Dr Mohammad Akbar
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Employment:

Senior Lecturer (January 2011 onwards)
Department of Mathematical Sciences
The University of Texas at Dallas, USA

Post-Doctoral Research Fellow and Casual Lecturer (2008 – 2010)
Department of Pure Mathematics
School of Mathematics and Statistics
University of New South Wales, Australia

PIMS Post-Doctoral Fellow & Sessional Lecturer (2005 – 2008)
Department of Mathematical and Statistical Sciences
University of Alberta, Canada

Post-Doctoral Scholar (2004 – 2005)
Institute for Gravitational Physics & Geometry, Department of Physics
The Pennsylvania State University, University Park, USA

Research Associate (2003 – 2004)
Department of Applied Mathematics & Theoretical Physics
University of Cambridge, UK

Education:

Ph.D. (2003) &
Master of Advanced Study (1997)
(Part III of the Mathematical Tripos)
University of Cambridge
Department of Applied Mathematics & Theoretical Physics

Research Interest:

Differential Geometry, General Relativity, Ricci flow, Lie groups and their applications in Mathematical Physics.

Articles in Journals:

1) M. M. Akbar and P. D. D'Eath, "Classical Boundary-value Problem in Riemannian Quantum Gravity and Self-dual Taub-NUT-(anti)de Sitter Geometries," Nucl. Phys. B **648** (2003) 397-416.

2) M. M. Akbar, "Classical Boundary-value Problem in Riemannian Quantum Gravity and Taub-Bolt-anti-de Sitter Geometries," Nucl. Phys. B **663** (2003) 215-230.

3) M. M. Akbar and G. W. Gibbons, "Ricci-flat Metrics with $U(1)$ Action and the Dirichlet Boundary-value Problem in Riemannian Quantum Gravity and Isoperimetric Inequalities," Class. Quant. Grav. **20** (2003) 1787-1822.

4) M. M. Akbar and S. Das, "Entropy Corrections for Schwarzschild and Reissner-Nordström Black Holes," Class. Quant. Grav. **21** (2004) 1383-1392.

5) M. M. Akbar and P. D. D'Eath, "$\mathbb{C}P^2$ and $\mathbb{C}P^1$ Sigma Models in Supergravity: Bianchi type IX Instantons and Cosmologies," Class. Quant. Grav. **21** (2004) 2407-2420.

6) M. M. Akbar, E. W. Woolgar, "Ricci Solitons and Einstein-Scalar Field Theory," Class. Quant. Grav. **26** (2009) 055015.

7) M. M. Akbar, "Schwarzschildanti-de Sitter black holes within isothermal cavity: Thermodynamics, phase transitions, and the Dirichlet problem," Phys. Rev. D **82** (2010) 064001.

8) "Gamma: Exploring Euler's Constant" (by Julian Havill), **Plus** Issue 27: November 2003. (Review)

Some forthcoming articles:
9) M. M. Akbar, "New Ricci flat Warped Geometries and New Forms of the Minkowski Metric."

10) M. M. Akbar, "Uniqueness of Spherically Symmetric Constant Curvature Hypersurfaces in Spherically Symmetric Static Spacetimes".

11) M. M. Akbar, "Embedding FRW cosmologies in five dimensional flat spaces."

Professional Responsibility:

Refereeing for three premier international journals, *Classical and Quantum Gravity*, *Nuevo Cimento* and *Journal of Physics A: Mathematical and Theoretical*.

Memberships:

(1) Fellow of the Cambridge Commonwealth Society (Elected on 12 March 1998).

(2) Junior Member, Isaac Newton Institute for Mathematical Sciences, Cambridge, UK (1997-2003).

(3) Life member of the Australasian Society for General Relativity and Gravitation (2010 onwards).

Key Teaching Experiences:[1]

(1) Spring 2011, the University of Texas at Dallas: a) Course Coordinator for the four-section course *Applied Calculus II* (Math 1326) and lectured two sections with 52 and 72 students, b) Lectured *Matrices, Vectors and their Applications* (Math 2333) to a calss of 33, c) Lectured *Linear Algebra* (Math 2418) to a class of 57.

(2) Lectured twice *Higher Topology and Differential Geometry* (Math 3701) to classes of 15 and 13 3rd year students (Semesters 2, 2009 and 2010), University of New South Wales.

(3) Lectured *Elementary Calculus I* (Math 113) to a class of 53 students (Spring 2008) and *Differential Equations* (Math 201) to a class of 74 Engineering students (Spring-Summer 2008), University of Alberta.

(4) Lectured *Linear Algebra II* (Math 225) to a class of 80 students and *Differential Equations* (Math 201) to a class of 97 Engineering students (Winter 2008), University of Alberta.

(5) Lectured *Differential Equations* (Math 201) to a class of 97 Engineering students and *Wave*

[1] Numbers accurate to the best of knowledge.

motion, Optics and Sound (Phys 130) to a class of 202 Engineering and Science students (Fall 2007), University of Alberta.

(6) Lectured *Differential Equations* (Math 201) to a class of 80 Engineering and Science students (Winter 2007), University of Alberta.

(7) Lectured *Integral Calculus* (Math 101) to a class of 43 Engineering students (Winter 2006), University of Alberta.

(8) Helped teach the advanced graduate course *Advanced General Relativity* (2004), Pennsylvania State University.

(9) Supervised students of Part III of the Mathematical Tripos, Cambridge University, for *General Relativity* (1999-2001) and for *String Theory* (1998).

(10) Supervised Natural Science Maths Part IA for St Catherine's College, University of Cambridge (1999-2000).

(11) Taught GCSE mathematics (2000, 2003) and physics (2003), Cambridge, UK. (Private tutoring.)

Major Awards, Honors and Scholarships:

(1) Pacific Institute for the Mathematical Sciences (PIMS) Post-Doctoral Fellowship, 2005-2007.

(2) Awarded the title of the "Malaysian Commonwealth Scholar" by His Royal Highness The Prince of Wales and The Rt Dato' Seri Dr Muhathir bin Mohamed, Prime Minister of Malaysia, in 1997.

(3) Overseas Research Students (ORS) Awards Scheme Scholarship for Ph.D. studies in Cambridge, 1997-98, 1998-99, 1999-2000.

(4) Malaysian Commonwealth Scholarship for Ph.D. in Cambridge, 1997-98, 1998-99, 1999-2000.

(5) Awards from the Cambridge Commonwealth Trust, 2000-01, 2001-02.

(6) Lundgren Research Award, University of Cambridge, 2000-01 and 2001-02.

(7) College Bursary, Downing College, 2001.

(8) Awards from the Department of Applied Mathematics & Theoretical Physics, 2002-03.

(9) Cambridge Overseas Development Administration (ODA) Scholarship for Master of Advanced Studies (Part III of the Mathematical Tripos), 1996-97.

(10) Downing-Müller Scholar, Downing College 1996-97.