

# Matthew B. Stenzel

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Ohio State University, Newark Campus  
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**Education**      **Massachusetts Institute of Technology**      Cambridge, MA  
Ph.D. in Mathematics awarded June, 1990.  
Thesis Advisor: Prof. Victor Guillemin.  
**Massachusetts Institute of Technology**      Cambridge, MA  
B.S. in Mathematics awarded June, 1986.

## Research Interests

Differential geometry, analysis on symmetric spaces, complex geometry. AMS subject classification numbers 53C, 32Q, 58J.

**Publications**      A reconstruction Theorem for Riemannian symmetric spaces of non-compact type. By Matthew Stenzel. To appear in the *Journal of Fourier Analysis and Applications*.  
An inversion formula for the Segal-Bargmann transform on a symmetric space of non-compact type. By Matthew Stenzel. *Journal of Functional Analysis* 240 (2006), 592–608.  
Sharp bounds for the heat kernel on certain symmetric spaces of non-compact type. By Brian Hall and Matthew Stenzel. *Finite and Infinite Dimensional Analysis in Honor of Leonard Gross*. *Contemporary Mathematics* 317 (2003), 117–135  
Orbits of the geodesic flow and chains on the boundary of a Grauert tube. By Matthew Stenzel. *Mathematische Annalen* 322 (2002) 2, 383–399.  
The Segal–Bargmann transform on a symmetric space of compact type. By Matthew Stenzel. *Journal of Functional Analysis* 165 (1999), 44–58.  
Asymptotic curvature of  $\Theta$ -metrics. By Matthew Stenzel. *Annals of Global Analysis and Geometry* 15 (1997) 243–262.  
Intrinsic microlocal analysis and inversion formulae for the heat equation on compact real-analytic Riemannian manifolds. By Eric Leichtnam, François Golse and Matthew Stenzel. *Annales Scientifiques de L'École Normale Supérieure 4<sup>e</sup> série*, t. 29 (1996) 669–736.  
Ricci-flat metrics on the complexification of a compact rank one symmetric space. By Matthew Stenzel. *Manuscripta Mathematica* 80 (1993) 151–163.  
Grauert tubes and the homogeneous Monge-Ampère equation II. By Victor Guillemin and Matthew Stenzel. *Journal of Differential Geometry* 35 (1992) 627–641.  
Grauert tubes and the homogeneous Monge-Ampère equation. By Victor Guillemin and Matthew Stenzel. *Journal of Differential Geometry* 34 (1991) 561–570.

Kähler structures on cotangent bundles of real analytic Riemannian manifolds. Ph.D. thesis, MIT (1990).

## Talks

“Sampling Theorems on symmetric spaces of non-compact type.” AMS Special Session on Lie Groups and Holomorphic Function Spaces: Analysis, Geometry, and Mathematical Physics.” AMS sectional meeting in Baton Rouge, Louisiana. March 29, 2008.

“Sampling series for symmetric spaces of non-compact type.” AMS Special Session on Holomorphic Methods and Heat Kernels in Harmonic Analysis and Quantization Theory. AMS sectional meeting in South Bend, Indiana. April 8, 2006.

“An inversion formula for the Segal-Bargmann transform on a symmetric space of non-compact type.” AMS Special Session on Stochastics, Quantization, and Segal-Bargmann Analysis. AMS sectional meeting in Baton Rouge, Louisiana. March 15, 2003.

“The Segal-Bargmann transform on a symmetric space of compact type.” HAAR Seminar, Ohio State University. October 31, 2002.

“Sharper than Gaussian estimates on the heat kernel of certain non-compact symmetric spaces.” Analysis Seminar, University of Notre Dame. July 10, 2001.

“Sharp bounds for the heat kernel on certain symmetric spaces of non-compact type.” AMS Special Session on Analysis on Infinite Dimensional Spaces (in honor of Leonard Gross). AMS national meeting in New Orleans, January 13, 2001.

“Chains on the boundary of a Grauert tube.” Analysis and Geometry Seminar, Ohio State University, Columbus. February 4, 2000.

“The Segal-Bargmann transform on a symmetric space of compact type.” Analysis seminar, University of California at San Diego, San Diego, CA. April 16, 1999.

“Inversion of the F.B.I. transform on certain infinite radius tubes.” AMS Special Session on Heat Kernel Analysis on Lie Groups. AMS sectional meeting in Philadelphia. April 5, 1998.

“Chains on the boundary of a Grauert tube.” Contributed paper, AMS Session on Differential Geometry. AMS national meeting in Baltimore. January 8, 1998.

“The F.B.I. transform on certain infinite radius tubes.” AMS Special Session on Geometric Analysis and Spectral Theory. AMS sectional meeting in Montreal, Canada, September 27, 1997.

“Curvature of  $\Theta$ -metrics at the boundary.” Geometric Analysis Seminar, Purdue University, West Lafayette, IN. May 8, 1997.

“Curvature of  $\Theta$ -metrics near the boundary.” AMS Special Session on Differential Geometry and its Applications. AMS sectional meeting in Detroit, May 3, 1997.

“Boundary behavior of  $\Theta$ -metrics.” Geometric Analysis Seminar, Ohio State University. February, 1997.

“Asymptotic curvature of  $\Theta$ -metrics.” Contributed paper, AMS Session on Geometry. AMS national meeting in San Diego. January 10, 1997.

“Intrinsic characterization of  $WF_A$ .” Invited talk at Ruhr Universität, Bochum, Germany. July, 1994.

“An intrinsic approach to analytic singularities.” Geometric Analysis Seminar, Ohio State University. October, 1994.

“Ricci-flat metrics on complexifications of rank one symmetric spaces”. Contributed Paper, AMS Session on Differential Geometry. AMS national meeting in San Antonio, January 16, 1993.

“Solving the Monge-Ampère equation with a square root singularity.” Geometric Analysis Seminar. University of California, Riverside, January, 1992.

“Kähler Structures, Cotangent Bundles, and the Homogeneous Monge-Ampère Equation.” Workshop on Symplectic Geometry. University of Arizona, January 22, 1991.

“Demailly’s Holomorphic Morse Inequalities.” Analysis Seminar. The Johns Hopkins University, November, 1990.

## Reviews

MR2294416 (2008b:53097): Aguilar, R., *The adapted complexification of an ellipsoid*. Internat. J. Math. **18** (2007), no. 1, 43–68

MR2266366 (2008c:53088) Burns, D., Hind, R., *Symplectic rigidity for Anosov hypersurfaces*. Ergodic Theory Dynam. Systems **26** (2006), no. 5, 1399–1416.

MR2127990 (2006e:53129) Szöke, R., *Canonical complex structures associated to connections and complexifications of Lie groups*. Math. Ann. **329** (2004) no. 3, 553–591.

MR 2004k:58003: Banos, B., *On symplectic classification of effective 3-forms and Monge-Ampère equations*. Differential Geom. Appl. **19** (2003) no. 2, 147–166.

MR 2004h:32025: Hind, Richard, *Automorphic involutions on Stein manifolds*. Internat. J. Math. **14** (2003), no. 5, 479–487.

MR 2004g:32025: Burns, D., Halverscheid, S., Hind, R., *The geometry of Grauert tubes and complexifications of symmetric spaces*. Duke Math. J. **118** (2003) no. 3, 465–491.

MR 2004a:32037: Banos, Bertrand, *Nondegenerate Monge-Ampère structures in dimension 6*. Lett. Math. Phys. **62** (2002), no. 1, 1–15.

MR 2003k:53047: Dancer, Andrew S., Strachan, Ian A. B., *Einstein metrics on tangent bundles of spheres*. Classical Quantum Gravity **19** (2002), no. 18, 4663–4670.

MR 2003i:32044: Kan, Su-Jen et al., *A note on the rigidity of Grauert tubes*. Addendum to: *On rigidity of Grauert tubes over locally symmetric spaces* [J. Reine Agnew. Math. **524** (2000), 205–225]. J. Reine Agnew. Math. **546** (2002), 155–158.

MR 2002m:53070: Hitchin, Nigel, *The geometry of three-forms in six dimensions*. J. Differential Geom. **55** (2000), no. 3, 547–546.

MR 2002k:32035: Biswas, Indranil; Mukherjee, Avijit, *Nonorientable manifolds, complex structures, and holomorphic vector bundles*. Acta Appl. Math. **69** (2001), no. 1, 25–42.

MR 2003g:53144: Aguilar, Raul., *Symplectic reduction and the homogeneous Monge-Ampère equation*. Ann. Global Anal. Geometry **19** (2001), no. 4, 327–353.

MR 2002f:32047: Burns, D.; Hind, R., *Symplectic geometry and the uniqueness of Grauert tubes*. Geom. Funct. Anal. **11** (2001), no. 1, 1–10.

MR 2002f:32045: Szöke, Róbert, *A family of Kähler-Einstein manifolds and metric rigidity of Grauert tubes*. Proc. Amer. Math. Soc. **129** (2001), no. 10, 2913–2917.

- MR 2002d:53037: Oproiu, Vasile, *A Kähler Einstein structure on the tangent bundle of a space form*. Int. J. Math. Math. Sci. 25 (2001), no. 3, 183–195.
- MR 2002c:53070: Petersen, Peter, *Rigidity and compactness of Einstein metrics*. Surveys in differential geometry: essays on Einstein manifolds, 221–234, Surv. Differ. Geom., VI, Int. Press, Boston, MA, 1999.
- MR 2002c:32040: Jeffres, Thalia D., *Uniqueness of Kähler-Einstein cone metrics*. Publ. Mat. 44 (2000), no. 2, 437–448.
- MR 2002b:53070: Wang, McKenzie Y., *Einstein metrics from symmetry and bundle constructions*. Surveys in differential geometry: essays on Einstein manifolds, 287–325, Surv. Differ. Geom., VI, Int. Press, Boston, MA, 1999.
- MR 2002b:32040 Ben Abdessellem, Adnène; Cherrier, Pascal, *Einstein-Kähler metrics on certain complex bundles*. Bull. Sci. Math. 124 (2000), no. 8, 659–684.
- MR 2001m:53092: Choe, Yeong-Wu; Lee, Hyunjin, *Characterization of CR submanifold in a complex projective space in terms of Ricci tensors*. J. Korea Soc. Math. Educ. Ser. B Pure Appl. Math. 7 (2000), no. 1, 7–18.
- MR 2001k:32042: Hulin, Dominique, *Kähler-Einstein metrics and projective embeddings*. J. Geom. Anal. 10 (2000), no. 3, 525–528.
- MR 2002b:58008: S. K. Donaldson, *Symmetric spaces, Kähler geometry and Hamiltonian dynamics*, in Northern California Symplectic Geometry Seminar, 13–33, Amer. Math. Soc. Transl. Ser. 2, 196, Amer. Math. Soc., Providence, RI, 1999.
- MR 2001i:32039: Kan, Su-Jen; Ma, Daowei, *On rigidity of Grauert tubes over locally symmetric spaces*. J. Reine Angew. Math. 524 (2000), 205–225.
- MR 2001f:53085: R. M. Aguilar, *Pseudo-Riemannian metrics, Kähler-Einstein metrics on Grauert tubes and harmonic Riemannian manifolds*. Q. J. Math. 51 (2000), no. 1, 1–17.
- MR 2001f:32030: A. Beauville, *Complex manifolds with split tangent bundle*. Complex analysis and algebraic geometry, 61–70, de Gruyter, Berlin, 2000.
- MR 2001b:32044: R. Mazzeo, *Kähler-Einstein metrics singular along a smooth divisor*. Journées “Équations aux Dérivées Partielles” (Saint-Jean-de-Monts, 1999), Exp. VI, 10 pp, Univ. Nantes, Nantes, 1999.
- MR 2001a:53122: S. K. Donaldson, *Moment maps and diffeomorphisms*. Sir Michael Atiyah: a great mathematician of the twentieth century. Asian J. Math. 3 (1999), no. 1, 1–15.
- MR 2001a:32035: P. Lu, *Kähler-Einstein metrics on Kummer threefold and special Lagrangian tori*. Comm. Anal. Geom. 7 (1999), no. 4, 787–806.
- MR 2000m:53058: W. Jelonek, *Killing tensors and Einstein-Weyl geometry*. Colloq. Math. 81 (1999), no. 1, 5–19.
- MR 2000f:32033: R. L. Bryant, *Some examples of special Lagrangian tori*. Adv. Theor. Math. Phys. 3 (1999), no. 1, 83–90.
- MR 2000d:32052: V. V. Ezhov, A. V. Isaev and G. Schmalz, *Invariants of elliptic and hyperbolic CR-structures of codimension 2*. Internat. J. Math. 10 (1999), no. 1, 1–52.

- MR 2000c:32075: N. J. Hitchin, *The moduli space of special Lagrangian submanifolds*. Ann. Scuola Norm. Sup. Pisa Cl. Sci. (4) **25** (1997), no. 3-4, 503–515 (1998).
- MR 2000b:32020: I. V. Maresin and A. G. Sergeev, *A microlocal version of Cartan-Grauert's theorem*. Ann. Polon. Math. **70** (1998), 157–162.
- MR 99k:53128: T.-C. Lee, *Complete Ricci flat Kähler metric on  $M_I^n$ ,  $M_{II}^{2n}$ ,  $M_{III}^{4n}$* . Pacific J. Math. **185** (1998), no. 2, 315–326.
- MR 99j:53067: Katagiri, Minyo, *On deformations of Einstein-Weyl structures*. Tokyo J. Math. **21** (1998), no. 2, 453–455.
- MR 99j:53066: Katagiri, Minyo, *On the uniqueness of a Weyl structure with prescribed Ricci curvature*. Tokyo J. Math. **21** (1998), no. 2, 453–455.
- MR 99i:32011: Kan, Su-Jen, *On the rigidity of non-positively curved Grauert tubes*. Math. Z. **229** (1998), no. 2, 349–363.
- MR 99d:32008: Stanton, N. K., *Homogeneous CR submanifolds in  $\mathbf{C}^n$* . Math. Z. **228**, no. 2 (1998), 247–253.
- MR 98m:32025: Ezhov, V. V., Schmalz, G., *Normal form and two-dimensional chains of an elliptic CR manifold in  $\mathbf{C}^4$* . J. Geom. Anal. **6**, no. 4 (1996), 495–529.
- MR 98j:32010: Kan, S.-J., *On the characterization of Grauert tubes covered by the ball*. Math. Ann. **309**, no. 1 (1997), 71–80.
- MR 98d:53070: Pak, H. K., *A note on Einstein–Weyl manifolds*. Proceedings of the First International Workshop on Differential Geometry (Taegu, 1996), Kyungpook Natl. Univ., Taegu (1997), 99–111.

## Graduate Students

Abraham L. Solomon (joint advisor with Prof. Yuji Kodama). Masters of Science awarded 2003. Thesis title: “Hamiltonian Systems and Poisson Manifolds.”

**Service to the University** Secretary to the Faculty Assembly, Ohio State University, Newark Campus. Autumn, 2009 to present.

Member of the Student Affairs Committee, Ohio State University, Newark Campus. Winter, 2009 to present.

Chair of the Information Technology Services Consultation Committee. Autumn, 2007 to 2008. Member, Autumn, 2004 to present.

Alternate Ombudsman. Autumn, 2005 to Spring, 2006.

Chair of the Professional Standards Committee. Ohio State University, Newark Campus. January, 2005 to December, 2005.

Analysis Qualifying Exam Committee. Ohio State University, Columbus Campus. Winter, 2004 to Spring, 2004.

Mathematics Coordinator. Ohio State University, Newark Campus. Autumn, 2001 to Spring, 2004.

Secretary to the Faculty Assembly, Ohio State University, Newark Campus. Autumn, 2003 to Spring, 2004.

Chair of the Faculty Assembly, Ohio State University, Newark Campus. Autumn, 2001 to Spring, 2002.

Member of President Kirwan's Commission on the Regional Campuses. Summer, 2001 to Spring, 2002.

Vice Chair of the Faculty Assembly, Ohio State University, Newark Campus. Autumn 2000–Spring 2001.

Secretary of the Faculty Assembly, Ohio State University, Newark Campus. Autumn 1999–Spring 2000.

Member of the Academic Affairs Committee, Ohio State University, Newark Campus. Winter, 1999–Autumn, 2001; Autumn 2002–Spring, 2003.

Member of the Student Affairs Committee, Ohio State University, Newark Campus. Winter, 1995–Autumn, 1997. Chair, Winter, 1997–Autumn, 1997.

### **Mathematical Service**

Referee for Monatshefte für Mathematik (2008)

Referee for Pacific Journal of Mathematics (1997, 2006)

Referee for Mathematical Research Letters (2004–2005)

Referee for Transactions of the American Mathematical Society (2002).

Peer reviewer for National Science Foundation Division of Mathematical Sciences, Geometric Analysis Program (1999, 2000, 2001), Analysis Program (2005).

Organizer of the Analysis and Geometry Seminar, Ohio State University, Columbus Campus. Spring, 2000.

Referee for the Quarterly Journal of Mathematics (1998).

Peer reviewer for McGraw-Hill College Division (1996).

Peer reviewer for National Science Foundation Division of Mathematical Sciences, Classical Analysis Program (1994).

### **Awards**

Nominated for the 2008 Barnes Award for Exemplary Teaching.

Awarded the Ohio State University at Newark Thomas J. Evans Award for Teaching Excellence. May 21, 1999.

### **Teaching**

**Ohio State University, Newark Campus**

Associate Professor of Mathematics

Newark, OH  
September 1993 to present

Teaching experience:

Precollege Mathematics I, II (Math 050, 075)

Enrichment of Basic College Mathematics (Math 103)

Basic College Mathematics (Math 104)

Excursions in Mathematics (Math 116)

Math Analysis for Business I, II, III (Math 130, 131, 132)

Algebra and Trigonometry and Their Applications (Math 148)

Elementary Functions (Math 150)  
Calculus and Analytic Geometry (Math 151, 152, 153, 254)  
Elementary Analysis (Math H190, H191, H264)  
Principles of Mathematical Analysis (Math 650, Columbus Campus)  
Complex Variables (Math 654, Columbus Campus)  
Introductory Complex Analysis (Math 660, Columbus Campus)  
Graduate Problem Seminar: Problems in Real Analysis (Math 787.03, Columbus Campus)

**University of California**

Riverside, CA.

Visiting Assistant Professor of Mathematics.

July 1991 to June 1993

Teaching experience:

Pre-calculus Mathematics (Mathematics 5)  
Vector Integral Calculus (Mathematics 10B)  
Vector Differential Calculus (Mathematics 10A)  
Differential Calculus of One Variable (Mathematics 9A)  
Game Theory (Mathematics 121).

**The Johns Hopkins University**

Baltimore, MD

Visiting Assistant Professor of Mathematics

July 1990 to June 1991.

Teaching experience:

Fourier Analysis and Generalized Functions  
Vector Calculus (Calculus III)  
Calculus of One Variable (Calculus I).

**Massachusetts Institute of Technology**

Cambridge, MA

Graduate Teaching Assistant

1986 to 1990.

Teaching experience:

Calculus of One Variable (18.01)  
Calculus of Several Variables (18.021)  
Head Tutor, undergraduate tutoring program.

**Other**

Member of the American Mathematical Society

Member of Sigma Xi, the scientific research society.