Aled Walker

DPhil MMath BA

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EDUCATION

DPhil (PhD)   2014-2018
University of Oxford (UK)
Thesis title: Topics in Analytic and Combinatorial Number Theory.
Supervisor: Prof. Ben J. Green.

MMath   2013-2014
University of Cambridge (UK)
Part III of the Cambridge Mathematics Tripos.
Distinction.

BA   2010-2013
University of Cambridge (UK)
1$^{\text{st}}$ class.

EMPLOYMENT

Lecturer   2022-present
King's College London (UK)
Permanent faculty position

Temporary Lecturer   2020-2021
University of Cambridge (UK)
Lecturer and examiner for two graduate courses

Junior Fellow   2021
Institut Mittag-Leffler, Stockholm (Sweden)
Four month post-doctoral research position.

Postdoctoral Research Fellow   2019-2020
Centre de Recherches Mathématiques, Université de Montréal (Canada)
One-year post-doctoral research position.

Temporary Lecturer   2019
McGill University (Canada)
One-semester lecturing position

Junior Research Fellow	2018-present

Trinity College, University of Cambridge (UK)
Post-doctoral research position.

Stipendiary Lecturer 2017-2018
Pembroke College, University of Oxford (UK)
Tutor of Pure Mathematics.

Program Associate 2017
Mathematical Sciences Research Institute, Berkeley (US)
Two-month position, Analytic Number Theory Program, MSRI.

PUBLICATIONS

On a Bohr set analogue of Chowla's conjecture 2023
`arXiv:2303.12574`
With Joni Teräväinen

Correlations of sieve weights and distributions of zeros 2023
International Journal of Number Theory, 9(1), 139-167
Also available at `arXiv:2101.04418`.

On the triple correlations of fractional parts of $n^2\alpha$ 2022
Canadian Journal of Mathematics, 74(5), 1347–1384
With Niclas Technau.
Also available at `arXiv:2005.01490`.

Effective results on the size and structure of sumsets 2021
`arXiv:2105.09181`.
With Andrew Granville and George Shakan

A tight structure theorem for sumsets 2021
Proceedings of the American Mathematical Society 149, 4073-4082
With Andrew Granville.
Also available at `arXiv:2006.01041`.

Extremal problems for GCDs 2021
Combinatorics, Probability and Computing 30(6), 922-929
With Ben Green.
Also available at `arXiv:2012.02078`.

Linear inequalities in primes 2021
Journal d'Analyse Mathématique 145, 29–127
Also available at `arXiv:1901.04855`

Arithmetic progressions with restricted digits 2020
The American Mathematical Monthly, 127(2), 140–150.
With Alexander Walker.
Also available at `arXiv:1809.02430`.

GCD sums and sum-product estimates 2020
Israel Journal of Mathematics 235, 1–11
With Thomas Bloom.
Also available at `arXiv:1806.07849`.

Gowers norms control diophantine inequalities 2020
Algebra & Number Theory, 14(6), 1457-1536
Also available at `arXiv:1703.00885`.

Additive energy and the metric Poissonian property 2018
Mathematika 64(3): 679–700.
With Thomas Bloom, Sam Chow, and Ayla Gafni.
Also available at `arXiv:1709.02634`.

The primes are not metric Poissonian 2018
Mathematika 64(1): 230-236.
Also available at `arXiv:1702.07365`.

A footnote in parity breaking 2018
J. Théor. Nombres Bordeaux 30(1): 219–225.
With Olivier Ramaré.
Also available at `arXiv:1610.05804`.

A multiplicative analogue of Schnirelmann's theorem 2016
Bull. London Math. Soc. 48(6): 1018-1028.
Also available at `arXiv:1505.03328`.

PRIZES AND AWARDS

Travel Award Jun 2022
American Institute of Mathematics (US)
Fully-funded attendance at conference at Institue for Advanced Study

Kovalevskaya Grant Jan 2022
International Congress of Mathematicians (ICM, Russia)
Fully-funded attendance at ICM in St. Petersburg (not taken up)

Travel Awards 2018-2022
Trinity College, University of Cambridge (UK)
Funded travel to conferences in Austria, U.S., Italy and Switzerland (£3500).

Travel Award Jan 2017
Madgalen College, University of Oxford (UK)
Fully-funded travel to MSRI Program in California (£800).

Edward Gibbon Prize Nov 2016
Magdalen College, University of Oxford (UK)
Awarded for post-graduate research communication (multidisciplinary).

Language Scholarship Award Jul 2016
Magdalen College, University of Oxford (UK)
Funded study at the British Institute in Florence (£650)

EPSRC Award Sep 2014
Engineering and Physical Sciences Research Council (UK)
DPhil place fully-funded by government research council.

Heilbronn Prize Oct 2013
Trinity College, University of Cambridge (UK)
Awarded for distinction in final mathematics exams (£600).

Gulbenkian Foundation Award   Jul 2012
Gulbenkian Foundation (Portugal)
Fully-funded attendance at Lisbon Combinatorics Summer School (£500).

Senior Scholar   2011-2014
Trinity College, University of Cambridge (UK)
Awarded for undergraduate performance (£1500 over three years).

OCR Bursary (Oxford, Cambridge, and RSA)   2010-2013
Cambridge Assessment (UK)
Full bursary for undergraduate tuition fees, provided by a major UK
examination board (£12000).

UK Team Member   Jul 2010
International Mathematical Olympiad (IMO)
One of six delegates who represented the UK at the 51st IMO.

TALKS

University of Oxford   March 2023
Oxford (UK)
Invited speaker, department number theory seminar (60mins)

FRG Grad seminar on L-functions and applications   Dec 2022
Global
Invited speaker (60mins)

Friday Bourbaki (Institut Henri Poincaré)   Nov 2022
Paris (France)
Invited speaker, Bourbaki seminar (60mins)

King's College London   May 2022
London (UK)
Invited speaker, London number theory seminar (60mins)

University of Cambridge   Feb 2022
Cambridge (UK)
Invited speaker, department cominatorics seminar (60mins)

University of Georgia   Jan 2022
Athens (US)
Invited speaker, department seminar (50mins)

University of Bristol   Dec 2021
Bristol (UK)
Invited speaker, department combinatorics seminar (60mins)

Durham University   Nov 2021
Durham (UK)
Invited speaker, department number theory seminar (50mins)

Canadian Mathematical Society (CMS)   Jun 2021
Ottawa (Canada)

Invited speaker, 'CMS Summer Meeting, Amicale de théorie des nombres en hommage à Robert Langlands' (30mins)

Combinatorial and Additive Number Theory (CANT)   May 2021
New York City (US)
Invited speaker (30 mins).

Kansas State University   Apr 2021
Manhattan KA (US)
Invited speaker, department number theory seminar (60 min).

Institut Mittag-Leffler   Mar 2021
Djursholm (Sweden)
Invited speaker, Number Theory programme (60 min).

Additive Combinatorics Webinar   Mar 2021
Global
Invited speaker (60 min).

Trinity College   Feb 2021
Cambridge (UK)
Invited speaker, alumni talks series (60 min).

CMS   Dec 2020
Montréal (Canada)
Invited speaker, 'CMS Winter Meeting, Discrete Analysis' (30 min).

CMS   Dec 2020
Montréal (Canada)
Invited speaker, 'CMS Winter Meeting, Probability in Number Theory' (30 min).

Université Laval   Sept 2020
Québec (Canada)
Invited speaker, Québec-Maine Number Theory conference (20 min).

Centre International de Recontres Mathematiques (CIRM)   Sept 2020
Marseille (France)
Invited speaker, Additive Combinatorics conference (30 min).

University of Göttingen   Jun 2020
Göttingen (Germany)
Invited speaker, department number theory seminar (90 min).

CANT   Jun 2020
New York City (US)
Invited speaker (30 min).

Université de Montréal   Mar 2020
Montréal (Canada)
Invited speaker, department analytic number theory seminar (1 hr).

CMS   Dec 2019
Toronto (Canada)
Invited speaker, 'CMS Winter Meeting, Analytic Number Theory' (20 min).

University of Maine   Oct 2019

Orono (US)
Contributing speaker, 'Québec-Maine Number Theory Conference' (20 min).

Concordia University Sept 2019
Montréal (Canada)
Invited speaker, Québec-Vermont Number Theory Seminar (90 min).

CANT May 2019
New York City (US)
Contributing speaker (30 min).

Johannes Kepler University Feb 2019
Linz (Austria)
Invited tutor, 'Local Statistics of Point Sequences' Winter School (90 min).

Johann Radon Institute Dec 2018
Linz (Austria)
Invited speaker, Mini-Workshop on Additive Combinatorics (40 min).

University of Bristol Nov 2018
Bristol (UK)
Invited speaker, department combinatorics seminar (1 hr).

University of Manchester Oct 2018
Manchester (UK)
Invited speaker, department number theory seminar (1 hr).

University of Warwick Jun 2018
Coventry (UK)
Invited speaker, department number theory seminar (1 hr).

University of York Dec 2017
York (UK)
Invited speaker, department number theory seminar (1 hr)

Bristol-Oxbridge-Warwick-London (BOWL) Sep 2017
Coventry (UK)
Invited speaker, the BOWL meeting in Additive Combinatorics (45 min).

University of Turku Aug 2017
Turku (Finland)
Invited speaker, department number theory seminar (1 hr).

Mathematical Sciences Research Institute (MSRI) Feb 2017
Berkeley CA (US)
Speaker at three graduate seminars, Analytic Number Theory Program.

Elementare und Analytische Zahlentheorie (ELAZ) Sep 2016
Strobl (Austria)
Contributing speaker, ELAZ conference on Elementary and Analytic
Methods in Number Theory (20 min).

Additive Combinatorics in Bordeaux Apr 2016
Bordeaux (France)
Contributing speaker (30 min).

Young Researchers in Mathematics (YRM) Aug 2015

Oxford (UK)
Contributing speaker (30 min).

University of Oxford   2014-2018
Oxford (UK)
Numerous hour-long talks in group meetings and junior seminars.

TEACHING

Lecturer   2022–
King's College London (UK)
Lectured 2nd year 'Discrete Mathematics' course
Developed and lectured graduate course on Gowers norms
Supervised PhD mini-projects on nilsequences and Roth's theorem
Supervised various undergraduate long essays

Lecturer   2021
University of Cambridge (UK)
Developed and lectured graduate-level course entitled
'Five ways to think about primes'

Research Supervisor   2021
University of Cambridge (UK)
Supervised 3 undergraduate students for summer research projects

Lecturer   2020-21
University of Cambridge (UK)
Developed and lectured graduate-level course entitled
'Multiplicative Functions'

Lecturer   2019
McGill University (Canada)
Lecturing the first Freshman Calculus course, c. 300 students.

College Supervisor   2018–2019
Trinity College, University of Cambridge (UK)
Teaching 1st year undergraduates in small groups
Number theory and group theory

Stipendiary Lecturer   2017-2018
Pembroke College, University of Oxford (UK)
Tutor of Pure Mathematics (analysis, groups, and linear algebra)
College interviewer

Summer school tutor   2017
Cambridge Immerse, Cambridge (UK)
Construction and delivery of a 40 hour course to school-age students
entitled 'Introduction to University Mathematics'.

College Tutor   2017
St. Edmund's Hall, Magdalen College, University of Oxford (UK)
2nd year Number Theory, and 1st year Statistics and Data Analysis.

Interviewer   2016
Wadham College, University of Oxford (UK)

Interviewer of undergraduate mathematics applicants.

Class Tutor 2015-2017
University of Oxford (UK)
Tutor for Analytic Number Theory, Probabilistic Combinatorics, and
Banach Spaces.

Mentor 2015
PROMYS Mathematics Summer Camp, Oxford (UK)
Mentoring senior students (18 year olds) on individual research projects.

Private Tutor 2014-2015
Self-Employed (UK)
Private A-Level Maths tutor.

Teaching Assistant 2014-2015
University of Oxford (UK)
Marker and classroom assistant for Analytic Number Theory and Graph
Theory.

OTHER ACADEMIC DUTIES

Conference Organiser 2022-present
Organiser of WOMBL one-day Additive Combinatorics meetings at KCL

Seminar Organiser 2018-present
*Virtual Local Analytic Number Theory Seminar (Universté de Montréal),
Discrete Analysis Seminar (University of Cambridge), London Number
Theory seminar (KCL)*

Journal Referee 2015-present
*Annals of Mathematics, GAFA, Forum of Mathematics Pi, Discrete
Analysis, LMS Journals, IMRN, Algebra & Number Theory, Quarterly
Journal of Mathematics, International Journal of Number Theory,
Journal of Integer Sequences, Proceedings of the AMS, Journal of Number
Theory, Journal de Théorie des Nombres de Bordeaux, Functiones et
Approximatio, MathSciNet Reviews.*

CONFERENCES

**A celebration of analytic number theory, a conference in
honour of Andrew Granville** Sep 2022
Montréal (Canada)

International Congress of Mathematicians (Number Theory) Jul 2022
Zürich (Switzerland)

50 years of random matrix theory and number theory Jun 2022
Princeton (US)

Canadian Mathematical Society Summer Meeting Jun 2021
Ottawa (Canada)

Combinatorial and Additive Number Theory May 2021
New York City (US)

CMS Winter Meeting
Montréal (Canada)   Dec 2020

Québec/Maine Number Theory Conference
Québec (Canada)   Sept 2020

Additive Combinatorics (CIRM)
Marseille (France)   Sept 2020

CANT
New York City (US)   Jun 2020

CMS Winter Meeting
Toronto (Canada)   Dec 2019

Québec/Maine Number Theory Conference
Orono (US)   Oct 2019

Second Symposium of Analytic Number Theory
Cetraro (Italy)   July 2019

Combinatorial and Additive Number Theory
New York City (US)   May 2019

Local Statistics of Point Sequences
Linz (Austria)   Feb 2019

Additive Combinatorics
Linz (Austria)   Dec 2018

Arithmetic Ramsey Theory
Manchester (UK)   Sep 2018

Perspectives on the Riemann Hypothesis
Bristol (UK)   Jun 2018

Probability in Number Theory
Montréal (Canada)   May 2018

Clay Research Workshop (Harmonic Analysis)
Oxford (UK)   Sep 2017

Diophantine approximation
York (UK)   Jun 2017

Analytic Number Theory workshop at MRSI
Berkeley (US)   Feb 2017

Pseudorandomness workshop at the Simons Institute
Berkeley (US)   Jan 2017

Elementare und Analytische Zahlentheorie (ELAZ)
Strobl (Austria)   Sep 2016

Additive Combinatorics in Bordeaux
Bordeaux (France)   Apr 2016

Young Researchers in Mathematics (YRM)
Oxford (UK)   Aug 2015

Regularity and Analytic Methods in Combinatorics workshop
Coventry (UK)   Jul 2015

LMS-CMI Bounded Gaps Between Primes Summer School   Sep 2014

Oxford (UK)

Clay Research Workshop (Analytic Number Theory)   Sep 2014
Oxford (UK)

BrOx/BOWL/WOMBL   2014-present
Bristol, Oxford, Coventry, London, Cambridge (UK)

PUBLIC ENGAGEMENT

Olympiad workshops   2016-present
UK
Presenter of numerous olympiad-style outreach and training talks,
most recently for students at King's Maths School

Host and Producer   2016-2018
University of Oxford (UK)
Creator of 'In Our Spare Time', a wide-ranging podcast about DPhil
research at Oxford.
Available at `https://podcasts.ox.ac.uk/series/our-spare-time` or
on iTunesU.

Chair   2015-2017
Mathematics in Action, The Training Partnership (UK)
Compère and host for mathematical outreach events for 16-18 year olds,
average audience of 500 per event. Three full-day sessions.

Author   2016
University of Oxford (UK)
Contributor to the 'F' entry of the Oxford Mathematics Alphabet, 'F is
for Fourier Transform'.