Fernando A. Schwartz *Curriculum vitae*

CONTACT INFORMATION

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The University of Tennessee
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Knoxville, TN 37996

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EMPLOYMENT

ASSOCIATE PROFESSOR, *University of Tennessee* ..... 2015 – Present
ASSISTANT PROFESSOR, *University of Tennessee* ..... 2009 – 2014
RESEARCH FELLOW, *University of Warwick* (UK) ..... 2008 – 2009
VISITING ASSISTANT PROFESSOR, *Duke University* ..... 2005 – 2008
POSTDOCTORAL ASSOCIATE, *Cornell University* ..... Summer 2005

EDUCATION

PH.D. MATHEMATICS, *Cornell University* 2005
Advisors: José Escobar (Cornell) and Richard Schoen (Stanford)
MATH. ENGINEERING, *University of Chile* 1999
Summa cum laude
B.S. ENGINEERING, *University of Chile* 1997

AWARDS, GRANTS & HONORS

NeuroNet Seed Grant ($5,000, co-PI) 2015
NSF Grant DMS-1332571, 43rd Barrett Lectures ($16,500, co-PI) 2013
NSF Grant DMS-0940878, SE Geom. Sem. ($49,355, co-PI) 2009–2014
NSF Grant DMS-1105785, 41st Barrett Lectures ($20,800, PI) 2011
MSRI Research Membership. Berkeley, CA ($6,550) ..... Fall 2013
AMS Travel Award for MCA (Guanajuato, Mexico, $1,600) 2013
AMS Travel Award for ICM (Madrid, Spain) 2006
Committee Member, AMS – Simons Foundation Travel Grants 2013–2016
Invited Plenary Speaker, 71st Midwest PDE Seminar 2013
Invited Speaker, Mathematical Congress of the Americas (Mexico) 2013
43rd Barrett Lectures, *University of Tennessee* ($16,500, PI) 2013
41st Barrett Lectures, *University of Tennessee* ($15,000, PI) 2011
Professional Development Award, *University of Tennessee* ($1,150) 2013
Professional Development Award, *University of Tennessee* ($5,000) 2010
Nominee for Jr.Fac. Research & Creative Achievement Award, *UT* 2012
Public Lecture Organizer, Academic Outreach, *UTK* ($1,080, PI) 2010
Exceptional Departmental Service Award, *Duke* 2007, 2008
Research Fund, *Duke* 2007
Hutchinson Graduate Fellowship, *Cornell* 2003
Teaching Award nominee, *Cornell* 2003
Dean's List, *University of Chile* 1995–1999
Bronze Medal, National Mathematics Olympiad (Chile) 1992
2nd Place, National Physics Olympiad (Chile) 1992

POSTDOCS MENTORED

K. Knox, Mathematics Postdoc (joint with C. Plaut) 2013–2016
I. Sgouralis, NIMBioS Postdoc (joint with V. Maroulas) 2014–2015

GRADUATE STUDENTS [PLACEMENT]

J. Mike, PhD Math ..... (expected) 2016
A. Aaron, MS Mech.Engr. (joint with X. Zhao) [Oak Ridge Nat Lab] 2015
C. Capdevila, MS Comp.Sci. (joint with H. Qi) [PYA Analytics] ..(expected) 2015
G. Clark, MS Math [GE Aviation] 2014
N. Schaefferkoetter, MS Math [Risk Analyst, ABS Consulting] 2011

Undergraduate Mentoring

Z. Xiang. CSURE REU Student at JICS ..... Summer 2014
L. Bown. CSURE REU Student at JICS ..... Summer 2014
T. Kandhawit. PRUV Mathematics Fellow at Duke ..... Spring 2006

Publications in Peer-Reviewed Journals

1. A. Freire and F. Schwartz, *Mass-capacity inequalities for conformally flat manifolds with boundary*, Comm. PDE **39** (2014), 98-119.
2. F. Schwartz, *Inequalities for the ADM-mass and capacity of asymptotically flat manifolds with minimal boundary,* Geometric Analysis, Mathematical Relativity, and Nonlinear PDE. Contemp. Math. **599** (2013), 199–211.
3. F. Schwartz, *A volumetric Penrose inequality for conformally flat manifolds*, Ann. Henri Poincaré **12** (2011), no. 1, 67–76.
4. F. Schwartz, *A note on the Yamabe constant of an outermost minimal hypersurface*, Proc. Amer. Math. Soc. **138** (2010), 4103–4107.
5. F. Schwartz, *Monotonicity of the Yamabe invariant under connect sum over the boundary,* Ann. Global Anal. Geom. **35** (2009), no. 2, 115–131.
6. F. Schwartz, *Existence of outermost apparent horizons with product of spheres topology,* Comm. Anal. Geom. **16** (2008), no. 4, 799–817.
7. F. Schwartz, *The zero scalar curvature Yamabe problem on noncompact manifolds with boundary,* Indiana Univ. Math. J. **55** (2006), no. 4, 1449–1459.
8. P. Dartnell, A. Maass and F. Schwartz *Combinatorial constructions associated to the dynamics of one-sided cellular automata,* Theoret. Comput. Sci. **304** (2003), 485-497.

Conference Papers

1. J. Mike, F. Schwartz and C. Sumrall, *Non-Landmark Classification in Paleobiology: Benefits of using Computational Geometry for Species Discrimination on Pentremites.* Accepted, 64th Southeastern Sectional Meeting, Geological Society of America. Chattanooga TN, March 2015.
2. I. Sgouralis, V. Maroulas, A. Nebenfürh and F. Schwartz *Analyzing intracellular movements using Kalman topological data filters.* Submitted, IEEE Biomedical Imaging.
3. F. Schwartz, L. Xiang and K. Wong, *Topology Backs Alternative Medicine Claim.* Accepted, SIAM Conference on Computational Science and Engineering. Salt Lake City, Utah, March 2015.

Publications in Preparation

1. E. Ferragut and F. Schwartz, *Complex networks: a geometric approach.* Submitted (2014).
2. A. Aaron, F. Schwartz and X. Zhao, *ICU Mortality Data Analysis.* In preparation.
3. E. Ferragut and F. Schwartz *A New Classifier Based on Computational Topology.* In preparation.
4. C. Capdevila, H. Qi and F. Schwartz. *Decoding the Brain.* In preparation.
5. D. Maximo, I. Nunes and F. Schwartz, *Rigidity of free-boundary minimal surfaces.* In preparation.
6. E. Cabezas-Rivas and F. Schwartz, *On the Shrink-wrap Principle.* In preparation.

Book Chapters	*On the Riemannian Penrose Inequality.* Topics Chapter for MSRI Publications Series volume "Aspects of Mathematical Relativity" (from mini-course). In preparation (2014).
Books Edited	AMS Contemporary Mathematics Volume for the Proceedings of the Southeast Geometry Seminar (2013). Edited by M Ghomi, J Li, J McCuan, V Oliker, F Schwartz (main editor) and G Weinstein.
Research Visits	Research Member, *MSRI* (Berkeley, CA)[funded but declined] ..... Fall 2013 Visiting Researcher, *University of Chile* (Santiago, Chile) ..... 2012 Summer Visiting Professor, *IMPA* (Rio de Janeiro, Brazil) ..... 2010 – 2012 Visitor, *AEI Max Planck Institute* (Gölm, Germany) ..... 2009 Summer Visiting Scholar, *EFI University of Chicago* ..... 2007 Visiting Graduate Student, *Stanford University* ..... 2004 – 2005 Visiting Graduate Student, *IMPA* (Rio de Janeiro, Brazil) ..... 2002 – 2004
Industry Contacts	PYA Analytics, Knoxville TN Cyber-Security Group, ORNL
Professional Membership & Service	Member, Center for Intelligent Systems and Machine Learning, UTK .. Since 2013 Member, NeuroNet Neuroscience Program, UTK ..... Since 2014 Member, American Mathematical Society ..... Since 1999 Member, Latinos in Science and Engineering ..... Since 2012 Member, Faculty Senate, University of Tennessee ..... 2011 – 2014 Committee Member, AMS – Simons Foundation Travel Grants ..... 2013 – 2016 Scientific Committee & Session co-organizer, CADS VI, Nahariya, Israel .... 2013 Editor, *AMS Contemporary Mathematics Volume* ..... 2013 Co-organizer of the NSF's Southeast Geometry Seminar ..... 2009 – 2014 Scientific Committee, Southeast Geom. Conf., College of Charleston 2011
Departmental & University Service	124th Allen Medal Committee Chair, UTK ..... 2014 Faculty Senate member ..... 2011 – 2014 Faculty Senate Appeals Committee Member ..... 2013 – 2014 Faculty Senate Library and Technology Committee Member ..... 2011 – 2013 PDE Qualifying Exam Committee Member/Chair ..... 2009 – 2014 Organizer of Barrett Lectures at UTK ..... 2011 & 2013 Graduate Committee Member at UTK ..... 2012 Geometry Postdoc Hiring Committee at UTK ..... 2012 Co-organizer of the UTK Colloquium ..... 2009 – 2011 Co-organizer of the Duke Geometry Seminar ..... 2005 – 2008
Refereeing and Reviewing	Referee for: Journal AMS, JDG, JFA, CQG, IMRN, Trans. AMS, Rev.Col.Mat.... Reviewer for MathSciNet, CUNY Research Foundation
Thesis Committee Membership	B. Allen, PhD Student in Mathematics ..... 2017 M. Hussein, PhD Student in Physics ..... 2017 H. Toumy, Masters Student in Mathematics ..... 2015 K. Yeter, PhD Student in Physics ..... 2015 R. Landfield, PhD Student in Physics ..... 2015 S. Ganguli, PhD Student in Physics ..... 2014 S. Kharel, PhD Student in Physics 2014

J. Collins, Masters Student in Mathematics 2013
J. Wilkins, PhD Student in Mathematics 2011

Invited Minicourses

Clay Math and MSRI Relativity Summer School, Cortona, Italy ..... July 2013
29th Brazillian Mathematics Colloquium [cancel due to scheduling] ..... Fall 2013
CMM, University of Chile ..... Sept 2012
MSRI Summer Graduate School in Mathematical Relativity ..... July 2012

Selected Talks

Lafayette-Lehigh Geometry-Topology Seminar (Easton, PA) ..... March 2015
SIAM Conf. on Comp. Sci. and Engr., Salt Lake City ..... March 2015
Colloquium (UTK) ..... November 2014
AMS Sectional Meeting, UNC Greensboro ..... November 2014
Junior Colloquium (UTK) ..... September 2014
Topology Seminar (UTK) ..... March 2014
Southeast Geometry Seminar XXIV, GA Tech (Atlanta, GA) ..... March 2014
AMS Sectional Meeting (UTK) ..... March 2014
Center for Intelligent Systems and Machine Learning (UTK) ..... November 2013
Mathematical Congress of the Americas (Guanajuato, Mexico) ..... August 2013
CADS VI (Nahariya, Israel) ..... May 2013
Plenary Speaker, 71st Midwest PDE Seminar (Ann Arbor, MI) ..... May 2013
Colloquium, College of Charleston (SC) ..... February 2013
Colloquium, CCNY (New York, NY) ..... December 2012
AMS Western Section Meeting (Tucson, AZ) ..... October 2012
Colloquium, University of Miami (Coral Gables, FL) ..... October 2012
PDE Seminar, University of Chile (Santiago, Chile) ..... August 2012
Geometry Seminar, IMPA (Rio de Janeiro, Brazil) ..... June 2012
Southeast Geometry Conference (Charleston, SC) ..... March 2012
Geometry Seminar, Emory (Atlanta, GA) ..... February 2012
Colloquium, University of Tennessee (Knoxville, TN) ..... September 2011
General Relativity Seminar, Columbia (New York, NY) ..... September 2011
Geometry Seminar, IMPA (Rio de Janeiro, Brazil) ..... August 2011
28th Brazilian Mathematics Colloquium (Rio de Janeiro, Brazil) ..... July 2011
Beijing International Center for Mathematical Research (China) ..... June 2011
CADS V (Akko, Israel) ..... May 2011
AMS South-Eastern Section Meeting (Statesboro, GA) ..... March 2011
Geometry Seminar, IMPA (Rio de Janeiro, Brazil) ..... June 2010
AMS South-Eastern Section Meeting (Boca Raton, FL) ..... November 2009
Geometry Seminar, University of Tennessee (Knoxville, TN) ..... November 2009
Junior Colloquium, University of Tennessee (Knoxville, TN) ..... October 2009
Geometry Seminar, DAMTP (Cambridge, UK) ..... June 2009
Geometry Seminar, AEI, Max Planck Institute, (Gölm, Germany) ..... May 2009
CADS IV (Nahariya, Israel) ..... May 2009
Geometry Seminar, Warwick (Coventry, UK) ..... December 2008
Colloquium, University of Tennessee (Knoxville, TN) ..... February 2008
Lehigh Geometry & Topology Conference (Bethlehem, PA) ..... October 2007
Geometry Seminar, Duke (Durham, NC) ..... October 2007
Geometry Seminar, Emory (Atlanta, GA) ..... September 2007
Physics Seminar, EFI, University of Chicago (IL) ..... August 2007
Physics Seminar, EFI, University of Chicago (IL) ..... June 2007
Physics Seminar, University of Barcelona (Spain) ..... May 2007
Colloquium, University of Alabama (Birmingham, AL) ..... April 2007
Colloquium, University of Toledo (OH) ..... April 2007

Southeast Geometry Seminar IX (Birmingham, AL) ..... March 2006
Southeast Geometry Conference (Charleston, SC) ..... March 2006
Geometry Seminar, Duke (Durham, NC) ..... September 2005
Geometry Seminar, Cornell (Ithaca, NY) ..... April 2005
Geometry Seminar, Stanford (CA) ..... April 2005
Colloquium, University of Alabama (Birmingham, AL) ..... February 2005
XIII School of Differential Geometry (São Paulo, Brazil) ..... July 2004
Latin American Congress of Mathematicians (Cancún, Mexico) ..... June 2004
Geometry Seminar, Stanford (CA) ..... May 2004

Teaching

At the University of Tennessee
Computational Geometry and Topology I ..... Fall 2014
Big Data (freshman seminar) ..... Fall 2014
Topology and Geometry for Data Analysis ..... Spring 2014
Riem. Geometry II, Matrix Calcs, Black Holes (freshman seminar) ... Spring 2013
Riemannian Geometry I, Calculus I ..... Fall 2012
Graduate PDE II ..... Spring 2012
Graduate PDE I, Differential Equations ..... Fall 2011
Topics in Differential Geometry II, Linear Algebra ..... Spring 2011
Topics in Differential Geometry I, Differential Equations ..... Fall 2010
Riemannian Geometry II, Differential Equations ..... Spring 2010
Riemannian Geometry I ..... Fall 2009
At Warwick
Graduate PDE ..... Fall 2008
At Duke
Point-Set Topology, Linear Algebra and Differential Equations ..... Spring 2008
Differential Equations ..... Fall 2007
Differential Equations ..... Spring 2007
Linear Algebra and Differential Equations, Topics Course ..... Fall 2006
Linear Algebra and Differential Equations ..... Spring 2006
Calculus II ..... Fall 2005