**Dr. Abdul Rahman Mohmad**
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## RESEARCH EXPERIENCE

- Molecular beam epitaxy (MBE) growth of various III-V semiconductors particularly GaAsBi alloys. Other materials include InGaAs, AlGaAs and GaInNAs.
- Optical and structural characterization of semiconductors using photoluminescence (PL), high resolution X-ray diffraction (HR-XRD) and atomic force microscopy (AFM).

## EDUCATION

University of Sheffield, UK (2009 – 2013)
**Qualification :** Doctor of Philosophy in Optoelectronics
**Title of thesis :** Growth and Characterization of GaAsBi.

University of Sheffield, UK (2004 – 2008)
**Qualification :** Master of Engineering in Microelectronics
**Examination Result :** First Class
**Achievements :** First Class in all semesters. Awarded the "Hector Aitken Wainwright Prize" for academic excellence

Mara College Banting, Malaysia (2002 – 2004)
**Qualification :** International Baccalaureate Diploma
**Examination Result :** 39/45 points

## EMPLOYMENT BACKGROUND

| | |
|---|---|
| Jan 2016 – present | Post-Doctoral Associate, Department of Materials Science & Engineering, Rutgers University, New Jersey, USA |
| Dec 2013 – present | Research Fellow, Institute of Microengineering & Nanoelectronics, National University of Malaysia (UKM), Bangi, Malaysia |
| Apr 2009 – Nov 2013 | PhD student, University of Sheffield, UK |
| Sept 2008 – Mar 2013 | Junior Research Fellow, Institute of Microengineering & Nanoelectronics, National University of Malaysia (UKM), Bangi, Malaysia |
| June 2007 – Sept 2007 | Paid internship, University of Newcastle, UK |

## AWARDS

| | |
|---|---|
| 2015 | Ministry of Higher Education Grant for post-doctoral studies |
| 2014 | Young Researcher Grant |
| 2011 | UK Semiconductor 2011 Best Poster Award |
| 2009 | Ministry of Higher Education Scholarship for PhD |

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| 2008 | Hector Aitken Wainwright Prize from University of Sheffield |
| 2007 | Summer Internship Award from University of Newcastle |
| 2004 | MARA Scholarship for undergraduate programme |
| 2002 | MARA Scholarship for International Baccalaureate Diploma |

## JOURNAL PUBLICATIONS

1. **A. R. Mohmad**, F. Bastiman, J. S. Ng, S. J. Sweeney and J. P. R. David, "Photoluminescence investigation of high quality GaAsBi on GaAs", Appl. Phys. Lett. **98** 122107 (2011) *[IF = 3.302, Q1]*
2. **A. R. Mohmad**, F. Bastiman, C. J. Hunter, J. S. Ng, S. J. Sweeney and J. P. R. David, "The effect of Bi composition to the optical quality of GaAsBi", Appl. Phys. Lett. **99** 042107 (2011) *[IF = 3.302, Q1]*
3. **A. R. Mohmad**, F. Bastiman, J. S. Ng, S. J. Sweeney and J. P. R. David, "Room temperature photoluminescence enhancement in GaAsBi alloys", Phys. Stat. Solidi. C **9** 259 (2012)
4. **A. R. Mohmad**, F. Bastiman, C. J. Hunter, R. D. Richards, S. J. Sweeney, J. S. Ng and J. P. R. David, "Effects of rapid thermal annealing on GaAsBi alloys", Appl. Phys. Lett **101** 012106 (2012) *[IF = 3.302, Q1]*
5. F. Bastiman, **A. R. Mohmad**, J. S. Ng, S. J. Sweeney and J. P. R. David, "Non - stoichiometric GaAsBi / GaAs (100) molecular beam epitaxy growth", J. Cryst. Growth **338** 57 (2012) *[IF = 1.698, Q2]*
6. C. J. Hunter, F. Bastiman, **A. R. Mohmad**, R. Richards, J. S. Ng, S. J. Sweeney and J. P. R. David, "Absorption characteristics of GaAsBi/GaAs diodes in the near infra-red", IEEE Photon. Technol. Lett. **24** 2191 (2012) *[IF = 2.11, Q1]*
7. R. Richards, F. Bastiman, C. J. Hunter, D. F. Mendes, **A. R. Mohmad**, J. S. Roberts, J. P. R. David, "Molecular beam epitaxy growth of GaAsBi using $As_2$ and $As_4$", J. Cryst. Growth **390** 120 (2014) *[IF = 1.698, Q2]*
8. **A. R. Mohmad**, F. Bastiman, C. J. Hunter, R. D. Richards, S. J. Sweeney, J. S. Ng, J. P. R. David and B. Y. Majlis "Localization effects and band gap of GaAsBi alloys", Phys. Stat. Solidi B **251** 1276 (2014) *[IF = 1.489, Q3]*
9. **A. R. Mohmad**, F. Bastiman, C. J. Hunter, F. Harun, D. F. Reyes, D. L. Sales, D. Gonzalez, R. D. Richards, J. P. R. David and B. Y. Majlis "Bismuth concentration inhomogeneity in GaAsBi bulk and quantum well structures", Semicond. Sci. Technol. **30** 094018 (2015) *[IF = 2.19, Q1]*
10. R. D. Richards, C. J. Hunter, F. Bastiman, **A. R. Mohmad** and J. P. R. David "Telecommunication wavelength GaAsBi LEDs", *accepted for publication in IET Optoelectronics*

## CONFERENCE AND POSTER PRESENTATIONS

1. **A. R. Mohmad**, F. Bastiman, J. S. Ng, S. Jin, S. J. Sweeney and J. P. R. David, "Photoluminescence investigation of bulk GaAsBi on GaAs", 1st International Workshop on Bismuth Containing Semiconductors, Michigan, USA, 14-16 July 2010.

2. F. Bastiman, **A. R. Mohmad**, J. S. Ng, S. Sweeney and J. P. R. David, "Growth and characterisation of $GaAs_{1-x}Bi_x$ for Opto-electronic applications", 25th Semiconductor and Integrated Opto-Electronics Conference (SIOE), Cardiff, UK, 18-20 April 2011.

3. Z. Batool, **A. R. Mohmad**, T. J. C. Hosea, N. Hossain, K. Hild, T. Tiedje and S. J. Sweeney, "Band gap – spin-orbit splitting cross-over observed in GaBiAs/GaAs layers with high bismuth concentration", 25th Semiconductor and Integrated Opto-Electronics Conference (SIOE), Cardiff,

UK, 18-20 April 2011.

4. **A. R. Mohmad**, F. Bastiman, J. S. Ng, S. J. Sweeney and J. P. R. David, "Composition dependent photoluminescence of $GaAs_{1-x}Bi_x$ alloys on GaAs", 38th International Symposium on Compound Semiconductors (ISCS), Berlin, Germany, 22-26 May 2011.

5. Z. Batool, K. Hild, T. J. C. Hosea**, A. R. Mohmad**, T. Tiedje, R. Butkute, V. Pacebutas, A. Krotkus and S. J. Sweeney, "Optical characterisation of GaBiAs/GaAs samples for 1.5 µm application", UK Semiconductor 2011, Sheffield, UK, 6-7 July 2011. (Won best poster)

6. **A. R. Mohmad**, F. Bastiman, C. J. Hunter, J. S. Ng, S. J. Sweeney and J. P. R. David, "The effect of Bi composition to the optical quality of $GaAs_{1-x}Bi_x$ alloys", 2nd International Workshop on Bismuth Containing Semiconductors, Surrey, UK, 18-20 July 2011.

7. Z. Batool, K. Hild, T. J. C. Hosea**, A. R. Mohmad**, X. Lu, T. Tiedje, R. Butkute, V. Pacebutas, A. Krotkus and S. J. Sweeney, "Resonance of band gap and spin orbit splitting in GaAsBi/GaAs alloys", 2nd International Workshop on Bismuth Containing Semiconductors, Surrey, UK, 18-20 July 2011

8. **A. R. Mohmad**, F. Bastiman, C. J. Hunter, R. D. Richards, S. J. Sweeney, J. S. Ng and J. P. R. David, "Effects of rapid thermal annealing on the optical and structural properties of $GaAs_{1-x}Bi_x$", Semiconductor and Integrated Opto-Electronics Conference (SIOE) 2012, Cardiff, UK, 2-4 April 2012.

9. C. J. Hunter, F. Bastiman **A. R. Mohmad**, R. D. Richards, J. S. Ng, S. J. Sweeney and J. P. R. David, "Absorption characteristics of GaAsBi/GaAs diodes in the near infra-red", Semiconductor and Integrated Opto-Electronics Conference (SIOE) 2012, Cardiff, UK, 2-4 April 2012.

10. F. Bastiman, C. J. Hunter, **A. R. Mohmad**, R. D. Richards, J. S. Ng, S. J. Sweeney and J. P. R. David, "Growth and characterisation of $GaAs_{1-x}Bi_x$ p-i-n diodes", E-MRS Spring meeting, Strasbourg, France, 14-18 May 2012.

11. R. D. Richards, F. Bastiman**,** C. J. Hunter, **A. R. Mohmad**, J. S. Ng and J. P. R. David, "Effect of arsenic species on growth of $GaAs_{1-x}Bi_x$", UK Semiconductor 2012, Sheffield, UK, 4-5 July 2012

12. C. J. Hunter, F. Bastiman **A. R. Mohmad**, R. D. Richards, J. S. Ng, S. J. Sweeney and J. P. R. David, "Optical and electrical properties of $GaAs_{1-x}Bi_x$/GaAs diodes", 3rd International Workshop on Bismuth Containing Semiconductors, Victoria, Canada, 15-18 July 2012

13. **A. R. Mohmad**, F. Bastiman, C. J. Hunter, R. D. Richards, S. J. Sweeney, J. S. Ng and J. P. R. David, "The effect of growth parameters on the optical and structural quality of $GaAs_{1-x}Bi_x$ alloys", 17th International Conference on Molecular Beam Epitaxy, Nara, Japan, 23–28 September 2012

14. R. D. Richards, F. Bastiman, **A. R. Mohmad**, C. J. Hunter, J. P. R. David, N. J. Ekins-Daukes, "GaAsBi MQWs for multi-junction Photovoltaics", 39th IEEE Photovoltaic Specialist Conference, Florida, USA, 16-21 June 2013.

15. C. J. Hunter, D. F. Reyes, D. González, F. Bastiman, **A. R. Mohmad**, R. Richards, and J. P. R. David, "TEM characterization of bulk GaAsBi layers", UK Semiconductor 2013, Sheffield, UK, 1-2 July 2013.

16. **A. R. Mohmad**, B. Y. Majlis, F. Bastiman, C. J. Hunter, R. D. Richards, J. P. R. David, "GaAsBi for photovoltaic applications", 7th IMEN UKM-PPET LIPI Joint Seminar on Nanotechnology, Microelectronic Devices, Systems and Instrumentations, Bandung Indonesia, 21-22 Nov 2013.

17. **A. R. Mohmad**, B. Y. Majlis, F. Bastiman, C. J. Hunter, R. D. Richards, J. S. Ng, J. P. R. David,

"Photoluminescence from localized states in GaAsBi epilayers", IEEE International Conference on Semiconductor Electronics (ICSE 2014), Kuala Lumpur Malaysia, 27-29 Aug 2014.

18. R. Roberts, F. Bastiman, C. Hunter, **A. R. Mohmad**, J. Roberts, J. David, "Growth and Characterisation of GaAsBi multiple quantum well structures", 41th International Symposium on Compound Semiconductor (ISCS 2014), Montpellier France, 11-15 May 2014

19. F. Harun, T. B. O. Rockett, **A. R. Mohmad**, R. D. Richards, Z. Zhou, F. Bastiman, J P. R. David, "Polarised Photoluminescence Study of GaAsBi Grown by Molecular Beam Epitaxy", UK Semiconductor 2015, Sheffield UK, 1-2 July 2015

20. D. Fernandez, F. Bastiman, **A. R. Mohmad**, D. L. Sales, R. Beanland, A. M. Sanchez, J. P. R. David and D. Gonzales, "(S)TEM analysis of segregation and CuPt atomic ordering in GaAsBi/GaAs layers", Microscopy of Semiconducting Materials (MSM-XIX), Cambridge UK, 29 Mar – 2 Apr 2015.

## TEACHING RESPONSIBILITIES

1. Z1RR6012 Fundamental of Nanoelectronics
2. Z1RR6042 Micro technology and MEMS/NEMS devices

## SERVICES

1. Reviewer for international journals (Applied Physics Letters) and conferences (RSM2013, ICSE2014)
2. Technical Program Chair for Topical Meeting on Photonics (TMP2015) in UKM, Malaysia

## REFEREES

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