

Curriculum Vitae

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Personal Details

Name, Nansen, Petrosyan
Surname

Education

- 2001–2006 **Ph.D, Mathematics with High Distinction**, *University of Wisconsin, Madison, WI.*
THESIS
title *Jumps in cohomology of groups, periodicity, and semidirect products*
supervisor Prof. Alejandro Adem
- 1997–2000 **BS, Mathematics with High Distinction**, *Brigham Young University, Provo, UT.*

Employment

- 2017–present **Associate Professor in Mathematics**, *University of Southampton, Southampton, UK.*
- 2013–2017 **Lecturer in Mathematics**, *University of Southampton, Southampton, UK.*
- 2012–2013 **Postdoctoral Research Assistant**, *K.U.Leuven, Kortrijk, Belgium.*
- 2009–2012 **FWO Postdoctoral Fellow**, *K.U.Leuven, Kortrijk, Belgium.*
- 2007–2009 **Postdoctoral Researcher**, *K.U.Leuven, Kortrijk, Belgium.*
- 2006–2007 **Visiting Assistant Professor**, *Indiana University, Bloomington, IN.*

Visiting Positions

- April, 2013 **Researcher**, *University of Gdansk, Gdansk, Poland.*
host Prof. Andrzej Szczepański
- March, 2012 **Researcher**, *Max Planck Institute, Bonn, Germany.*
- May, 2010
- May, 2009 **Researcher**, *University of Neuchatel, Neuchatel, Switzerland.*
host Prof. Alain Valette
- Jan–June, 2005 **Researcher**, *University of British Columbia, Vancouver, Canada.*
host Prof. Alejandro Adem

Awards, Grants, and Honors

- 2019 **Conference Grant, 4,300£**, *LMS.*
PROJECT
title *Southampton-Bielefeld Geometric Group Theory Meeting*

2016–2018 **First Grant, 125,000£**, EPSRC, EP/N033787/1.

PROJECT

title *Classifying spaces for proper actions and almost-flat manifolds*

2010–2014 **Research Grant, 300,000€**, K.U.Leuven, OT/10/029.

PROJECT

title *The study of crystallographic actions and the corresponding orbit manifolds by creating and exploiting connections between the geometrical, topological, group theoretical and Lie algebraic aspects involved*

joint with Prof. Karel Dekimpe and Prof. Paul Igodt

2009–2012 **FWO Postdoctoral Fellowship**, Research Foundation of Flanders.

PROJECT

title *The study of group actions on manifolds and Lie groups, with special emphasis on generalized Auslander and Talelli conjectures*

2008 **The Emil Artin Junior Prize in Mathematics**, AMS, for “Jumps in cohomology and free group actions”, *Journal of Pure and Applied Algebra* 210 (2007), 695–703.

Publications

1. T. Jarvis, W. Lang, G. Rimmasch, J. Roger, N. Petrosyan, and E. Summers. Classification of singular fibres of rational elliptic surfaces in characteristic three. *Communications in Algebra*, 33:1–34, 2005.
2. N. Petrosyan. Jumps in cohomology of groups. *Mathematics in Higher School*, 2(1):11–15, 2006. Ministry of Education and Sciences of Republic of Armenia.
3. N. Petrosyan. Jumps in cohomology and free group actions. *Journal of Pure and Applied Algebra*, 210:695–703, 2007.
4. A. Adem, J. Ge, J. Pan, and N. Petrosyan. Compatible actions and cohomology of crystallographic groups. *Journal of Algebra*, 320:341–353, 2008.
5. N. Petrosyan. Cohomology of split group extensions and characteristic classes. *Journal of Algebra*, 321:2916–2925, 2009.
6. K. Dekimpe and N. Petrosyan. Homology of Hantzsche-Wendt groups. *Contemporary Mathematics, AMS*, 501:87–103, 2009.
7. D. Dreesen and N. Petrosyan. Fiberwise volume non-increasing diffeomorphisms on product manifolds. *Geometriae Dedicata*, 149:417–424, 2010.
8. D. Degrijse and N. Petrosyan. Characteristic classes for cohomology of split Hopf algebra extensions. *Journal of Algebra*, 332:366–385, 2011.
9. D. Degrijse and N. Petrosyan. On cohomology of split Lie algebra extensions. *Journal of Lie Theory*, 22(1):1–15, 2012.
10. F. Dembegioti, N. Petrosyan, and O. Talelli. Intermediaries in Bredon (co)homology and classifying spaces. *Publicacions Matemàtiques*, 56(2):393–412, 2012.
11. A. Adem, K. Dekimpe, N. Petrosyan, and B. Putrycz. On generators of crystallographic groups and actions on flat orbifolds. *Journal of Group Theory*, 15(4):553–561, 2012.

12. N. Petrosyan and B. Putrycz. On cohomology of crystallographic groups with cyclic holonomy of split type. *Journal of Algebra*, 367(1):237–246, 2012.
13. D. Degrijse and N. Petrosyan. Commensurators and classifying spaces with virtually cyclic stabilizers. *Groups, Geometry, and Dynamics*, 7(3):543–555, 2013.
14. D. Degrijse and N. Petrosyan. \mathfrak{F} -structures and Bredon-Galois cohomology. *Applied Categorical Structures*, 21:545–586, 2013.
15. D. Degrijse and N. Petrosyan. Geometric dimension of groups for the family of virtually cyclic subgroups. *Journal of Topology*, 3(7):697–726, 2014.
16. K. Dekimpe and N. Petrosyan. Crystallographic actions on contractible algebraic manifolds. *Transactions of the American Mathematical Society*, 367(4):2765 – 2786, 2015.
17. N. Petrosyan. Action-induced nested classes of groups and jump (co)homology. *Forum Mathematicum*, 27(3):1591–1612, 2015.
18. D. Degrijse, R. Köhl, and N. Petrosyan. Classifying spaces with virtually cyclic stabilizers for linear groups. *Transformation Groups*, 20(2):381– 394, 2015.
19. D. Degrijse and N. Petrosyan. Bredon cohomological dimensions for groups acting on CAT(0)-spaces. *Groups, Geometry, and Dynamics*, 9(4):1231–1265, 2015.
20. A. Gasiór, N. Petrosyan, and A. Szczepanski. Spin structures on almost-flat manifolds. *Algebraic & Geometric Topology*, 16(2):783–796, 2016.
21. B. Nucinkis and N. Petrosyan. Complete Bredon cohomology and its applications to hierarchically defined groups. *Mathematical Proceedings of the Cambridge Philosophical Society*, 161(1):143–156, 2016.
22. I. J. Leary and N. Petrosyan. On dimensions of groups with cocompact classifying spaces for proper actions. *Advances in Mathematics*, 311:730–747, 2017.
23. R. Lutowski, N. Petrosyan, and A. Szczepanski. Classification of spin structures on 4-dimensional almost-flat manifolds. *Mathematika*, 64:253–266, 2018.
24. B. Nucinkis and N. Petrosyan. Hierarchically cocompact classifying spaces for mapping class groups of surfaces. *Bulletin of the London Mathematical Society*, 50:569–582, 2018.
25. R. Lutowski, N. Petrosyan, J. Popko, and A. Szczepanski. Spin structures of flat manifolds of diagonal type. *Homology, Homotopy and Applications*, 2:333–344, 2019.
26. N. Petrosyan and T. Prytula. Bestvina complex for group actions with a strict fundamental domain. *Groups, Geometry, and Dynamics*. To appear, available at math arXiv.
27. N. Petrosyan. Decomposing groups by codimension-1 subgroups. Available at math arXiv.

Invited Lectures

2 Feb, 2005 University of British Columbia Topology Seminar

- Periodicity and Jumps in Cohomology of Groups*
- 13 Feb, 2006 University of Wisconsin Group Theory Seminar
R-Torsion-Free Groups and Group Cohomology
- 26 July, 2006 University of British Columbia Topology Seminar
 \mathbb{Z}/k -Equivariant Cohomology of the n -Torus and Group Cohomology
- 6 Sep, 2006 Indiana University Topology Seminar
Hirsch Rank and Actions of Solvable Groups
- 3 Oct, 2006 McMaster University Geometry & Topology Seminar
Compatible Actions and Cohomology of Semidirect Products
- 17 Mar, 2007 1025th AMS Meeting, Miami University, Oxford, OH
Toroidal Orbifolds and Cohomology of Semidirect Products
- 12 Apr, 2007 SUNY Binghamton University Geometry/Topology Seminar
Jumps in Cohomology of Groups and Group Actions
- 29 May, 2008 Discrete Groups and Geometric Structures, with Applications III, Kortrijk, Belgium
Homology of Hantzsche-Wendt Groups
- 12 Jun, 2008 Conference on Algebraic and Geometric Topology, Gdansk, Poland
Cohomology of Split Group Extensions and Characteristic Classes
- 31 Oct, 2008 University of Duisburg-Essen Number Theory Seminar, Essen, Germany
Equivariant Cohomology and Cohomology of $SL_2(\mathbb{Z})$
- 5 Dec, 2008 K.U.Leuven Departmental Colloquium, Leuven, Belgium
An Evolution of the Topological Spherical Space Form Problem
- 28 Jan, 2009 Catholic Univ. of Louvain-la-Neuve, Alg. Topology Seminar, Louvain-la-Neuve, Belgium
Cohomology of Split Group Extensions and Characteristic Classes
- 12 May, 2009 University of Neuchatel Groups and Operator Algebras Seminar, Neuchatel, Switzerland
New Classes of Action Induced Nested Groups
- 27 Jan, 2010 Master Class on von Neumann Algebras and Group Actions, Copenhagen, Denmark
New Action Induced Nested Classes of Groups and Jump (Co)homology
- 17 Jan, 2011 University of Athens Algebra Seminar, Athens, Greece
Crystallographic Groups and Their Actions
- 6 May, 2011 University of Southampton Pure Mathematics Seminar, Southampton, UK
Crystallographic Groups and Generalizations
- 13 May, 2011 University of Lille Geometry/Dynamics Seminar, Lille, France
Crystallographic Actions on Contractible Algebraic Manifolds
- 30 May, 2011 Discrete Groups and Geometric Structures, with Applications IV, Oostende, Belgium
Crystallographic Actions on Contractible Algebraic Manifolds
- 23 Aug, 2011 Homotopical Approaches to Group Actions, Copenhagen, Denmark
Cohomology of Crystallographic Groups with Cyclic Holonomy of Split Type
- 7 Mar, 2012 UCL - Université catholique de Louvain, Louvain-la-Neuve, Belgium
I: Crystallographic actions on contractible algebraic manifolds II: Classifying spaces for the family of virtually cyclic subgroups

- 29 Mar, 2012 Université libre de Bruxelles (ULB), Brussels, Belgium
I: Crystallographic actions on contractible algebraic manifolds II: Classifying spaces for the family of virtually cyclic subgroups
- 10 Apr, 2013 University of Gdansk Topology Seminar, Gdansk, Poland
Algebraic Crystallographic Groups
- 20 Aug, 2013 Geometric and Cohomological Group Theory, Durham Symposium, UK
Bredon finiteness properties of groups acting on $CAT(0)$ -spaces
- 19 Sep, 2014 The First Joint Meeting of DMV-PTM, Poznań, Poland
Spin structures on almost-flat manifolds
- 17 Nov, 2014 University of Copenhagen Topology Seminar, Copenhagen, Denmark
Groups with cocompact classifying spaces for proper actions and a question of K. S. Brown
- 9 Dec, 2014 Royal Holloway, University of London Pure Math Colloquium, UK
Groups with cocompact classifying spaces for proper actions and a question of K. S. Brown
- 4 Nov, 2015 University of Sheffield, Pure Math Colloquium, UK
Dimensions of discrete groups and Brown's question
- 15 Dec, 2015 Aspects of Homotopy Theory, LMS South West & South Wales Regional Meeting and Associated Workshop, LMS 150th anniversary, Southampton, UK
Spin structures on almost-flat manifolds
- 16 Mar, 2016 North British Geometric Group Theory Seminar, Edinburgh, UK
Dimensions of discrete groups: from the Eilenberg-Ganea Conjecture to Brown's question and back
- Jun 15, 2016 Workshop "Group Actions - Classical and Derived", The Fields Institute for Research in Mathematical Sciences, Toronto, Canada
Dimensions of discrete groups: from the Eilenberg-Ganea Conjecture to Brown's question and back
- 7 Nov, 2016 University of Southampton, Topology Seminar, Southampton, UK
Dimensions of discrete groups and Brown's question
- 14 Nov, 2016 University of Aberdeen Topology Seminar, Aberdeen, UK
Dimensions of discrete groups and Brown's question
- 22 Feb, 2017 University of Glasgow Algebra Seminar, Glasgow, UK
Dimensions of discrete groups and Brown's question
- 13 Jul, 2017 Workshop "Homological Algebra and Topological Groups", University of Southampton, Southampton, UK
Virtually polycyclic groups are nil-affine crystallographic
- 26 Nov, 2018 University of Southampton, Topology Seminar, Southampton, UK
Groups acting on contractible complexes with a strict fundamental domain
- 9 Apr, 2019 British Mathematical Colloquium, Lancaster University, UK
Classifying spaces of groups, strict fundamental domains and Bredon cohomology
- 14 Feb 2020 "Manifolds and groups", Oberwolfach Workshop, Oberwolfach, Germany

Topological spines, minimal realisations and cohomology of strictly developable simple complexes of groups

25 May, 2020 “Polyhedral Products in Geometric Group Theory”, Workshop, The Fields Institute for Research in Mathematical Sciences, Toronto, Canada

Topological spines, minimal realisations and cohomology of strictly developable simple complexes of groups

Teaching Experience

- 2002-2004 University of Wisconsin, Math 113: *Trigonometry*
- Spring, 2006 University of Wisconsin, Math 101: *Intermediate Algebra*
- Fall, 2006 Indiana University, Math D116: *Introduction to Finite Math I*
- Fall, 2006 Indiana University, Math K310: *Statistical Techniques*
- Spring, 2007 Indiana University, Math D117: *Introduction to Finite Math II*
- 2007–2008 K.U.Leuven Campus Kortrijk, GOA09B: *Research Seminar in Algebra and Topology*
- Spring, 2009 K.U.Leuven, GOA01A: *Advanced Algebra, Topology and Algebraic Geometry with Applications in Number Theory*
- title Group Actions on Topological Spaces
- 2009–2010 K.U.Leuven, G0B63A: *Capita Selecta*
- title Introduction to Group Cohomology
- Fall, 2012 K.U.Leuven, X0A33a: *Geometry I*
- Spring, 2013 K.U.Leuven, *Differential Topology*
- 2015-2017 University of Southampton, Math 1056: *Multivariable Calculus*
- Spring, University of Southampton, Math 6079: *Hyperbolic Geometry*
- 2016-present

Students

- Kevin Li**, PhD, 2022, expected.
- DOCTORAL THESIS
- title *Bounded cohomology of groups*
- Ho Yiu Chung**, PhD, 2020, expected.
- DOCTORAL THESIS
- title *Bieberbach groups and fibering flat manifolds of diagonal type*
- Ana Lopes Onorio**, PhD, 2018.
- DOCTORAL THESIS
- title *Relative ends and splittings of groups*
- Dieter Degrijse**, PhD, March 2013.
- DOCTORAL THESIS
- title *Cohomology of split extensions and classifying spaces for families of subgroups*
- Jeroen Wynen**, MS in Mathematics, 2013.
- MASTER THESIS
- title *The construction of buildings and the correspondence with groups*

Conference Co-organizer

May 26-May 30 2008 **Discrete Groups and Geometric Structures, with Applications III**, Kortrijk, Belgium.

May 30-June 2 2011 **Discrete Groups and Geometric Structures, with Applications IV**, Oostende, Belgium.

Homepage: <http://www.kuleuven-kortrijk.be/workshop>

joint with Frank De Clerck, Karel Dekimpe, Yves Félix, and Paul Igodt

Service

- referee **Algebraic & Geometric Topology.**
- referee **Archiv der Mathematik.**
- referee **Mathematische Annalen.**
- referee **Homology, Homotopy and Applications.**
- referee **Groups, Geometric, and Dynamics.**
- referee **International Mathematics Research Notices.**
- referee **The Israel Journal of Mathematics.**
- referee **Osaka Journal of Mathematics.**
- referee **Pure and Applied Mathematics Quarterly.**
- referee **Bulletin of the Mexican Mathematical Society.**
- referee **International Journal of Algebra and Computation.**
- reviewer **Mathematical Reviews, AMS.**
- internal examiner **KU Leuven Doctoral Dissertation**, Sarah Wauters, 2013.
- internal examiner **University of Southampton Doctoral Dissertation**, Simon St. John-Green, 2014.

Languages

- Armenian fluent
- English fluent
- Russian fluent
- Dutch moderate