

JEFF A. VIACLOVSKY

Work Address:

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Education

Princeton University, Princeton, New Jersey.
Ph.D. Mathematics, June, 1999 (Advisor: Phillip A. Griffiths).
M.A. Mathematics, June, 1996.
The University of Texas, Austin, Texas.
B.A. Mathematics, June, 1994.
B.S. Physics, June, 1994.

Employment

Professor of Mathematics, University of Wisconsin, Madison, 2009–present.
Associate Professor of Mathematics, University of Wisconsin, Madison, 2006–2009.
Associate Professor of Mathematics, Massachusetts Institute of Technology, 2006–2007.
Assistant Professor of Mathematics, Massachusetts Institute of Technology, 2002–2006.
C.L.E. Moore Instructor of Mathematics, Massachusetts Institute of Technology, 1999–2002.
R.H. Bing Instructor of Mathematics, The University of Texas at Austin, 1999–2000.

Research Interests

Differential Geometry and Partial Differential Equations.

Fellowships and Honors

National Science Foundation Research Grant DMS-0804042 (2008–2011).
National Science Foundation Research Grant DMS-0503506 (2005–2008).
Alfred P. Sloan Research Fellowship (2004–2006).
National Science Foundation Research Grant DMS-0202477 (2002–2005).
National Science Foundation Postdoctoral Research Fellowship (1999–2002).
Alfred P. Sloan Doctoral Dissertation Fellowship (1998–99).
National Science Foundation Graduate Fellowship (1995–98).
Dean’s Honored Graduate, Department of Mathematics, University of Texas (1994).
Department of Mathematics Outstanding Graduating Senior, University of Texas (1994).

Publications and Preprints

Twistor geometry and warped product orthogonal complex structures (with L. Borisov and S. Salamon), preprint, 39 pages, arXiv:0905.3662.
Conformal symmetries of self-dual hyperbolic monopole metrics (with N. Honda), preprint, 46 pages, arXiv:0902.2019.
Threefolds of order one in the six-quadric (with L. Borisov) Proceedings of the Steklov Institute of Mathematics **264** no. 1, 2009, pages 18-29,
Orthogonal complex structures on domains in \mathbb{R}^4 (with S. Salamon), Mathematische Annalen **343**, no. 4, 2008, pages 853-899.

**Publications
(continued)**

- Volume growth, curvature decay, and critical metrics* (with G. Tian), *Commentarii Mathematici Helvetici* **83**, Issue 4, 2008, pages 889-911.
- Conformal geometry and fully nonlinear equations*, Inspired by S. S. Chern, 435–460, *Nankai Tracts Math.*, 11, World Sci. Publ., 2006.
- Convexity and singularities of curvature equations in conformal geometry* (with M. Gursky), *International Mathematics Research Notices*, 2006, Article ID 96890, 43 pages.
- Prescribing symmetric functions of the eigenvalues of the Ricci tensor* (with M. Gursky), *Annals of Mathematics* **166** (2007) no. 2, 475-531.
- Bach-flat asymptotically locally Euclidean metrics* (with G. Tian), *Inventiones Mathematicae* **160** (2005) no. 2, 357–415.
- Moduli spaces of critical Riemannian metrics in dimension four* (with G. Tian), *Advances in Mathematics* **196** (2005) no. 2, 346–372.
- A fully nonlinear equation on four-manifolds with positive scalar curvature* (with M. Gursky), *Journal of Differential Geometry* **63**, no. 1, 2003, 131–154.
- Volume comparison and the σ_k -Yamabe problem* (with M. Gursky), *Advances in Mathematics* **187**, no. 2, 2004, 447–487.
- Fully nonlinear equations on Riemannian manifolds with negative curvature* (with M. Gursky), *Indiana University Mathematics Journal* **52** (2003), 399–420.
- A variational characterization for $\sigma_{n/2}$* (with S. Brendle), *Calculus of Variations and Partial Differential Equations* **20** (2004), no. 4, 399–402.
- Some properties of the Schouten tensor and applications to conformal geometry* (with P. Guan and G. Wang), *Transactions of the American Mathematical Society* **355** (2003), 925–933.
- Estimates and existence results for some fully nonlinear elliptic equations on Riemannian manifolds*, *Communications in Analysis and Geometry* **10** (2002) no.4, 815–846.
- On the regularity of solutions to Monge-Ampère equations on Hessian manifolds* (with L. Caffarelli), *Communications in Partial Differential Equations* **26** (2001), no. 11-12, 2339–2351.
- A new variational characterization of three-dimensional space forms* (with M. Gursky), *Inventiones Mathematicae* **145** (2001) 2, 251–278.
- Regularity of weak solutions to critical exponent variational equations* (with K. Uhlenbeck), *Mathematical Research Letters* **7** (2000), no. 5-6, 651–656.
- Some fully nonlinear equations in conformal geometry*, *Differential equations and mathematical physics* (Birmingham, AL, 1999) (Providence, RI), American Mathematical Society, Providence, RI, 2000, pp. 425–433.
- Conformal Geometry, Contact Geometry, and the Calculus of Variations*, *Duke Mathematical Journal* **101** (2000), no. 2, 283–316.
- Conformally invariant Monge-Ampère equations: global solutions*, *Transactions of the American Mathematical Society* **352** (2000), no. 9, 4371–4379.

**Invited Talks
& Conferences**

- Differentialgeometrie im Großen, Mathematisches Forschungsinstitut Oberwolfach, July 26-August 1, 2009.
- Lectures on recent advances on ϵ -regularity and volume growth, *Geometry of Einstein Metrics*, Nantes, June 24-27, 2009.
- Workshop on Kähler and Sasakian Geometry in memory of Krzysztof Galicki, Rome, June 16-19, 2009.
- Lectures on the geometry of anti-self-dual metrics, *Trimester on Geometric Flows and Geometric Operators*, Centro De Giorgi, Pisa, June 8-12, 2009.
- International Conference on Spectral Theory and Geometry, in honor of P. Bérard and S. Gallot, Institut Fourier, Grenoble, June 1-5, 2009.
- Differential Geometry Seminar, Osaka University, May 18, 2009.
- Workshop on Geometric Partial Differential Equations, IAS Princeton, February 23-27, 2009.
- Geometric Partial Differential Equations Seminar, IAS Princeton, November 4, 2008.
- Algebraic and Differential Geometry, A Conference in Celebration of the 70th Birthday of Phillip Griffiths, IAS Princeton, October 16-17, 2008.

**Invited Talks
(continued)** Lectures on the geometry of four-manifolds, School and Conference on Differential Geometry, ICTP Trieste, June 9-20, 2008.

23rd Annual Geometry Festival, Duke University, April 25-27, 2008.

Program on Extremal Kähler Metrics and Kähler-Ricci Flow, Centro De Giorgi, Pisa, March 12-26, 2008.

Fall Midwest PDE Seminar, Northwestern University, November 11-12, 2007.

Pacific Rim Geometry Conference, Kobe, Japan, August 8-12, 2007.

Workshop on Nonlinear Differential Equations and Applications, Beijing Univeristy, China, June 25-29, 2007.

Geometry Seminar, Massachusetts Institute of Technology, May 16, 2007.

Topology/Geometry Seminar, University of Wisconsin, Madison, May 4, 2007.

MSRI Seminar, Program on Geometric Evolution Equations, January 9, 2007.

Plenary Lecture, Southeast Geometry Seminar, Emory Univeristy, December 13, 2006.

Workshop on Nonlinear Evolution Problems, Centro Di Ricerca Matematica Ennio De Giorgi, Pisa, Italy, September 20, 2006.

Geometry Seminar, Nara Women's University, Nara, Japan, July 14, 2006.

Departmental Colloquium, Tokyo University of Science, Tokyo, Japan, July 12, 2006.

Geometry Seminar, Tokyo Institute of Technology, Tokyo, Japan, July 7, 2006.

Gauge Theory and Topology Seminar, Harvard University, March 3, 2006.

Departmental Colloquium, Duke University, January 23, 2006.

Departmental Colloquium, Northwestern University, January 16, 2006.

Geometric Analysis Seminar, University of California San Diego, January 10, 2006.

Departmental Colloquium, University of California Irvine, January 6, 2006.

Seminar in PDE and Geometry, University of Minnesota, December 14, 2005.

Departmental Colloquium, University of Minnesota, December 13, 2005.

Departmental Colloquium, Cornell University, December 1, 2005.

Geometry/Topology Seminar, Duke University, November 22, 2005.

Departmental Colloquium, Rice University, November 16, 2005.

Departmental Colloquium, University of Wisconsin, Madison, November 11, 2005.

Geometry Seminar, University of Wisconsin, Madison, November 10, 2005.

GADGET Geometry Seminar, University of Texas Austin, November 8, 2005.

Analysis Seminar, University of Texas Austin, November 7, 2005.

MSRI Workshop, Recent Results in Nonlinear Elliptic Equations and their Interactions with Geometry, October 31, 2005.

2005 International Workshop on Fully Nonlinear PDE and Applications, 5 lectures, Zhejiang University, Hangzhou, China, May 30 - June 9, 2005.

Differential Geometry Seminar, University of California San Diego, April 12, 2005.

Analysis Seminar, University of Texas Austin, March 25, 2005.

Departmental Colloquium, Rice University, March 24, 2005.

Geometry/Topology Seminar, Duke University, March 8, 2005.

Differential Geometry in Tokyo 2004, Tokyo Institute of Technology, December 16, 2004.

Departmental Colloquium, Cornell University, November 18, 2004.

Analysis Seminar, University of Pennsylvania, November 16, 2004.

Joint Columbia/NYU/Princeton Geometry Seminar, Courant Institue, November 12, 2004.

Departmental Colloquium, University of Southern California, November 3, 2004.

**Invited Talks
(continued)**

Program on Differential Geometry and Topology, Centro Di Ricerca Matematica Ennio De Giorgi, Pisa, Italy, October 11 and 13, 2004.

Conference on Geometric and Nonlinear Analysis, University of Notre Dame, September 17, 2004.

Japan Symposium on Geometry, Tokyo Metropolitan University, Tokyo, Japan, August 9, 2004.

Departmental Colloquium, Tokyo University of Science, Tokyo, Japan, July 26, 2004.

Geometry Seminar, Tokyo Institute of Technology, Tokyo, Japan, July 23, 2004.

Symposium on elliptic equations in geometry, Beijing University, Beijing, China, July 2, 2004.

Summer Graduate school seminar, Jiaotong University, Xi'an, China, June 22, 2004.

Undergraduate lecture, Xi'an Institute of Science and Technology, China, June 21, 2004.

Undergraduate lecture, Xi'an University of Engineering, Science, and Technology, China, June 21, 2004.

Workshop on Geometric Analysis, USTC, Hefei, China, June 18, 2004.

Geometric Analysis Seminar, Princeton University, April 30, 2004.

Gauge Theory and Topology Seminar, Harvard University, April 23, 2004.

Departmental Colloquium, University of Wisconsin, Madison, April 9, 2004.

Geometry Seminar, University of Texas, Austin, March 25, 2004.

Geometry Seminar, Columbia University, March 11, 2004.

Geometry/Analysis Seminar, Stanford University, January 21, 2004.

Differential Geometry Program Seminar, MSRI, January 15, 2004.

Workshop in Geometric Analysis, MSRI, December 2, 2003.

Geometric Analysis Seminar, University of Tennessee, Knoxville, November 14, 2003.

Undergraduate Math Club lecture, MIT, September 23, 2003.

BIRS Workshop, Monge-Ampère Type Equations and Applications, Banff, August 4, 2003.

BIRS Workshop, Perspectives in Differential Geometry, Banff, July 10, 2003.

CMBS Regional Conference on Fully Nonlinear Equations, Notre Dame, June 26, 2003.

AMS Eastern Meeting, Special Session on Nonlinear Partial Differential Equations in Differential Geometry, Courant Institute, April 12, 2003.

XVIIIth Annual Geometry Festival, Duke University, March 15, 2003.

Departmental Colloquium, McMaster University, March 7, 2003.

Geometry Seminar, Northeastern University, November 23, 2002.

AMS Eastern Meeting, Special Session on Developments in Differential Geometry, Boston, MA, October 5, 2002.

Geometry Seminar, Academia Sinica, Beijing, July 9, 2002.

Lectures on conformal geometry, Peking University, Beijing, July 3-10, 2002.

Geometry Seminar, McMaster University, April 15, 2002.

Departmental Colloquium, University of Massachusetts, Amherst, April 11, 2002.

Nonlinear Analysis Seminar, Rutgers University, March 27, 2002.

Analysis Seminar, University of Texas, Austin, November 29, 2001.

Departmental Colloquium, Rice University, October 25, 2001.

Oberseminar Geometry, Mathematisches Institut der Universität München, July 24, 2001.

AMS-SMF Joint Mathematical International Meeting, Session on PDE and Geometry, Lyon, France, July 17, 2001.

Workshop on Geometric Analysis, Forschungsinstitut für Mathematik, ETH, Zurich, July 3, 2001.

26th Spring Lecture Series, Solutions of Partial Differential Equations in Periodic Media, University of Arkansas, April 26, 2001.

Analysis Seminar, Johns Hopkins University, March 26, 2001.

- Invited Talks (continued)** Geometry and Analysis Seminar, Columbia University, March 1, 2001.
Spectral Geometry Program Seminar, MSRI, January 24, 2001.
10th Midwest Geometry Conference, University of Iowa, November 17, 2000.
Differential Geometry Seminar, Massachusetts Institute of Technology, October 2, 2000.
Geometry Seminar, Princeton University, March 10, 2000.
Nonlinear Analysis Seminar, Rutgers University, March 8, 2000.
AMS National Meeting, Special Session on Geometric Analysis, Washington, D.C., January 20, 2000.
Differential Geometry/PDE Seminar, University of Washington, November 17, 1999.
Analysis Seminar, University of Texas at Austin, September 8, 1999.
The 1999 UAB-GIT International Conference on Differential Equations and Mathematical Physics, Birmingham, March 20, 1999.
Geometry Seminar, Princeton University, February 19, 1999.
Nonlinear Analysis Seminar, Rutgers University, February 9, 1999.
Differential Geometry Seminar, University of Illinois, Urbana-Champaign, November 10, 1998.
Nonlinear Analysis Seminar, University of Illinois, Urbana-Champaign, November 10, 1998.
Differential Geometry Seminar, Duke University, October 6, 1998.
Global Analysis Seminar, University of Texas at Austin, September 10, 1998.
Director's Seminar, Institute for Advanced Study, March 12, 1998.
- Recent Courses** Fall 2006: 761 – Differentiable Manifolds, graduate.
Spring 2007: 765 – Riemannian Geometry, graduate.
Spring 2007: 551 – Elementary Topology, undergraduate.
Fall 2007: 320 – Linear Algebra and Differential Equations, undergraduate.
Fall 2007: 865 – Advanced Topics in Geometry, graduate.
Spring 2008: 820 – Partial Differential Equations, graduate.
Fall 2008: 320 – Linear Algebra and Differential Equations, undergraduate.
Fall 2008: 761 – Differentiable Manifolds, graduate.
Spring 2009: 765 – Riemannian Geometry, graduate.
Fall 2009: 320 – Linear Algebra and Differential Equations, undergraduate.
Fall 2009: 865 – Advanced Topics in Geometry, graduate.
Spring 2010: 820 – Partial Differential Equations, graduate.
- Journals** Editor for International Mathematics Research Notices/Papers, December 2007 – present.
I have refereed journal articles for Acta Mathematica, American Journal of Mathematics, Annals of Mathematics, Calculus of Variations and Partial Differential Equations, Communications in Analysis and Geometry, Communications in Partial Differential Equations, Duke Mathematical Journal, Geometric and Functional Analysis, International Journal of Mathematics, International Mathematical Research Notices, Inventiones Mathematicae, Journal of Differential Geometry, Transactions of the AMS.