

# CURRICULUM VITAE

MARIA G. WESTDICKENBERG

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NAME Maria G. Westdickenberg  
FORMER NAME Maria G. Reznikoff  
ADDRESS School of Mathematics  
Georgia Institute of Technology  
686 Cherry Street  
Atlanta, GA 30332  
PHONE (404) 894 - 8767  
(404) 894 - 4409 (fax)  
EMAIL maria@math.gatech.edu  
WEBPAGE [www.math.gatech.edu/~maria](http://www.math.gatech.edu/~maria)

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RESEARCH INTERESTS Nonlinear dynamics in gradient flow partial differential equations  
Sharp interface limits and interface motion laws  
Rare events and stochastically perturbed partial differential equations  
Logarithmic Sobolev inequalities

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## ACADEMIC POSITIONS

07/2006 - present Assistant professor, Georgia Institute of Technology, Mathematics  
08/2005 - 06/2006 Postdoctoral researcher, Princeton University, Mathematics  
NSF fellowship, teaching/research option; postdoctoral mentor: Weinan E  
08/2004 - 08/2005 Postdoctoral researcher, University of Bonn, Applied Mathematics  
NSF fellowship, research option; postdoctoral mentor: Felix Otto

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## EDUCATION

05/2004 Ph.D. Applied Mathematics  
Courant Institute of Mathematical Sciences, New York University  
Advisors: Robert V. Kohn and Eric Vanden-Eijnden  
05/2000 M.S. Applied Mathematics  
Rensselaer Polytechnic Institute  
12/1993 B.S. Education, *Summa Cum Laude*  
State University of New York, College at Geneseo  
Dual Major: Special and Elementary Education

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## GRANTS, FELLOWSHIPS, AND AWARDS

2007-2010	National Science Foundation Research Grant <i>Slow Motion, Rare Events, and Sharp Bounds in High-Dimensional Systems</i>
2004-2007	National Science Foundation Postdoctoral Research Fellowship
2005	Kurt O. Friedrichs Prize, Courant Institute <i>for an outstanding dissertation in mathematics</i>
2002	Bella Manel Prize, Courant Institute <i>for excellence and promise in graduate mathematics by a woman</i>
09/2000 - 05/2004	Henry M. MacCracken Fellowship, Courant Institute

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## TEACHING EXPERIENCE

Lectures	Analysis I (MAT 4317): <i>GA Tech, spring 2008</i> Calculus I (MAT 1501): <i>GA Tech, fall 2007</i> Differential Equations: <i>GA Tech, fall 2006</i> Intro to Ordinary and Partial Differential Equations: <i>Princeton, fall 2005</i> Calculus I: <i>NYU, fall 2003</i> Business Calculus: <i>NYU, spring 2003</i> Mathematical Thinking: <i>NYU, fall 2001</i>
Recitations	Mathematical Analysis (graduate course): <i>NYU, fall 2002</i> Advanced Calculus: <i>NYU, spring 2002</i> Precalculus: <i>NYU, spring 2001</i> Calculus II: <i>RPI, spring 1999</i> Calculus I: <i>RPI, fall 1998, fall 1999, spring 2000</i>
K-12	Private school teacher: <i>9-12 grade, 1996-1998</i> Learning disabilities specialist: <i>K-5 grade, 1994-1995</i> Teacher of students with emotional disturbances: <i>K-3 grade, 1994</i>

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## ADDITIONAL RESEARCH EXPERIENCE

05/2002	Mathematical Modeling Workshop at the IMA <i>Mentor: Leonard Borucki, Motorola</i>
05-08/2000	Research Assistant, Los Alamos National Laboratory <i>Supervisor: Bryan Travis, LANL</i>
05-08/1999	Research Assistant, Rensselaer Polytechnic Institute and Guest Student, Woods Hole Oceanographic Institute <i>Supervisor: Joyce McLaughlin, RPI</i>

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## PUBLICATIONS

*A two-scale approach to logarithmic Sobolev inequalities and the hydrodynamic limit*, N. Grunewald, F. Otto, C. Villani, and M.G. Westdickenberg, to appear Annales de l'Institut Henri Poincaré (B) Probabilités et Statistiques.

*Rare events in stochastic partial differential equations on large spatial domains*, E. Vanden-Eijnden and M.G. Westdickenberg, J. Stat. Phys. **131** (2008), 1023-1038.

*Rare events, action minimization, and sharp interface limits*, M. G. Westdickenberg, in *Singularities in PDE and the Calculus of Variations*, Eds. S. Alama, L. Bronsard, and P. J. Sternberg, CRM Proceedings and Lecture Notes **44** (2008), 217-232.

*Higher multiplicity in the one-dimensional Allen-Cahn action functional*, M.G. Westdickenberg and Y. Tonegawa, Indiana Univ. Math. J. **56** (2007), 2935-2990.

*Slow motion of gradient flows*, F. Otto and M.G. Reznikoff, J. Differential Equations **237** (2007), 372-420.

*A new criterion for the logarithmic Sobolev inequality*, F. Otto and M.G. Reznikoff, J. Functional Analysis **243** (2007), 121-157.

*Action minimization and sharp-interface limits for the stochastic Allen-Cahn equation*, R.V. Kohn, F. Otto, M.G. Reznikoff, and E. Vanden-Eijnden, Comm. Pure App. Math. **60** (2007), 393-438.

*Bounds on vertical heat transport for infinite Prandtl number Rayleigh Bénard convection*, C.R. Doering, F. Otto, and M.G. Reznikoff, J. Fluid Mech. **560** (2006), 229-241.

*Sharp-interface limit of the Allen-Cahn action functional in one space dimension*, R.V. Kohn, M.G. Reznikoff, and Y. Tonegawa, Calc. Var. PDE **25** (2006), 503-534.

*A two-scale proof of a logarithmic Sobolev inequality*, N. Grunewald, F. Otto, M.G. Reznikoff, and C. Villani, SFB preprint (2005).

*Magnetic elements at finite temperature and large deviation theory*, R.V. Kohn, M.G. Reznikoff, and E. Vanden-Eijnden, J. Nonlinear Sci. **15** (2005), 223 - 253.

*Invariant measures of stochastic partial differential equations*, M.G. Reznikoff and E. Vanden-Eijnden, C.R. Acad. Sci. Paris **340** (2005), 305 - 308.

*Rare Events in Finite and Infinite Dimensions*, M.G. Reznikoff, Ph.D. thesis, New York University, 2004.

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## RECENT INVITED TALKS

- Toulouse, 05/2008      Toulouse III, Université Paul Sabatier, Probability seminar  
*Two Recent Results on the LSI*
- McMaster, 05/2008      McMaster University, Applied Mathematics Seminar  
*A Functional Analytic Approach to LSI and Two Recent Results*
- Madison, 03/2008      University of Wisconsin, Mathematics Colloquium and WISELI speaker  
*Noise-Driven Rare Events and Action Minimization*
- Knoxville, 02/2008      University of Tennessee, Mathematics Colloquium  
*Entropy Dissipation and the LSI*
- SIAM, 12/2007      SIAM Conference on Analysis of PDE
- Minisymposium: Energy Based Approaches to Nonlinear PDE  
*Nusselt Number Scaling in Thermal Convection*
  - Minisymposium: Current Trends in the Calculus of Variations  
*Slow Motion of Gradient Flows*
- UConn, 11/2007      University of Connecticut, PDE Seminar  
*Slow Motion of Gradient Flows*
- HIM, 11/2007      Hausdorff Institute of Mathematics  
Workshop on Particle Systems, Nonlinear Diffusions, and Equilibration  
*Two Recent Results on the Logarithmic Sobolev Inequality*
- AMS, 10/2007      AMS Sectional Conference
- Minisymposium: Variational Problems in Condensed Matter  
*Sharp Interface Limits in the Study of Rare Events*
- Michigan, 06/2007      Workshop on Large Deviations, Michigan Center for Theoretical Physics  
*Limiting Regimes of Action Minimization*
- SIAM, 05/2007      Dynamical Systems meeting at Snowbird
- Minisymposium: Stochastic PDE and Pattern Formation  
*Phase Transformation in Stochastic Reaction-Diffusion Equations:  
Limits of Small Noise and Large System Size*
- Chicago, 05/2007      University of Chicago, Applied Mathematics Seminar  
*Rare Events, Action Minimization, and Sharp Interface Limits*
- ENS Lyon, 04/2007      ENS Lyon, Probability Seminar  
*Two Recent Results on the Logarithmic Sobolev Inequality*
- Clemson, 03/2007      Clemson University, Analysis Seminar  
*Sharp Interface Limits in the Study of Rare Events*
- CMS, 12/2006      Canadian Mathematical Society, Winter 2006 Meeting  
*Slow Motion of Gradient Flows*

#### RECENT INVITED TALKS, CONTINUED

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|-------------------|---|
| Duke, 12/2006     | Duke University, Applied Mathematics Seminar<br><i>Rare Events and Action Minimization</i>  |
| CRM, 07/2006      | Centre de Recherches Mathématiques (Montreal)<br>Workshop on Singularities in PDE and the Calculus of Variations<br><i>Sharp Interface Limits in the Study of Rare Events</i>   |
| SIAM, 07/2006     | Conference on Analysis of PDE <ul style="list-style-type: none"><li>• Minisymposium: Asymptotic Problems and Methods for SPDE<br/><i>Rare Events in Large Systems</i></li></ul> |
| Tokyo, 04/2006    | Tokyo University, Seminar on Mathematics for Various Disciplines<br><i>Thermally-Driven Rare Events and Action Minimization</i>   |
| Hokkaido, 03/2006 | Hokkaido University, PDE Seminar<br><i>Slow Motion of Gradient Flows</i>  |
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#### PROFESSIONAL MEMBERSHIPS

*American Mathematical Society*  
*Mathematical Association of America*  
*Society for Industrial and Applied Mathematics*

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