

## CURRICULUM VITAE

**Victor J. Donnay**

March 2016

### Address:

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### Education:

B.S. Dartmouth College, 1981  
M.S. Courant Institute, New York University, 1983  
Ph.D. Courant Institute, New York University, 1986. Peter Sarnak, Adviser

### Positions:

1981-85 Research/Teaching Assistantship, Courant Institute, New York University  
1982-83 (Summers) Instructor, Junior Faculty Member, Pre-Medical Research and Education Program, New York City  
1985-86 Visiting Scholar, Stanford University  
1986 (Winter, 1986 Winter, Spring) Institute for Mathematics and Its Applications, Minneapolis  
1990-1996 Assistant Professor, Bryn Mawr College  
1991 July Guest of "Sonderforschungsbereich 170", "Geometry and Analysis", University of Gottingen, Germany  
1992-93 Visitor, Institute for Advanced Study, Princeton, NJ  
1994 October Short term visitor, The Geometry Center, Minneapolis  
1996-2002 Associate Professor, Bryn Mawr College  
1996-2002 Chair, Department of Mathematics, Bryn Mawr College  
1998-99 Visiting Scholar, University of California, Berkeley  
2002 - Professor, Bryn Mawr College  
2012 - 2014 Chair, Bryn Mawr College Sustainability Leadership Group  
2013 - Director, Environmental Studies Program, Bryn Mawr College  
2013 - William R. Kenan, Jr. Chair in Mathematics

### Grants:

NSF Grants 1988-1990, \$21,496  
Bryn Mawr College Faculty Research Grant, 1991-1992, \$1000  
Pew Science Program, 1991-1992, \$6779

Bryn Mawr College Faculty Research Grant, 1992-1993, \$1163  
 NSF Travel Grant 1992-93, \$3000  
 Bryn Mawr College Faculty Research Grant, 1993-1994, \$1535  
 Bryn Mawr College Provost's Grant, summer 1994, \$2705, to fund the Bryn Mawr -  
 Swarthmore Geometry and Computer Visualization Project  
 U.S. Civilian Research and Development Foundation (CRDF) Grant, \$33,900, 1996-1998, Co-  
 PI with Vladimir Lazutkin.  
 Bryn Mawr College Faculty Research Grant, 1998-1999, \$2000.  
 Bryn Mawr College Praxis Course Development Grant 2001, \$3000.  
 Sigma Xi National Computer Science Institute workshop for Tri-college faculty, Co-PI, Dec. 2003.  
 Mellon Tri-College Forum Grant, 2003-2004, \$5000  
 NSF Math-Science Partnership Grant, 2003-2008, \$12.5 million, Co-PI, Joe Merlino, PI. PI of the  
 Bryn Mawr-Haverford MSPGP subaward (\$700,000).  
 Project Kaleidoscope Leadership Planning Grant, 2004-2005, \$5000.  
 National Fish and Wildlife Foundation, Delaware Estuary Watershed Grants Program  
 Environmental Assessment and Action Plan for the Haverford State Hospital site,  
 2007-2008, \$45,320. Project Director Jan Marie Rushforth. Member of project  
 leadership team.  
 NSF Math Science Partnership START grant, Environment, Energy, and Sustainability  
 Science: An Institute for 21st Century Teacher Leaders, 2008-2010, \$299,498. Co-  
 PI, Steve Madigosky, Widener University, PI.  
 NSF Noyce Teacher Scholarship Program at Bryn Mawr and Haverford Colleges, PI,  
 5 year grant for \$897,421, 7/1/09 – 6/30/2014.  
 NSF Noyce Capacity Building grant, Philadelphia Regional Noyce Partnership, PI, 2 year grant  
 for \$300,000, 9/1/11 – 8/31/13.  
 Mellon Tri-Co Seed grant, Tri-College Biomathematics Initiative, \$3000, 2011-12.  
 Course Development Grant for Math and Sustainability course, \$3000, Bryn Mawr College, summer  
 2011.  
 Consortium for Excellence in Teacher Education (CETE), \$3000 seed grant to sponsor conference on  
 STEM Teacher Preparation at Liberal Arts Institutions. October 2011.  
 NSF Workshop grant, \$50,000 to fund conference on STEM Teacher Preparation at  
 Liberal Arts Institutions. 4/1/12-3/31/14.  
 NSF Noyce Capacity Building grant, Philadelphia Regional Noyce Partnership New Teacher  
 Support Program, PI, \$300,000, 2014-17.  
 NSF ISUE grant, The Summer STEM Teaching Experiences for Undergraduates  
 from Liberal Arts Institutions (TEU) program, 5 year grant for \$2.35 million, C. Steinhorn  
 PI, V. J. Donnay, Co-PI, 9/1/15 – 8/31/20.

### **Honors and Awards:**

June 1981	Graduated Phi Beta Kappa, Summa Cum Laude with Distinction in Mathematics from Dartmouth College. Recipient of the Reynolds Scholarship (Honorary).
March 1987	Friedrichs Prize for an outstanding Ph.D. thesis from the Courant Institute.
1998	Recipient of Enhanced Sabbatical Leave from Bryn Mawr College.
2008	Curriculum for my Differential Equations course chosen as a Model



November 2005 Differential Geometry Day, Eastern Illinois University  
 January 2014 QR Sigma, Annual meeting, Keynote Address, Joint Mathematics Meetings,  
 Baltimore.  
 March 2015 Chicago Symposium, Northeastern Illinois University.  
 March 2015 Midwest SENCER meeting, Northeastern Illinois University.  
 August 2015 SENCER Summer Institute, WPI, Worcester, MA.

**Contributed Talks:**

June 1989 Workshop on the Geometry of Hamiltonian Systems, MSRI  
 January 1990 Joint Mathematics Meetings, MAA Special Session, "Computers in  
 the Classroom, the time is Right", Louisville  
 January 1992 Joint Mathematics Meetings, MAA Special Session, "Toolkit for the  
 Liberal Arts", Baltimore  
 March 1992 International Conference on Hamiltonian Dynamical Systems,  
 University of Cincinnati  
 May 1993 Joint Northeastern University-Bryn Mawr Ergodic Theory Conference,  
 Bryn Mawr College  
 August 1999 Art and Mathematics Conference, UC Berkeley  
 January 2009 Joint Mathematics Meetings, MAA Session on College Algebra:  
 Focusing on Conceptual Understanding, Real-World Data, and  
 Mathematical Modeling. Talk titled Building Civic  
 Engagement into Mathematics Courses as a Way to Motivate  
 and Inspire Students,  
 January 2014 Joint Mathematics Meetings, Baltimore, MAA Session  
 Undergraduate Sustainability Experiences in the Introductory  
 Mathematics Classroom: (i) Is it "Worth It" to Change Your  
 Light Bulb? with E. Biernet and H. Weinstein; (ii) Arctic Sea  
 Ice Activities in Class with B. Bauldry and L. Reed; (iii) Using  
 Solar Panels to Teach Integration.

**Attended:**

August 1988 Symposium in Mathematics, ETH Zurich, on the occasion of  
 Professor J. Moser's 60th birthday  
 May 1989 Geometric Rigidity Conference, University of Colorado  
 March 1990 Geometric Rigidity Conference, Northwestern University  
 April 1990 Dynamical Systems Conference, University of Maryland  
 July 1990 International Convention on Cooperative Learning, Baltimore,  
 Maryland  
 October 1990 Dynamical Systems Conference, Penn State University  
 March 1991 Geometric Rigidity and Hyperbolic Dynamics Conference, Penn  
 State University  
 October 1991 Dynamical Systems Conference, Penn State University



September 2015

Vassar College

**Seminar Lectures:**

March 1986	Cal Tech Dynamics Seminar
June 1986	CUNY Graduate Center Dynamics Seminar
October 1986	ETH Zurich Analysis Seminar
January 1987	McGill University Analysis Seminar
June 1987	University of Bern, Dynamics Seminar
November 1987	Rutgers University, Mathematical Physics Seminar
December 1987	Institute for Advanced Study, Dynamics Seminar
March 1988	Penn State University, Applied Math Seminar
July 1988	University of Rome, Analysis Seminar, 2 lectures
July 1988	Mathematical Institute of the Hungarian Academy of Sciences, Budapest
August 1988	Technical University of Berlin, Mathematical Physics Seminar
November 1988	Institute for Advanced Study, Dynamics Seminar
June 1989	University of California, Berkeley, Dynamics Seminar
January 1990	University of Michigan, PDE-Dynamics Seminar
February 1990	IMA, Minneapolis, Dynamics Seminar
May 1990	University of Minnesota, Geometry Seminar
July 1991	University of Gottingen, Analysis Seminar
July 1991	University of Bielefeld, Dynamics Seminar
October 1991	University of Pennsylvania, Geometry - Topology Seminar
October 1991	Stockton State College, Mathematics Seminar
January 1992	Penn State University, Mills College Summer Program Reunion
July 1992	Northwestern University, Dynamics Seminar
October 1992	SUNY Stony Brook, Dynamics Seminar
October 1992	University of Maryland, Dynamics Seminar
December 1992	University of Arizona, Dynamics Seminar
March 1993	Institute for Advanced Study, Geometry Seminar
April 1993	CUNY Graduate Center, Dynamics Seminar
April 1993	Princeton University, series of 2 lectures in Lewowicz's Dynamics

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August 2005	Radnor High School Math Dept, presentation on Formative Assessment
October 2005	Haverford School District, presentation on Formative Assessment
May 2005	Haverford College. Organizer, one day workshop on math and science pedagogy for faculty from MSPGP partner IHEs.
August 2005	MSPGP-PKAL Leadership Planning Institute. Organizer and co-facilitator of 3 day leadership institute.
November 2005	Northwestern University. Faculty workshop on How People Learn and Formative Assessment.
November 2005	Bryn Mawr College. Computer Graphics workshop for Coopertown Elementary School students leading to their participation in undergraduate poster session.
January – May 2006	Organizer and co-facilitator of MSPGP monthly pedagogy seminar on Formative Assessment lead by Dr. Dylan Wiliam, attended by 40 secondary and IHE faculty.
February 2006	MSPGP Math Disciplinary Faculty Symposium, TIMSS video study: Ichiro Japanese lesson.
February 2006	Drew University. Faculty workshop on How People Learn and Formative Assessment.
June 2006	Bryn Mawr College. and MSPGP. Organizer, one day workshop on assessment in math and science education, Dr. George Bodner, Purdue University, keynote speaker. For faculty from Bryn Mawr, Haverford and MSPGP partner IHEs.
August 2006	MSPGP-PKAL Leadership Planning Institute. Organizer and co-facilitator of 4 day leadership institute.
September 2006	Colonial School District, presentation on How People Learn to 24 middle school and high school math teachers.
November 2006	Pennsauken School District, presentation on How People Learn and Formative Assessment to 40 middle school and high school math teachers.
January – May 2007	Lincoln University. Facilitated four part series on How People Learn and Formative Assessment for math, science, and education faculty.
April 2007	Bryn Mawr College. Organizer, workshop on Student Centered Discussion Techniques led by Dr. Eric Mazur, Harvard University, for Higher Ed and Secondary educators from the MSPGP.
June 2007	St. Joseph's University, workshop on How People Learn and Formative Assessment to faculty pedagogy seminar.
July 2007	Workshop on How People Learn for Cherry Hill School District for 40 math and science teachers.
November 2007 and by Mr. Larry	Ridley High School. 2 day workshop on Modeling Physics and Modeling Chemistry high school curriculum, led



	Dukerich, Arizona State University. Member,
Planning Group.	
February 2008	Workshop on How People Learn for Interboro School District for 20 math teachers.
March 2008	Bryn Mawr College. Organizer, workshop on “Strategies that support Students Success in Math and Science”, Dr. Freeman Hrabowski, President of University Maryland Baltimore County, keynote speaker. For Higher Ed faculty from the MSPGP.
April, May 2008	Two workshops with teachers from the Haverford School District on using the Haverford open space site for educational purposes.
June 2008	MSPGP IHE Pedagogy Conference: Exploring the Brain: Implications for Teaching. Member of Conference Planning Committee.
August 2008	Workshop on How People Learn for Cherry Hill School District for 35 math and science teachers.
December 2008	Chaotic Billiards, presentation to 9 <sup>th</sup> grade science class at Haverford High School.
May 2009	Participant, NSF sponsored conference on Social Network Analysis.
May 2009	Organized and facilitated half-day

Connecting Global Literacy with STEM Education  
 presentation on Math and Sustainability.  
 October 2016 Bryn Mawr College Parents Weekend: Math and Sustainability.  
 October 2016 Distinguished Visiting Scholar, University of Hawaii West Oahu. Gave series of  
 4 talks on Math and Sustainability.

### **Education Conference Presentations**

December 2004 National Research Council MSP Workshop, Washington DC.  
 Panelist: Finding common ground between IHE and K-12  
 educators; examples of implementation.

November 2005 EPDEL section of MAA, Service Learning panelist.

January 2006 2006 MSP Learning Network Conference. Washington DC.  
 Workshop jointly presented with Cathy Carol. Going to Scale:  
 Supporting the People Who Work with Teachers of  
 Elementary Mathematics.

May 2006 Lafayette College. The Mathematics of Social Justice. Course  
 Development Workshop. Keynote speaker: What is Possible?

January 2007 2007 MSP Learning Network Conference. Breakout session  
 presentation: Pedagogy Seminar for Math and Science  
 Faculty: Vehicle for Change.

June 2007 Presentation on Formative Assessment at MSPGP IHE Millennial  
 Learners Conference; Member of Conference Planning  
 Committee.

October 2007 MSPGP 2nd Annual Conference for Research in Math and Science  
 Education. New Course Design: Changing Pedagogies in Math  
 and Science Education; Member of Conference Planning  
 Committee.

December 2007 Leveraging Impact: From the classroom to a regional STEM  
 Compact, presentation at NSF and DOE Mathematics and  
 Science Partnerships STEM Summit

September 2008 PHEEND Conference on Service Learning, Cabrini College; spoke  
 about the MSPGP and the START Environmental  
 Sustainability project.

November 2008 MSPGP 3rd Annual Conference for Research in Math and Science  
 Education. Changing Pedagogies in Math and Science  
 Education: An Assessment of Course's Impact on recruiting  
 students into education. Joint with Julie Zebst.

January 2009 2009 Joint Mathematical Meetings, MAA Session on College  
 Algebra. How Mathematics Can Contribute to Solving the  
 Problems Facing the World: Building Civic Engagement into  
 Mathematics Courses as a Way to Motivate and Inspire Students.

January 2009 2009 MSP Learning Network Conference. Breakout session

presentation: Assessing the Effectiveness of a New Course in Math and Science Education in Recruiting Math and Science Majors into Education.

December 2000	Bryn Mawr College, Visual Cultures seminar
September 2001	Arcadia University, Graduate Colloquium Series
April 2002	St. Joseph's University, Math Awareness Day speaker
October 2002	Indiana University Undergraduate Colloquium
April 2003	Bryn Mawr College, Math Awareness Week speaker
October 2005	Bucknell University Undergraduate Colloquium
February 2006	Drew University Undergraduate Colloquium
April 2013	Abraham Lincoln High School, Philadelphia, PA. Earth Day presentation on Math and Sustainability

### **Publications:**

1. Geodesic flow on the two-sphere, Part I: Positive measure entropy, *Ergod. Th. & Dynam. Sys.* 8 (1988), 531-553.
2. Geodesic flow on the two-sphere, Part II: Ergodicity, *Dynamical Systems*, Springer Lecture Notes in Math., Vol. 1342 (1988), 112-153.
3. Using integrability to produce chaos: billiards with positive entropy, *Comm. Math. Phys.* 141 (1991), 225-257.
4. Joint with C. Liverani, Potentials on the two-torus for which the Hamiltonian flow is ergodic, *Commun. Math. Phys.* 135 (1991), 267-302.
5. Physical examples of linked twist maps with chaotic dynamics in *Twist Mappings and Their Applications*, R. McGehee and K. Meyer, Eds, Springer-Verlag (1993).
6. Transverse Homoclinic Connections for Geodesic Flows, *Hamiltonian Dynamical Systems: History, Theory and Applications*, H.S. Dumas, K.R. Meyer and D.S. Schmidt, Eds, Springer-Verlag (1995), 115-125.
7. Elliptic islands in generalized Sinai billiards, *Ergod. Th. & Dynam. Sys.* (1996), 16, 975-1010.
8. Joint with K. Burns, Embedded surfaces with ergodic geodesic flow, *Inter. J. of Bifurcation and Chaos*, Vol. 7, No. 7 (1997) 1509-1527.
9. Non-ergodicity of two particles interacting via a smooth potential, *J. of Statistical Physics*, Vol. 96, Nos. 5/6 (1999) 1021-1048.
10. Chaotic geodesic motion: an extension of M.C. Escher's Circle Limit Design, pp. 318-333, *M.C. Escher's Legacy: A Centennial Celebration* Schattschneider, Doris; Emmer, Michele (Eds.) 2003, Springer-Verlag, (refereed publication).
11. Joint with C. Pugh, Anosov geodesic flows for embedded surfaces, *Astérisque* 287 (2003), 61-69 in *Geometric methods in Dynamics II - Volume in honor of Jacob*

Palis, W. de Melo, M.Viana, J.C. Yoccoz (Ed.)

12. Creating transverse homoclinic connections in planar billiards, *Zap. Nauchn. Sem. S.-Peterburg. Otdel. Mat. Inst. Steklov. (POMI)* **300** (2003), Teor. Predst. Din. Sist. Spets. Vyp. 8, 122--134, 287.
13. Joint with C. Pugh, Finite horizon Riemann Structures and Ergodicity, *Ergod. Th. & Dynam. Sys.* (2004) 24, 89 - 106.
14. Perspectives on Mathematics Education Projects in a Service-Learning Framework, in *Mathematics in Service to the Community*, MAA Notes #66, Charles Hadlock editor, 2005.
15. Destroying ergodicity in geodesic flows on surfaces, *Nonlinearity* 19 (2006) 149-169.
16. Joint with A. Root and J. Zaebst, Changing Pedagogies Course: a study of the effectiveness of a new course in recruiting STEM majors into education 2008.
17. Civic Engagement via Differential Equations, *UMAP Journal* 33.4 (2013) 387-392.
18. Using sustainability to incorporate service-learning into a mathematics course: a case study, *PRIMUS special issue on Service Learning* 23.6 (2013) 519-537.
19. Joint with Catherine A. Roberts and Thomas J. Pfaff, Balancing needs and seeking solutions for a complex changing world. The role of mathematics in addressing issues of sustainability. Introductory essay for Mathematics Awareness Month 2013 – the Mathematics of Sustainability, January 2013. Available at <http://www.mathaware.org/mam/2013/essays/>
20. Sustainability, Service-Learning and Student Engagement, theme essay for Mathematics Awareness Month 2013 – the Mathematics of Sustainability. March 2013. Available at <http://www.mathaware.org/mam/2013/essays/>

### **Expository:**

1. I think, therefore I sum, *Bryn Mawr Alumnae Bulletin*, Fall 1991.
2. The Mathematics of Climate Change, *Bryn Mawr Alumnae Bulletin*, Spring 2016.

### **Educational Materials**

- The Topology and Geometry of the Costa surface, a 5 minute video produced in collaboration with B. Butoi, S. Levy, T. Munzner, and M. Teodorescu, (1995 )

- Seraut-the-dots, School Arts (2005) Vol 105, November 2005, p. 43. Instructions on how to carry out a collaborative learning, hands-on art project for 2<sup>nd</sup> graders.
- Family of Five Math Lesson: the Mathematical Content, joint with Ned Wolff, for West Ed's Leadership Curriculum for Mathematics Professional Development project, 2005.
- Using TIMSS Videos to Improve Learning of Mathematics: A Resource Guide, Richard Askey and Patsy Wang-Iverson, Editors, 2005. I am acknowy for cn(t)-2 (r)3 diting to(t)-2 (he)4 d  
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Mathematics of Sustainability. March 2013. Available at <http://www.mathaware.org/mam/2013/sustainability> .

- Ted-Ed video on Billiards and Climate Change. October 2014. At <http://ed.ted.com/lessons/is-our-climate-headed-for-mathematical-chaos-victor-j-donnay>

### **Exhibits**

- The Costa surface video is displayed (1995-1997) at the Maryland Science Museum as part of their permanent exhibition on mathematics. Also part of their traveling exhibit.
- Created a set of color prints of computer generated pictures of embedded surfaces with ergodic geodesic flow. Displayed at :

Artist Market, Norwalk Ct, as part of Beyond Escher exhibit, November 1998.  
MSRI, Berkeley CA, summer 1999.  
Bryn Mawr College Gallery, fall 2000.

One of these images was used for the cover of the text Differential Geometry and Topology by K.Burns and M. Gidea, Chapman & Hall/CRC, 2005.

### **Web Materials**

of Mathematics of Sustainability. Developed a K-16 educational component called Sustainability Counts. Available at <http://www.mathaware.org/index.html> .

Member of Advisory Committee (Chair of Education Subcommittee) for Sustainable Climate Risk Management (SCRiM), NSF funded research network. 2012 –

Member of Advisory Committee, for Engaging Mathematics: Building a National Community of Practice, NSF funded education project directed by SENCER, 2013 -