

CURRICULUM VITAE

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PERSONAL INFORMATION

Date of birth: April 4, 1974

Citizenship: Russian, Canadian

EDUCATION

Ph. D. in Mathematics, 1999 – 2002, University of Saskatchewan.

Advisor: A. Chigogidze

M. Sc. in Mathematics and Applied Mathematics (with distinction), 1991 – 1996,
Moscow State University. Advisor: V.V. Fedorchuk

GRANTS, AWARDS, SCHOLARSHIPS

- NSERC Discovery Grant, \$16,000/year, 2009 – 2014
- Nipissing University Research Achievement Award, \$5,000, 2009 – 2010
- NSERC Discovery Grant, \$9,000/year, 2004 – 2009
- Nipissing University Start-Up Research Grant, \$3,000, 2003 – 2004
- University of Saskatchewan Graduate Thesis Award in the Physical and Engineering Sciences, Spring 2002
- University Graduate Scholarship, 1999 – 2002, University of Saskatchewan
- Russian Foundation for Basic Research Grant, project no. 97-01-00357, 1996 – 1999
- I.G. Petrovsky Scholarship, 1994, Moscow State University, Moscow, Russia

RESEARCH

RESEARCH INTERESTS

General and Geometric Topology, Functional Analysis

PAPERS, PUBLISHED OR ACCEPTED IN REFEREED JOURNALS

1. *On metrizable remainders of locally compact noncompact connected separable metrizable spaces* (with V. Chatyrko), preprint.
2. *On homotopical and homological Z_n -sets* (with T. Banakh and R. Cauty), *Topology Proc.*, accepted.
3. *Generalized Cantor manifolds and homogeneity* (with P. Krupski, V. Valov, and V. Todorov), *Houston J. Math.*, accepted.
4. *Finite-to-one maps into Euclidean manifolds and spaces with disjoint disks properties* (with M. Tuncali and V. Valov), *Topology Appl.* 157 (2010) 779788.
5. *Equivalent metrics with some predetermined distances, and applications to spans* (with L. Hoehn), *Colloq. Math.* 114 (2009), no. 1, 135–153.
6. *Universal spaces, homotopy, and dimension of maps* (with V. Valov), *Modern Math. and its Appl.*, Georgian Acad. Sci. (in Russian); transl. in *J. Math. Sci.* 155, Issue 4 (2008).
7. *Michael's problem and weakly infinite-dimensional spaces*, *Topology Appl.* 155 (2008), no. 15, 1694–1698.
8. *Root closed function algebras on compacta of large dimension* (with N. Brodskiy, J. Dydak, and K. Kawamura), *Proc. Am. Math. Soc.* 135 (2007), 587–596.
9. *Extension dimension and quasi-finite CW-complexes* (with V. Valov), *Topology Appl.* 153 (2006), no. 17, 3241–3254.
10. *Universal absolute extensors in extension theory* (with V. Valov), *Proc. Amer. Math. Soc.* 134 (2006), no. 8, 2473–2478.
11. *On two problems in extension theory*, *Topology Appl.* 153 (2006), no. 10, 1609–1613.
12. *On commutative and noncommutative C^* -algebras with the approximate n -th root property* (with A. Chigogidze, K. Kawamura, and V. Valov), *Bull. Austral. Math. Soc.* 72 (2005), 197–212.
13. *The Urysohn identity for closed subsets of some nonmetrizable manifolds*, *Topology Proc.* 28 (2004), no. 2, 579–585.
14. *Real rank and squaring mapping for unital C^* -algebras* (with A. Chigogidze and M. Rordam). *Proc. Am. Math. Soc.* 132 (2004), 783–788.
15. *Topological model categories generated by finite complexes* (with A. Chigogidze). *Monatshefte für Mathematik* 139 (2003), no. 2, 129–150.

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16. *Approximations and selections of multivalued mappings of finite-dimensional spaces* (with N. Brodsky and A. Chigogidze). JP Journal of Geometry and Topology 2 (2002), no. 1, 29–73.
17. *On $[L]$ -homotopy groups*. JP Journal of Geometry and Topology 3 (2001), no. 3, 301–310.
18. *Topological semigroups and universal spaces related to extension dimension* (with A. Chigogidze and M. Zarichnyi). Mat. Stud. 16, no. 2 (2001), 195 – 198.
19. *An infinite-dimensional 4-manifold of finite cohomological dimension with the continuum hypothesis*. Mat. Zametki 66 (1999), no. 5, 664–670 (Russian); English translation in Mathematical Notes 66 (1999), no. 5.
20. *On the inductive dimension of subsets of some nonmetrizable manifolds*. Vestnik Moskov. Univ. Ser. I Mat. Mekh. (1997) no. 5, 11–14 (Russian).

INVITED PUBLICATIONS

21. *Topology in North Bay: some problems in continuum theory, dimension theory, and selections* (with V. Valov and M. Tuncali), a chapter in the “Open Problems in Topology II” (Edited by Elliott Pearl), 2007, Elsevier

THESES

22. *On extension dimension and $[L]$ -homotopy*. (2002) Ph.D. Thesis.
23. *On the inductive dimension of subsets of some nonmetrizable manifolds*. (1996) Ms.Sc. Thesis.

INVITED TALKS

- *Spans of continua*, Topology Seminar at the University of Tennessee, Knoxville. March, 2011.
- *Finite-to-one maps into Euclidean manifolds and spaces with disjoint disks properties*, International Conference on Topology and its Applications, June 26 – 30, 2010, Nafpaktos, Greece.
- *Equivalent metrics and the spans of graphs*, International Conference “Analysis, Topology and Applications”, June 21 – 25, 2010, Vrnjačka Banja, Serbia.
- *Michael’s problem and weakly infinite-dimensional Spaces*, International Conference “Analysis and Topology”, June 2 – 7, 2008, Ivan Franko National University of Lviv, Lviv, Ukraine.
- *Root closed function algebras on compacta of large dimension*, Spring Topology and Dynamics Conference, March 23 – 25, 2006, University of North Carolina at Greensboro, NC, USA

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- *On commutative and noncommutative C^* -algebras with the approximate n -th root property*, Topology Seminar at the University of Tennessee, Knoxville. April 11 – 15, 2005
- *Quasi-finite complexes and universal absolute extensors*, International Conference dedicated to P.S. Aleksandrov. May 2004. Moscow State University, Moscow, Russia
- *On two problems in extension theory*, Topology Seminar at the University of Tennessee, Knoxville. April 5 – 9, 2004

OTHER CONFERENCE PRESENTATIONS

- *Finite-to-one maps into Euclidean manifolds and spaces with disjoint disks properties*, 7th Annual Workshop on Topology, Analysis, and Math Education, May 18-22, 2009, Nipissing University, North Bay, Canada.
- *Michael's problem and weakly infinite-dimensional Spaces*, Spring Topology and Dynamics Conference, March 13 – 15, 2008, Milwaukee, Wisconsin, USA.
- *Root closed function algebras on compacta of large dimension*, International Conference on Topology and its Applications, June 23 – 26, 2006, Aegion, Greece.
- *Approximations and selections of multivalued mappings*, Canadian Mathematical Society Summer 2001 Meeting. Special Session: Geometric Topology. June 2001. University of Saskatchewan, Saskatoon, Canada
- *On L -homotopy groups*, International Conference dedicated to P.S. Aleksandrov. May 2000. Moscow State University, Moscow, Russia

PARTICIPATION IN COLLOQUIA AND SEMINARS

- Topology seminar, Nipissing University, North Bay, Canada (September 2003 – present)
- Topology seminar, University of Saskatchewan, Saskatoon, Canada (September 2000 – May 2003)
- P.S. Aleksandrov topology seminar, Moscow State University, Moscow, Russia (1992–1999)

LIST OF COLLABORATORS

Taras Banakh (Ivan Franko National Univ. of Lviv, Ukraine), Nikolay Brodskiy (U. of Tennessee), Robert Cauty (Université de Paris VI (Pierre et Marie Curie), France), Vitalij A. Chatyrko (Linköping University, Sweden), Alex Chigogidze (U. of North Carolina), Jerzy Dydak (U. of Tennessee), Logan Hoehn (U. of Toronto), Kazuhiro Kawamura (U. of Tsukuba, Japan), Pawel Krupski (University of Wrocław, Poland), Mikael Rordam (U. of Copenhagen, Denmark), Vladimir Todorov (U. for Architecture and Civil Engineering, Sofia, Bulgaria), Murat Tuncali (Nipissing U.), Vesko Valov (Nipissing U.), Michael Zarichnyi (Ivan Franko National Univ. of Lviv, Ukraine)

MEMBERSHIP

- American Mathematical Society

REFEREE

Colloquium Mathematicum

JP Journal of Geometry and Topology

Proceedings of the American Mathematical Society

Rocky Mountain Journal of Mathematics

Topology Proceedings

Topology and its Applications

TEACHING

TEACHING EXPERIENCE

- July 2003 – present: Associate Professor, Nipissing University.
Undergraduate courses taught: Calculus I&II, Discrete Mathematics II, Probability and Statistics I&II, Introduction to Computational Geometry, Problem Solving, History of Mathematics, Combinatorics and Graph Theory, Mathematics of Finance, and Topology.
Graduate courses taught: General Topology, Introduction to Algebraic Topology
- January 2002 – June 2003: Sessional Lecturer, University of Saskatchewan.
Courses taught: Intermediate Calculus, Calculus II, Calculus II for Engineers, Differential Equations, Euclidean Geometry, and Linear Algebra I.
- August 2002: Tutorial Leader, Math Readiness Course
- September 2000 – December 2002: Instructor, Mathematics and Statistics Help Centre, University of Saskatchewan
- September 1999 – April 2002: Teaching Assistant, University of Saskatchewan
- June 1997 – August 1999: Instructor (Microsoft Certified Trainer), IT Training Centre “Academy of Networking”, Moscow, Russia.
- Spring 1997: Instructor, Special seminar in Discrete Mathematics, Faculty of Economics, Moscow State University, Russia

GRADUATE STUDENTS SUPERVISED

- Jason Grandy (MRP, titled “The Additivity of Crossing Number with Respect to the Composition of Knots”, was successfully defended on August 26, 2010)

USRA STUDENTS SUPERVISED

- Jon Heindl (Project: “Aperiodic Tilings and Tiling Spaces”), Summer 2011.
- Jon Heindl (Project: “Z-sets in Hilbert Cube”), Summer 2010.
- Jon Heindl (Project: “Algebraic methods for distinguishing extension types”), Summer 2009.
- Jonathan Zimmerling (Project: “Homogeneous continua”), Summer 2008.
- Jonathan Zimmerling (Project: “Spans of continua”), Summer 2007.
- Brandon Brown (Project: “Lipschitz extensors”), Summer 2006.
- Natasha May (Project: “Asymptotic topology”), Summer 2005.

STUDENT RESEARCH PROJECTS SUPERVISED

Fall 2010 / Winter 2010

“Around Kuratowski’s Theorem” and “Number Theory” Jessica Bushell.

“Hilbert Cube Manifolds” and “Algebraic Topology” by Jon Heindl.

“Cryptography” and “Game Theory” by Steve Lauzon.

Fall 2009 / Winter 2010

“Hyperbolic Geometry” and “Fary’s Theorem and Kuratowski’s Theorem” by Alain Baxter.

“When Astronomy and Math Collide” by Stephanie Hicks.

“Maps and Mathematics” by Shannon Klawitter.

Fall 2008 / Winter 2009

“Markov Chains” and “Information Retrieval” by Krista Morrow.

“Hyperbolic Geometry and M.C. Escher” by Breanne King.

“The Prime Counting Function” by Richard Smith.

“Potentially Visible Set” by Rob Alkins.

Fall 2007 / Winter 2008

“Hyperbolic Geometry” and “Knot Theory” by Jason Grandy.

“Riemann Hypothesis” and “Multivariable Calculus” by Tomara Kaye.

Fall 2006 / Winter 2007

“Applications of Topology in Chemistry” and “Non-standard analysis” by Brandon Brown.

“Game Theory: Von Neumann’s Theorem” by Breann Duncan.

“Algebraic Graph Theory” by Cameron Hodgins.

“Cryptography” and “Rigorous Probability Theory and Mathematics of Finance” by Nick Mailloux.

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“Cryptography” and “Coding Theory” by Christopher Phillips

Fall 2005 / Winter 2006

“Algebraic Topology” by Kaitlyn Church.

“Hyperbolic Geometry” and “Computational Geometry” by Jill Lazarus.

Fall 2004 / Winter 2005

“Set Theory” and “The History of Non-Euclidean Geometry” by Natasha May.

“Chaotic Elections and Arrow’s Theorem” by David Briggs.

SERVICE

PARTICIPATION IN COMMITTEES AND SENATE

- Nipissing University Academic Senate(2011 – present)
- Graduate Studies Council (2009 – present)
- Nipissing University Faculty Review Committee (2009 – 2010)
- Research Achievement Award Selection Committee (2009 – 2010)
- Internal Research Grant Review Committee (2009 – 2010)
- University Research Council
- Academic Computing Committee (2006 – 2008)
- Concurrent Education Coordinating Committee (2005 – 2006)

ORGANIZATION OF WORKSHOPS AND CONFERENCES

- 9th Annual Workshop, May 16-20, 2011, Nipissing University, North Bay, Canada.
- Workshops on Recent Advances in Topological and Measure-Theoretic Methods in Dynamical Systems, May 17-22, 2010, Nipissing University, North Bay, Canada.
- Canadian Mathematical Society Summer 2009 meeting. Special session on Topological Algebra, Topology, and Functional Analysis. June 5-8 2009, Memorial University of Newfoundland, St. John’s, Canada.
- 7th Annual Workshop on Topology, Analysis, and Math Education, May 18-22, 2009, Nipissing University, North Bay, Canada.
- Fields Institute Workshop on Topological Methods in Algebra, Analysis and Dynamical Systems, May 2008, Nipissing University, North Bay, Canada.
- 5th Annual Workshop on General Topology and Related Areas, May 2007, Nipissing University, North Bay, Canada.
- 4th Annual Workshop on General Topology and Related Areas, May 2006, Nipissing University, North Bay, Canada.

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- Canadian Mathematical Society Summer 2005 meeting. Special session on General Topology and Its applications. June 2005, University of Waterloo, Waterloo, Canada.
- 3rd Annual Workshop on General and Geometric Topology, May 2005, Nipissing University, North Bay, Canada.

CURRICULUM DEVELOPMENT

- Participation in the development of an on-line version of MATH 1036 (Calculus I).
- Preparation (jointly with Mark Wachowiak) of two new course proposals: “Introduction to computational geometry” and “Advanced computational geometry” (offered in 2008/2009).
- Redesigning of the Calculus course (2005/2006).

OUTREACH ACTIVITIES

- Membership in the Nipissing University Mathematics Education Research and Information Council (NUMERIC)
- “Math Circles”
- Popular talks for high-school students (2005 – present; slides of some talks are available at <http://www.nipissingu.ca/faculty/alexandk/popular/popular.html> and on the CD, appended to the dossier)
 - *Quantum computing*, April 25, 2008, Widdifield Secondary School, North Bay.
 - *Why do we need more than three dimensions?*, October 19, 2007, Nipissing University.
 - *What is the Poincaré Conjecture?*, October 20, 2006, Nipissing University.
 - *Cryptography: from substitution cipher to RSA*, November 2005, Nipissing University.
 - A series of talks on complex numbers, Fall 2005, Nipissing University.
- Participation in the organization of the Math Fair, May 2008 and May 2009, Nipissing University.

OTHER ACTIVITIES

- Organization of a seminar for Math and Comp. Science majors (Fall 2008)
- Organization of the Pre-Calculus Camps (August 2006, August 2007, August 2008)
- Development of the Calculus website – Supervisor, Summer 2005 (<http://www.nipissingu.ca/calculus>)
- Development and maintenance of the Topology Research Group website (<http://www.nipissingu.ca/topology>)

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- Development and maintenance of the webpage for the Fields Institute Workshop on Topological Methods, May 2008
(<http://www.nipissingu.ca/topology/workshop2008/workshop08.html>)

OTHER

COMPUTER SKILLS

Microsoft Windows, Microsoft Office, Maple, MatLab, LaTeX, HTML, programming skills

INTERESTS AND HOBBIES

Chess, cross-country skiing, fishing, horseback riding, painting, photography, tennis