

# Gregory James Pearlstein

Department of Mathematics  
Michigan State University

## Biographical Information:

Born: May 23, 1970,  
St. Louis Missouri.

Citizenship: USA

## Contact Information:

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**Research Interests:** Hodge Theory and algebraic geometry.

## Education:

Ph.D. University of Massachusetts at Amherst, May 1999.  
*Thesis Advisor:* Aroldo Kaplan

B.S. University of Massachusetts at Amherst, May 1991.

## Appointments:

May—June 2010: Institut des Études Scientifique.  
May 2009: Invited position, Université Joseph Fourier.  
Fall 2006—Present: Assistant Professor, Michigan State University.  
Fall 2005—Spring 2006: Visiting Assistant Professor, Duke University.  
Fall 2004—Spring 2005: Member, Institute for Advanced Study.  
August 2004: Max Planck Institute for Mathematics.  
July—September 2002: Max Planck Institute for Mathematics.  
Fall 2001—Spring 2004: Visiting Assistant Professor, University of California, Irvine.  
Fall 1999—Spring 2001: Visiting Assistant Professor, University of California, Santa Cruz.

## Publications:

*The locus of Hodge classes in an admissible variation of mixed Hodge structure*,  
(with P. Brosnan and C. Schnell), *C. R. Acad. Sci. Math.*, **348** (2010), 657-660.

*Zero loci of admissible normal functions with torsion singularities* (with P. Brosnan),  
*Duke Math. J.*, **150** (2009), 77-100.

*Singularities of admissible normal functions* (with P. Brosnan, H. Fang, Z. Nie),  
*Invent. Math.*, **177** (2009) 599-629.

*The zero locus of an admissible normal function* (with P. Brosnan), *Annals of Math.*,  
(2) **170** (2009), 883-893.

*An exponential history of functions with logarithmic growth* (with Matt Kerr),  
Accepted, Proceedings of the MSRI workshop on the topology of stratified spaces,  
September 2008.

*SL<sub>2</sub> orbits and degenerations of mixed Hodge structure*, J. Diff. Geom, **74** (2006), 1-67.

*Opposite filtrations, variations of Hodge structure and Frobenius Modules*,  
(with J. Fernandez), Aspects of Mathematics, vol. E 36, 2004.

*Singularities of variations of mixed Hodge structure* (with A. Kaplan),  
Asian Journal of Mathematics, **7** (2003), 307--336.

*On the asymptotic behavior of admissible variations of mixed Hodge structure*.  
Proceedings, *Algebraic Geometry in East Asia*, 2001, Kyoto.

*Degenerations of mixed Hodge structure*, Duke Math. J., **110** (2001), 217--25.

*Variations of mixed Hodge structure, Higgs fields and quantum cohomology*.  
Manuscripta Mathematica **102** (2000), 269—310.

### **Preprints and other manuscripts:**

*Normal functions and the GHC*, (with M. Kerr). Accepted, RIMS Kôkyûroku  
*Note*: This volume is for a conference in honor of the 60'th birthday of Sampei Usui.

*On the algebraicity of the zero locus of an admissible normal function* (with P. Brosnan),  
[arXiv:0910.0628v1](https://arxiv.org/abs/0910.0628v1), submitted Compositio.

*Tannakian categories and the SL<sub>2</sub>-splitting* (with P. Brosnan), in preparation.

*A generalization of the Neron models of Green, Griffiths and Kerr*.  
(with P. Brosnan and M. Saito), [arXiv:0809.5185](https://arxiv.org/abs/0809.5185)

*Tannakian fundamental groups of categories of variations of mixed Hodge structure*,  
(with R. Hain, M. Matsumoto, and T. Terasoma), in preparation.

*A distance estimate between nilpotent orbits and period maps*. (with T. Hayama),  
in preparation.

*Jumps in the Archimedean height*. (with P. Brosnan), in preparation.

### **Presentations:**

May 2011, Seminar, Washington University, St. Louis.

April 2011, Seminar, University of Wisconsin, Madison.

March 2011, Lecture, Fields Institute, Toronto.

February 2011, Seminar, University of Illinois, Chicago.

November 2010, Lecture, Fields Institute, Toronto.

August 2010, Lecture, ICM satellite conference (invited).

June 2010, *Lecture*, International Center for Theoretical Physics, Italy (invited).  
 June 2010, Two Lectures, Erwin Schrödinger Institute, Vienna.  
 March 2010, *Lecture*, UQAM.  
 February 2010, *Seminar*, John Hopkins University.  
 December 2009, *String Theory and Physics*, University of Vienna.  
 December 2009, *Seminar*, Harvard/MIT.  
 October 2009, *Seminar*, University of Illinois, Chicago.  
 July 2009, *Lecture*, “Hodge theory and algebraic geometry”: Occasion of the 60th birthday of Sampei Usui, RIMS Kyoto University,  
 June 2009, *Colloquium*, Università degli Studi di Napoli Federico II. Naples, Italy.  
 May 2009, *Three Lectures on Hodge Theory*, Hodge theory and Motives, Dijon.  
 May 2009, *Colloquium*, Université de Grenoble.  
 May 2009, *Mini-course*, “Travaux de Griffiths”, Université de Grenoble.  
 April 2009, *Seminar*, SUNY Stonybrook.  
 April 2009, *Colloquium*, University of Miami,  
 March 2009, *Arithmetic and Geometry of Algebraic Varieties*, Fields Institute.  
 March 2009, *Colloquium*, University of Western Ontario.  
 February 2009, *Colloquium*, University of Durham, England.  
 September 2008. *Topology of Stratified Spaces* (workshop), MSRI.  
 April 2008. *Regulators and Heights in Algebraic Geometry*, University of Alberta.  
 March 2008. *Conference on Algebraic Cycles*, Ohio State University.  
 April 2007. *Algebraic Geometry Seminar*, University of Chicago.  
 March 2007. *Curves, abelian varieties and their interactions on the occasion of the 65th birthday of Roy Smith*, University of Georgia, Athens.  
 February 2007, *Algebraic Geometry Seminar*, University of British Columbia.  
 November 2006. *Three Lectures on Hodge Theory*, University of Chicago.  
 June 2006. *Motives and Periods*, University of British Columbia.  
 March 2005. *Hodge Theory and Log Geometry*, (JAMI) John Hopkins.  
 September 2004. *Oberseminar*, Max Planck Institute for Mathematics.  
 March 2004. *Spring Workshop*, University of Miami.  
 September 2003. *Number Theory Seminar*, University of Toronto.  
 May 2003. *Applications of Arithmetic Degenerations of Moduli*, UC Irvine.  
 March 2003, *Lecture*, Algebraic Geometry Seminar, UC Riverside.  
 September 2002. *Number Theory Seminar*, Max Planck Institute for Mathematics.  
 May, 2002. *Colloquium*, University of California, Irvine.  
 April, 2002. *Conference on Hilbert Schemes, Vector Bundles and their Interplay with Representation Theory*, University of Columbia, Missouri.  
 March 2002. *Workshop on Non-Abelian Hodge Theory*. MSRI.  
 October, 2001. *Lecture*, Arithmetic Geometry Seminar, University of California, Irvine.  
 August 2001. *Algebraic Geometry in East Asia*. Kyoto, Japan.  
 May, 2001. *Lecture*, Arithmetic Geometry Seminar, University of California, Irvine.  
 Spring, 2000. *Lecture*, Geometry Seminar, University of California, Santa Cruz.  
 July 1999. *Lecture*, Università degli Studi di Napoli Federico II. Naples, Italy.  
 Spring, 1999. *Lecture*, Algebra Seminar, University of California, Santa Cruz.  
 December 1998. *Symposium*. SFB 478, University of Munster, Germany.  
 November 1998, *Seminar*, Duke University

Fall 1998, Lecture, AMS meeting in Chicago.  
July 1998. *AMS Summer Conference on Quantum Cohomology*, Mt. Holyoke College.  
February 1998, *Lecture*, Valley Geometry Seminar, University of Massachusetts.  
January 1998, *AMS Session on Algebraic Geometry and Fields*, AMS Joint Meeting, Baltimore.  
March 1997. University of Cordoba, Argentina.  
February 1997. *Moduli Spaces in Geometry and Physics*, University of Florida.

### **Awards/Grants:**

NSF Grant (PI, DMS 1002625) , awarded June 2010.  
NSF Grant (PI, DMS 0703956) , awarded June 2007.  
Invitation, Institut des Études Scientifique, May & June 2010.  
Invited position, Université Joseph Fourier, May 2009.  
Member, Mathematical Sciences Research Institute, May 2008.  
Co-Organizer: Hodge theory, Banff International Research Station, April 2008.  
Member, Institute for Advanced Study, 2004—2005.  
Visitor, Max Planck Institute for Mathematics, August 2004.  
Visitor, Max Planck Institute for Mathematics, July—September 2002.

(All invited/visiting positions and memberships with financial support form the host institution).

### **Teaching:**

Fall 2010:

Math 425, *Complex analysis*.  
Math 415, *Applied Linear Algebra*.

Spring 2010:

Math 132, *Calculus*  
Math 890: Henrik Jansson

Fall 2009:

Math 414, *Linear Algebra*.  
Math 914, *Lie Algebras*.

Fall 2008:

Math 132, *Calculus I*.  
Math 415, *Applied Linear Algebra*.

Spring 2008: Math 819, Algebra II.

Fall 2007:

Math 425, *Complex Analysis*.  
Math 818, *Algebra I*.

Fall 2006: Math 132, *Calculus I* (2 sections).

**Service:**

Department Service:

Phillips Lecture Committee (2007).  
Graduate Qualifying Exam Committee (2008).

Professional Service:

Refereeing & Mathematical Reviews.