

C. Furey - CV

Citizenship Canadian **Languages** English, basic French, basic Spanish

Education PhD in theoretical physics, Perimeter Institute and U. of Waterloo 2015
Part III Mathematics, Cambridge University, UK (Master's) 2006
Honours B.Sc. in Mathematics and Physics, Simon Fraser University, 2005

Research Fellowships

2015 Walter Grant Scott Fellowship in Physics, Trinity Hall, Cambridge University
2015 Canadian NSERC postdoctoral fellowship, held at Cambridge University
2015 Was offered the Newton International Fellowship, tenable at Imperial College

Research Experience

2016-19	Research Fellow	Prof. P.K. Townsend	Twistors, Jordan algebras
2015	PhD Student	Prof. A. Kempf	Algebraic particle physics
2006	Research Project	Dr. R. Williams	Machian causal sets
2004	Honours Thesis	Dr. A. DeBenedictis	Modified gravity

(Medical issues caused numerous interruptions, beginning 2004. These have been resolved.)

Publications

- C. Furey, $SU(3)_C \times SU(2)_L \times U(1)_Y \times U(1)_X$ as a symmetry of division algebraic ladder operators, Eur. Phys. J. C, **78** 5 (2018) 375
- C. Furey, A demonstration that electroweak theory could violate parity automatically (leptonic case), Int.J.Mod.Phys.A, (2018)
- C. Furey, Standard model physics from an algebra?, PhD thesis, University of Waterloo, 2015, [arXiv:1611.09182]
- C. Furey, Charge quantization from a number operator, Phys. Lett. B, **742** (2015), pp. 195–199
- C. Furey, Generations: Three prints, in colour, JHEP **10** (2014) 046 [arXiv:1405.4601 hep-th]
- C. Furey, Towards a unified theory of ideals, Phys. Rev. D **86** (2012) 025024, [arXiv:1002.1497 hep-th]
- Furey, DeBenedictis, Wormhole throats in R^m gravity, Class. Quantum Grav. **22** (2005) 313–322, [arXiv: gr-qc/0410088]

Current projects

- C. Furey, Three generations, two unbroken gauge symmetries, and one eight-dimensional algebra, article under review
- With P.K. Townsend: Twistors, Jordan algebras, particle physics

Presentations

2018	Talk	Prof. S. Majid's group, Queen Mary University	London, UK
2018	Talk	15th Marcel Grossmann meeting	Rome, Italy
2018	Talk	Bethe Center for Theoretical Physics	Bonn, Germany
2017	Colloquium	School of Mathematics, Trinity College	Dublin, Ireland
2017	Talk	Prof B. Coecke's group, Oxford University	Oxford, UK
2017	Talk	Quantum fields and strings group, DAMTP	Cambridge, UK
2017	Talk	Bangkok Workshop on Discrete Geometry	Bangkok, Thailand
2017	Talk	Prof. M. Sakamoto's group, Kobe University	Kobe, Japan
2017	Talk	Prof. N. Maekawa's group, Nagoya University	Nagoya, Japan
2017	Talk	Prof. K. Yoshida's group, Kyoto University	Kyoto, Japan
2017	Talk	Center for Theoretical Physics of the Universe, IBS	Daejeon, S. Korea
2017	Talk	Prof. H.L. Yu's group, Academia Sinica	Taipei, Taiwan
2017	Talk	National Tsing Hua University	Hsinchu, Taiwan
2017	Talk	Prof M.C. Tan's group, National U. of Singapore	Singapore
2017	Talk	6th Bangkok Workshop on High Energy Theory	Bangkok, Thailand
2016	Talk	2016 Advances in Quantum Gravity conference	Hawaii, USA
2016	Talk	Prof. A. Lasenby's group, Cavendish Laboratory	Cambridge, UK

C. Furey - CV

2016	Talk	Particle theory group, University of Nottingham	Nottingham, UK
2016	Talk	Algebraic Geometry and Math-Physics Conference	Tromso, Norway
2016	Talk	54th International School of Subnuclear Physics (won the Giulio Racah Diploma)	Erice, Italy
2016	Talk	Mathematical physics group, DAMTP	Cambridge, UK
2016	Talk	Particle Theory group, University of Sussex	Brighton, UK
2015	Talk	2015 Advances in Quantum Gravity conference	Los Angeles, USA
2015	Talk	For John Barrett's group, University of Nottingham	Nottingham, UK
2014	Talk	For Pierre Ramond's group, University of Florida	Florida, USA
2014	Talk	For Jorge Pullin's group, Louisiana State University	Louisiana, USA
2014	Talk	10th International Conference on Clifford Algebras and their Applications in Mathematical Physics (won best talk award)	Tartu, Estonia
2014	Talk	Frontiers of Fundamental Physics Conference	Marseille, France
2014	Talk	Centre de Physique Theorique	Marseille, France
2014	Talk	52nd International School of Subnuclear Physics (won the Eugene P. Wigner Diploma)	Erice, Italy
2014	Talk	Theory Canada 9 Conference	Waterloo, Canada
2014	Talk	Quantum gravity research group, Perimeter Inst.	Waterloo, Canada
2014	Talk	Dept Mathematics, University of Waterloo (x2)	Waterloo, Canada
2014	Talk	Dept Physics, University of Waterloo (x2)	Waterloo, Canada
2013	Talk	For department of theoretical physics INFN	Naples, Italy
2007	Talk	Current challenges for causal set quantum gravity	Waterloo, Canada
2007	Talk	Graduate Student Conference, Perimeter Inst.	Waterloo, Canada
2003	Talk	40th Western Regional Nuclear and Particle Physics Conference, this trip was the prize for winning the TRIUMF competition, below.	Lk Louise, Canada
2002	Talk	TRIUMF Annual Research Student Competition (won the competition)	Vancouver, Canada

Quanta article: [The Peculiar Math that could Underlie the Laws of Nature](#), by N. Wolchover

Video series - [Division algebras and the standard model](#)

Outreach -	2017	Talk	British Science Association, SciBar public talk, Cambridge
	2017	Panel	Speaker Trinity Hall Women in Science, Cambridge
	2016	Talk	Natural Sciences Society, Trinity Hall, Cambridge
	2016	Talk	Natural sciences first-years Trinity Hall, Cambridge

Leadership / Community

- Referee for *Nuclear Physics B*
- Referee for *Physics Letters B*
- Referee for *Advances in Applied Clifford Algebras*, Springer
- Referee for *Commentationes Mathematicae Universitatis Carolinae*, Prague
- 2018 (Offered) Guest Editor in Chief, *Adv. in Applied Clifford Algebras*
- 2018 Informally mentoring a small number of graduate students
- 2016-9 Member of governing body, Trinity Hall Cambridge
- 2016 Interviewed students for entrance into the Math Tripos, Cambridge
- Member of Perimeter Institute's Environmental Committee

Funding	2016-2019	Walter Grant Scott Fellowship in Physics, Cambridge
	2016-2018	NSERC Postdoctoral Fellowship, Cambridge
	2016-2018	Newton International Fellowship (offered) Imperial College
	2015	PhD Completion award, Dept Physics, U. of Waterloo
	2014-2015	NSERC grant (through supervisor)
	2012-2014	John Templeton Foundation (through supervisor)
	2006-2010	NSERC Alexander Graham Bell PGS-D and CGS-D awards
	2006-2010	President's Graduate Scholarships, U. of Waterloo
	2009	NSERC Michael Smith Foreign Study Supplement, M.I.T.
	2005	Rudi Haering Award in Physics, Simon Fraser University