Anthony Gruber, Ph.D.

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Albuquerque, NM 87111

Education

Ph.D., Mathematics, Texas Tech University, Lubbock, TX 2019

M.S., Mathematics, Texas Tech University, Lubbock, TX 2017

B.G.S., Music Performance/Chemistry/Mathematics,
Texas Tech University, Lubbock, TX 2015

Professional Experience

Sandia National Laboratories Albuquerque, NM
Senior Member of Technical Staff *Sep 2024–Present*

- Staff researcher in Computational Mathematics group 1442.

John von Neumann Fellow *Sep 2022–Sep 2024*

- Funded half-time for self-directed research on structure-informed surrogate modeling with emphasis on nonintrusive and variationally consistent methods.
- Remaining time funded by a DOE Early Career award (PI Nat Trask) on projects related to scientific machine learning and the data-driven exterior calculus on graphs.
- John von Neumann Fellowship funded by the DOE ASCR research program in conjunction with the Sandia LDRD program.

Florida State University Tallahassee, FL and Columbia, SC
Postdoctoral Research Associate *Jan 2021–Aug 2022*

- Advised by Prof. Max Gunzburger on the design of algorithms for function approximation and reduced-order modeling related to the simulation of ocean dynamics.
- Further advised on related work by Prof. Lili Ju and Prof. Zhu Wang at the University of South Carolina.
- Funded by DOE grant DE-SC0020418: Efficient and Scalable Time-Stepping Algorithms and Reduced-Order Modeling for Ocean System Simulations (PI Max Gunzburger).

Texas Tech University Lubbock, TX and San José, Costa Rica
Assistant Professor of Practice *Aug 2019–Dec 2020**

- Mathematics program director at the TTU satellite campus in San José.
- Taught a 2-2 load of mathematics courses, conducted research, and coordinated with TTU faculty and administration state-side to further the University mission in Costa Rica.
- (*) Remained employed on unpaid leave until Aug. 2022.

Graduate Part-Time Instructor *Aug 2015–Aug 2019*

- Served as instructor of record for a 2-2 load of mathematics courses each year.
- Responsible for all aspects of instruction, including writing/delivering lectures and assigning homework, as well as writing and grading exams.
- Funded through scholarships/endowments at TTU.

Oak Ridge National Laboratory Oak Ridge, TN
NSF Graduate Research Fellow *June 2018–Aug 2018*

- Developed "active manifolds" (see publications below) under Dr. Robert Bridges, applying geometric methods to data science problems involving high-dimensional function approximation.
- Produced mathematical and computational results specially selected for presentation to the leaders of the Computing and Computational Sciences Division at ORNL.
- Funded through the NSF Mathematical Sciences Graduate Internship (NSF MSGI) program.

University of Texas at Dallas Richardson, TX
NSF Research Intern *May 2014–Aug 2014*

- Worked under Prof. Manuel Quevedo to design, construct, and characterize TiSi and CrB2-Si-SiC thin-film resistors (TFRs) using a combination of lithography, x-ray photoelectron spectrometry, and Hall-effect measurements.
- Generated data that facilitated the identification of a superior ratio of Ti:Si, thereby improving resistivity of previous TFRs by 30%.
- Funded through the NSF Research Experiences for Undergraduates (NSF REU) program.

Research Awards and Funding

PI, "Learning Operators for Structure-Informed Surrogate Models", Sandia LDRD award. 2022-2024

Awardee, John von Neumann Fellowship 2022-2024

Awardee, NSF Mathematical Sciences Graduate Internship 2018

Awardee, NSF REU Internship 2014

Publications

Journal Articles

16. A. Gruber and I. Tezaur, "Variationally consistent Hamiltonian model reduction," *SIAM J. Appl. Dyn. Sys*, (in press).

15. A. Gruber and I. Tezaur, "Canonical and noncanonical Hamiltonian operator inference," *Computer Methods in Applied Mechanics and Engineering*, vol. 416, p. 116334, 2023.

14. A. Gruber, Á. Pámpano, and M. Toda, "Instability of closed p-elastic curves in $\mathbb{S}^2$," *Analysis and Applications*, pp. 1–27, 2023.

13. A. Gruber, "Parallel Codazzi tensors with submanifold applications," *Mathematische Nachrichten*, vol. 00, pp. 1–11, 2023.

12. A. Gruber, M. Gunzburger, L. Ju, R. Lan, and Z. Wang, "Multifidelity Monte Carlo estimation for efficient uncertainty quantification in climate-related modeling," *Geoscientific Model Development*, vol. 16, no. 4, pp. 1213–1229, 2023.

11. A. Gruber, M. Gunzburger, L. Ju, and Z. Wang, "Energetically consistent model reduction for metriplectic systems," *Computer Methods in Applied Mechanics and Engineering*, vol. 404, p. 115709, 2023.

10. Y. Teng, Z. Wang, L. Ju, A. Gruber, and G. Zhang, "Level set learning with pseudoreversible neural networks for nonlinear dimension reduction in function approximation," *SIAM Journal on Scientific Computing*, vol. 45, no. 3, pp. A1148–A1171, 2023.

9. A. Gruber, Á. Pámpano, and M. Toda, "On p-Willmore disks with boundary energies," *Differential Geometry and its Applications*, vol. 86, p. 101971, 2023.

8. A. Gruber, M. Gunzburger, L. Ju, and Z. Wang, "A multifidelity Monte Carlo method for realistic computational budgets," *Journal of Scientific Computing*, vol. 94, no. 1, 2022.

7. A. Gruber, M. Toda, and H. Tran, "Stationary surfaces with boundaries," *Annals of Global Analysis and Geometry*, vol. 62, no. 2, pp. 305–328, 2022.

6. A. Gruber, M. Gunzburger, L. Ju, and Z. Wang, "A comparison of neural network architectures for data-driven reduced-order modeling," *Computer Methods in Applied Mechanics and Engineering*, vol. 393, p. 114764, 2022.

5. A. Gruber, "Planar immersions with prescribed curl and Jacobian determinant are unique," *Bulletin of the Australian Mathematical Society*, vol. 106, no. 1, pp. 126–131, 2022.

4. A. Gruber, M. Gunzburger, L. Ju, Y. Teng, and Z. Wang, "Nonlinear level set learning for function approximation on sparse data with applications to parametric differential equations," *Numerical Mathematics: Theory, Methods and Applications*, vol. 14, no. 4, pp. 839–861, 2021.

3. A. Gruber, Á. Pámpano, and M. Toda, "Regarding the Euler–Plateau problem with elastic modulus," *Annali di Matematica Pura ed Applicata*, vol. 200, no. 5, pp. 2263–2283, 2021.

2. A. Gruber and E. Aulisa, "Computational p-Willmore flow with conformal penalty," *ACM Transactions on Graphics (TOG)*, vol. 39, aug 2020.

1. A. Gruber, M. Toda, and H. Tran, "On the variation of curvature functionals in a space form with application to a generalized Willmore energy," *Annals of Global Analysis and Geometry*, vol. 56, no. 1, pp. 147–165, 2019.

Articles in Refereed Conference Proceedings

7. E. Aulisa, A. Gruber, and M. Toda, "Generalized Willmore Energies and Applications," *Geometry, Integrability and Quantization, Papers and Lecture Series*, vol. 29, no. none, pp. 1 –

10, 2024.

6. M. Kang, D. Lee, W. Cho, K. Lee, A. Gruber, N. Trask, Y. Hong, and N. Park, "Can we pre-train ICL-based SFMs for the zero-shot inference of the 1D CDR problem with noisy data?," in *Neurips 2024 Workshop Foundation Models for Science: Progress, Opportunities, and Challenges*, 2024.

5. A. Gruber, K. Lee, and N. Trask, "Reversible and irreversible bracket-based dynamics for deep graph neural networks," in *Thirty-seventh Conference on Neural Information Processing Systems*, 2023.

4. A. Gruber and E. Aulisa, "Quaternionic remeshing during surface evolution," *AIP Conference Proceedings*, vol. 2425, no. 1, p. 330003, 2022.

3. A. Gruber, M. Toda, and H. Tran, "Willmore-stable minimal surfaces," *AIP Conference Proceedings*, vol. 2425, no. 1, p. 330004, 2022.

2. E. Aulisa, A. Gruber, M. Toda, and H. Tran, "New developments on the p-Willmore energy of surfaces," in *Proceedings of the Twenty-First International Conference on Geometry, Integrability and Quantization*, vol. 21, pp. 57–66, Institute of Biophysics and Biomedical Engineering, Bulgarian Academy of Sciences, 2020.

1. R. Bridges, A. Gruber, C. Felder, M. Verma, and C. Hoff, "Active manifolds: A non-linear analogue to active subspaces," in *Proceedings of the 36th International Conference on Machine Learning* (K. Chaudhuri and R. Salakhutdinov, eds.), vol. 97 of *Proceedings of Machine Learning Research*, pp. 764–772, PMLR, 09–15 Jun 2019.

Submitted Articles

5. S. Hong, F. Wu, A. Gruber, and K. Lee, "Neural SDEs are differentially-private learners: Mitigating membership risks using neural SDEs," (under review).

4. M. Kang, D. Lee, W. Cho, J. Park, K. Lee, A. Gruber, Y. Hong, and N. Park, "MaD-Scientist: AI-based scientist solving convection-diffusion-reaction equations using massive PINN-based prior data," (under review).

3. J. A. Actor, A. Gruber, E. C. Cyr, and N. Trask, "Gaussian variational schemes on bounded and unbounded domains," (under review).

2. A. Gruber, K. Lee, H. Lim, N. Park, and N. Trask, "Efficiently parameterized neural metriplectic systems," (under review).

1. A. Gruber and E. Aulisa, "Quasiconformal mappings with surface domains," (under review).

Feature Articles and News Releases

2. Distinguished fellowships offer research opportunities to some of the nation's best and brightest. Sandia National Laboratories 2022-2023 Academic Programs Collaboration Report, pp. 119.

1. Meet a Participant: Anthony Gruber. NSF Mathematical Sciences Graduate Internship, *Oak Ridge Institute for Science and Education (ORISE)*, 2019.

Other

4. A. Gruber, "Learning operators for structure-informed surrogate models," tech. rep., Sandia National Lab.(SNL-NM), Albuquerque, NM (United States), 2024.

3. A. Vijaywargia, S. A. McQuarrie, and A. Gruber, "Tensor parametric operator inference with structure information," *CSRI Summer Proceedings*, 2024.

2. I. R. Moore, C. Wentland, A. Gruber, and I. Tezaur, "Domain decomposition-based coupling of operator inference reduced order models via the Schwarz alternating method," *CSRI Summer Proceedings*, 2024.

1. A. Gruber, *Curvature Functionals and p-Willmore Energy.* PhD thesis, Texas Tech University, 2019.

Research Mentoring

Formal Mentoring: Served as formally designated mentor/advisor with documented role.

- *Arjun Vijaywargia* (6/2024-Present), M2dt year-round graduate intern, currently Ph.D. student at U. of Notre Dame.
  Project: Tensor parametric Hamiltonian operator inference.

- *Ian Moore* (6/2024-Present), M2dt year-round graduate intern, currently Ph.D. student at Virginia Tech.
  Project: Schwarz coupling of operator inference models.

- Ph.D. committee member: *Madusha Atampalage* (graduated Aug. 2021), Texas Tech U.
  Thesis: Topics in Minimal Surfaces and Applications.

Informal Mentoring: Contributed substantially and informally to mentee's professional development.

- *Sohyeon Jung* (8/2024-Present), currently Ph.D. student at Arizona State U.
  Project: Model reduction with neural metriplectic systems.

- *Roxana Pohlmann* (9/2023-1/2024), Visiting graduate student intern, currently Ph.D. student at TU Wein.
  Project: Reduced-order models to accelerate injection molding.

- *Edward Huynh* (5/2023-8/2023), CSRI summer graduate intern, currently Ph.D. student at U. of Texas at Austin.
  Project: Obtaining inverse Sobolev-type inequalities for tanh neural networks.

- *Yuankai Teng* (1/2021-8/2022), Ph.D. student at U. of South Carolina, currently Quantitative Analytics Specialist at Wells Fargo.
  Thesis: Deep learning methods for some problems in scientific computing.

Professional Service

Conferences/Minisymposia Organized

8. Co-organizer "Geometric mechanics formulations and structure-preserving discretizations for models of physical systems", minisymposium, 18^th US National Congress on Computational Mechanics, July 20-24, 2025.

7. Co-organizer "Intersections of scientific machine learning and classical computational approaches", minisymposium, 18^th US National Congress on Computational Mechanics, July 20-24, 2025.

6. Co-organizer, "Structure-preserving model reduction for large-scale systems", minisymposium, SIAM Computational Science and Engineering, Mar. 3-7, 2025.

5. Co-organizer, "Geometric Mechanics Formulations and Structure-Preserving Discretizations for Models of Physical Systems", minisymposium, SIAM Joint Mathematics Meetings, Jan. 8-11, 2025.

4. Co-organizer, "Advances in machine learning on graphs for physical sciences and data analysis", minisymposium, SIAM Mathematics of Data Science, Oct. 21-25, 2024.

3. Co-organizer, "Geometric mechanics formulations and structure-preserving discretizations for continuum mechanics and kinetic models", minisymposium, 16^{th} Wold Congress on Computational Mechanics, July 21-26, 2024.

2. Co-organizer, "Geometric mechanics formulations and structure-preserving discretizations for continuum mechanics", minisymposium, 17^{th} U.S. National Congress on Computational Mechanics, July 26-30, 2023.

1. Organizer, "Elastic curves and surfaces with applications and numerical representations", special session #54, 18^{th} International Conference of Numerical Analysis and Applied Mathematics, Sep 17-23, 2020.

Reviews and Quick Opinions For

- *SIAM Journals: Scientific Computing, Uncertainty Quantification, Applied Mathematics*
- *Computer Methods in Applied Mechanics and Engineering*
- *Journal of Computational Physics*
- *Journal für die reine und angewandte Mathematik (Crelle's Journal)*
- *Geoscientific Model Development*
- *Technometrics*
- *Physical Review E*
- *Numerical Methods for Partial Differential Equations*
- *Journal of Scientific Computing*
- *Journal of Geometry and Physics*
- *Electronic Journal of Statistics*
- *Journal of Machine Learning for Modeling and Computing*
- *Neural Networks*
- *NeurIPS, ICML, ICLR, AISTATS*

Other Service

- Reviewer, Sandia CSRI Summer Proceedings. (since 2023)
- Panel Member, Alumni Panel (virtual), NSF-MSGI Virtual Symposium. (Aug. 23, 2023)
- Panel Member, Early Career Panel (virtual), Association of Women in Mathematics, Texas Tech University, Lubbock, TX. (Apr. 21, 2022)

Teaching

Courses Taught	**Dates:**
- "Advanced Calculus I, (400 level, TTU-CR)	one section, Fall 2020
- "Foundations of Algebra I, (300 level, TTU-CR)	one section, Fall 2020
- "Higher Math for Engineers and Scientists II", (300 level, TTU)	one section, Spring 2019
- "Higher Math for Engineers and Scientists I", (300 level, TTU-CR)	one section, Spring 2020
- "Higher Math for Engineers and Scientists I", (300 level, TTU)	two sections, Spring 2017 large section, Spring 2018 virtual section, Fall 2018
- "Intro to Critical Reasoning and Proof", (300 level, TTU-CR)	one section, Fall 2019
- "Calculus III with Applications", (200 level, TTU)	large section, Fall 2016 two sections, Fall 2017 virtual section, Summer 2019
- "Calculus III with Applications", (200 level, TTU-CR)	one section, Fall 2019 one section, Spring 2019 one section, Fall 2020
- "College Algebra", (100 level, TTU)	one section, Summer 2016
- "Intro to Data Analytics", (general knowledge, TTU-CR)	short course, Fall 2020

Technical Expertise

Computer Languages

- Python (expert)
- C++ (some experience)
- MATLAB (some experience)
- Mathematica (limited experience)
- Java (limited experience)

Professional Presentations

Invited External Presentations

19. "Tensor parametric Hamiltonian operator inference", minisymposium on Reduced Order Models for Convection-Dominated Flows: Modeling, Analysis, and Simulation, Joint Mathematics Meetings, Seattle, WA. (30 min; Jan. 10, 2024)
18. "Data-Driven Dynamical Systems with Structural Guarantees", Los Alamos National Laboratory, Los Alamos, NM. (50 min; Nov. 19, 2024)
17. "Variationally consistent Hamiltonian model reduction", minisymposium on Recent Advancements in Data-Driven Model Reduction: Theory, Algorithms, and Applications, SIAM Mathematics of Data Science, Atlanta, GA. (25 min; Oct. 21, 2024)

16. "Learning metriplectic systems and other bracket-based dynamics" (virtual), Universität Wein, Vienna, Austria. (50 min; June 19, 2024) Announcement here.

15. "Learning metriplectic systems and other bracket-based dynamics", minisymposium on Mathematics for Machine Learning, Canadian Mathematical Society Summer meeting, University of Saskatchewan, Saskatoon, Canada. (30 min; June 2, 2024)

14. "Learning bracket-based dynamical systems for property preserving model reduction", guest lecture, University of Pennsylvania, Philadelphia, PA. (50 min; Apr. 23, 2024)

13. "Property preserving model reduction in bracket-based dynamical systems", Applied Mathematics Seminar Series, University of New Mexico, Albuquerque, NM. (50 min; March 25, 2024) Announcement here.

12. "Data-driven dynamical systems with structural guarantees" (virtual), S. Scott Collis Advanced Modeling & Simulations seminar series, Rio Grande Consortium for Advanced Research on Exascale Simulation. (50 min; Nov. 10, 2023)

11. "Data-driven dynamical systems with structural guarantees" (virtual), Applied Mathematics and Machine Learning seminar, Texas Tech University, Lubbock, TX. (50 min; Nov. 8, 2023)

10. "Property-preserving model reduction for conservative and dissipative systems" (virtual), Numerical Analysis of Galerkin ROMs seminar series, the ARIA project, INRIA, Bordeaux, France. (50 min; Oct. 10, 2023) Available here.

9. "Data-driven surrogate models for bracket-based dynamical systems", minisymposium on Data-driven Methods for Circuits and Devices, 2^{nd} IACM Mechanistic Machine Learning and Digital Engineering for Computational Science Engineering and Technology, El Paso, TX. (20 min; Sep. 27, 2023)

8. "Mathematics in different settings" (virtual), Hong Duc University, Thanh Hòa, Vietnam. (30 min; May 20, 2023)

7. "Energetically consistent model reduction for Hamiltonian and metriplectic systems", CRUNCH webinar (virtual), Brown University, Providence, RI. (60 min; Dec. 9, 2022) Available here.

6. "Convolutional neural networks for data compression and reduced-order modeling", minisymposium on machine learning for large-scale scientific data analytics, SIAM Mathematics of Data Science, San Diego, CA. (25 min; Sep. 28, 2022)

5. "Computing quasiconformal mappings between immersed surfaces", AMS Fall Central Sectional, University of Texas at El Paso, El Paso, TX. (20 min; Sep. 17, 2022)

4. "Calculus in computer graphics and data science" (virtual), Mathematics Seminar Series, Cameron University, Lawton, OK. (50 min; Oct 19, 2021)

3. "Convolutional neural networks for data compression and reduced order modeling", SIAM SEAS special session on Deep Learning Methods for Data Driven Models, Auburn University, Auburn, AL. (30 min; Sep 18, 2021)

2. "Codazzi tensors with parallel mean curvature" (virtual), AMS special session #1159, Geometry of Submanifolds and Integrable Systems, University of Texas at El Paso, El Paso, TX. (25 min; Sep. 12, 2020)

1. "Stationary surfaces for curvature functionals", 63rd Texas Geometry and Topology Conference (virtual), Texas Tech University, Lubbock, TX. (50 min; April 23, 2020)

Contributed Presentations

10. "Reversible and irreversible bracket-based dynamics for deep graph neural networks", minisymposium on Machine Learning on Graphs for Physical Sciences and Data Analysis, SIAM Mathematics of Data Science, Atlanta, GA. (poster; Oct. 22, 2024)
9. "Property-preserving machine learning of metriplectic systems", Oden Institute Workshop on Scientific Machine Learning, Austin, TX. (30 min; Oct. 3, 2024)
8. "Flexible and variationally consistent Hamiltonian model reduction", Model Reduction and Surrogate Modeling (MORe2024), La Jolla, CA. (30 min; Sep. 10, 2024)
7. "Learning metriplectic systems from full and partial state information", minisymposium on Geometric Mechanics Formulations and Structure-Preserving Discretizations for Continuum Mechanics and Kinetic Models, 16th World Congress on Computational Mechanics, Vancouver, CA. (20 min; July 23, 2024)
6. "Reversible and irreversible bracket-based dynamics for deep graph neural networks", Advances in Neural Information Processing Systems, New Orleans, LA. (poster; Dec. 12, 2023)
5. "Variational Consistency in Model Reduction for Conservative and Dissipative Systems", Minisymposium on Data-Driven Methods—Solids, A Conference Celebrating the 80th Birthday of Thomas J.R. Hughes, Austin, TX. (25 min; Oct. 23, 2023)
4. "Canonical and Noncanonical Hamiltonian Operator Inference", minisymposium on Geometric Mechanics Formulations and Structure-Preserving Discretizations, 17^{th} U.S. National Congress on Computational Mechanics, Albuquerque, NM. (25 min; July 26, 2023)
3. "Canonical and Noncanonical Hamiltonian Model Reduction", workshop on Establishing Benchmarks for Data-Driven Modeling of Physical Systems, University of Southern California, Los Angeles, CA. (30 min; April 6, 2023)
2. "Quaternionic remeshing during surface evolution" (virtual), 18^{th} International Conference of Numerical Analysis and Applied Mathematics, Rhodes, Greece. (30 min; Sep 17, 2020)
1. "Willmore-stable minimal surfaces" (virtual), 18^{th} International Conference of Numerical Analysis and Applied Mathematics, Rhodes, Greece. (30 min; Sep 17, 2020)

Invited Internal and Other Presentations

22. "Learning on Graphs with Bracket-Based Dynamical Systems" (virtual), SEA-CROGS MMICC 3^{rd} year review. (15 min; Nov. 14, 2024)
21. "Hamiltonian Structure-Preserving ROMs" (virtual), M2dt MMICC 3^{rd} year review. (15 min; Nov. 6, 2024)
20. "Flexible and Variationally Consistent Hamiltonian Model Reduction", Sandia Fellows Day, Livermore, CA. (15 min; July 30, 2024)
19. "Cohomology-aware model reduction" (virtual), Sandia M2dt MMICC meeting, Albuquerque, NM and Livermore, CA. (45 min; June 25, 2024)

18. "Data-driven dynamical systems with structural guarantees", Applications in Algebra working group, Sandia National Laboratories, Albuquerque, NM. (50 min; March 7, 2024)

17. "Learning Operators for Structure-Informed Surrogate Models", DOE ASCR PI Meeting, Albuquerque, NM. (poster; Jan. 8, 2024)

16. "SNL progress highlights: data-driven couplings (RT3.1) and preservation of geometric structure in ROM (RT2.2)", M2dt MMICC all-hands meeting, Oden Institute, University of Texas at Austin, Austin, TX. (20 min; Oct. 25, 2023, w/ Irina Tezaur)

15. "Data-Driven Surrogate Models for Bracket-Based Dynamical Systems", Sandia SEA-CROGS MMICC meeting, Albuquerque, NM. (50 min; Oct. 11, 2023)

14. "Tensor methods for metriplectic systems" (virtual), Sandia M2dt MMICC meeting, Albuquerque, NM and Livermore, CA. (25 min; May 16, 2023)

13. "ROM ideas for Hodge-de Rham systems" (virtual), Sandia M2dt MMICC meeting, Albuquerque, NM and Livermore, CA. (25 min; Dec. 6, 2022)

12. "Hamiltonian Operator Inference with Examples" (virtual), Sandia M2dt MMICC meeting, Albuquerque, NM and Livermore, CA. (25 min; Nov. 1, 2022)

11. "Structure-preserving ROM ideas" (virtual), Sandia M2dt MMICC meeting, Albuquerque, NM and Livermore, CA. (25 min; Oct. 18, 2022)

10. "Variationally consistent model reduction", Sandia Fellows Day, Albuquerque, NM. (20 min; Aug 29, 2023)

9. "Artificial neural networks for dimension reduction and reduced-order modeling", Applied Mathematics group, Texas Tech University, Lubbock, TX. (50 min; Sep 30, 2021)

8. "Some nonlinear PDEs in computer graphics and data science", Mathematics Colloquium Series, Texas Tech University, Lubbock, TX. (50 min; Sep 29, 2021)

7. "Optimal quasiconformal mappings with prescribed boundary" (virtual), Probability, Geometry, and Mathematical Physics group, Texas Tech University, Lubbock, TX. (50 min; April 7, 2021)

6. "Geometric flows via finite element methods" (virtual), Elasticity group, Texas Tech University, Lubbock, TX. (50 min; Dec 2, 2020)

5. "Variational Aspects of Curvature Functionals", Elasticity group, Texas Tech University, Lubbock, TX. (50 min; Sep 2, 2020)

4. "Computing stationary solutions to p-Willmore flow", Applied Mathematics group, Texas Tech University, TX. (50 min; April 22, 2020.)

3. "A conformally-adjusted Willmore flow of closed surfaces", Applied Mathematics group, Texas Tech University, Lubbock, TX. (50 min; May 8, 2019)

2. "Curvature functionals and p-Willmore energy", Analysis group, Texas Tech University, Lubbock, TX. (50 min; April 29, 2019)

1. "Active Manifolds: A geometric approach to dimension reduction for sensitivity analysis", Computational and Applied Mathematics group, Oak Ridge National Laboratory, Oak Ridge, TN. (50 min; August 1, 2018)

Last updated: January 19, 2025