CURRICULUM VITAE

NAME: David J. Groisser

PRESENT POSITION: Associate Professor

DEGREES: Ph.D. Harvard University - 1983
                                                A.B. Harvard University - 1978

RESEARCH INTERESTS: Differential geometry, image analysis,
                                                mathematical physics

PROFESSIONAL EXPERIENCE:

Teaching Fellow, Mathematics, Harvard University, 1980.

Teaching Fellow, Physics, Harvard University, 1980–83.

Fellowship, Mathematical Sciences Research Institute, Berkeley, 1983–84.

Hildebrandt Assistant Professor, University of Michigan, Ann Arbor, 1984–86.

Research Fellow/Lecturer, SUNY, Stony Brook, 1986–88.

Assistant Professor, University of Florida, 1988–91.

Associate Professor, University of Florida, 1991–present.

Visitor, Institute for Advanced Study (Princeton, N.J.), Fall semester 1995.

University of Florida Preview advisor, 1996, 1998, 1999.

Visiting Professor, Michigan State University, Fall semester 1996.

Undergraduate Coordinator, UF Department of Mathematics, 2002–2008.

GRANTS:

Horace Rackham Fellowship, University of Michigan, 1985

Horace Rackham Research Grant at University of Michigan, 1985–86

NSF support under grant DMS-8405661, 1986–88

University of Florida Division of Sponsored Research grant #88092830, 1988–89

NSF support under grant DMS-8905211, 1989–91 (Principal Investigator)

University of Florida Division of Sponsored Research grant #93030405, 1993–94

NSF support under grant DMS-9307648, 1993–95 (Principal Investigator)

NSF grant DMS-9700492, 1997–98, for conference (Principal Investigator)

HONORARY SOCIETIES:

Phi Beta Kappa

ORGANIZATIONS:

American Mathematical Society

REVIEWING & REFEREEING ACTIVITIES:

Reviewer of several calculus textbooks

Reviewer of grant proposals in geometric analysis for NSF

Have reviewed numerous papers for *Mathematical Reviews*

Have refereed papers for 16 journals and conference proceedings

OTHER PROFESSIONAL ACTIVITIES:

Co-organizer of conference, "Moduli Spaces in Geometry and Physics", February 14–16, 1997.

AWARDS AND HONORS:

Teacher of the Year Award (College of Liberal Arts and Sciences), 1994

TIP Award (Teaching Incentive Program), 1998

Anderson Scholar Faculty Honoree, 2013 and 2014

MENTIONED IN LISTINGS:

American Mathematical Society

THESES AND DISSERTATIONS DIRECTED:

Sheshadri Thiruvenkadam, Ph.D. 2005 (co-chair of doctoral committee)

Jung-ha An, Ph.D. 2005 (co-chair of doctoral committee)

Andres Zuniga, supervised 2021–

UNDERGRADUATE PROJECTS DIRECTED:

Frances Tirado, senior thesis, 2009-2010

Brian Williams, senior thesis and University Scholars Program project, 2011–2012

Kirollos Masood, senior thesis, 2015–2016

DOCTORAL COMMITTEES SERVED ON AS NON-CHAIR MEMBER:

Mathematics Students

Xiao-Ping Gu, 1991–92

Antonis Valaristos, 1992–94

Richard White, 1994–2001

Weihong Guo, 2005–2007

Yuri Turygin, 2006–2007

Prabhu Venkataraman, 2006–2008

Andrew Fisher, 2007–2010

Fuhua Chen, 2008–2012

Iulia Posirca Voss, 2008–2012

Robert Newton, 2012–2013

Matthew Gluck, 2011–2014

Chase Saucier, 2013–2018

Deep Kundu, 2020–

Non-mathematics Students

José Rubio (Physics), 1992–94

Karl Zachary (Chemistry), 1993–98

Teparkshorn Pengpan (Physics), 1998–2000

Xiaobin Wu (Computer and Information Science and Engineering), 2001–2005

Vakif Onemli (Physics), 2001–2003

Sudarshan Ananth (Physics), 2002–2005

Marc Soussa (Physics), 2002–2004

Kyungwook Kim (Physics), 2002–2004

Kyoungchul Kong (Physics), 2003–2006

Larry Price (Physics), 2004–2007

Minho Kim (Computer and Information Science and Engineering), 2004–2008

Sung-Soo Kim (Physics), 2004–2008

Shun-Pei Miao (Physics), 2004–2007

Jianhua Fan (Computer and Information Science and Engineering), 2005–2010

Ashish Myles (Computer and Information Science and Engineering), 2005–2008

Tianyun Ni (Computer and Information Science and Engineering), 2005–2008

Jyungryun Seo (Computer and Information Science and Engineering), 2006–2007

Michael Burns (Physics), 2007–2010

Jesus Escobar (Physics), 2007–2011

Patrick Hearin (Physics), 2007–2011

Francisco Rojas (Physics), 2008–2012

Soyhun Park (Physics), 2010–2012

Tongguang Cheng (Physics), 2010–2014

Pedro Mora (Physics), 2010–2014

Michael J. Perez (Physics), 2010–2015

Liqian Peng (Department of Mechanical and Aerospace Engineering), 2014–2016

Changlong Wang (Department of Physics), 2014–2016

Rudrasis Chakraborty (Computer and Information Science and Engineering), 2014–2018

Hang Guan (Computer and Information Science and Engineering), 2014–2018

Gaoli Chen (Physics), 2014–2018

Fabien Emmetiere (Chemistry), 2015–2020

Moinul H. Rahat (Physics), 2017–2022

Lintao Tan (Physics), 2017–2022

Chun-Hao Yang (Statistics), 2019–2021

Sanjib Katuwal (Physics), 2019–2023

Nathaniel Strauss (Physics), 2019–2023

James J. Gillespie (Philosophy), 2020–2023

Xiaoda Qu (Statistics), 2021–

H.C. Regan B. Bhatta (Physics), 2022–

OTHER UNIVERSITY SERVICE:

Member, University Constitution Committee, 2013–2016 ; Chair 2015–2016

Member, Mathematics Chair Search committee, 2012–2013

Member, Faculty Senate, 2009–2011, 2013–2016

Member, College of Liberal Arts and Sciences Curriculum Committee, 2004–2006, 2010–2012; Chair 2005–2006

Member, Mathematics Chair Search committee, 1992–93

Faculty advisor, University of Florida Chess Club, 1997–2000

Faculty advisor, Atheist and Agnostic Students Association, 2000–2005

COMMUNITY SERVICE:

Interviewer for Harvard College

TALKS, LECTURES, AND INVITED ADDRESSES AT MEETINGS& COLLOQUIA:

Colloquium, Pennsylvania State University, February 1983
Colloquium, University of Rochester, February 1983
Colloquium, University of California at Santa Barbara, October 1983
Contributed talk, special session on gauge theory and geometry, annual meeting of American Mathematical Society, San Antonio, January 1987

Colloquium, Oklahoma State University, March 1987

Colloquium, Michigan State University, February 1988

Colloquium, University of Florida, February 1988

Colloquium, University of Connecticut, February 1988

Invited talk, special session on gauge theory and geometry, regional meeting of American Mathematical Society, Worcester, April 1989

Colloquium, Indiana University-Purdue University at Indianapolis, October 1990

Invited talk at special session on differential geometry and mathematical physics, regional meeting of American Mathematical Society, Tampa, March 1991

Contributed talk, symposium on Gauge Theory, Differential Geometry, and Topology, University of Warwick, July 1992

Invited talk, Differential Geometry Seminar, Michigan State University, October 1992

Invited talk, Adelaide Workshop on Differential Geometry, University of Adelaide, June 1993

Invited talk, Differential Geometry Seminar, Harvard University, November 1993

Invited talk, January Program on Geometry and Mathematical Physics, Mathematical Sciences Research Institute, January 1994

Invited talk, Differential Geometry Seminar, Graduate Center of the City University of New York, March 1994

Invited talk, Park City (Utah) Mathematics Institute, July 1994

Invited talk, Differential Geometry and Global Analysis Seminar, University of Texas, October 1994

Invited talks, Workshop on Quantum and Classical Gauge Theory, Stefan Banach International Mathematical Center (Warsaw), May 1995

Invited talk, Differential Geometry and Global Analysis Seminar, University of Texas, November 1995

Invited talk at special session on gauge field theory, regional meeting of American Mathematical Society, New York, April 1996

Invited talk, Differential Geometry Seminar, University of Michigan, November 1996

Invited talk, Differential Geometry Seminar, Michigan State University, December 1996

Invited talk, Workshop in Topology and Geometry, University of Florida, June 1997

Invited talk, Fall Eastern Section Meeting of The American Mathematical Society, Pittsburgh, November 2004

Invited poster presentation, Workshop in Statistical Inferences on Shape Manifolds, May 2005

Invited talk via WebEx, Seminar on Data Analysis on Sample Spaces with a Manifold Stratification, Statistical and Applied Mathematical Sciences Institute, March 2011

PUBLICATIONS: (Published, accepted, submitted)

1. (with S. Jung and A. Schwartzman) *A genericity property of Fréchet sample means on Riemannian manifolds*, 34 pp., submitted. Preprint (2023), posted as arXiv:2309.13823

2. (with S. Jung, B. Rooks, and A. Schwartzman) *Averaging symmetric-positive definite matrices on the space of eigen-decompositions*, Bernoulli J., 69 pp., to appear.

3. (with S. Jung and A. Schwartzman) *Uniqueness questions in a scaling-rotation geometry on the space of symmetric positive-definite matrices*, Diff. Geom. and its Applications, **79** (2021) https://doi.org/10.1016/j.difgeo.2021.101798, 1–40

4. (with L. Ellingson, D. Osborne, V. Patrangenaru, and A. Schwartzman) *Non-parametric Bootstrap of Sample Means of Positive-Definite Matrices with an Application to Diffusion-Tensor-Imaging Data Analysis*, Communications in Statistics – Simulation and Computation **46** (2017), 4851–4879

5. (with S. Jung and A. Schwartzman) *Geometric foundations for scaling-rotation statistics on symmetric positive definite matrices: minimal smooth scaling-rotation curves in low dimensions*, Electronic J. Stat. **11** (2017), 1092–1159

6. (with S. Jung and A. Schwartzman) *Scaling-rotation distance and interpolation of symmetric positive-definite matrices*, SIAM J. Matrix Analysis and Applications **36** (2015), 1180–1201 + 9-page online supplement

7. (with J. Peters) *Matched G^k-constructions yield C^k-continuous iso-geometric elements*, Computer Aided Geometric Design, **34** (2015), 67–72

8. (with D. Osborne, V. Patrangenaru, L. Ellingson, and A. Schwartzman) *Non-parametric Two-Sample Tests on Homogeneous Riemannian Manifolds, Cholesky Decompositions and Diffusion Tensor Image Analysis*, J. Multivar. Anal. **119** (2013), 163–175

9. (with H.D. Tagare, O. Skrinjar) *Symmetric Non-rigid Registration: A Geometric Theory and Some Numerical Techniques*, J. Math. Imaging and Vision **34** (2009), 61–88

10. (with H.D. Tagare) *On the topology and geometry of spaces of affine shapes*, J. Math. Imaging and Vision **34** (2009), 222–233

11. *Certain optimal correspondences between plane curves II: Existence, local uniqueness, regularity, and other properties*, Trans. Amer. Math. Soc. **361** (2009), 3001–3030

12. *Certain optimal correspondences between plane curves I: Manifolds of shapes and bimorphisms*, Trans. Amer. Math. Soc. **361** (2009), 2959–3000

13. (with H.D. Tagare, O. Skrinjar) *A Geometric Theory of Symmetric Registration*, abstract p. 73 in table of contents, Proceedings of the 2006 Conference on Computer Vision and Pattern Recognition (CVPRW'06), Workshop on Mathematical Methods in Biomedical Image Analysis, IEEE (2006). Table of contents available at IEEE Computer Society Digital Library, http://csdl2.computer.org/persagen/DLAbsToc.jsp?resourcePath=/dl/proceedings/&toc=comp/proceedings/cvprw/2006/2646/00/2646toc.xml. Full text, 8 pp., available at http://doi.ieeecomputersociety.org/10.1109/CVPRW.2006.16

14. *Some differential-geometric remarks on a method for minimizing constrained functionals of matrix-valued functions*, J. Math. Imaging and Vision **24** (2006), 349–358

15. (with X. Zheng, Y. Chen, D. Wilson) *Nonrigid correspondence and classification of curves based on more desirable properties*, Nonconvex Optimization and its Applications v. 82 (Multiscale optimization methods and applications: selected papers from the Conference on Multiscale Optimization Methods and Applications, Feb. 2004, Gainesville, Florida), eds. W. Hager et al. (2006), 393–407

16. (with S. Thiruvenkadam, Y. Chen) *Non-rigid Shape Comparison of Implicitly-Defined Curves*, Lecture Notes in Computer Science v. 3752), (Proceedings of Variational, Geometric, and Level Set Methods in Computer Vision: Third International Workshop, VLSM 2005), Beijing, China, October 16, 2005), eds. N. Paragios et al. (2005) 222–234

17. *On the convergence of some Procrustean averaging algorithms*, Stochastics **77** (2005), 31–60

18. *Newton's method, zeroes of vector fields, and the Riemannian center of mass*, Adv. in Appl. Math **33** (2004), 95–135

19. (with H. D. Tagare, D. O'Shea) *Non-rigid shape comparison of plane curves in images*, J. Math. Imaging and Vision **16** (2002), 57–68

20. (with L. Sadun) *Simple type and the boundary of moduli space*, J. Geom. and Physics **36** (2000), 324–384

21. *Totally geodesic boundaries of Yang-Mills moduli spaces*, Houston J. Math. **24** (1998), 221–276

22. (with M. K. Murray) *Instantons and the information metric*, Ann. Global Anal. and Geom. **15** (1997), 519–537

23. *The L^2 metric in gauge theory: an introduction and some applications*, Symplectic Singularities and Geometry of Gauge Fields, Banach Center Publications **39** (1997), 317–329

24. (with T. H. Parker) *Sharp decay estimates for Yang-Mills fields, Commun. Analysis and Geom.* **5** (1997), 439–474

25. *Curvature of Yang-Mills moduli spaces near the boundary, I, Commun. Analysis and Geom.* **1** (1993), 139–215

26. (with T. H. Parker) *Semiclassical Yang-Mills Theory I: Instantons*, Commun. in Math. Physics **135** (1990), 101–140

27. *The geometry of the moduli space of $\mathbf{CP}^2$ instantons*, Inventiones Mathematicae **99** (1990), 393–409

28. (with D. S. Freed) *The basic geometry of the manifold of Riemannian metrics and of its quotient by the diffeomorphism group*, Michigan Math. J. **36** (1989), 323–344

29. (with T. H. Parker) *The geometry of the Yang-Mills moduli space for definite manifolds*, J. Differential Geom. **29** (1989), 499–544

30. (with T. H. Parker) *The Riemannian geometry of the Yang-Mills Moduli Space*, Commun. in Math. Physics **112** (1987), 663–689

31. *Integrality of the monopole number in $SU(2)$ Yang-Mills-Higgs Theory on $\mathbf{R}^3$*, Commun. in Math. Physics **93** (1984), 367–378

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