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 algebra (including differential algebra), geometry and number theory.
- In the past I did research in universal algebra, in particular, I explored the first and second order properties of De Morgan algebras.

Employment

2019 – present **Senior Research Associate**, *School of Mathematics, University of East Anglia*, 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, Awards and Grants

2019 Emil Artin Junior Prize in Mathematics

2016–2017 AGBU UK Scholarship

2015 LMS research grant 81308 for co-organising the British Postgraduate Model Theory Conference

2013–2017 Luys Scholarship

2013–2016 Dulverton Scholarship, University of Oxford

2012–2013 Nominal Fellowship Djrbashian 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

Preprints

1 V. Aslanyan, J. Kirby, V. Mantova, A geometric approach to some systems of exponential equations, arXiv:2105.12679 (2021), pp. 1–34.

Publications

19 V. Aslanyan, Adequate predimension inequalities in differential fields, To appear in *Annals of Pure and Applied Logic* arXiv:1803.04753 (2021), pp. 1–49.

18 V. Aslanyan, J. Kirby, Blurrings of the j-function, *Quarterly Journal of Mathematics*, arXiv:2005.10167, https://doi.org/10.1093/qmath/haab037 (2021), pp. 1–16.

17 V. Aslanyan, S. Eterović, J. Kirby, A closure operator respecting the modular j-function, To appear in *Israel Journal of Mathematics*, arXiv:2010.00102 (2021), pp. 1–28.

16 V. Aslanyan, Weak Modular Zilber-Pink with Derivatives, *Mathematische Annalen*, arXiv:1803.05895, https://doi.org/10.1007/s00208-021-02213-7 (2021), pp. 1–38.

15 V. Aslanyan, Some remarks on atypical intersections, *Proceedings of the AMS*, arXiv:1905.00827, https://doi.org/10.1090/proc/15611 (2021), pp. 1–15.

14 V. Aslanyan, S. Eterović, J. Kirby, Differential Existential Closedness for the j-function, *Proceedings of the AMS*, 149:4 (2021), pp. 1417-1429.

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 quasi-lattices. *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

9 Jun 2021 Models and Sets, University of Leeds, UK, "A geometric approach to some systems of exponential equations"

11 Mar 2021 Logic seminar, Università degli Studi della Campania Luigi Vanvitelli, Italy, "A geometric approach to certain systems of exponential equations"

1 Mar 2021 Online seminar: Topological and Differential Expansions of O-minimal Structures, "Blurrings of the j-function", Recording available here.

25 Nov 2020 Manchester logic seminar, University of Manchester, UK, "Blurrings of the j-function"

24 Nov 2020 LMS Online Lecture Series: An Excursion Into Model Theory and Its Applications, "Introduction to o-minimality and applications". Recording available here.

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

2019-2021	**University of East Anglia**
Spring 2021	Number Theory
Autumn 2020	LMS online lecture series in Model Theory
Autumn 2019	Mathematical Logic
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