

Dr David Craven D.Phil. M.Sci.

Senior Birmingham Fellow

[School of Mathematics \(/schools/mathematics/index.aspx\)](/schools/mathematics/index.aspx)

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About

Dr Craven is a lecturer of pure mathematics in the School of Mathematics.

His research interests are primarily in topics associated with the representation theory of finite groups, although he has projects in other areas of algebra, and associated combinatorics.

School web pages: web.mat.bham.ac.uk/D.A.Craven/ (<http://web.mat.bham.ac.uk/D.A.Craven/>)

Qualifications

- D.Phil. in Mathematics, University of Oxford, 2008
- M.Sci. in Mathematical Sciences, University of Birmingham, 2004

Biography

Dr Craven received an M.Sci. from Birmingham in 2004, then moved to Oxford, where he was first awarded a D.Phil. from St John's College in 2008, and then moved to Christ Church as a Junior Research Fellow for the next three years.

He was appointed as a Birmingham Fellow in November of 2011.

Research

Research Themes

- Modular representation theory: particularly Broué's conjecture and representations of finite simple groups
- Fusion systems
- The Unit Conjecture for group rings
- Profinite and polycyclic groups
- Representation theory of symmetric groups and associated combinatorics

Research Activity

The main areas of Dr Craven's research activity are representation theory of finite groups and fusion systems.

In finite group representation theory, Professor Raphael Rouquier of Oxford and Dr Craven have embarked on an ambitious project to prove, or at least make substantial progress on, Broué's abelian defect group conjecture, particular for principal blocks of finite groups of Lie type. In recent work they have laid the foundations of a systematic attack on the geometric form of Broué's conjecture, using the new concept of perverse equivalences.

In fusion systems, Dr Craven focuses on the algebraic side, attempting to construct an internal theory of fusion systems, that neither translates boldy results from local finite group theory nor relies heavily on topological intuition, the two currently most successful methods of approaching the subject. This approach manifests itself in his recent theorem proving the equivalence of the two definitions of a simple fusion system.

Publications

An up-to-date list may be found at web.mat.bham.ac.uk/D.A.Craven/papers.html (<http://web.mat.bham.ac.uk/D.A.Craven/papers.html>)

Craven, D.A. (2011), *Normal Subsystems of Fusion Systems*, **J. Lond. Math. Soc.**, 84:137-158.

Craven, D.A., Eaton, C., Kessar, R., and Linckelmann, M. (2011), *Blocks with a Klein Four Defect Group*, **Math. Z.**, 268:441-476.

Craven, D.A. (2011), *Algebraic Modules and the Auslander-Reiten Quiver*, **J. Pure Appl. Algebra**, 215:221-231.

Craven, D.A. (2010), *Lower Bounds for Representation Growth*, **J. Group Theory**, 13:873-890.

Craven, D.A. (2010), *Control of Fusion and Solubility in Fusion Systems*, **J. Algebra**, 323:2429-2448.

Craven, D.A. (2009), *Simple Modules for Groups with Abelian Sylow 2-subgroup Are Algebraic*, **J. Algebra**, 321:1473-1479.

Holloway, A.F., Craven, D.A., Xiao, L., del Campo, J. And Wildgoose, G. (2008), *Developing Random Network Theory for Carbon Nanotube Modified Electrode Voltammetry: Introduction and Application to Estimating the Potential Drop between MWCNT-MWCNT Contacts*, **J. Phys. Chem. C**, 112:13729-13738.

