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John Arhin

Goal

To secure a position as a postdoctoral assistant, or postdoctoral fellow, in mathematics.

Education

School of Mathematical Sciences, Queen Mary, University of London. (Sept. 2000 – Sept. 2006)

PhD, “On the structure and construction of SOMAs and related partial linear spaces”, approved Oct. 2006.

Initially studied part-time and then went on to study full-time.

Supervised by Professor Leonard H. Soicher. My thesis focuses on a class of partial linear spaces called SOMAs, or $SOMA(k, n)_s$, which generalise the notion of k mutually orthogonal Latin squares of order n . My thesis investigates the connections between the structure of SOMAs and certain graphs, and more generally, links between the structure of partial linear spaces of order (s, t) and certain other graphs.

School of Mathematics Sciences, Queen Mary, University of London. (1997 – 2000)
BSc (Hons) 1st, Mathematics.

Raines Foundation School, Approach Road, London E2 9LY. (1995 – 1997)
A-Levels: Mathematics (A), Biology (B), Chemistry (B), Physics (B).

Publications and Papers

John Arhin. Every $SOMA(n-2, n)$ is Trojan. *Discrete Mathematics*, 2008. <http://dx.doi.org/10.1016/j.disc.2008.09.050>.

John Arhin. On the structure of 1-designs with at most two block intersection numbers. *Designs, Codes and Cryptography*, v. 43 n. 2–3, p. 103–114, June 2007. <http://dx.doi.org/10.1007/s10623-007-9067-4>.

John Arhin and M. A. Ollis. Some infinite families of non-Trojan SOMAs. In preparation, 30 pages.

Research Interests

My research interests include:

- combinatorial designs,
- finite partial geometry,
- computational design theory, and
- applications of group theory to combinatorial designs.

For future research, I plan to build upon the work in my PhD thesis and investigate the structure of combinatorial designs, in particular, the structure of certain generalisations of affine resolvable designs. I also plan to use a computational system GAP together with its share package DESIGN to develop constructions of combinatorial designs, more specifically, constructions of infinite families of SOMAs with certain automorphism groups.

Research Interests (continued)

Relevant Experience

Research Assistant,

Oct. 2005 – Dec. 2005

School of Mathematical Sciences, Queen Mary.

Supervisor: Professor Leonard H. Soicher.

A three month EPSRC **NetCA** network grant project that provided a world-wide web resource on SOMAs, which is of interest to combinatorialists, finite geometers and statisticians. This web resource has the following aims: to provide systematically generated examples of $SOMA(k, n)$ s with $n \leq 9$, including complete classifications in certain cases, and an analysis of the structure of each of these SOMAs; and to communicate certain results from my thesis within the context of known results on SOMAs. This web resource is located at the URL <http://www.maths.qmul.ac.uk/~arhin/soma/somas.html>.

Teaching and Demonstrating Experience

Mathematics Fellow

Aug. 2008 – present

Marlboro College,

Supervisor:

Teaching the courses Calculus II, Game Theory (co-teaching with M. A. Ollis) and Topics in Algebra, Trigonometry & Pre-Calculus in Spring 2009. For Fall 2008, I taught the courses Calculus I; Topics in Algebra, Trigonometry and Pre-Calculus; and Rubik's Cube & Group Theory (co-taught with J. Mahoney).

Lecturer,

Apr. 2008 – June 2008

School of Mathematical Sciences, Queen Mary.

Supervisor:

Lecturer on the course Discrete Mathematics for late entry students on the Science and Engineering Foundation Programme (SEFP).

Maths Tutor,

Oct. 2007 – Apr. 2008

School of Mathematical Sciences, Queen Mary.

Supervisor: Prof. Mark Jerrum and Prof. Bernard Carr.

Ran tutorial groups for the first year undergraduate mathematics course Essential Mathematical Skills.

Maths Tutor,

Oct. 2006 – Apr. 2008

School of Biological Sciences, Queen Mary.

Supervisor: Dr Fuad M. Shareef.

Ran tutorial groups for students enrolled on college the SEFP.

Script marking and demonstrating in exercise classes for numerous mathematics undergraduate courses, including the SEFP course.

Section of Talks and of Presentations

Every $SOMA(n-2, n)$ is Trojan, 21st British Combinatorial Conference (BCC), University of Reading, 10th July 2007.

On the structure of 1-designs with at most two block-intersection numbers, Design Theory of Alex Rosa Conference, Bratislava, Slovakia, 5th July 2007.

Every $SOMA(n-2, n)$ is Trojan, Combinatorics Study Group, Queen Mary, 8th June 2007.

Some Problems on SOMAs, Queen Mary Internal Postgraduate Seminar (QuIPS), Queen Mary, 3rd November 2005.

On the structure of equireplicate partial linear spaces with constant line size, 20th BCC, University of Durham, 13th July 2005; and Pure Maths Seminar, Queen Mary, 21st February 2005.

Is every $SOMA(n-2, n)$ Trojan?, 19th BCC, University of Wales, Bangor, 1st July 2003.

SOMAs, London Intercollegiate Postgraduate Seminars (LIPS), Queen Mary, 10th October 2002.

Section of Talks and of Presentations (continued)

Prizes and Awards

Drapers' Company Prize for outstanding academic achievement, 1998 – 1999.

Computer Skills

Computer skills: GAP including its share package DESIGN, L^AT_EX, B_IB_TE_X, Maple, Microsoft Word, Microsoft Excel.

Programming

Languages: Advanced knowledge of programming in GAP, and basic knowledge in Maple.

Widening Participation

Course Leader

17th March 2007

Queen Mary,

Supervisor: Dr. Francis J. Wright

Course Leader for an *Aim higher* year 11 University Class on matrices, entitled *Introduction to Matrices*.

Course Assistant

20th July 2005

Queen Mary,

Supervisor:

Assisted with “Taster Course” for a year 11 Summer School workshop on graph theory, entitled *Join-the-dots for grown-ups*.

Selected Positions of Responsibility

Committee Member,

Aug. 2008 – present

World Studies, Marlboro College

Supervisor:

The committee promotes the study of global perspectives by the World Studies Program and by giving students guidance on international academic programs.

Admissions assistant,

Aug. 2007, Aug. 2004 and Aug. 2003

School of Mathematical Sciences, Queen Mary.

Supervisor:

Worked for three weeks answering student queries on the clearing process for undergraduate courses, when the A-level results were released. The main focus of this job was to obtain the details of the prospective students so that the course selectors can make informed decisions in the filling of vacancies on math degree programmes.

Seminar organiser for the London Intercollegiate Postgraduate Seminars (LIPS)

Oct. 2002 – Dec. 2002

Queen Mary, Imperial college, School of Mathematical Sciences

Supervisor:

Organised a series of seminars for LIPS for maths PhD students at Queen Mary. Also involved when LIPS was held at Imperial College the following academic term.

Treasurer,

Sept. 1998 – Aug. 1999

Afro-Caribbean Society (ACS), Queen Mary.

Supervisor:

My role as the ACS treasurer involved managing the accounts, advising on any and all expenditure, playing an active role in fund raising, and helping to organise a 3 day trip to a UK festival.

Selected Positions of Responsibility (continued)

**Company secretary,
Youth Enterprise Company, Raines Foundation School**

Sept. 1995 – Jul. 1996

Supervisor:

My role included taking minutes of all meetings and carrying out many administrative tasks; for example, formally registering the company with the Youth Enterprise Scheme. In addition, worked closely with the other company members to provide and sell products aimed at fellow school pupils.

Referees

Prof. Leonard Soicher (supervisor),
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