in Optical Fibre	Prof. Dr. Sahbudin Shaari
Nadia Mohd Nasir	BEngg. (Hons) from Universiti Kebangsaan Malaysia	Design and Fabrication of Planar Waveguide In-Line Multi-Wavelength Optical Taper for FTTH	Prof. Dr. Sahbudin Shaari
Tengku Hasnan b. Tengku Abdul Aziz	BSc Fizik (UKM)	Organic light emitting diode with TiO2 nanoparticles thin film as a hole injection layer	Prof. Dr. Muhamad Mat Salleh
Ashkan Shafiee	BSc Physics (Bou Ali-Sina University, Hamedan, IRAN) 2006	Printed organic solar cell	Prof. Dr. Muhamad Mat Salleh
Aidhia Rahmi	S.Si Fizik (Universiti Andalas, Indonesia) 2008	Quantum dots fabricaton	Prof. Dr. Muhamad Mat Salleh

1. Yunas, J., Hamzah, A.A. and Majlis, B.Y., 2009. Fabrication and characterization of surface micromachined stacked transformer on glass substrate. Microelectronic Engineering 86 (10), pp. 2020-2025.

2. Dee, C.F., Lee, J.D., Sow, C.H., Majlis, B.Y., Hamzah, A., Abdullah, H. and Lee, S.K., 2009. Simulation for deposition of ZnO thin film layer by kinetic Monte Carlo method. Materials Research Innovations 13 (3), pp. 135-138.

3. Ganji, B. A. and Majlis, B.Y., 2009. High sensitivity and small size MEMS capacitive microphone using a novel slotted diaphragm. Microsystem Technologies 15 (9), pp. 1401-1406.

4. Tiong, T. Y., Yahaya, M., Dee, C. F., Lim, K.P., Majlis, B.Y. and Sow, C.H., 2009. Influence of growth temperature on SnO2 nanowires. Materials Research Innovations 13 (3), pp. 203-206.

5. Karamdel, J., Ahmadi, M.T., Damghanian, M. and Majlis, B. Y., Dee, C. F., Ismail, R., 2009. Analysis and simulation of carriers statistic for semiconducting single wall carbon nanotube. Materials Research Innovations 13(3), pp. 211-213.

6. Ganji, B. A. and Majlis, B.Y., 2009. Fabrication and characterization of a new mems capacitive microphone using perforated diaphragm. International Journal of Engineering, Transactions B: Applications 22 (2), pp. 153-160.

7. Damghanian, M. and Majlis, B.Y., 2009. Analysis and design of a wide micro beam as a pressure gauge for high sensitivity MEMS fingerprint sensors. Microsystem Technologies 15 (5), pp. 731-737.

8. Tehranirokh, M., Majlis, B.Y. and Bais, B., 2009. Design and simulation of a normally closed glucose sensitive hydrogel based microvalve. Microsystem Technologies 15 (5), pp. 753-762.

9. Ganji, B.A. and Majlis, B.Y., 2009. Design and fabrication of a novel single-chip MEMS capacitive microphone using slotted diaphragm. Journal of Micro/Nanolithography, MEMS, and MOEMS 8 (2), art. No. 021112.

10 Yunas, J., Hamzah, A.A. and Majlis, B.Y., 2009. Surface micromachined on-chip transformer fabricated on glass substrate. Microsystem Technologies 15 (4), pp. 547-552.

11. Ganji, B.A. and Majlis, B.Y., 2009. Design and fabrication of a new MEMS capacitive microphone using a perforated aluminium diaphragm. Sensors and Actuators, A: Physical 149 (1), pp. 29-37.

12. Mitra Damghanian and Burhanuddin Yeop Majlis, 2009. Novel design and fabrication of high sensitivity MEMS capacitive sensor array for fingerprint imaging. Journal of Advanced Materials Research Vol. 74 (2009), pp 239-242.

13. Muhamad Ramdzan Buyong, Norazreen Abd Aziz and Burhanuddin Yeop Majlis, 2009. Characterization and optimization of seals-off for Very Low pressure sensors (VLPS) fabricated by CMOS MEMS process. Journal of Advanced Materials Research Vol. 74 (2009), pp 231-234.

14. Fatimah Lina Ayatollahi and Burhanuddin Yeop Majlis, 2009. Materials design and analysis of low-power MEMS microspeaker using magnetic actuation technology. Advanced Materials Research 74:243-246.

15. Rosminazuin Ab. Rahim, Badariah Bais, Burhanuddin Yeop Majlis, Hybrid Simulation Approach on MEMS Piezoresistive Microcantilever Sensor for Biosensing Applications, Advanced Materials Research Vol. 74 (2009) pp 283-286.

16. Norazreen Abd Aziz, Muhamad Ramdzan, Burhanuddin Yeop Majlis, Process characterization of wet etching for high aspect ratio microneedles development, Advanced Materials Research Vol. 74 (2009) pp 341-344.

17. N. A. Dzulkefli, B. bais and B. Y. Majlis, Fabrication of Glucose Sensitive Actuator for DDS Micro valve, Advanced Materials Research Vol. 74 (2009) pp 287-290.

18. Gebeshuber I.C., Stachelberger H., Ganji B.A., Fu D.C., Yunas J. and Majlis B.Y. Exploring the innovational potential of biomimetics for novel 3D MEMS", Adv. Mat. Res. 74: 265-268, doi:10.4028/www.scientific.net/AMR.74.265.

19. Tiong T.Y., Yahaya M., Dee C.F., Lim K.P., Majlis B.Y., Sow C.H. Influence of growth temperature on SnO2 nanowires. Materials Research Innovations Vol. 13 Issue 3 (1.230).

20. Juliana Johari, Jumril Yunas, Burhanuddin Yeop Majlis, Diezoelectric micropump for drug delivery systems fabrication using two optical masks, Advanced Materials Research Vol. 74 (2009) pp 279-282

21. Umar A.A., Oyama M., Salleh M.M., Majlis B.Y. Formation of high-yield gold nanoplates on the surface: Effective two-dimensional crystal growth of nanoseed in the presence of poly(vinylpyrrolidone) and cetyltrimethylammonium bromide. Crystal Growth and Design Vol.9 Issue 6 (4.046).

22. Srajer J., Majlis B.Y. and Gebeshuber I.C. Microfluidic simulation of a colonial diatom chain reveals oscillatory movement. Acta Bot. Croat. 68(2): 431-441.

23. Hashim, U; Fatah, MFAA; Ahmad, I & Majlis, BY. 2009. Statistical Design of Ultra-Thin SiO2 for Nanodevices. Sains Malaysiana 38(4):553-557.

24. K Kumarajah, Menon, P. S., Ismail, M., Yeop, B. Y. & Shaari, S. 2009. MQW design parameter variation in a 1.5 um wavelength InP-based LW-VCSEL. WSEAS Transactions on Electronics 5(11):437-446.

25. Ganji B.A. & Majlis B.Y. 2009. Design and fabrication of a novel single-chip MEMS capacitive microphone using slotted diaphragm. Journal of Micro-Nanolithography, MEMS and MOEMS 8(2): art. no. 021112.

26. Bahram Azizollah Ganji & Burhanuddin Yeop Majlis. 2009. Fabrication of deep trenches in silicon wafer using deep reactive ion etching with aluminum mask. Sains Malaysiana 38(6): 889-894.

27. Tomala A., Werner W.S.M., Gebeshuber I.C., Doerr N. & Stoeri H. 2009. Tribochemistry of monomolecular lubricant films of ethanolamine oligomers. Tribology International 42(10): 1513-1518.

28. Gebeshuber I.C., Gruber P. and Drack M. 2009. A gaze into the crystal ball - biomimetics in the year 2059. Proc. IMechE Part C: J. Mech. Eng. Sci. 50st Anniversary Issue, pp. 2899.

29. Tomala A., Werner W.S.M., Gebeshuber I.C., Doerr N. and Stoeri H. 2009. Tribochemistry of monomolecular lubricant films of ethanolamine oligomers. Tribology International 42(10): 1513-1518.

30. Zika T., Gebeshuber I.C., Buschbeck F., Preisinger G. & Groeschl M. 2009. Surface analysis on rolling bearings after exposure to defined electric stress. Proc. IMechE, Part J: J.Engineering Tribology, 223(J5) :787-797.

31. Gebeshuber I.C., Holzer D., Goschke R., Aumayr F. and Stoeri H. 2009. Development of an atomic force microscope closed fluid cell for tribological investigations of large samples in chemically aggressive environments. Proc. IMechE, Part J: J. Engineering Tribology. 223(J5): 759-765.

32. Vivi Fauzia, Akrajas Ali Umar, Muhamad Mat Salleh, Muhammad Yahya & Burhanuddin Yeop Majlis. 2009. The synthesis of CdSe quantum dots and solar cells application. Jurnal Elektronika dan Telekomunikasi 9(2): 149-153.

33. Ilie C. Gebeshuber & Burhanuddin Yeop Majlis. 2009. Applied biomimetics : Low noise aircraft design. Jurnal Elektronika dan Telekomunikasi

34. Jumril Yunas, Azrul Azlan Hamzah, Burhanuddin Yeop Majlis. 2009. Improved fabrication technique of stack sandwich micro-transformers. Jurnal Elektronika dan Telekomunikasi 9(2):174-179.

35. Azrul Azlan Hamzah, Jumril Yunas, Dee Chang Fu, Burhanuddin Yeop Majlis & Ibrahim Ahmad. 2009. Encapsulation Fabrication Techniques for MEMS Devices: An Overview of Current Technologies. Jurnal Elektronika dan Telekomunikasi 9(2):154-162.

36. Kumarajah, K., Ismail, M., Menon, P. S., Shaari, S. & Majlis, B. Y. 2009. Multi-quantum well design parameter variation in InP-based VCSEL. Proceedings of 8th WSEAS International Conference on Microelectronics, Nanoelectronics and Optoelectronics (MINO09), pp. 115-117.

37. Kumarajah, K., Ismail, M., Menon, P. S., Shaari, S. & Majlis, B. Y. 2009. Self-heating effects in a gain-guided vertical-cavity surface-emitting laser. Proceedings of the International Symposium on Photonics and Optoelectronics (SOPO2009), pp. 1-4.

38. Kumarajah K., Menon P.S., Ismail M., Yeop B.Y., Shaari S. 2009. Effect of MQW design parameters on the characteristics of an air-post 1.5 μm VCSEL. Pacific Rim Conference on Lasers and Electro-Optics, CLEO - Technical Digest, pp. 1-2.

57. Burhanuddin Yeop Majlis & Nur Azrina Dzulkefli. 2009. Glucosed-sensitive: Hydrogel and Actuator for DDS Microvalve. Proceedings of Nanotech Malaysia 2009, pp. 311-312.

58. Jafar Alvankarian & Burhanuddin Yeop Majlis. 2009. Design of a Lab-on-a-chip for gDNA Preparation. Proceedings of Nanotech Malaysia 2009, pp. 313.

59. Gandi Sugandi & Burhanuddin Yeop Majlis. 2009. Comparative Studies of Corrugated Polyimide Diaphragm for Micro-speaker MEMS Devices. Proceedings of Nanotech Malaysia 2009, pp. 314-316.

60. Mitra Damghanian & Burhanuddin Yeop Majlis. 2009. Fabrication of Capacitive MEMS Pressure Sensor Array with Deflecting Wide Beams. Proceedings of Nanotech Malaysia 2009, pp. 317-318.

61. Nadzril Sulaiman; Jumril Yunas & Burhanuddin Yeop Majlis. 2009. Design of MEMS MicroMagnetometer for Low Magnetic Field Measurement. Proceedings of Nanotech Malaysia 2009, pp. 319-321.

63. Rozita Teymourzadeh; Burhanuddin Yeop Majlis; Jimmy Mok Vee Hong & Masuri Othman. 2009. VLSI Implementation of High Resolution High Speed Low Latency Pipeline Floating Point Adder/ Subtractor for FFT Applications. Proceedings of Nanotech Malaysia 2009, pp. 327-331.

64. Juliana Johari; Jumril Yunas & Burhanuddin Yeop Majlis. 2009. Piezoelectric Micropump with Nanoliter per Minute Flow Delivery for Drug Delivery Systems. Proceedings of Nanotech Malaysia 2009, pp. 332-334.

65. Mohd Nor Fadli Abu Kassim; Azrul Azlan Hamzah; Yusnira Husaini; ; Burhanuddin Yeop Majlis. 2009. Carbon Fiber Encapsulation for Packaging Biomedical Lab-on-Chip Components. Proceedings of Nanotech Malaysia 2009, pp. 374-375.

66. Khairul Nisha Khairuddin; Azrul Azlan Hamzah & Burhanuddin Yeop Majlis. 2009. Design of Hybrid Solar-Piezoelectric Microgenerator for Concurrently Scavening Solar, Wind and Hydromechanical Energies. Proceedings of Nanotech Malaysia 2009, pp. 409-411.

67. Aidhia Rahmi, Akrajas Ali Umar, Muhammad Mat Salleh, Burhanuddin Yeop Majlis & Muhammad Yahaya. 2009. Tunable and highly luminescence of CdTe quantum dots. Proceedings of Nanotech Malaysia 2009, pp. 95-96.

68. Jahariah Sampe, Masuri Othman, Iskandar Baharin & A. Norrimah. 2009. Contention limit anti-collision fro RFID class 0 UHF tag implemented on chip. Proceedings of Nanotech Malaysia 2009, pp. 186-187.

69. Abrar Ismardi, Dee, C.F. & Majlis, B.Y. 2009. Co-synthesis and characterization of ZnO and indium nanowires. Proceedings of Nanotech Malaysia 2009, pp. 221-223.

70. M.N.Norazia; H.Abdullah; S.Shaari & C.F.Dee. 2009. Influence of the Growth Conditions on the Structural, Morphology and Optical Properties on Zn1-xSnxO (x = 0.15 and 0.2) thin films prepared by Sol-gel Method. Proceedings of Nanotech Malaysia 2009, pp. 177-180.

71. Md. Shabiul Islam; M.S. Bhuyan & Masuri Othman. 2009. FPGA Implementation of 2-D Discrete Cosine Transform Algorithm for Higher Image Compression. Proceedings of Nanotech Malaysia 2009, pp. 322-324.

72. Ille C. Gebeshuber; Michael Haidinger; Christoph G. Goesselsberger; Eva Wollman & Oliver Hekele. 2009. Nanomedicine: Possible Early diagnostics of Leukemia via Atomic Force Microscopy of Red Blood Cells. 368-370.

73. Ille C. Gebeshuber & Burhanuddin Yeop Majlis. 2009.Biomimetics. Proceedings of Nanotech Malaysia 2009, pp. P3.

74. K. Kumarajah, Menon, P. S., Ismail, M., Yeop, B. Y., Shaari, S. Quantum well mole fraction variation effects towards the characteristics of an InP-based MQW LW-VCSEL. Proceedings of the IEEE Regional Symposium on Micro and Nano Electronics (RSM09), pp. 304-308.

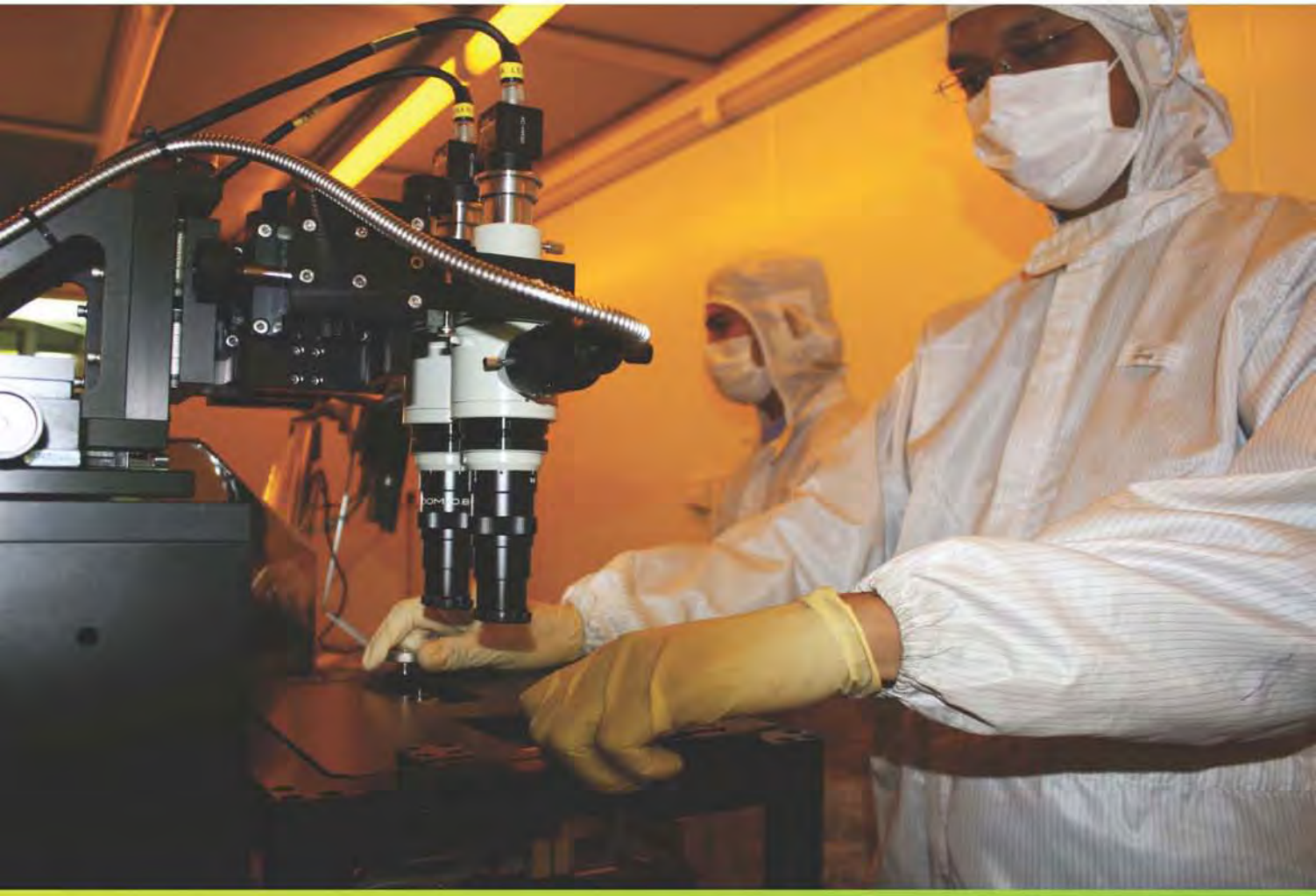
75. AR. Bahadorimehr and Burhanuddin Yeop Majlis. 2009. Analytical Comparison between Square, Rectangular and Circular Diaphragms using in numerous MEMS Applications. Proceedings of the IEEE Regional Symposium on Micro and Nano Electronics (RSM09), pp.182-185.

76. Tina R. Matin, P. Susthitha Menon, Sahbudin Shaari, Burhanuddin Y. Majlis and Ille C. Gebeshuber Structural colours in biology and how these natural micro- and nanostructures inspire current technology. Proceedings of the International Seminar on Science and Technology ISST 2009, pp.6-15.

77. Azrul Azlan Hamzah, Jumril Yunas, Dee Chang Fu, Burhanuddin Yeop Majlis & Ibrahim Ahmad. 2009. Encapsulation Fabrication Techniques for MEMS Devices: An Overview of Current Technologies. Proceedings of the 3rd PPET-IMEN Joint Seminar on Electronic Devices, MEMS and Nanotechnology, pp. 45.

78. Jumril Yunas, Azrul Azlan Hamzah & Burhanuddin Yeop Majlis. 2009. Improved Fabrication Technique of Stack Sandwich Micro-Transformers. Proceedings of the 3rd PPET-IMEN Joint Seminar on Electronic Devices, MEMS and Nanotechnology, pp. 44.

79. J. Yunas, J. Johari, B.Y. Majlis, 2009, "A simple technique in fabricating planer raineless micropump using double side etch stop technique", Proceedings of Nanotech Malaysia 2009, PP 337-339.



35. Abang Annuar Ehsan, Sahbudin Shaari, Mohd Nizam Abdullah, Mohd Kamil Abd. Rahman, "Asymmetric Hollow POF Coupler Design for Portable Optical Access Card System", SPIE Europe Microtechnologies for the New Millennium, Dresden, Germany, 2009.

36. A.A. Ehsan, S. Shaari, M. K. Abd. Rahman. 2009. Tap-Off Ratio (TOFR) Optimization of a 1x2 Hollow POF Coupler for Portable Optical Access-Card System. The 18th International Conference on Plastic Optical Fibers.

37. Noor Azie Azura Mohd Arif, Mohammad Syuhaimi Ab-Rahman, Sahbudin Shaari. "Zinc Sulphide :Manganese Nanocrystals For Photonic Crystals" Nanotoday. 2nd -5th Aug, Singapore. poster P2-20.

38. Sahbudin Shaari, Mohd Syuhaimi Ab-Rahman, Noor Azie Azura Mohd Arif. "Effect of Fabrication Parameters on Luminescent Properties of ZnS:Mn Nanocrystals". Proceeding of Asia Communications and Photonics Conference (ACP 2009), Shanghai China, 2-6 November 2009. Paper no: 7631-08.

39. Abang Annuar Ehsan, Sahbudin Shaari, Mohd Kamil Abd Rahman. 2009. Metal-based 1X2 Plastic Optical Fiber (POF) Splitter for video over POF System Application. Proceeding of Asia Communications and Photonics Conference (ACP 2009), Shanghai China, 2-6 November 2009. Paper no:

40. Hesham A. Bakarman, Ali Z. Ghazi Zahid, Feras N. Hasoon, Sahbudin Shaari, and Mahamod Ismail "Simulation of Security Performance for Unipolar and Bipolar Optical CDMA Network Systems", MICC'09, Kuala Lumpur, Malaysia.

41. Ali Z. Ghazi Zahid, Feras N. Hasoon, Hesham A. Bakarman, and Sahbudin Shaari, , "Implementing EDW in Point to Multi Point Optical Access Network for FITH Applications", MICC'09, Kuala Lumpur, Malaysia.

42. Azliza Juliana Bt Mohd Adnan and Sahbudin Shaari. 2009. Photonic Crystal Multiplexer/Demultiplexer Device for Optical Communications. Advances in Lasers and Electro optics.

43. Tawfig Eltaif, Hossam M. H. Shalaby, Sahbudin Shaari, Mohammad M. N. Hamarsheh. Interference Mitigation Using Successive Interference Cancellation in Optical CDMA Systems. Proceedings of 8th WSEAS International Conference on Microelectronics, Nanoelectronics and Optoelectronics (MINO'09), Istanbul, Turkey. 2009, pp. 77-81.

44. Kumarajah Kandiah, P. S. Menon, Ismail, M., Majlis, B. Y. & Shaari, S. 2009. Mesa and device diameter variation effects in multi-quantum well LW-VCSELs. Nanotech Malaysia 2009, Kuala Lumpur, Malaysia, Oct 27-29th, 2009; pg. 335-336.

45. Tina R. Matin, P. Susthitha Menon, Sahbudin Shaari, & Ille C. Gebeshuber. 2009. Photonic crystal micro- and nanostructures in iridescent butterfly wings. Nanotech Malaysia 2009, Kuala Lumpur, Malaysia, Oct 27-29th, 2009; pg. 170-171.

46. C. F. Dee, P. S. Menon, B. Bais, H. Abdullah, B. Y. Majlis & S. Shaari. 2009. Simulation of I-V property of a Boron-doped single silicon nanowire. Nanotech Malaysia 2009, Kuala Lumpur, Malaysia, Oct 27-29th, 2009; pg. 172-173.

47. Sahbudin Shaari, Mohammad Syuhaimi Ab-Rahman & Noor Azie Azura Mohd Arif. Electrical Properties on the Surface Layers of ZnS:Mn2+ Nanocrystals. Nanotech Malaysia 2009, Kuala Lumpur, Malaysia, Oct 27-29th, 2009; pg. 340-342.

48. Sofiane Selmani, Huda Abdullah, Sahbudin Shaari & Ruslan Abdul Shuko. Electrical and Optical Characterisations of Zn (1-x)CoxS Nanoparticles. Nanotech Malaysia 2009, Kuala Lumpur, Malaysia, Oct 27-29th, pg. 72-73.

49. H. Abdullah, A. R. Affa Rozana, Abang Annuar Ehsan & Sahbudin Shaari. 2009. Structural and morphological studies of nanoparticles magnesium-dopes zinc oxide, Nanotech Malaysia 2009, Kuala Lumpur, Malaysia, Oct 27-29th, pg. 174-176.

50. M. N. Norazia, H. Abdullah, S. Shaari & C. F. Dee. 2009. Influence of the growth conditions on the structural, morphology and optical properties of Zn(1-x)Sn(x)O (X=0.15 and 0.2) thin films prepared by sol-gel method. Nanotech Malaysia 2009, Kuala Lumpur, Malaysia, Oct 27-29th,pg. 177-180.

51. N. P. Nugroho, H. Abdullah, S. Shaari. 2009. Synthesis of flower-like Zinc Oxide consist of nanoflake. Nanotech Malaysia 2009, Kuala Lumpur, Malaysia, Oct 27-29th pg. 181-184.

52. Tina R. Matin, P. Susthitha Menon, Sahbudin Shaari, Burhanuddin Y. Majlis and Ille C. Gebeshuber. 2009. Structural colours in biology and how these natural micro- and nanostructures inspire current technology. Proceedings of the International Seminar on Science and Technology ISST 2009, Padang, Indonesia, Oct 24-25th (Keynote paper by Prof Ille).

53. Dilla Duryha Berhanuddin, P Susthitha Menon and Sahbudin Shaari. 2009. Design and Simulation of SOI-based Micro-Ring Resonator for CWDM applications. Proceedings of the 7th International Symposium on Modern Optics and Its Applications (ISMOA 2009), Bandung, Indonesia. (Aug. 12-14th, 2009).

54. Kumarajah Kandiah, P Susthitha Menon and Sahbudin Shaari. 2009. Variation of MQW design parameters in an InP-based LW-VCSEL and its effects on the spectral linewidth. Proceedings of the 7th International Symposium on Modern Optics and Its Applications (ISMOA 2009), Bandung, Indonesia. (Aug 12-14th, 2009).

55. Kumarajah, K., Ismail, M., Menon, P. S., Shaari, S. & Majlis, B. Y. 2009. Multi-quantum well design parameter variation in InP-based VCSEL. Proceedings of 8th WSEAS International Conference on Microelectronics, Nanoelectronics and Optoelectronics (MINO'09), Istanbul, Turkey. pp. 115-117.

56. Noor Azie Azura Mohd Arif, Sahbudin Shaari, Mohammad Syuhaimi Ab-Rahman. Temperature Ramping Rate During Annealing Process On ZnS:Mn Nanocrystals. Proceeding of 4th International Conference on Recent advances in materials, minerals & environment and 2nd asian symposium on materials & processing (RAMM & ASMP '09). 1st -3rd June 2009. poster PNM 13.

57. Hesham A. Bakarman, F. N. Hasoon, Sahbudin Shaari, and Mahamod Ismail, "Tapping and Detecting Optical Signals from Optical CDMA Networks", IEEE International Conference on Signal & Image Processing Applications 2009 (ICSIPA09) 18th-19th Nov, 2009. Cititel Midvalley Hotel, Kuala Lumpur.

58. Dilla Duryha Berhanuddin, Abang Annuar Ehsan, P. Susthitha Menon and Sahbudin Shaari. 2009. Analytical and experimental determination of RF frequencies in fiber ring resonators for CATV channel distribution. The 3rd Korea-Malaysia Joint Technology Workshop (KMJNW), pp. 123-133.

59. K. Kumarajah, Menon, P. S., Ismail, M., Yeop, B. Y., Shaari, S. 2009. Quantum well mole fraction variation effects towards the characteristics of an InP-based MQW LW-VCSEL. Proceedings of the IEEE Regional Symposium on Micro and Nano Electronics (RSM'09): pp. 304-308.

60. Noor Azie Azura Mohd Arif, Mohammad Syuhaimi Ab-Rahman, Sahbudin Shaari. Surface Morphology and Luminescence of ZnS:Mn Nanocrystals Annealed at Different Temperatures. Proceedings of the IEEE Regional Symposium on Micro and Nano Electronics (RSM'09): pp. 452-454.

61. Noor Azie Azura Mohd Arif, Mohd Syuhaimi Ab Rahman and Sahbudin Shaari. 2009. Properties of Sol gel Synthesized Mn2+ Doped ZnS Nanocrystals. Proceedings of the IEEE Regional Symposium on Micro and Nano Electronics (RSM'09): pp. 304-308.

62. Mohd Nizam Abdullah, Sahbudin Shaari, Abang Annuar Ehsan. 2009. Generation of Wavelengths In Triple Wavelength, Proceedings of the IEEE Regional Symposium on Micro and Nano Electronics (RSM'09): pp. 297-299.
Mohd Nizam Abdullah, Sahbudin Shaari, Abang Annuar Ehsan. 2009. Wavelength Lasing In Fibre Ring Laser Stimulate Four Wave Mixing, Proceedings of the IEEE Regional Symposium on Micro and Nano Electronics (RSM'09): pp. 290-292.

63. Kumarajah Kandiah, P. S. Menon, Ismail, M., Majlis, B. Y., Shaari, S. & Apte, P. R. 2010. Peak power optimization of a LW-VCSEL using Taguchi method. Proceedings of The 2nd ISESCO International Workshop and Conference on Nanotechnology (IWCN2010), pp 119.

64. P. Susthitha Menon, Tina R. Matin, Ille C. Gebeshuber, Burhanuddin Yeop Majlis & Sahbudin Shaari. 2010. 3D Corporate Tourism: A Concept for Innovation in Nanomaterials Engineering. Proceedings of The 2nd ISESCO International Workshop and Conference on Nanotechnology (IWCN2010), pp 45.

Conference / Seminars Organized

Nanotech Malaysia 2009
October 27-29, 2009
Kuala Lumpur Convention Centre (KLCC)

2009 IEEE Regional Symposium on Microelectronics (RSM 2007)
August 10-12, 2009
Kota Bharu Kelantan

Conference / Seminars Attended

1st Nano Today Conference 2009
2nd-5th August 2009
Singapore
Prof. Dr. Burhanuddin Yeop Majlis
Prof. Dr. Muhamad Mat Salleh

3rd Joint Seminar on Electronic Devices, MEMS and Nanotechnology
17th-20th August 2009
Bali, Indonesia
Prof. Dr. Burhanuddin Yeop Majlis

The 3rd Korea-Malaysia Joint Nanotechnology Workshop
24th-26th September 2009
National Education Center for Semiconductor Technology, Daegu Korea
Prof. Dr. Burhanuddin Yeop Majlis
Prof. Dr. Sahbudin Shaari
Prof Dr. Muhamad Mat Salleh

Conference in Europe and USA
15th September – 4th October 2009
Vienna, Austria
Prof. Dr. Ilse Gebeshuber

Conference on Nanotechnology and Application
11-14th November 2009
Vietnam
Prof. Dr. Ilse Gebeshuber

Workshop: BioMEMS and Biomimetics
30th December 2009
Kuala Lumpur
Prof. Dr. Ilse Gebeshuber

Conference in Vienna (Viennano `09) and Tribocorr in Wiener Neustadt
15th-23rd March 2009
Austria
Prof. Dr. Ilse Gebeshuber

International Conference on Materials for Advanced Technologies (ICMAT) 2009
28th June -3rd July 2009
Singapore
Prof. Dr. Burhanuddin Yeop Majlis
Prof. Dr. Ilse Gebeshuber

3rd AHESINT International Workshop Adhesive Interactions between Particles and Surfaces at Micro and Nano-Scales
29 June -4th July 2009
Russia
Prof. Dr. Ilse Gebeshuber

11th IEEE International Conference on Advanced Communication Technology
15th-19th February, 2009
Phoenix Park, South Korea
Prof. Dr. Sahbudin Shaari

8th WSEAS International Conference on Microelectronics,Nanoelectronics, Optoelectronics (MINO 2009)
30th May - 1st June, 2009
Istanbul, Turkey
Dr. P.Susthitha Menon

International Symposium on Photonics and Optoelectronics (SOPO2009)
14th-16th August, 2009
Wuhan, China
Dr. P.Susthitha Menon

Asia Communications and Photonics Conference and exhibition
1st-6th November, 2009
Shanghai China
Prof. Dr. Sahbudin Shaari

Conference on Lasers and Electro-Optics (CLEO2009)
30th August – 2nd September 2009
Shanghai, China
Dr. P. Susthitha Menon

The conference featured nine plenary talks and three invited talks. The plenary speakers were :

- Prof. Dr. Peter Laggner from Austrian Academy of Sciences presented
  "Bridging the gap to synetrons : New high-brilliance SAXS techniques for the laboratory"
- Prof. Dr. Hisham Abdel-Aal from Arts et Metier ParisTech, France presented
  "Ductile regime processing of silicon for MEMS/NEMS applications"
- Prof. Emeritus Dato' Dr. Muhammad Yahaya from UKM presented
  "Recent survey of nanotechnology in higher education in OIC countries"
- Prof. Dr. Fidel Castro Diaz-Balart, scientific advisor to the State of Council of Cuba presented
  "Capturing the potential of science and technology: The Cuban experience in biotech, ICT and its vision in nanotechnology"
- Prof. Dr. Ille Gebeshuber from UKM presented
  "Biomimetics"
- Assoc. Prof. Dr. Sow Chorng Haur from National University of Singapore presented
  "Ductile regime processing of silicon for MEMS/NEMS applications"
- Prof. Dr. Hisham Abdel-Aal from Arts et Metier ParisTech, France presented
  "Nanoscale metal oxide materials : Synthesis, characterizations and applications"
- Dr. Lerwen Liu, Director of NanoGlobe Pte. Ltd. Singapore presented
  "Nanotechnology development in Asia overview and application in energy, healthcare and ICT"
- Prof. Dr. Myrtill Simko, Austrian Academy of Sciences presented
  "Nano meets cell : The interaction between engineered nanoparticles and living matter"

The invited speakers were:

- Prof. Dr. Mats-Olof Mattsson, SCENIHR, Austria
- Dr. Frank Sinner, BioNanoNet, Austria
- Dr. Alexander Pogany, Federal Ministry of Transport, Innovation and Technology, Austria

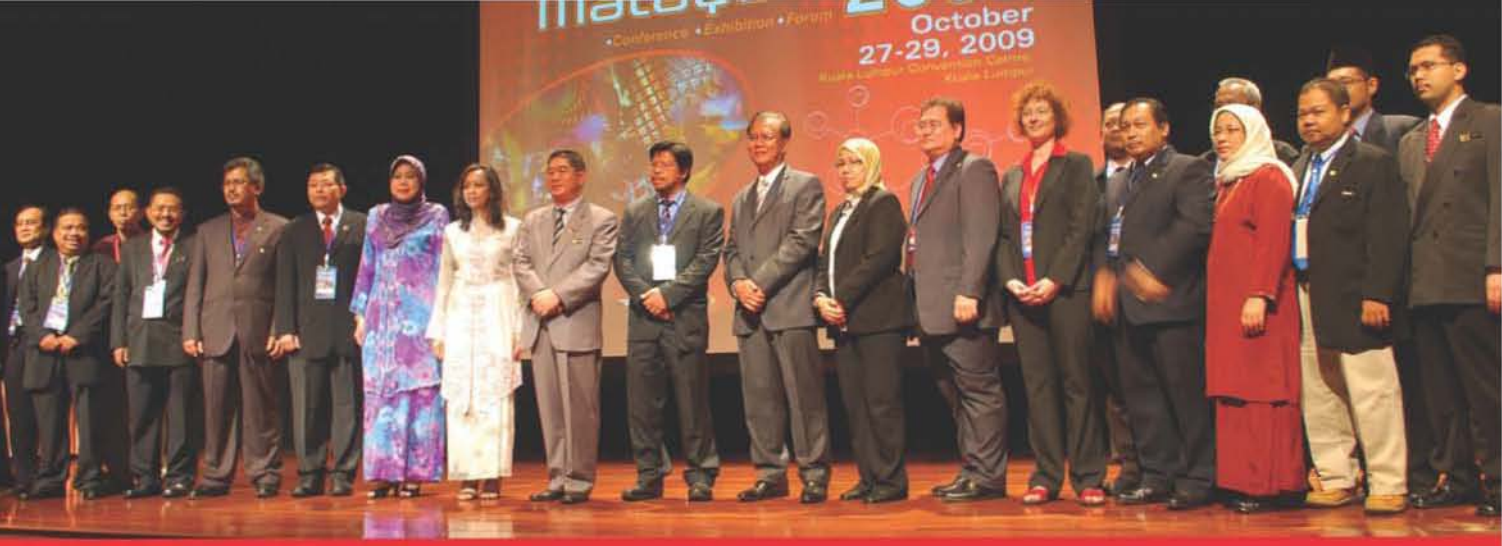
The conference saw a total of 161 proceedings published from the conference as compared to 87 proceedings from the first Nanotech Malaysia conference and attendance of over 180 participants. Although the conference was registered as a national conference, there were a significant number of foreign participants notably from the Middle East region. Selected proceedings from the conference would be published in either Sains Malaysiana or World Applied Sciences journals.

The Nanotech Malaysia 2009 forum meanwhile was organized by the Academy of Sciences, MIMOS Berhad and QT Tech (Singapore). The forum themed "Nanotechnology: Knowledge evolution to market" featured four speakers namely:

- Dr. Muntak Son from QT Tech Singapore
- Dr. Andre Gaszo from Austrian Academy of Sciences
- Prof. Dr. Edward Chang from National Chiao Tung University, Taiwan
- Prof. Dr. Shamim Ahmad (Visting professor at UNIMAP-Jamia Hamdard University, New Delhi)

The forum session held on the second day of Nanotech Malaysia attracted over 100 participants. The forum was chaired by Prof. Dr. Halimaton Hamdan, Chair of Nanotech Malaysia 2009. The business luncheon held on the first day of Nanotech Malaysia 2009 was attended by 200 participants and featured two invited talks from:

- Dr. Alan Smith (AZ Tech, UK). Presented
  "Nanotechnology realization: Awareness, education and commercialization"
- Mr. Andres Kroell (Nanostart AG, Germany)
  "Presented "Role of venture capital in realizing nanotechnology"


October
27-29, 2009


NANOtech
Malaysia 2009


NANOtech
Malaysia 2009
October
27-29, 2009


NANOtech
Malaysia 2009
Form Filling
Counter

The 2nd Korea-Malaysia Joint Workshop on Nanotechnology (KMJNW), August 15

Opening ceremony for IMEN new office at Block D2, UKM-MTDC

Signing of the 2nd Letter of Intent with Lembaga Ilmu Pengetahuan Indonesia

3rd Joint Seminar on Electronic Devices, MEMS and Nanotechnology, August 17-120

IMEN students at Nanotech Malaysia 2009

Nanotech Malaysia 2009 Conference in progress

2009 IEEE Regional Symposium on Microelectronics (RSM 2007), Kota Bharu Kelantan

Launching of Nanotech Malaysia 2009 by Minister of Science, Technology and Innovation

MoU between IMEN and LIPI

Nanotech Malaysia 2009

Bengkel Penulisan Makalah Saintifik, OPEL group in Malacca

Visit by Dr. Munetaka Oyama from Kyoto University

Visit by Deputy Ministery of Defence, Brunei Darussalam

Meeting with Ambassador of Cuba at IMEN

UKM's Chancellor, DYMM Tuanku Muhriz ibni Almarhum Tuanku Munawir's visit to UKM

Seminar Halatuju Penyelidikan IMEN, Seremban, March 2009

MoU between MIPAC group and EFGO Scientific Sdn. Bhd.

Visit from UTAR students to IMEN

Prof. Gebeshuber presenting a talk on biomimetics

"Awareness of ISO and 5S" course for IMEN staff

"Awareness of ISO and 5S" course for IMEN staff

Feast day of excellent workers

Meeting with Scientific Advisor to the state of Cuba, Dr. Fidel Castro Diaz-Balart

Participants at Nanotech Malaysia 2009

Institute of Microengineering and Nanoelectronics (IMEN)
Universiti Kebangsaan Malaysia
43600 UKM Bangi, Selangor Darul Ehsan, Malaysia
Tel : + 603-8926 5861
Fax : + 603-8925 0439
E-mail : burhan@vlsi.eng.ukm.my
Web : www.ukm.my/imen