Davit(David) Harutyunyan

Employment

2017– **Assistant Professor, Math. Department, University of California Santa Barbara.**
Email: harutyunyan@ucsb.edu
Office: South Hall 6504

2016-2017 Postdoctoral Associate, EPFL, Lausanne, Switzerland.
2013-2016 Research Assistant Professor, University of Utah.
2011-2013 Postdoctoral Research Assistant Professor, Temple University.

Education

June 2012 **Ph.D.** Hausdorff Center for Mathematics, University of Bonn, Germany
Supervisor: Prof. Stefan Müller
2005-2006 **M.S.,** University of Fribourg, Faculty of Mathematics, Fribourg, Switzerland
2006 **M.S.,** Yerevan State University, Faculty of Mathematics, Yeravan, Armenia
2004 **B.S.,** Yerevan State University, Faculty of Mathematics, Yerevan, Armenia

Research Interests

Applied Analysis and Applied Mathematics: Partial Differential Equations, Calculus of Variations, Continuum Mechanics (Elasticity), Materials Science, Composite Materials, Metamaterials, Micromagnetics.

Selected Awards and Honors

2018 **Emil Artin Junior Prize in Mathematics,** American Mathematical Society
2018 **Regent's Junior Faculty Fellowship**, University of California Santa Barbara
2016 **Outstanding Postdoc Award,** University of Utah
2007–2009 **MULTIMAT Fellowship**, Max-Planck Institute for Mathematics, Leipzig, Germany
2005 **Best Student of Yerevan State University Award,** Yerevan State University
2000 **Republic of Armenia Government House Medal,** awarded by the Prime-Minister of Republic of Armenia for outstanding achievements as a high-school student

2005 **Gold Medal** at the 10th International Scientific Mathematical Olympiad
2000 **Silver Medal** at the 41st International Mathematical Olympiad
1999 **Bronze Medal** at the 40th International Mathematical Olympiad
1998 **Bronze Medal** at the 39th International Mathematical Olympiad

Grants

2018-2021 **NSF Individual grant, DMS-1814361** ($154,276), PI

Publications and Preprints

31. D. Harutyunyan. On the L^2 to L^p passage in sharp Geometric Rigidity Estimates and Korn inequalities in thin domains. In preparation (2020).
30. D. Harutyunyan and H. Mikayelyan. Fractional Hardy and Korn inequalities in bounded simplexes. In preparation (2020)
29. D. Harutyunyan. On the preferred localization of deformations at vanishing curvature points on thin shells. In preparation (2020).
28. Zh. Avetisyan, **D. Harutyunyan,** and N. Hovsepyan. The linear rigidity of a thin domain depends on the curvature, size, and boundary conditions. In revision in *Appl. Math. Opt.*, (2020).
27. D. Harutyunyan. On the geometric rigidity interpolation estimate in thin bi-Lipschitz domains. *C. R. Acad. Sci. Paris, Ser. I.*, in revision 2020.
https://arxiv.org/abs/1902.03311
26. D. Harutyunyan. The Sharp L^p Korn interpolation and second inequalities in thin domains, *SIAM J. Math. Anal.,* in revision, 2020. https://arxiv.org/abs/1809.04439
25. D. Harutyunyan. The asymptotically sharp geometric rigidity interpolation estimate in thin bi-Lipschitz domains. *Journal of Elasticity*, in revision 2020. https://arxiv.org/abs/1902.03311
24. D. Harutyunyan and H. Mikayelyan. On the $L^\infty-$maximization of the solution of Poisson's equation: Brezis-Galouet-Wainger type inequalities and applications. *Proceedings of the Royal Society Edinburgh A,* Published online by Cambridge University Press: 20 February 2020. DOI: https://doi.org/10.1017/prm.2020.
23. D. Harutyunyan. A note on the extreme points of the cone of quasiconvex quadratic forms with orthotropic symmetry. *Journal of Elasticity,* 09 January, 2020, pp. 1–15.
22. D. Harutyunyan and H. Mikayelyan. Weighted asymptotic Korn and interpolation Korn inequalities with singular weights. *"Proceedings of the AMS",* 147 (2019), 3635–3647.
21. D. Harutyunyan. On the Korn interpolation and second inequalities in thin domains, *SIAM J. Math. Anal.,* 50(5), 4964–4982, 2018.
20. D. Harutyunyan. The asymptotically sharp Korn interpolation and second inequalities for shells. *C. R. Acad. Sci. Paris, Ser. I.,* Vol. 356, Iss. 5, May 2018, pp. 575–580.
19. D. Harutyunyan. When the Cauchy inequality becomes a formula, *Amer. Math. Month.* 125:9, pp. 835–838, 2018.
18. D. Harutyunyan. Gaussian curvature as an identifier of shell rigidity. *Arch. Ration. Mech. Anal.,* Vol. 226, Iss. 2, pp. 743–766, 2017.
17. G.W. Milton, **D. Harutyunyan**, and M. Briane. Towards a complete characterization of effective elasticity tensors of mixtures of an elastic phase and an almost rigid phase, *Math. Mech. Compl. Syst.,* 5(1), 95–113, 2017.
16. G.W. Milton, M. Briane and **D. Harutyunyan**. On the possible effective elasticity tensors of 2-dimensional and 3-dimensional printed materials. *Math. Mech. Compl. Syst.,* Vol. 5, No. 1, 41–94, 2017.
15. D. Harutyunyan. Quantitative anisotropic isoperimetric and Brunn-Minkowski inequalities for convex sets with improved defect estimates. *ESAIM: COCV,* 24(2), (2018) pp. 479–494.
14. Y. Grabovsky and **D. Harutyunyan**. Korn inequalities for shells with zero Gaussian curvature. *Annal. d'Inst. Henry Poincaré (C) Anal. Non Lin.,* Vol. 35, Iss. 1 (2018), pp. 267–282.
13. D. Harutyunyan. Sharp weighted Korn and Korn-like inequalities and an application to washers. *J. Elasticity,* Vol. 127, Iss. 1, pp 59–77, 2017.
12. D.Harutyunyan, G.W. Milton and R.V. Craster. High Frequency Homogenization for traveling waves in periodic media. *Proc. Roy. Soc. London, A.* Published 13 July 2016. DOI: 10.1098/rspa.2016.0066
11. D. Harutyunyan and G.W. Milton. Towards characterization of all 3×3 extremal quasiconvex quadratic forms. *Comm. Pure Appl. Math.,* Vol. 70, Iss. 11, pp. 2164–2190, 2017.

10. D.Harutyunyan, G.W. Milton, J.Boyer and T.Dick. On ideal dynamic climbing ropes. *Proc. Inst. Mech. Engin. P: J. Sports Engin. Tech.* 2016, DOI: 10.1177/1754337116653539
9. D. Harutyunyan and G.W. Milton. On the relation between extremal elasticity tensors with orthotropic symmetry and extremal polynomials. *Arch. Ration. Mech. Anal.,* Vol. 223, Iss. 1, pp 199–212, 2017.
8. Y. Grabovsky and **D. Harutyunyan**. Scaling instability in the buckling of axially compressed cylindrical shells. *J. Nonl. Sci.*, Vol. 26, Iss. 1, pp. 83-119, Feb. 2016.
7. D. Harutyunyan. On the existence and stability of minimizers in ferromagnetic nanowires. *J. Math. Anal. Appl.,* Vol. 434, Iss. 2, pp. 1719-1739. 15 Feb. 2016.
6. Y. Grabovsky and **D. Harutyunyan**. Rigorous derivation of the formula for the buckling load in axially compressed circular cylindrical shells. *J. Elasticity,* 120(2), pp. 249-276, 2015.
5. D. Harutyunyan and G.W. Milton. Explicit examples of extremal quasiconvex quadratic forms that are not polyconvex. *Calc. Var. PDE,* October 2015, Volume 54, Issue 2, pp 1575-1589.
4. D. Harutyunyan. New asymptotically sharp Korn and Korn-like inequalities in thin domains. *J. Elasticity,* 117(1), pp. 95-109, 2014.
3. Y. Grabovsky and **D.Harutyunyan**. Exact scaling exponents in Korn and Korn-type inequalities for cylindrical shells. *SIAM J. Math. Anal.*, 46(5), pp. 3277–3295, 2014.
2. D. Harutyunyan. Scaling laws and the rate of convergence in thin magnetic films. *J. Math. Anal. Appl.*, 420(2), pp. 1744–1761, 2014.
1. D. Harutyunyan. On the number of arrangements of n-ary brackets. *Lomonosov 2002 proceedings*, 2002.
0. D. Harutyunyan. On the G-convergence of the energies and the convergence of almost minimizers in infinite magnetic cylinders. Dissertation, *published online in 2012 in Universitäts und Landesbibliothek Bonn,* http://hss.ulb.uni-bonn.de/2012/2886/2886.htm

Referreing Service

2020	NSF DMS Panelist
2019	NSF DMS Panelist
2018-2019	Reviewer for Germany-Israeli Scientific Research and Development Program

2014- Reviewer for:
1. Analles d'Institute Henri Poincare (C)
2. Annali di Matematica Pura ed Applicata
3. Archive for Rational Mechanics and Analysis
4. ESAIM: Control, Optimization and Calculus of Variations.
5. Journal of Elasticity
6. Journal of Mathematical Analysis and Applications
7. Journal of Optimization Theory and Applications
8. Mathematical and Computational Applications
9. Meccanica
10. Nonlinearity
11. Proceedings of the Royal Society Edinburgh A
12. Research in the Mathematical Sciences
13. Siam Journal of Applied Mathematics

Languages

Armenian(native), English, Russian, German.