

# Vahagn Aslanyan

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## Research Interests

- My research interests are in model theory, which is a branch of mathematical logic, and its applications in number theory.
- In the past I did research in universal algebra, in particular, I explored first and second order properties of De Morgan algebras.

## Employment

- 2019 – present **Senior Research Associate**, *School of Mathematics, UEA, Norwich, UK.*
- 2017 – 2019 **Postdoctoral Associate**, *Department of Mathematical Sciences, Carnegie Mellon University, Pittsburgh, PA, USA.*
- 2017 – 2019 **Junior Researcher**, *Institute of Mathematics, National Academy of Sciences, Yerevan, Armenia.*
- 2013– 2017 **Tutor and TA**, *Mathematical Institute, University of Oxford, Oxford, UK.*

## Education

- 2013 – 2017 **PhD in Mathematics**, *University of Oxford, Oxford, UK.*
- Thesis title: *Ax-Schanuel Type Inequalities in Differentially Closed Fields*
  - Supervisors: Boris Zilber, Jonathan Pila
- 2009 – 2013 **BSc in Mathematics**, *Yerevan State University, Yerevan, Armenia.*

## Achievements and Awards

- 2019 Emil Artin Junior Prize in Mathematics
- 2016–2017 Luys Scholarship
- 2016–2017 AGBU UK Scholarship
- 2013–2016 Dulverton Scholarship, University of Oxford
- 2012–2013 Nominal Fellowship Djrbashian, given to one student for excellence and research, Yerevan State University
- 2010–2012 Three Second Prizes, International Mathematics Competition for university students, Blagoevgrad, Bulgaria
- 2010 Bronze Medal of Yerevan State University for excellence and scientific activity
- 2009 Bronze Medal, International Mathematical Olympiad, Bremen, Germany

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## Preprints

- 6 V. Aslanyan, S. Eterović, J. Kirby, Closure operators respecting the modular  $j$ -function, arXiv:2010.00102 (2020), pp. 1–26.
- 5 V. Aslanyan, J. Kirby, Blurrings of the  $j$ -function, arXiv:2005.10167 (2020), pp. 1–16.
- 4 V. Aslanyan, Some remarks on atypical intersections, arXiv:1905.00827 (2019), pp. 1–17.
- 3 V. Aslanyan, Weak Modular Zilber-Pink with Derivatives, arXiv:1803.05895 (2018), pp. 1–38.
- 2 V. Aslanyan, Adequate predimension inequalities in differential fields, arXiv:1803.04753 (2018), pp. 1–49.
- 1 V. Aslanyan, Ax-Schanuel type theorems and geometry of strongly minimal sets in differentially closed fields, arXiv:1606.01778 (2016), pp. 1–12.

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## Publications

- 14 V. Aslanyan, S. Eterović, J. Kirby, Differential Existential Closedness for the  $j$ -function, To appear in *Proceedings of the AMS*, arXiv:2003.10996 (2020).
- 13 V. Aslanyan, Ax-Schanuel and strong minimality for the  $j$ -function, *Annals of Pure and Applied Logic*, 172:1 (2021).
- 12 V. Aslanyan, Existentially closed De Morgan algebras, *Algebra Universalis*, 81:4 (2020).
- 11 V. Aslanyan, Ax-Schanuel for linear differential equations, *Archive for Mathematical Logic*, 57:5-6 (2018), pp. 629–648.
- 10 V. Aslanyan, Definability of derivations in the reducts of differentially closed fields, *The Journal of Symbolic Logic*, 82:4 (2017), pp. 1252–1277.
- 9 V. Aslanyan, Characterization of zigzag De Morgan functions. *Discrete Math. Algorithms Appl.* 8 (2016), no. 2.
- 8 Yu. Movsisyan, V. Aslanyan, A functional completeness theorem for De Morgan functions, *Discrete Applied Mathematics*, 162 (2014), pp. 1–16.
- 7 Yu. Movsisyan, V. Aslanyan, Boole-De Morgan algebras and quasi-De Morgan functions, *Communications in Algebra*, 42:11 (2014), pp. 4757–4777.
- 6 Yu. Movsisyan, V. Aslanyan, Super-De Morgan functions and free De Morgan quasilattices, *Central European Journal of Mathematics*, 12 (2014), no. 12, pp. 1749–1761.
- 5 Yu. Movsisyan, V. Aslanyan, Super-Boolean functions and free Boolean quasilattices. *Discrete Math. Algorithms Appl.* 6 (2014), no. 2.
- 4 Yu. Movsisyan, V. Aslanyan, De Morgan functions and free De Morgan algebras. *Demonstr. Math.* 47 (2014), no. 2, pp. 271–283.
- 3 Yu. Movsisyan, V. Aslanyan, Subdirectly irreducible algebras with hyperidentities of the variety of De Morgan algebras, *Journal of Contemporary Mathematical Analysis*, 48 (2013), no. 6, pp. 241–246.

- 2 Yu. Movsisyan, V. Aslanyan, Algebras with hyperidentities of the variety of De Morgan algebras, *Journal of Contemporary Mathematical Analysis*, 5 (2013), no. 5, pp. 233–240.
- 1 Yu. Movsisyan, V. Aslanyan, Hyperidentities of De Morgan algebras, *Logic Journal of the IGPL*, 20(2012), pp. 1153–1174.

## Conference and seminar talks

- 16 Jun 2020 Berkeley model theory seminar, UC Berkeley, USA, “Blurrings of the  $j$ -function”
- 15 Apr 2020 Number Theory learning seminar, UC Berkeley, USA, “Introduction to the Zilber-Pink conjecture”
- 11 Dec 2019 SEEMOD, Imperial College London, UK, “Strongly minimal sets in  $j$ -reducts of differentially closed fields”
- 11 Nov 2019 Pure mathematics seminar, UEA, UK, “A remark on atypical intersections”
- 7 Nov 2019 Logic Seminar, Oxford, UK, “Functional Modular Zilber-Pink with Derivatives”
- 9 Apr 2019 Logic Seminar, CMU, USA, “The Conjecture on Intersections with Tori”
- 26–29 Jun 2018 Around Functional Transcendence, University of Oxford, UK, “Weak Modular Zilber-Pink with Derivatives”
- 16–19 May 2018 ASL North American Annual Meeting, WIU, USA, “Ax-Schanuel and strongly minimal sets in reducts of differentially closed fields”
- 17 Apr 2018 Logic Seminar, CMU, USA, “Geometry of strongly minimal sets in differentially closed fields”
- 14 Nov 2017 Logic Seminar, UIUC, USA, “Ax-Schanuel and Strong Minimality”
- 23 Oct 2017 Model Theory Seminar, CMU, USA, “Schanuel’s conjecture and the Ax-Schanuel theorem”
- 23 Oct 2017 Logic Seminar, CMU, USA, “Schanuel’s conjecture, pseudo-exponentiation and Ax’s theorem”
- 13 Oct 2017 Kolchin Seminar in Differential Algebra, CUNY, USA, “Ax-Schanuel and Strong Minimality”
- 20 Feb 2017 Pure Mathematics Research Seminar, UEA, UK, “Ax-Schanuel and existential closedness for the  $j$ -function”
- 6 Jul 2016 SEEMOD, University of Oxford, UK, “Ax-Schanuel type theorems and geometry of strongly minimal sets in  $DCF_0$ ”
- 13 Apr 2016 Logic seminar, University of Manchester, UK, “Ax-Schanuel for linear differential equations”
- 4 Feb 2016 Logic advanced class, University of Oxford, UK, “Definability of derivations in the reducts of differentially closed fields, II”
- 30 Apr 2015 Logic advanced class, University of Oxford, UK, “Definability of derivations in the reducts of differentially closed fields, I”
- 7–9 Jan 2015 British Postgraduate Model Theory Conference, Oxford, UK, “Ax-Schanuel type theorems in differential fields”

- 23 Oct 2014 Logic advanced class, University of Oxford, UK, "Ax-Schanuel type inequaities in differential fields"
- 5 Jun 2014 Logic advanced class, University of Oxford, UK, "The problem of definability of the ring of integers in number fields (after Poonen)"
- 11 Feb 2014 Logic advanced class, University of Oxford, UK, "A survey of the theory of differentially closed fields, II"
- 1–3 Nov 2012 Mathematical Logic and Applications, Yerevan, Armenia, "Hyperidentities of De Morgan algebras"

## Teaching Experience

- 2019 **University of East Anglia**
- Autumn 2019 Model Theory
- 2017–2019 **Carnegie Mellon University**
- Spring 2019 Linear Algebra
- Fall 2018 Number Theory
- Spring 2018 Abstract Algebra
- Fall 2017 Number Theory
- 2013–2017 **University of Oxford**
- Hilary 2017 Algebraic Number Theory tutor
- Michaelmas 2016 Logic and Analytic Number Theory tutor
- Trinity 2016 Model Theory, Galois Theory, Algebraic Number Theory consultation sessions
- Hilary 2016 Algebraic Number Theory tutor
- Michaelmas 2015 Model Theory tutor, Analytic Number Theory teaching assistant
- Trinity 2015 Model Theory and Galois Theory consultation sessions
- Hilary 2015 Algebraic Number Theory teaching assistant
- Michaelmas 2014 Model Theory tutor, Galois Theory teaching assistant
- Hilary 2014 Set Theory teaching assistant
- Michaelmas 2013 Model Theory teaching assistant

## Languages

- Armenian native
- English fluent
- Russian advanced