

# Paolo Aluffi

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## Personal

Born: **6/14/1960 in Turin, Italy.**

Citizenship: **Dual Italian/U.S.A..**

## Education

May 1987 **Ph.D. in Mathematics**, *Brown University*, Providence, RI, USA.  
(W. Fulton, thesis advisor)

- Dissertation: On some characteristic numbers for smooth plane curves

July 1983 **Laurea in Matematica**, *Università degli Studi di Torino*, Italy.

(A. Collino, relatore)

- Tesi: Elementi di teoria delle varietà abeliane; Jacobiana associata ad una curva.  
Un criterio di caratterizzazione delle Jacobiane

## Academic positions

1/2012-12/2013 **Marion Bradley Brennan Professor**, *Florida State University*.

(2009-present **Visiting Research Associate**, *California Institute of Technology*).

2000-present **Professor**, *Florida State University*.

1995-2000 **Associate Professor**, *Florida State University*.

1991-1995 **Assistant Professor**, *Florida State University*.

1989-1991 **Visiting Assistant Professor**, *Oklahoma State University*.

1987-1989 **Dickson Instructor**, *University of Chicago*.

## Grants and awards

2009 **FSU**, *COFRS award*. - Project title: *Geometry and Physics*.

2007-09 **NSA**, award #H98230-07-1-0024,  
- Project title: *Limits in Intersection Theory and Invariants of Singular Spaces*.

2007-08 **FSU**, *University Teaching award*.

2004-05 **NSA**, award #H98230-04-1-0112,  
- Project title: *Blow-up algebras, characteristic classes, and enumerative geometry*.

2000-01 **FSU**, *University Teaching award*.

1998 **FSU**, *Developing Scholar award*.

1995 **FSU**, *Teaching Incentive Program award*.

1995-98 **NSF**, award #9500843, - Project title: *Topics in Intersection Theory*.

1994-95 **FSU**, *University Teaching award*.

1993 **FSU**, *First Year Assistant Professor summer award*.

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## Publications

Abstracts and links to most of the publications listed here may be found at <http://www.math.fsu.edu/~aluffi/mainhtmls/pubs.html>

— BOOKS

3. *Algebra: Chapter 0*. 713 pages, 2009.  
American Mathematical Society, Graduate Studies in Mathematics Volume 104  
A textbook for upper level undergraduate or beginning graduate courses in Algebra, including an introduction to homological algebra. The material is presented via a categorical approach emphasizing universal properties. The book includes more than 1000 exercises.
2. *Fare Matematica — Astratto e concreto nella matematica elementare*. 144 pages, 2009.  
Aracne Editrice. In Italian.  
This book is aimed at the general public. It consists of a brief introduction to a few elementary themes in mathematics, emphasizing the interplay between the abstractness of the material and the concreteness of the mathematical approach to it.
1. *Quantum cohomology at the Mittag-Leffler Institute*. 163 pages, 1998.  
Appunti della Scuola Normale Superiore di Pisa.  
A write-up of talks given in the Fall semester of 1996 by the participants to the year on “Enumerative geometry and its interactions with theoretical physics” at the Mittag-Leffler institute in Stockholm, Sweden.

— PREPRINTS

47. *Chern classes of graph hypersurfaces and deletion-contraction relations*, 29 pages.  
We establish a weak deletion-contraction relation for Chern classes of graph hypersurfaces, analogous to the relation for the Grothendieck class obtained in previous work, and prove corresponding multiple edge formulas. The main results are obtained as corollary of a formula for the Chern-Schwartz-MacPherson class of a transversal intersection. We also provide an alternative approach, based on Verdier specialization.
46. *Grothendieck classes and Chern classes of hyperplane arrangements*, 20 pages.  
We show that the characteristic polynomial of a hyperplane arrangement can be recovered from the class in the Grothendieck group of varieties of the complement of the arrangement, and from its Chern-Schwartz-MacPherson class. We also give relations with the Segre class of the singularity subscheme of the arrangement, and study the issue of positivity of the Chern-Schwartz-MacPherson class of an arrangement.
45. *A motivic approach to phase transitions in Potts models*, with Matilde Marcolli, 33 pages.  
We describe an approach to the study of phase transitions in Potts models based on an estimate of the complexity of the locus of real zeros of the partition function, computed in terms of the classes in the Grothendieck ring of the affine algebraic varieties defined by the vanishing of the multivariate Tutte polynomial.

44. *Verdier specialization via weak factorization*, 28 pages.  
To appear in *Arkiv för Matematik*.  
We define a constructible function on arbitrary closed subschemes of nonsingular varieties, recovering and partially extending a construction originally introduced by Verdier. We also introduce a counterpart of the construction in a motivic group, and show that these invariants have a natural ‘monodromy’ decomposition.
43. *Graph hypersurfaces and a dichotomy in the Grothendieck ring*, with Matilde Marcolli.  
*Lett. Math Phys.* (2011) 95:223-232  
We prove that every graph hypersurface is stably birationally equivalent to a union of points. This implies that Grothendieck classes of graph hypersurfaces span a tiny portion of the Grothendieck ring, while Belkale and Brosnan have proved that they span the whole Grothendieck ring after a suitable localization.
42. *Feynman motives and deletion-contraction relations*, with Matilde Marcolli.  
In *Topology of Algebraic Varieties and Singularities, Contemporary Mathematics*, vol. 538, Amer. Math. Soc., Providence, RI, 2011, pp. 21-64.  
We explore analogues of combinatorial deletion-contraction rules for the Feynman rules introduced in our previous work. We prove multiple edge formulas, and formulas for graphs consisting of chains of polygons. We show that the deletion-contraction relation can be lifted to the level of the category of mixed motives.
41. *Algebraic-Geometric Feynman rules*, with Matilde Marcolli.  
*Int. J. Geom. Methods Mod. Phys.* 8 (2011) 203-237  
We introduce ‘algebraic-geometric’ Feynman rules, with values in the Grothendieck groups of varieties (via motivic considerations) and in a polynomial ring (via characteristic classes), and discuss renormalization procedures and some motivic zeta functions.
40. *Parametric Feynman integrals and determinant hypersurfaces*, with Matilde Marcolli.  
*Adv. Theor. Math. Phys.* 14 (2010) 911-963  
Modulo the issue of divergences, we express Feynman integrals on a graph as a period of the complement of a determinant hypersurface in a space of matrices with respect to certain loci determined by rank conditions. This provides evidence for a conjectural description of the integrals as periods of mixed Tate motives.
39. *New orientifold weak coupling limits in F-theory*, with Mboyo Esole.  
*J. High Energy Phys.* (2010) no. 2, 1-53.  
We produce new explicit examples of weak coupling limits in F-theory, obtaining new brane configurations that would not be admissible in the original framework of the limit constructed by Ashoke Sen. In our approach, limits depend on the choice of a transition from a semistable to an unstable singular fiber of an elliptic fibration. We also classify configurations of smooth D-branes satisfying the tadpole condition.
38. *Chern classes of blow-ups*.  
*Math Proc. of the Cambridge Phil. Soc.* (2010) 148: 227-242.  
We generalize a classic formula of Porteous, computing the Chern classes of a blow-up. The classic formula deals with the nonsingular case, while our generalization works whenever the center of the blow-up is regularly embedded.
37. *Limits of PGL-translates of plane curves, II*, with C. Faber.  
*Journal of Pure and Applied Algebra* 214 (2010), 548-564.

We continue the study of degenerations of plane curves, obtaining certain numerical invariants necessary for applications to enumerative geometry.

36. *Limits of PGL-translates of plane curves, I*, with C. Faber.  
Journal of Pure and Applied Algebra 214 (2010), 526-547.  
We study the degenerations of plane curves under the action of one-parameter families of linear transformations.
35. *Feynman motives of banana graphs*, with Matilde Marcolli.  
Comm. in Number Theory and Physics (2009) 1-57.  
We study an infinite family of graphs known as 'banana graphs' from an algebro-geometric, intersection-theoretic viewpoint, with the goal of obtaining information about corresponding Feynman integrals.
34. *Chern class identities from tadpole matching in type IIB and F-theory*, with Mboyo Esole.  
J. High Energy Phys. (2009) no. 3, 032, 29 pp.  
We prove a family of Chern class identities for elliptic fibrations, conjectured on the basis of considerations in string theory.
33. *Chern classes of Schubert cells and varieties*, with Leonardo Constantin Mihalcea.  
J. Algebraic Geom. 18 (2009), 37-61.  
We give explicit formulas for the Chern-Schwartz-MacPherson classes of all Schubert varieties in the Grassmannian of  $d$ -planes in a vector space, and conjecture that these classes are effective. We prove this is the case for (very) small values of  $d$ .
32. *Une nouvelle preuve de la concordance des classes définies par M.-H. Schwartz et par R. MacPherson*, with Jean-Paul Brasselet.  
Bull. Soc. math. France 136 (2008) 159-166.  
We give a very short proof of the identity between different definitions of Chern classes for singular varieties.
31. *Celestial integration, stringy invariants, and Chern-Schwartz-MacPherson classes*, in 'Real and Complex Singularities', J.-P. Brasselet, M.A. Soares Ruas Eds., Birkhäuser (2007) 1-14.  
We survey the notion of integration on the category of modifications of a variety, that we defined in 28., and several applications.
30. *Limits of Chow groups, and a new construction of Chern-Schwartz-MacPherson classes*.  
Pure Appl. Math. Q., Robert MacPherson special issue, part II, 2 (2006), 915-942.  
We introduce a new 'proChow functor', and use it to give a new construction of Chern-Schwartz-MacPherson classes, providing a new proof of a conjecture of Deligne and Grothendieck.
29. *Classes de Chern pour variétés singulières, revisitées*,  
C. R. Math. Acad. Sci. Paris 342 (2006), no. 6, 405-410.  
We summarize a new construction of Chern-Schwartz-MacPherson classes, and use it to give very short proofs of (generalizations of) two known results on these classes.
28. *Modification systems and integration in their Chow groups*,  
Selecta Mathematica 11 (2005) 155-202.  
We introduce a formal integration on the category of modifications of a given variety. This leads to new invariants, including 'stringy' Chern classes, and is closely related to the theory of Chern-Schwartz-MacPherson classes.

27. *Lectures on characteristic classes of singular varieties*,  
in 'Topics in cohomological studies of algebraic varieties', Birkhäuser (2005) 1–32.  
Notes for a cycle of five lectures given at the Banach Center, Warsaw, in April 2002.
26. *Chern classes of birational varieties*,  
International Mathematics Research Notices 63 (2004), 3367–3377.  
We prove that the Chern classes of birational varieties 'with the same canonical class' are images of the same class in a resolution of indeterminacies of any birational map between them. This is an analog of a celebrated theorem of Batyrev, asserting the equality of the Betti numbers of varieties satisfying the same condition.
25. *Shadows of blow-up algebras*,  
Tohoku Math. J. (2) 56 (2004), 593–619.  
We introduce a new 'blow-up algebra' interpolating between the Rees and Symmetric algebras of an ideal, and use it to give a new construction of the Chern-Schwartz-MacPherson class of a hypersurface in a nonsingular variety.
24. *Inclusion-exclusion and Segre classes, II*,  
Contemp. Math. 324 (2003) 51–61.  
We pursue the exploration of 'inclusion-exclusion' principles in the theory of Segre classes, by proving such a principle holds for another variation on the notion of Segre class. This is used to provide a simple computation of the classes introduced in our previous work, in certain special (but representative) cases.
23. *Inclusion-exclusion and Segre classes*,  
Comm. Algebra 31 (2003) 3619–3630.  
We propose a variation of the notion of Segre class, by forcing a naive 'inclusion-exclusion' principle to hold. We establish several general properties of the new class, and obtain an expression for the Milnor class of an arbitrary scheme in terms of this class.
22. *Interpolation of characteristic classes of singular hypersurfaces*, joint with Jean-Paul Brasselet,  
Advances in Math 180 (2003) 692–704.  
We show that Chern-Schwartz-MacPherson's classes of a hypersurface 'interpolate' two other notions of characteristic classes, provided that a regularity condition on the singular locus is satisfied. We apply this result to obtain a lift of Chern-Schwartz-MacPherson's classes to intersection homology for the same class of hypersurfaces.
21. *Computing characteristic classes for projective schemes*,  
Journal of Symbolic Computation 35 (2003) 3–19.  
We present an algorithm (implemented in Macaulay2) computing several classes associated to a projective scheme, given its defining homogeneous ideal.
20. *Linear orbits of arbitrary plane curves*, joint with Carel Faber,  
Michigan Math. Jour., 48 (2000), 1–37.  
We obtain an algorithm computing the degree of the closure of the linear orbit of an arbitrary plane curve, and give explicit formulas for plane curves with irreducible singularities.
19. *Differential forms with logarithmic poles and Chern-Schwartz-MacPherson classes of singular varieties*,  
Comptes Rendus de l'Académie des Sciences, Série I, 329 (1999), 619–624.

We prove a formula for Schwartz-MacPherson's chern class of a singular variety in terms of the classes of the sheaf of differential forms with logarithmic poles along the components of a divisor arising in the resolution of singularities of the variety. As an application, we obtain a formula for the class of a singular hypersurface in terms of the Mather-Chern class of a suitable sheaf.

18. *Plane curves with small linear orbits II*, joint with Carel Faber, International Journal of Mathematics, 11 (2000) 591–608.

The completion of the study of plane curves with positive dimensional stabilizer under the action of the group of projective linear transformations of the plane. In this work we analyze curves obtained as unions of lines.

17. *Plane curves with small linear orbits I*, joint with Carel Faber, Annales de l'institut Fourier, 50 (2000) 151–196.

A study of the enumerative geometry of the orbits of most plane curves with positive dimensional stabilizer under the action of the group of projective linear transformations of the plane.

16. *Weighted Chern-Mather classes and Milnor classes of hypersurfaces*, in 'Singularities and Arrangements, Sapporo-Tokyo 1998', Advanced Studies in Pure Mathematics 29, p.1–20.

We extend the notion of Chern-Mather class to possibly nonreduced schemes, and show how this new notion can be used to compute the difference between Schwartz-MacPherson's chern class and the class of the virtual tangent bundle of a singular hypersurface of a nonsingular variety.

15. *Chern classes for singular hypersurfaces*, Trans. Amer. Math. Soc. 351 (1999) 3989–4026.

A new formula relating Fulton's Chern class and MacPherson's Chern class of a possibly singular hypersurface in a nonsingular variety is proved, and applied to Segre class and Chern class computations.

14. *Characteristic classes of discriminants and enumerative geometry*, Comm. in Algebra 26(10) (1998) 3165–3193.

We show how computing characteristic classes of strata of the discriminant of a linear system on a nonsingular variety would lead to enumerative results, and carry out these computations in low codimensions. Also, we compute the classes for all strata of the discriminant of  $d$ -tuples of points on the projective line, and of cubic curves in the projective plane.

13. *Singular schemes of hypersurfaces*, Duke Math. Journal, 80 (1995) 325–351.

A class is introduced generalizing the notion of Milnor number to possibly nonisolated hypersurface singularities. This is used to recover several results in duality theory, as well as producing new constraints for a scheme to be the jacobian scheme of a hypersurface in a smooth variety.

12. *A blow-up construction and graph coloring*, Discrete Math., 145 (1995) 11–35.

A nonsingular algebraic variety is constructed, encoding the incidence information of a given graph  $G$ , and is used to obtain the chromatic polynomial of  $G$  in terms of intersection-theoretic information.

11. *A remark on the Chern class of a tensor product*, with Carel Faber, Manu. Math. 88 (1995) 85–86.

A short note showing that the  $(r + 1)$ -st Chern class of a rank- $r$  element  $\alpha$  in the Grothendieck group of vector bundles over a scheme does not change if  $\alpha$  is tensored by a line bundle.

10. *MacPherson's and Fulton's classes of hypersurfaces*,  
International Mathematics Research Notices (1994), 455–465.  
It is shown that MacPherson's Chern class of a hypersurface in a smooth variety agrees, at least numerically, with a construction inspired by Fulton's canonical class of a scheme.
9. *Linear orbits of  $d$ -tuples of points in  $P^1$* ,  
with Carel Faber, Jour. für die R. und Ang. Math. 444 (1993), 205–220.  
Orbit closures of sets of points of the projective line under the action of the automorphism group of the latter are studied in terms of their degree and multiplicity along their boundary.
8. *Multiplicities of discriminants*, with Fernando Cukierman,  
Manu. Math. 78 (1993), 245–258.  
The multiplicity of the discriminant of a line bundle over a nonsingular variety at a section is computed in terms of the Segre class of the jacobian scheme of the section.
7. *Linear orbits of smooth plane curves*,  
with Carel Faber, Journal of Alg. Geom. 2 (1993) 155–184.  
A desingularization of the orbit closures of plane curves under the action of the automorphism group of the plane is constructed and used to study such orbits.
6. *Some characteristic numbers for nodal and cuspidal plane curves of any degree*,  
Manu. Math. 72 (1991), 425–444.  
A compactification of the space of reduced plane curves is used to compute characteristic numbers for singular plane curves of arbitrary degree.
5. *The enumerative geometry of plane cubics II: nodal and cuspidal cubics*,  
Math. Annalen 289 (1991), 543–572.  
A variety of complete cubics is used to study the enumerative geometry of several families of irreducible singular plane cubics.
4. *How many smooth plane cubics with given  $j$ -invariant are tangent to 8 lines in general position?*,  
Contemporary Mathematics 123 (1991), 15–29.  
Formulas are obtained for the characteristic numbers of families parametrized by hypersurfaces in the projective space of plane cubics.
3. *Two characteristic numbers for smooth plane curves of any degree*,  
Trans. of the Amer. Math. Soc., vol. 329 (1992), 73–96.  
A sequence of blow-ups over projective spaces parametrizing plane curves is used to obtain enumerative results concerning smooth plane curves of arbitrary degree.
2. *The enumerative geometry of plane cubics I: smooth cubics*,  
Trans. of the Amer. Math. Soc., vol. 317 (1990), 501–539.  
A variety of complete plane cubics is constructed and employed to obtain a thorough analysis of the enumerative geometry of smooth cubics.
1. *The characteristic numbers for smooth plane cubics*,  
Proceedings of 'Algebraic Geometry, Sundance 1986', Springer Lecture Notes 1311, 1–8.  
The characteristic numbers for the family of smooth plane cubics are computed, verifying results of Maillard and Zeuthen.

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## Visits ( $\geq 1$ month)

- May-July 2011 **California Institute of Technology.**
- May-July 2010 **California Institute of Technology.**
- July 2009 **Max-Planck-Institut für Mathematik, Bonn, Germany.**
- Jan.-April 2009 **Mathematical Sciences Research Institute, Berkeley.**
- Sep.-Dec. 2008 **California Institute of Technology.**
- May-July 2008 **Max-Planck-Institut für Mathematik, Bonn, Germany.**
- June-July 2007 **Max-Planck-Institut für Mathematik, Bonn, Germany.**
- April-May 2007 **Mittag-Leffler Institut, Stockholm, Sweden.**
- Jan.-Mar. 2007 **Institut de Mathématiques, Luminy, France.**
- June-July 2006 **Max-Planck-Institut für Mathematik, Bonn, Germany.**
- June-July 2005 **Max-Planck-Institut für Mathematik, Bonn, Germany.**
- May 2005 **Institut de Mathématiques, Luminy, France.**
- May-July 2004 **Max-Planck-Institut für Mathematik, Bonn, Germany.**
- May-July 2003 **Max-Planck-Institut für Mathematik, Bonn, Germany.**
- Sep. 01-July 02 **Max-Planck-Institut für Mathematik, Bonn, Germany.**
- May-July 2001 **Institut de Mathématiques, Luminy, France.**
- July 2000 **Max-Planck-Institut für Mathematik, Bonn, Germany.**
- Sep.-Dec. 1999 **Harvard University.**
- Sep. 96-Apr. 97 **Mittag-Leffler Institut, Stockholm, Sweden.**
- June-July 1996 **Mathematisches Forschungsinstitut, Oberwolfach, Germany.**
- May 1996 **University of Chicago.**
- May 1995 **University of Chicago.**
- May 1994 **University of Chicago.**
- Jan.-June 1993 **Mathematical Sciences Research Institute, Berkeley.**
- Jan.-June 1992 **Max-Planck-Institut für Mathematik, Bonn, Germany.**
- May-July 1990 **Mathematisches Institut, Erlangen, Germany.**

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## Selected talks (2006-11)

- 2011 **Hefei, China**, Singularity theory conference, (X. Chen, L. Maxim).  
*Chern classes of hyperplane arrangements*
- 2011 **Villa de Leyva, Colombia**, Summer school, 'Geometric, Algebraic and Topological Methods for Quantum Field Theory, (A. Cardona, H. Ocampo, S. Paycha, A. Reyes).  
*Chern classes of singular varieties, graph hypersurfaces and Feynman integrals* (four lectures)
- 2011 **Oklahoma State University, Stillwater, OK**, (R. Zierau; colloquium).  
*Naive motives of graph hypersurfaces*
- 2011 **Arizona State University, Tempe, AZ**, (W. Raskind; colloquium).  
*Naive motives of graph hypersurfaces*
- 2010 **University of Utrecht, Utrecht, the Netherlands**, Arithmetic Geometry and Noncommutative Geometry, MRI Master Class, (G. Cornelissen).  
*Characteristic classes and Feynman integrals* (three lectures)

- 2010 **Berkeley, CA**, AMS meeting #1061, Special session on Singularity Theory and Algebraic Geometry, (D. Eisenbud, A. Libgober, J. Seade, X. Gomez-Mont).  
*Deletion-contraction and multiple edge formulas for graph hypersurfaces*
- 2010 **Caltech, Pasadena, CA**, Algebraic geometry seminar, (T. Graber).  
*Chern classes identities from weak coupling limits*
- 2010 **Georgia Tech, Atlanta, GA**, Algebra seminar, (S. Garoufalidis).  
*Chern classes identities from weak coupling limits*
- 2010 **Kagoshima, Japan**, 5th Algebra-Analysis-Geometry Workshop, (S. Yokura).  
*Chern classes of singular varieties, graph hypersurfaces, and Feynman integrals*
- 2009 **Riverside, CA**, AMS meeting #1054, Special session in Algebraic Geometry, (C. Hacon, Z. Ran).  
*Chern classes identities from weak coupling limits*
- 2009 **University of Notre-Dame, South Bend, IN**, Algebraic Geometry Seminar, (N. Budur).  
*Chern Classes of Singular Varieties, Graph Hypersurfaces, and Feynman Integrals*
- 2009 **Max-Planck-Institut, Bonn, Germany**, Seminar on Algebra, Geometry, and Physics, (Y. Manin).  
*Chern Classes of Singular Varieties, Graph Hypersurfaces, and Feynman Integrals*
- 2009 **Jaca, Spain**, Lib60ber conference.  
*Chern Classes of Singular Varieties, Graph Hypersurfaces, and Feynman Integrals*
- 2009 **Harvard University, Cambridge, MA**, Seminar, (S.-T. Yau, M. Esole).  
*Unexpected applications of characteristic classes for singular varieties*
- 2009 **Worldwide center of Mathematics, Cambridge, MA**, (D. Massey).  
*Chern Classes of Blow-ups*
- 2009 **Mathematical Sciences Research Institute, Berkeley, CA**, MSRI colloquium.  
*(Unexpected) applications of characteristic classes for singular varieties*
- 2008 **Duke University, Durham, NC**, Algebraic Geometry seminar, (L. Mihalcea).  
*Chern class identities from string theory*
- 2007 **Mittag-Leffler Institute, Stockholm, Sweden**, Seminar, (C. Faber, T. Ekedahl).  
*Limits and Chern classes*
- 2007 **Centre de Mathématiques, Technopôle Château-Gombert, Marseille, France**, Seminar on singularities, (J.-P. Brasselet).  
*Variétés de Schubert et leurs classes de Chern*
- 2006 **Universität Freiburg, Freiburg, Germany**, Seminar on mirror symmetry, (B. Siebert).  
*Chern classes of singular varieties*
- 2006 **Galatasaray University, Istanbul, Turkey**, Arithmetic and geometry around quantization, (O. Ceyhan).  
*Invariants of singular varieties, old and new*
- 2006 **Renyi Institute, Budapest, Hungary**, Summer school, (four lectures, organized by A. Nemethi).  
*Characteristic classes of singular varieties*
- 2006 **Centre de Mathématiques, Technopôle Château-Gombert, Marseille, France**, Seminar on singularities, (J.-P. Brasselet).  
*Groupes de proChow et classes de Chern-Schwartz-MacPherson*
- 2006 **Ohio State University, Columbus, OH**, Lefschetz Colloquium, (G. Kennedy).  
*Invariants of singular varieties, old and new*

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## Ph.D. students

- Bill Adams
- James Fullwood
- Xia Liao
- **Deborah Jones, Ph.D. 2003**  
Thesis: *Intersection numbers of divisors in graph varieties*
- **Judson Stryker, Ph.D. 2011**  
Thesis: *Chern-Schwartz-MacPherson classes of graph hypersurfaces and Schubert varieties*
- **Dimitre Tzigantchev, Ph.D. 2006**  
Thesis: *Predegree polynomials of plane configurations in projective space*

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## Service (to the profession)

- Associate Editor, *Journal of Singularities*, (D. Massey, managing editor) 2009—
- Editor, *ISRN Geometry*, 2011—
- Refereeing: *Advances in Mathematics*; *Aspects of Mathematics*; *Asian Journal of Mathematics*; *American Journal of Mathematics* (2); *Canadian Journal of Mathematics*; *Communications in Algebra* (3); *Compositio Mathematica* (3); *Contemporary Mathematics* (3); *Duke Math Journal*; *Impanga Lecture Notes*; *Journal of Algebraic Geometry* (3); *Journal of Geometry*; *Journal of Geometry and Physics*; *Journal of Pure and Applied Algebra*; *Journal of Software for Algebra and Geometry*; *Journal of Topology*; *Pure and Applied Math Quarterly* (2); *K-theory*; *Mathematische Zeitschrift*; *Proceedings of the American Mathematical Society* (2); *Rendiconti del circolo matematico di Palermo*; *Springer Lecture Notes*; *Topology and its applications*; *Transactions of the American Mathematical Society* (4).
- Grant reviewing: N.S.A. (3), N.S.F. (25); Swedish Research Council (8); Dutch NWO 'Veni' and 'Vidi' programs.
- Panelist for the ANTC program of the NSF, evaluating and ranking 62 grant proposals (2003).
- Co-organizer (with Ettore Aldrovandi and Eriko Hironaka) of the Special Session on Algebraic Geometry and Topology at the Sectional Meeting #994 of the AMS, Tallahassee, March 12-13, 2004.
- *Mathematical Reviews* (39 reviews)
- Outside Ph.D. thesis examiner for Dmitry Kerner, Tel-Aviv University, 2007 (Thesis: 'Enumeration of singular hypersurfaces'; E. Shustin, Ph.D. advisor)
- Outside evaluator of the mathematics program at Bethune-Cookman University, May 2009

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## Service (departmental/university)

- DIRECTOR OF PURE MATHEMATICS: 2005-07 (through Fall '07)  
Duties include: revision of graduate curriculum; organization of graduate and undergraduate courses; graduate student recruitment and advising; membership in the executive, faculty evaluation, and hiring committees.
- COMMITTEES:
  - Chair nomination (mathematics): 2004-05 (chair); 2011-12
  - Chair nomination (statistics): 2007-08
  - COFRS evaluation: 2011

- Colloquium: 1998-99
- Curriculum: 1993-96
- Doctoral preliminary examination: 1999-2001; 2002-03; 2003-05 (chair); 2009-10
- Election: 2002-04
- Executive: 1999-2000; 2005-07 (through fall '07)
- Facilities and technology (self-study): 1992-93
- Faculty evaluation: 2000-01; 2002 (fall); 2004 (spring); 2004-07 (through fall '07)
- FSU math society: 1995-96
- Graduate: 2006-07, 2010
- Graduate student recruitment and financial aid: 1997-2001; 2002-05
- Hiring: 1999-2000; 2004-05
- Library: 1994-96, 1997-2001
- Preliminary examination policy (chair): 1999-2000
- Pure mathematics: 2004-05 (chair)
- Retirement: 2003 (spring)
- SPP peer evaluation: 2011
- TIP peer evaluation: 1994-95, 1998-99
- Unit assessment survey ('QER'): 2003-04
- University Senate: 2000-01; 2006-08
- Undergraduate major recruitment and retention: fall 2004 (chair)
- Visibility: 2000-present

— GRADUATE STUDENT COMMITTEES:

- *Advanced topics examination/Ph.D. candidacy:*  
W. Adams (Apr. 98, chair); D. Jones (Dec. 98, chair); B. Goforth (Apr. 99);  
C. Stockwell (Apr. 99); D. Tzigantchev (Jan. 03, chair); A. Novocin (Feb. 06);  
R. Todd (Oct. 06); G. Levy (Nov. 06); E. Tatar (Dec. 06); Y. Lebedev (Nov. 07);  
Q. Yuan (Nov. 07); Y. Cha (Jan. 08); J. Stryker (Apr. 08, chair); D. Li (Aug.  
08); T. Fang (Nov. 09); X. Liao (Nov. 09, chair); I. Kunwar (Mar. 10); I. Dungan  
(Apr. 10); J. Fullwood (Apr. 10, chair); Y. Shen (Aug. 11).
- *Master's committees:*  
J. de Marco (2004, chair).
- *Ph.D. committees (mathematics):*  
—B. Goforth (April 2005, dissertation: 'Description and analysis of a two-variable  
version of the NTRU crypto system'. Sam Huckaba, major professor).  
—A. Novocin (April 2008, dissertation: 'Factoring Univariate Polynomials over the  
Rationals'. Mark van Hoeij, major professor).  
—Y. Lebedev (November 2008, dissertation: 'Openmath library for computing on  
Riemann surfaces'. Mika Seppala, major professor).  
—G. Levy (December 2009, dissertation: 'Solutions of Second Order Recurrence  
Relations'. Mark van Hoeij, major professor).  
—E. Tatar (May 2010, dissertation: 'Picard 2-Stacks and length 3 complexes of  
abelian sheaves'. Ettore Aldrovandi, major professor).  
—Y. Cha (December 2010, dissertation: 'Closed form solutions of linear difference  
equations'. Mark van Hoeij, major professor).

- *Ph.D. committees (university representative)*:
  - Fernando Febres Cordero (Physics, 2004 prospectus; 2007 Ph.D. dissertation: 'Next-to-leading-order corrections to weak boson production with a massive quark jet pair at hadron colliders'. Laura Reina, major professor)
  - Farrooh Fattoyev (Physics, 2009 prospectus; 2011 Ph.D. dissertation: 'Sensitivity of neutron star properties to the equation of state'. Jorge Pieckarevicz, major professor)
  - Heribertus Hartanto (Physics, 2010 prospectus: 'Top-Quark associated production with one hard photon at hadron colliders'. Laura Reina, major professor)
  - Paulo Rottmann (Physics, 2011 Ph.D. dissertation: 'Z-sum approach to loop integrals'. Laura Reina, major professor)

## Teaching

— FLORIDA STATE UNIVERSITY (1991-PRESENT):

Graduate:

- *Abstract algebra I*: Fall 1995; Fall 2003
- *Abstract algebra II*: Spring 1996
- *Groups, Rings, Vector Spaces I*: Fall 1994; Fall 2002; Fall 2004; Fall 2005; Fall 2009
- *Groups, Rings, Vector Spaces II*: Spring 1995; Spring 2003; Spring 2005; Spring 2006; Spring 2010
- *Groups, Rings, Vector Spaces III*: Fall 2005; Fall 2006; Fall 2010
- *Algebraic geometry (topics course)*: Fall 1993; Spring 1994; Fall 1997; Spring 1998; Fall 2000; Spring 2006
- *Homological and commutative algebra (topics course)*: Spring 2011
- *Algebra seminar*: Fall 1992; Spring 2000; Fall 2000
- *Algebraic geometry seminar*: Fall 1998; Spring 1999; Spring 2006; Fall 2009; Spring 2010; Fall 2010, Spring 2011

Undergraduate:

- *Applied Linear Algebra I*: Fall 2007
- *Calculus I*: Fall 1991, 2 sections
- *Calculus II*: Spring 1995
- *Calculus III*: Fall 1992, 2 sections; Fall 1994; Spring 1996; Fall 1998; Spring 2000; Fall 2000; Fall 2002; Fall 2003
- *College geometry*: Fall 1998
- *Discrete mathematics I*: Fall 1993; Fall 1995
- *Discrete mathematics II*: Spring 1994
- *Introduction to abstract algebra I*: Fall 1997; Fall 2000; Fall 2003; Fall 2004; Fall 2006; Fall 2007
- *Introduction to abstract algebra II*: Spring 1998; Spring 2005; Spring 2008
- *Introduction to advanced mathematics*: Spring 1999; Spring 2010; Fall 2010; Fall 2011
- *Introduction to real analysis*: Fall 2009
- *Mathematical logic*: Spring 2011

- BROWN UNIVERSITY (1984–87):
  - Elementary Calculus I, II; Intermediate Calculus I, II.
- THE UNIVERSITY OF CHICAGO (1987-89):
  - Honors Calculus, I, II, III; Abstract Algebra I, II, III; Introduction to Algebraic Geometry.
- OKLAHOMA STATE UNIVERSITY (1989-91):
  - Business Calculus, Calculus II, Differential Equations, Linear Algebra, Combinatorics, Complex Analysis.
- KTH, STOCKHOLM, SWEDEN (JANUARY-APRIL 1997):
  - Intersection theory and enumerative geometry.
- CALIFORNIA INSTITUTE OF TECHNOLOGY (FALL 2008):
  - Homological algebra.