

## MATTHIAS HEYMANN, Ph.D

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### EDUCATION :

- **2007 – present:** Assistant Research Professor, Duke University, Math Department
- **2007:** Ph.D, Courant Institute of Mathematical Sciences (CIMS), New York University. Advisor: Eric Vanden-Eijnden. Thesis: *The geometric minimum action method: A least action principle on the space of curves*
- **2001 – 2002:** Internship at Bell Laboratories, Dept. for Statistics and Data Mining, Murray Hill, NJ
- **2001:** “Diploma” degree in mathematics, University of Hannover, Germany, GPA 1.0 (**best** possible grade on German scale from 1.0 to 4.0). Thesis: *Fractional powers of operators, and their applications*

### HONORS AND AWARDS :

- **2008:** The math department’s nominee for the NYU-wide Dean’s Outstanding Thesis Award in the Sciences
- **2007:** Co-winner of the CIMS Moses Greenfield Prize for outstanding interdisciplinary studies
- **2005:** The math department’s nominee for the NYU-wide Dean's Outstanding Graduate Teaching Award
- **2004:** Co-winner of the CIMS Harold Grad Memorial Prize for outstanding performance and promise as a graduate student
- **2000 – 2002:** Studienstiftung scholarship (scholarship foundation of the German Government, supporting about the top 1% of all students with German citizenship)
- **1996:** First prize in the second round of the "Bundeswettbewerb Mathematik" (National German Mathematics Competition), qualification for the finals

### SKILLS / EXPERIENCE :

- **Computational skills:** MatLab, R (freeware clone of SPLUS), Java, some Pearl and C++; LaTeX, HTML; standard office software
- **Analytical skills:** Coursework in a variety of pure and applied subjects, including probability theory (in particular large deviation theory, stochastic processes), statistics, numerical analysis, functional analysis, ODE, PDE.
- **Teaching experience:** Taught 2 graduate courses (complex analysis, functional analysis), 10 undergraduate courses (precalculus, 3x linear algebra, 2x business calculus, calculus I, 2x probability theory, ordinary differential equations), 3 recitations (precalculus, calculus I & II)
- **Other experiences:** Filed for a US utility patent (2004)

### SELECTED PAPERS AND PUBLICATIONS :

- *Existence and Properties of Minimum Action Curves for Degenerate Finsler Metrics*, **2010**, submitted to the Memoirs of the AMS 04/26/2010
- *The sources of rare transitions in continuous-time Markov jump processes*, **2008/09**, in preparation
- *The geometric minimum action method for computing minimum energy paths*, Journal of Chemical Physics 128, 061103, **2008**
- *Pathways of maximum likelihood for rare events in nonequilibrium systems, Application to nucleation in the presence of shear*, Physical Review Letters 100.14, 140601, **2007**
- *The geometric minimum action method: A least action principle on the space of curves*, **PhD thesis**, New York University, **2007**; published in *Comm. in Pure & Appl. Math.* 61.8, 1052-1117, **2008**
- *The Stieltjes convolution and a functional calculus for non-negative operators*, **2002**
- *Fractional powers of operators, and their applications*, diploma thesis, Hannover University, **2001**