ZAINOVIA LOCKMAN

1. PERSONAL DATA

Nationality	:	MALAYSIAN
Current Position	:	Associate Professor (DS54) at Universiti Sains Malaysia
Qualifications	:	PhD (Electronic Materials, Imperial College London, UK)
	:	BEng, Materials and Engineering, 1st Class Hons,
		Imperial College London, UK
Tel (office)	:	+604 5996178
Fax (office)	:	+604 5991011
email	:	zainovia@ usm.my / zainovia@gmail.com
Address (office)	:	School of Materials and Mineral Resources Engineering,
		Universiti Sains Malaysia, 14300 Nibong Tebal, Penang

2. RESEARCH ACTIVITY

- **Research interest** : Electronic oxide nanomaterials, nanomaterials synthesis, superconductor, electro/photoactive materials
- **Research group** : Green Electronics nanoMaterials Group
- **Niche** : Science and Engineering of Nanomaterials Team,

3. RESEARCH OUTPUT

3.1. RESEARCH PUBLICATIONS

http://www.researcherid.com/rid/F-5260-2011

No. of Publications	**117**
Sum of the Times Cited:	**873**
Average Citations per Article:	**8.73**
h-index:	**16**

www.scopus.com (id: 6602103409)

Documents	**114**
Citation:	**953**
h-index:	**17**

*** accumulative impact factor ~ 200 (based on average of 2 per manuscript)**

A. International Journals: main articles for the past 3 years (full list can be found in www.scopus.com and/or Web of Science)

1. Tan Wai Kian, Li Leow Cheah, Razak Khairunisak Abdul, Kawamura Go,Muto Hiroyuki, Matsuda Atsunori, Lockman Zainovia. (2014), Formation of Two-Dimensional ZnO Nanosheets by Rapid Thermal Oxidation in Oxygenated Environment, Journal of Nanoscience and Nanotechnology, 14, 4
2. Ng C.Y., Abdul Razak K., Lockman Z. (2014), WO_3 nanorods prepared by low-temperature seeded growth hydrothermal reaction, Journal of Alloys and Compounds, 588, 5, pp. 585-591

3. W.K. Tan, K. Abdul Razak, Z. Lockman, G. Kawamura, H. Muto, A. Matsuda, (2014), Synthesis of ZnO nanorod-nanosheet composite via facile hydrothermal method and their photocatalytic activities under visible-light irradiation, Journal of Solid State Chemistry, 211, pp. 146-153
4. S. Ismail, Z. Lockman, Z. A. Ahmad, 2013, Crystallization of TiO_2 nanotubes arrays grown by anodization of Ti in organic electrolyte, Advanced Materials Research, 620, pp. 412-417
5. Wai Kian Tan, Khairunisak Abdul Razak, Zainovia Lockman, Go Kawamura, Hiroyuki Muto, Atsunori Matsuda(2013), Formation of highly crystallized ZnO nanostructures by hot-water treatment of etched Zn foils, Materials Letters, 91, pp.111-114
6. Soo, M.T., Kawamura, G., Muto, H., Matsuda, A., Lockman, Z., Cheong, K.Y. (2012) , Design of hierarchically meso-macroporous tetragonal ZrO_2 thin films with tunable thickness by spin-coating via sol-gel template route, Microporous and Mesoporous Materials, Article in Press
7. Zainovia Lockman, N.R.Z. Abidin, S. Ismail, K.Y. Cheong, Z. Hassan (2012), Effects of applied voltage on the properties of anodic zirconia thin film on (100) silicon, Thin Solid Films, 522, pp. 117-124
8. Mun Teng Soo, Go Kawamura, Hiroyuki Muto, Atsunori Matsuda, Zainovia Lockman, Kuan Yew Cheong, (2012), Fabrication of well-crystallized mesoporous ZrO2 thin films via Pluronic P123 templated sol–gel route, Original Research Article, Ceramics International, In Press, Corrected Proof, Available online 15 October 2012
9. W. F. Lim, Z. Lockman, K. Y. Cheong, (2012), Metal-oxide-semiconductor characteristics of lanthanum cerium oxide film on Si, Applied Physics A: Materials Science and Processing, 107, (2) , pp. 459-467
10. Z. Lockman, K. A. Razak, T. K. Huat, T.K., T. W. Kian, L. C. Li, G. Kawamura, A. Matsuda, (2012), Formation of 1-dimensional (1D) and 3-dimensional (3D) ZnO nanostructures by oxidation and chemical methods, Materialwissenschaft und Werkstofftechnik 43 (5) , pp. 457-460
11. M.T. Soo, N. Prastomo, A. Matsuda, G. Kawamura, H. Muto, A. F. M Noor, Z. Lockman, K. Y. Cheong, (2012), Elaboration and characterization of sol-gel derived ZrO_2 thin films treated with hot water, Applied Surface Science 258 (13), pp. 5250-5258
12. Srimala Sreekantan, Lai ChinWei, and Zainovia Lockman, (2011), Extremely Fast Growth Rate of Ti_{O2} Nanotube Arrays in Electrochemical Bath Containing H_2O_2, Journal of The Electrochemical Society, 158 (12) C397-C402
13. K. Tedi, K.Y. Cheong and Z. Lockman, (2011), Effect of sputtering time on ZrOx thin film on Si, Microelectronics International, 28, (3), pp. 7–11
14. Chan, K.L., Mariatti, M., Lockman, Z., Sim, L.C., (2011), Effects of the size and filler loading on the properties of copper- and silver-nanoparticle-filled epoxy composites , Journal of Applied Polymer Science 121, (6), pp. 3145-3152
15. Makhsin, S.R, Razak, K.A , Lockman, Z. (2011), Study on tungsten oxide (WO_3) nanostructures formation via seeded growth hydrothermal reaction, Applied Mechanics and Materials, 83, pp. 204-209
16. Ridhuan, N.S. , Fong, Y.P., Lockman, Z. , Razak, K.A. (2011) Formation of ZnO nanorods via seeded growth hydrothermal reaction, Applied Mechanics and Materials, 83, pp. 116-122
17. Chuah, S., Cheong, K., Lockman, Z., Hassan, Z. (2011), Effect of post-deposition annealing on electrical properties of RF-magnetron sputtered CeO_x gate on 4H-silicon carbide, Physica Status Solidi (A) Applications and Materials 208 (8), pp. 1925-1930
18. Soo Kiet Chuah, Kuan Yew Cheong, Zainovia Lockman, Zainuriah Hassan (2011), Effect of post-deposition annealing temperature on CeO_2 thin film deposited on silicon substrate via RF magnetron sputtering technique, Materials Science in Semiconductor Processing, 14, 2, 2011, pp. 101-107
19. Mun Teng Soo, Go Kawamura, Hiroyuki Muto, Kuan Yew Cheong, Zainovia Lockman, Ahmad Fauzi Mohd Noorand Atsunori Matsuda, (2011), Design and synthesis of mesoporous ZrO_2 thin films using surfactant Pluronic P123 via sol–gel technique, Journal of the Ceramic Society of Japan, Vol. 119, No. 1390, pp. 517-521
20. W. F. Lim, K. Y. Cheong, and Z. Lockman, (2011) Effects of Post-Deposition Annealing Temperature and Time on Physical Properties of Metal-Organic Decomposed Lanthanum Cerium Oxide Thin Film, Thin Solid Films, 519 (15), pp. 5139-5145
21. Tedi Kurniawan, Yew Hoong Wong, Kuan Yew Cheong, Jeong Hyun Moon, Wook Bahng, Khairunisak Abdul Razak, Zainovia Lockman, Hyeong Joon Kim, Nam-Kyun Kim, (2011), Effects of post-oxidation annealing temperature on ZrO_2 thin film deposited on 4H-SiC substrate, Materials Science in Semiconductor Processing, 14, 1, pp. 13-17.

22. W.K. Tan, K. Abdul Razak, K Ibrahim, Zainovia Lockman (2011), Oxidation of etched Zn foil for the formation of ZnO nanostructure, Journal of Alloy and Compounds, 509, 24, pp. 6806-6811
23. Zainovia Lockman, Syahriza Ismail, Go Kawamura and Atsunori Matsuda, (2011), Formation of Zirconia and Titania Nanotubes in Fluorine Contained Glycerol Electrochemical Bath, Defect and Diffusion Forum, Vols. 312-315, pp 76-81
24. Syahriza Ismail, Zainal A. Ahmad, Andrey Berenov, Zainovia Lockman (2011), Effect of applied voltage and fluoride ion content on the formation of zirconia nanotube arrays by anodic oxidation of zirconium, Corrosion Science, (Elsevier), 53, 4, pp. 1156-1164
25. Syahriza Ismail, Zainal A. Ahmad, Andrey Berenov, Zainovia Lockman (2011), Formation and Mechanistic Study of Self-Ordering ZrO_2 Nanotubes by Anodic Oxidation, Advanced Materials Research, Vol. 173, (2011), pp 173-177
26. W.K. Tan, Khairunisak Abdul Razak, K. Ibrahim, Zainovia Lockman, (2011), Formation of ZnO nanorod arrays on polytetraflouroethylene (PTFE) via a seeded growth low temperature hydrothermal reaction, Journal of Alloys and Compounds, Volume 509, pp. 820–826

B. Published International Conference Proceedings (refereed and Scopus Listed) - last 5 years

1. S Iping, Zainovia Lockman, S D Hutagalung, A Kamsul and Atsunori Matsuda, **Formation of $CuAlO_2$ Film by Ultrasonic Spray Pyrolysis**, (2011), IOP Conf. Ser.: Mater. Sci. Eng. 18 082022 doi:10.1088/1757-899X/18/8/082022
2. Zainovia Lockman, Syahriza Ismail, Khairunisak Abdul Razak and Lim Shu Lee, (2011) **Effect of Anodisation Parameters on the Formation of Porous Anodic Oxide on Ti, Zr and W, I**nstitute of Physics, UK, IOP Conf. Ser.: Mater. Sci. Eng. **18,** 052004 doi: 10.1088/1757-899X/18/5/052004
3. Syahriza Ismail, Khairunisak Abdul Razak, Pang Woei Jing, and Zainovia Lockman,(2011), **Tungsten Oxide Nanoporous Structure Synthesized Via Direct Electrochemical Anodization,** American Institute of Physics Conf. Proc, 1341, 21, pp. 21-24**,** doi:10.1063/1.3586946
4. Syahriza Ismail, Andrey Barenov, Zainal Ariffin Ahmad, and Zainovia Lockman, (2011), **Self Ordering of Anodic ZrO_2 Nanotubes in Viscous Glycerol Electrolyte Using Anodization**, American Institute of Physics Conf. Proc 1341, 29
5. M. D. L. Balela, Z. Lockman, A. Azizan, E. Matsubara, and A. V. Amorsolo, Jr., (2010), **Protective Agent-Free Synthesis of Colloidal Cobalt Nanoparticles** , American Institute of Physics Conf. Proc 1217, 113

C. National Journals (refereed and Scopus Listed) – last 5 years

1. Z. Lockman, S. Ismail, K. A. Razak, K.A. P.W Jing, (2011), **Formation of porous tungsten trioxide (WO_3) by anodisation of W in electrolyte containing different levels of NH_4F Lockman**, Malaysian Journal of Microscopy, vol. 7, 1 , pp. 191-195
2. Tan Wai Kian, Zainovia Lockman, Khairunisak Abdul Razak, Kamarulazizi Ibrahim, Go Kawamura, Jun-ichi Hamagami, Atsunori Matsuda, (2010), **Formation of ZnO Nano and Sub-Micron Rods by Chemical Process on Hot Water Treated and Non treated Sol-Gel Coating,** Malaysian Journal of Microscopy (Electron Microscopy Society of Malaysia), vol. 6, pp. 58-63, 2010
3. F.A. Jasni, K.Y. Cheong, Z. Lockman, and Z. Hassan, (2008), **Effects of annealing temperature on cerium oxide thin film deposited on silicon via metal-organic decomposition,** Malaysian Journal of Microscopy (Electron Microscopy Society of Malaysia), vol. 4, pp. 180-185

D. Other Publications

1. Zainovia Lockman, Srimala Sreekantan, (2010) **Responsible Research Conduct, Research Integrity, Professional and Personal Development**, Institute of Postgraduate Studies, USM, ISBN 9789675417856
2. Zainovia Lockman, **Raising Employability**, (2011) to be published by Professional and Personal Development, Institute of Postgraduate Studies, USM
3. Articles for MICROSOM (Bulletin of Electron Microscopy Society, Malaysia), 2011, 2012, 2013
4. Articles for Bulitin Enjiner, School of Materials and Mineral Resources Engineering, USM, 2005

E. Patents

1. Method for fabricating silicon nanowire transistor, involves etching substrate with basic anisotropic chemical etchant to remove portions of substrate, and with acidic isotropic chemical etchant to remove nanoscale oxide pattern
   Patent Number(s): WO2012002794-A1
   Patent Assignee: UNIV SAINS MALAYSIA
   Inventor(s): HUTAGALUNG S D; LOCKMAN Z; CHUNG L K; et al.
2. Producing silicon carbide nanowires on a silicon substrate (silicon wafer), includes placing the silicon substrate and a crucible filled with carbon powder into a furnace, vacuuming, introducing argon gas, heating, and cooling the furnace
   Patent Number(s): WO2012002795-A1
   Patent Assignee: UNIV SAINS MALAYSIA
   Inventor(s): CHEONG K Y; LOCKMAN Z; CHIEW Y L
3. Apparatus useful for producing titanium dioxide nanotube arrays, comprises anodization chamber, electrolyte solution contained in anodization chamber, anodization means, bubbling means, cooling means and electrolyte circulating means
   Patent Number(s): WO2012026799-A1
   Patent Assignee: UNIV SAINS MALAYSIA
   Inventor(s): SREEKANTAN S; AHMAD Z A; LOCKMAN Z; et al.

3.2. PRODUCTS EXHIBITION/MEDAL

1. **Silver Medal –** Zainovia Lockman, Cheong Kuan Yew, Khairunisak Abdul Razak, Zirconia Nanotube Sheets, , The 24th International Invention, Innovation & technology Exhibition (ITEX), May 2014
2. **Gold Medal –** Cheong Kuan Yew, **Zainovia Lockman,** Chiew Yi Ling, Chemical Vapor Growth of Nanowires, PENCIPTA 2011, Kuala Lumpur Convention Centre, 13-15 September 2011
3. **Bronze Medal -** Cheong Kuan Yew, **Zainovia Lockman**, Quah Hock Jin, Lim Way Fong, The 21st International Invention, Innovation & technology Exhibition (ITEX) 2010, 14 – 16 May 2010, at KL Convention Center, Kuala Lumpur, Malaysia, for an invention of CERIA Gate for High Efficient Power Applications
4. **Silver Medal -** Sabar Derita Hutagalung, Ahmad Makarimi Abdullah, **Zainovia Lockman**, Lee Kam Chung, The 21st International Invention, Innovation & technology Exhibition (ITEX) 2010, 14 – 16 May 2010, at KL Convention Center, Kuala Lumpur, Malaysia, for an invention of Silicon nanowire Transistor with 33nm Lateral Gate Gap
5. **Bronze Medal -** Sabar Derita Hutagalung, Ahmad Makarimi Abdullah, **Zainovia Lockman**, International Exposition of Research and Invention on Institution of higher Learning (PENCIPTA), 8-10 October 2009, KLCC, KL
6. **Gold Medal -** Srimala Sreekantan, **Zainovia Lockman**, Zainal Arrifin Ahmad, Syahriza Ismail, TNT as Novel Photocatalyzer, Malaysian Association of Research Scientist, Malaysia Technology Expo (MTE) 2008, 21-23 February 2008, Kuala Lumpur, Malaysia
7. **Gold Medal -** Srimala Sreekantan, **Zainovia Lockman**, Zainal Arrifin Ahmad, Syahriza Ismail, TNT as Novel Photocatalyzer, Salon International Des Inventions Genève, 3rd April 2009, Geneva

4. WORKING EXPERIENCE

Year	Position	Place of Work
July 1999-July 2002	Universiti Sains Malaysia (under the academic staff training programme)	Department of Materials, Imperial College London, UK
February 2003- August 2003	Postdoctoral Research Associate	Department of Materials, Imperial College London, UK
August 2003- August 2004	Postdoctoral Research Associate	Department of Materials and Metallurgy, University of Cambridge, UK
August 2009- Present	Associate Professor (DS 54)	Universiti Sains Malaysia

5. ACADEMIC RECOGNITION & LEADERSHIP

5.1. AWARDS

1. Malaysian Solid State Science and Technology Society (MASS) Award for Young Researcher in Solid State Science and Technology Research, 2010

2. Young Scientist Award, Springer, Awarded at Diffusion Liquid Solid Conference in Paris, France, 2010
3. Prime Minister's Initiative 2 for International Education (PMI 2), UK, Strategic Alliances and Partnerships project, Research Co-operation strand, Research Grant, Awarded with Imperial College London,2008
4. Sijil Perkhidmatan Cemerlang Universiti Sains Malaysia (Excellence Service Award), 2009
5. Universiti Sains Malaysia Hall of Fame Award (Anugerah Sanggar Sanjung) 2004, 2007, 2008, 2009 and 2010 under Publication/products Categories
6. Nippon Sheet Glass Foundation, Japan, Material Science Research Grant, 2007
7. Abdusallam international Centre for Theoretical Physics (ICTP Grant), Neutron Scattering Laboratory, National Nuclear Energy, Indonesia, 2007
8. Malaysian Toray Science Foundation, Science and Technology Grant, 2006
9. Lord Richardson Award (UK), Best Undergraduate students at UK Universities, 1999
10. Overseas Research Scheme Award (UK) Committee of Vice-Chancellors and Principals of UK and Eire , 1999-2002
11. J R Beard Travelling Fund Award, Institute of Electrical Engineers, UK, 2001
12. Malaysian Public Service Department, British Top Universities Scholar, 1994-1999

5.2. INVITED SPEAKER/INTRODUCTORY TALKS

1. Zainovia Lockman, Strategies to Produce 3 dimensional 1 dimensional Functional Oxide: Focusing on Green Technology Applications, The 3rd ISESCO International Workshop and Conference On Nanotechnology 2012 (IWCN2012), Bangi, December 2012
2. Zainovia Lockman, USM-TUT Relationship, Introductory Talk at the 1st Seminar Universiti Sains Malaysia-Toyohashi University Technology, Japan, February 2012
3. Zainovia Lockman, Syanriza Ismail, Khairunisak Abdul Razak, Leow Cheah Li, Tan Wai Kian, Self Ordered Metal Oxide 1D, 2D and 3D Nanostructures by Oxidation and Chemical Methods, Introductory talk at the Advanced Computational and Experimental Conference, ACE-X 2011, Algarve, Portugal, July 2011
4. Zainovia Lockman, Iping Suhardi, Development of Transparent Oxides Semiconductors: Progress, Prospect, Applications & Challenges, Electron Microscopy Society, 19th Annual Conference, Langkawi, Malaysia, December 2010
5. Zainovia Lockman, Syahriza Ismail, Ordered Nanoporous WO_3, International Conference on the Advancement of Materials & Nanotechnology II, Kuala Lumpur, Malaysia, November 2010
6. Zainovia Lockman, Syahriza Ismail, Go Kawamura, Atsunori Matsuda, Effect of Anodisation Parameters on the Formation of Porous Anodic Oxide on Ti, Zr, W, Nb & Zn 3rd International Ceramic Congress, 3rd International Ceramic Congress, Symposium 2C: Novel Chemical Processing; Chemical Tectonics for Materials Design, Osaka, Japan, November 2010
7. Zainovia Lockman, J Driscoll, Superconducting Compound MgB_2, Centre of Excellence, COE, 3rd Workshop on Regional Network Formation for Enhancing Research and Education on Materials Engineering, Nagaoka University of Technology-USM, Penang Malaysia, August 2005
8. Zainovia Lockman, J Driscoll, Electrodeposition of CeO_2, 7th Field Wise Seminar, AUN/SEED-Net, Japanese International Cooperation Agency, Bandung, Indonesia, January 2006
9. Z Lockman, X Qi, A Berenov, W Goldacker, R, Nast, B deBoer, B Holpfapzel, J MacManus Driscoll, Study of the Surface Oxidation Epitaxy of Pure Ni, 4th International Conference on Processing and Manufacturing of Advanced Materials, Thermec, Leganes, Madrid, Spain, July 2003

5.3. VISITING SCIENTIST/ACADEMIC VISITOR

- Visiting Scientist - 25th May 2006- 1st August 2006 - Department of Materials and Metallurgy, University of Cambridge, Cambridge, UK, fully funded by Marie-Curie Network of Excellence, European Commission (MEXT-CT-2004-014156)
- Visiting Scientist - 19-23rd February 2007 – Department of Materials, Toyohashi University of Technology, Japan, fully funded by Japanese International Cooperation Agency, JICA, Japan
- Visiting Scientist - 5th-6th May 2008 – Korean Electrotechnology Institute (KERI), South Korea
- Visiting Scientist - 14-20th December 2008 – department of Materials, Imperial College London, UK
- Academic Visitor – 7th July 2011 – Department of Materials, Imperial College London
- Academic Visitor - 8th July 2011 - Department of Materials and Metallurgy, University of Cambridge, Cambridge, UK

5.4. EDITOR/REVIEWING ARTICLES in ACADEMIC JOURNALS

- **Editor** of International Scholarly Research Network (ISNR), ISNR Nanomaterials
- **Reviewer for:**
    1. ISRN Nanomaterials
    2. Powder Technology, Elsevier
    3. Journal of Solid State Electrochemistry, Springer
    4. Journal of Hazard Materials, Elsevier
    5. Applied Surface Science, Elsevier
    6. Superconductor Science and Technology, Institute of Physics (IOP), UK
    7. Surface Science, Elsevier
    8. Corrosion Science, Elsevier
    9. Journal of Alloy and Compounds, Elsevier
    10. Journal of Nanomaterials, Hindawi
    11. Journal of the American Ceramic Society, American Ceramic Society, USA
    12. ASEAN Engineering Journal, JICA Project for AUN/SEED-Net, Japan
    13. Advanced Materials Research, Trans Tech Publications
- Reviewer for Qatar National Research Fund (QNRF), Qatar Foundation, the National Priorities Research Program (NPRP), 2012

5.5. MEMBERSHIPS

- Member of Young Scientists Network - Academy of Sciences Malaysia (YSN-ASM) since 2012
- Life member, Microscopy Society Malaysia (committee member 2007-2008, Honorary Secretary 2008-2013)
- Life member, The Malaysian Solid State Science and Technology Society (MASS) (MASS 119/00)
- Ordinary member of Malaysian Nanotechnology Association
- Ordinary member, Malaysian Nuclear Society (MNS 500/2007)

6. SUPERVISION

- Ongoing PhD = 10 (main and co supervisor); graduated = 3
- Ongoing MSc =24 (graduated = 22) * Full list can be extracted from Institut Pengajian Siswazah USM

7. TEACHING

Courses Taught (Materials Engineering Programme)

- EBB154. Materials laboratories
- EBB325. Microscopy laboratories
- EBB215. Semiconductor Materials
- EBB204. Materials Properties
- EBB338. Nanomaterials
- EBB525. Electronic Materials

8. TRAINING

- **Facilitator/Trainer for USains Holding** on Nanomaterials and Nanotechnology Course
- **Facilitator for Institut Pengajian Siswazah, IPS, USM:** Thesis writing, Presentation Skills, Attributes to Successful Postgraduates