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Vahagn Aslanyan

Research Interests

- My research interests are in model theory, a branch of mathematical logic, and its applications in number theory, geometry, algebra (including differential algebra), and analysis.
- 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 – 2022 **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

2021 LMS Research in Pairs grant 42106 for collaborating with Chris Daw at the University of Reading

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

Service

2020 – present UEA pure mathematics seminar co-organiser

2020 Co-organiser of the SEEMOD meeting at UEA (cancelled due to Covid-19)

2018 – present Grant reviewer for Science Committee of Armenia

2017 – present Reviewer for Selecta Mathematica, Journal of LMS, Mathematical Reviews, zbMATH, etc.

2015 British Postgraduate Model Theory conference co-organiser

Publications

20 V. Aslanyan, J. Kirby, V. Mantova, A geometric approach to some systems of exponential equations, *International Mathematics Research Notices*, arXiv:2105.12679, https://doi.org/10.1093/imrn/rnab340 (2021), pp. 1–34.

19 V. Aslanyan, Adequate predimension inequalities in differential fields, *Annals of Pure and Applied Logic*, arXiv:1803.04753, https://doi.org/10.1016/j.apal.2021.103030 (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 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

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**

Mathematical Logic, Number Theory, LMS online lecture series in Model Theory

2017–2019 **Carnegie Mellon University**

Number Theory × 2, Abstract Algebra, Linear Algebra

2013–2017 **University of Oxford**

Model Theory, Algebraic Number Theory, Analytic Number Theory, Galois Theory, Logic, Set Theory

Languages

Armenian, English, Russian