

# Curriculum Vitae of Igor Belegradek

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## Education:

- Ph.D. in Mathematics, University of Maryland, College Park, August 1998.
- M.S. in Mathematics with distinction, Novosibirsk State University (Russia), June 1991.

## PhD thesis work:

- Advisor: William M. Goldman.
- Thesis title: Counting negatively curved manifolds.

## Research Interests:

Geometry and Topology; global Riemannian geometry and geometric group theory.

## Positions:

- Associate Professor at Georgia Institute of Technology, 2008-present.
- Assistant Professor at Georgia Institute of Technology, 2003-2008.
- Taussky–Todd Instructor at California Institute of Technology, 2000-2003.
- Postdoctoral Fellow at McMaster University, Canada, 1998-2000.
- Visiting at Bar-Ilan University, Israel, May 1999.
- Visiting at University of Bielefeld, SFB 343, Germany, January 1997.

## Service:

- member of the Undergraduate Committee (Fall 2006-2008).
- member of the Faculty Advisory Committee (Spring 2005-Spring 2006).
- co-organizing (with I. Mineyev and J. Barnard) the Geometric Group Theory on the Gulf Conference ( $G^3$ ), March 2008 and April 2009 (supported by NSF DMS-0737851, Total \$76,050 for 3 years).
- co-organized (with M. Ghomi) the Riemannian Geometry Special Session at Joint AMS Meeting in Atlanta, January 2005.
- reviewer for NSF, and for Mathematical Reviews.
- referee for Journal of Differential Geometry, Pacific Journal of Mathematics, Topology and Applications; Inventiones Mathematicae; Differential Geometry and Applications, Geometry Dedicata, Acta Mathematica, Groups, Geometry and Dynamics, Geometric and Functional Analysis, Collectanea Mathematica.

## Grants and Awards:

- NSF grant # DMS-0804038, August 2008-present.
- NSF Conference grant DMS-0737851, March 2008-February 2011.
- NSF Grant # DMS-0503864, June 2005-present.
- NSF Grant # DMS-0203979, June 2002-May 2006.
- University of Maryland Graduate School Fellowship, 1993–95.

**Preprints** (all submitted, and available at arXiv):

**25.** Complex hyperbolic hyperplane complements, 35 pages.

**24.** Rigidity and relative hyperbolicity of real hyperbolic hyperplane complements, 28 pages, accepted in *Pure and Applied Mathematics Quarterly* (special issue dedicated to Farrell-Jones).

**23.** Degenerations of Riemannian manifolds (expository note containing two articles written for *Modern Encyclopedia of Mathematical Physics*), accepted, 11 pages.

**Publications** (all available at arXiv except #1, 2, 5):

**22.** Aspherical manifolds with relatively hyperbolic fundamental groups, *Geom. Dedicata* **129** (2007) no. 1, 119-144.

**21.** (with D. Osin) Rips construction and Kazhdan property (T), *Groups Geom. Dyn.* **2** (2008) no. 1, 1-12.

**20.** (with A. Szczepanski, and with appendix by O. V. Belegradek) Endomorphisms of relatively hyperbolic groups, 14 pages, to appear in *Inter. J. Alg. and Comput.*.

**19.** Aspherical manifolds, relative hyperbolicity, simplicial volume, and assembly maps, *Algebr. Geom. Topol.* **6** (2006) 1341-1354.

**18.** (with V. Kapovitch) Classification of negatively pinched manifolds with amenable fundamental groups, *Acta Math.* **196** (2006), no. 2, 229-260.

**17.** (with V. Kapovitch) Pinching estimates for negatively curved manifolds with nilpotent fundamental groups, *Geom. Funct. Anal.*, **15** 2005 no. 5, 929-938.

**16.** Nonnegative curvature, symmetry, and fundamental group, *Geom. Dedicata.* **106** (2004), no. 1, 169-184.

**15.** (with G. Wei) Metrics of positive Ricci curvature on bundles, *Int. Math. Res. Not.* (2004) no. 57, 3079-3096.

**14.** On co-Hopfian nilpotent groups, *Bull. London. Math. Soc.* **35** (2003), no. 6, 805-811.

**13.** Vector bundles with infinitely many souls, *Proc. Amer. Math. Soc.* **131** (2003), no. 7, 2217-2221.

**12.** Pinching surface groups in complex hyperbolic plane, *Geom. Dedicata.* **97** (2003), no. 1, 45-54

**11.** (with V. Kapovitch) Obstructions to nonnegative curvature and rational homotopy theory, *J. Amer. Math. Soc.* **16** (2003), 259-284.

**10.** (with G. Wei) Metrics of positive Ricci curvature on vector bundles over nilmanifolds, *Geom. Funct. Anal.* **12** (2002), no. 1, 56-72.

**9.** On Mostow Rigidity for variable negative curvature, *Topology* **41** (2002), no. 2, 341-361.

**8.** (with V. Kapovitch) Topological obstructions to nonnegative curvature, *Math. Ann.* **320** (2001), 167-190.

**7.** (with V. Kapovitch) Finiteness theorems for nonnegatively curved vector bundles, *Duke Math. J.* **108** (2001), 109-134.

**6.** Pinching, Pontrjagin classes, and negatively curved vector bundles, *Invent. Math.* **144** (2001), 353-379.

**5.** Lipschitz precompactness for closed negatively curved manifolds, *Proc. Amer. Math. Soc.* **127** (1999), 1201-1208.

**4.** Counting open negatively curved manifolds up to tangential homotopy equivalence, *J. Differential Geom.*, **50** (1998) 59-88.

**3.** Intersections in hyperbolic manifolds, *Geom. Topol.*, **2** (1998), 117-144.

**2.** Some curious Kleinian groups and hyperbolic 5-manifolds, *Transform. Groups*, **2** (1997), 3-29.

1. Conformally flat Seifert manifolds, *Siberian Adv. Math.*, **3** (1993), 1–18.

### **Teaching at Georgia Institute of Technology:**

- Abstract Algebra I–MATH 4107 (31 students, Spring 2009)
- REU with Cindy Phillips (Summer 2008)
- Calculus II–MATH 1502 (280 students, Fall 2008)
- Topology of Euclidean Spaces–MATH 6021 (3 students, Spring 2008)
- Calculus II–MATH 1502 (160 students, Fall 2007)
- Algebraic Topology for undergraduates–MATH 4432 (10 students, Spring 2007)
- ODE for undergraduates–MATH 2403 (137 students, Fall 2006)
- ODE for undergraduates–MATH 2403 (239 students, Spring 2006)
- Curves and surfaces–MATH 4441 (13 students, Fall 2005)
- ODE for undergraduates–MATH 2403 (35 students, Summer 2005, 2nd half)
- ODE for undergraduates–MATH 2403 (142 students, Spring 2005)
- ODE for undergraduates–MATH 2403 (31 students, Fall 2004)
- Atiyah-Singer index theorem, reading course, (1 student, Summer 2004)
- Morse theory–MATH 6453, (5 students, Spring 2004).
- General Topology–MATH 4431, (3 students, Fall 2003)

### **Teaching at California Institute of Technology:**

- Characteristic Classes, (6 students, Spring 2003).
- Introduction to Topology, (20-25 undergrad students, Fall 2000, Fall 2001).
- Algebraic Topology, (10-15 students, Fall 2001, Winter 2001, Fall 2002).
- Differential Geometry, (20 undergrad students, Winter 2001).
- Supervision in a research project (SURF) (1 freshman, Summer 2002).

### **Teaching at McMaster University:**

- Engineering Calculus (140 students, Spring 2000).
- Proof-oriented Linear algebra (65 students, Fall 1998).
- Calculus II, (100 students, Spring 1999).
- Introduction to Linear Algebra, (20 students, Fall 1999).

### **Teaching at the University of Maryland:**

- Instructor for Precalculus (30 students, Fall 1995).
- TA for Calculus I (100 students, Spring 1995, Fall 1996).
- Instructor for Calculus II (30 students, Summer 1996, Summer 1997).
- TA for Calculus II (100 students, Fall 1997, Spring 1998).

### **Conference Talks:**

- Geometric Group Theory, Banach Center, Poland, June 2009.
- Curvature and Global Shape, Münster, Germany, June 2009.
- Workshop in Global Riemannian Geometry, Cuernavaca, Mexico, May 2008
- Metric geometry in Guangzhou, China, November 2007
- Workshop in Nonnegative Curvature, American Institute of Mathematics, September 2007
- Topological and Geometric Rigidity, Bunff, July 2007
- Topology, Geometry, and their interactions, Morelia January 2007.
- Combinatorial and geometric group theory, Nashville, May 2006
- Nanjing Workshop on Geometry and Analysis, Nanjing, June 2005

- Wasatch Topology Conference, Park City, June 2005
- Spring Topology Conference, Mt Berry College, March 2005
- Geometric Group Theory on the Gulf Coast Conference, Destin, November 2004.
- Special Session on Hyperbolic Manifolds, Nashville AMS meeting, October 2004
- Workshop on collapsing and metric geometry, Münster, August, 2004
- Geometry and Topology of Manifolds, McMaster University, May 2004.
- Special Session on Convergence of Riemannian Manifolds, Lawrenceville AMS meeting, April 2004.
- Pacific Northwest Geometry Seminar, Corvallis, November 2002.
- Russian-German Geometry meeting, St Petersburg, Russia, June 2002.
- Oberwolfach meeting *Differentialgeometrie im Großen*, June 2001.
- Southern California Topology Colloquium, Pasadena, May 2001.
- AMS meeting, session on *Ricci curvature and related topics*, Hoboken, April 2001.
- Ontario Topology seminar, Toronto, April 1999.
- Crystallographic Groups and their Generalizations II, Kortrijk, May 1999.
- Spring Topology Conference, Utah, March 1999.
- Nonpositive Curvature in Group Theory, Topology, and Geometry, Nashville, May 1998.
- AMS meeting, session on *Topology of Manifolds and Singular Spaces.*, Memphis, March 1997.

### Seminar and Colloquium Talks:

- University of Southampton, Group Theory Seminar, June 2006
- Bilgi University, Group theory Seminar, May 2006
- University of Georgia, Geometry-Topology Seminar, April 2006
- University of Toronto, Geometry Seminar, March 2006, December 2008
- University of Notre Dame, Felix Klein Seminar, March 2006
- University of Illinois at Chicago, Geometry-Topology-Dynamics Seminar, November 2005
- University of Illinois at Urbana-Champaign, Group Theory Seminar, November 2005.
- Ohio State, Topology Seminar, October 2005.
- Georgia Tech, Geometry seminar, Fall 2003, Spring 2004, Fall 2005.
- University of Chicago, Geometry-Topology Seminar, April 2004, November 2005.
- University of California Irvine, Differential Geometry Seminar, April, 2002.
- University of Illinois at Urbana-Champaign, Colloquium, January 2002.
- University of California Davis, Colloquium, January 2002.
- Rutgers University, Colloquium, January 2002.
- Georgia Institute of Technology, Colloquium, December 2001.
- University of Southern California, Topology seminar, November 2001.
- University of California Los Angeles, Topology and Geometry Seminar, April 2001.
- University of California Riverside, Differential Geometry Seminar, November 2000.
- University of California Santa Barbara, Differential Geometry Seminar, October 2000.
- California Institute of Technology, Topology Seminar, Fall-Winter 2000, March, October 2002.
- Novosibirsk Institute of Mathematics, Geometry Seminar, June 2000, June 2002, July 2006, July 2009.
- Courant Institute, Differential Geometry seminar, February 2000.
- Dartmouth College, Colloquium, February, 2000.
- University of Pennsylvania, Analysis-Topology seminar, November 1999.
- Hebrew University, Geometry seminar, May 1999.
- Bar-Ilan University, Colloquium, May 1999.

- McMaster University, Geometry seminar, Fall 1998, 1999
- University of Bonn, Geometry seminar, January 1997.
- University of Bielefeld, Hyperbolic Geometry seminar, January, 1997.
- University of Maryland, Geometry-Topology seminar, Fall 1996, 1997, 2005 (December).