

Colin James Grudzien

Postdoctoral Researcher – NERSC

<https://cgrudz.github.io>

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Professional Experience

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| Aug. 2016 – Present | Nansen Environmental & Remote Sensing Center (NERSC) Bergen, Norway – Postdoctoral Researcher Extending dimensional reduction methodology for Bayesian data assimilation in physical systems under the project Reduced subspace in big data treatment: A new paradigm for efficient geophysical Data Assimilation. |
| Oct. 2012 – May. 2016 | Mathematics & Climate Research Network (MCRN) https://mcrn.hubzero.org/ – Graduate Research Assistant Organized the Joint Data Assimilation Seminar between MCRN, NERSC and ICTS-TIFR of Bangalore, India. Developed and maintained educational and research oriented resources to promote scientific literacy and outreach for MCRN. Employed novel technology platforms for collaboration in virtual research networks under the NSF Science Across Virtual Institutes program. |
| June 2015 – Aug. 2015 | Los Alamos National Laboratory Los Alamos, New Mexico – Graduate Research Assistant Utilized Matlab & Javascript libraries to design reduction algorithms and visualization techniques for electric grid multiscale-networks. Published algorithms and visualizations in code repository: https://github.com/cgrudz/electric_grid_model_reduction |

Education

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| 2011 – 2016 | Applied Mathematics PhD, University of North Carolina at Chapel Hill Advisor: Christopher KRT Jones |
| 2008 – 2011 | BSc Magna Cum Laude, University of Oregon Majors: Mathematics & History |
| 2006 – 2008 | Lane Community College |

Publications

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| 2018 | Grudzien, C. , A. Carrassi, and M. Bocquet. Extending assimilaition in the unstable subspace to the presence of model error. <i>In Preparation</i> , 2018 |
| 2017 | Grudzien, C. , A. Carrassi, and M. Bocquet. Asymptotic forecast uncertainty and the unstable subspace in the presence of additive model error. <i>arXiv preprint arXiv:1707.08334</i> , 2017 |
| 2017 | Grudzien, C. , D. Deka, M. Chertkov, and S.N. Backhaus. Structure-& physics-preserving reductions of power grid models. <i>arXiv preprint arXiv:1707.03672</i> , 2017 |
| 2017 | M. Bocquet, K.S. Gurumoorthy, A. Apte, A. Carrassi, Grudzien, C. , and C.K.R.T. Jones. Degenerate kalman filter error covariances and their convergence onto the unstable subspace. <i>SIAM/ASA Journal on Uncertainty Quantification</i> , 5(1):304–333, 2017 |
| 2017 | K.S. Gurumoorthy, Grudzien, C. , A. Apte, A. Carrassi, and C.K.R.T. Jones. Rank deficiency of kalman error covariance matrices in linear time-varying system with deterministic evolution. <i>SIAM Journal on Control and Optimization</i> , 55(2):741–759, 2017 |
| 2016 | Grudzien, C. , T.J. Bridges, and C.K.R.T. Jones. Geometric phase in the hopf bundle and the stability of non-linear waves. <i>Physica D: Nonlinear Phenomena</i> , 334:4–18, 2016 |
| 2016 | Grudzien, C. The instability of the hocking–stewartson pulse and its geometric phase in the hopf bundle. <i>Journal of Computational and Applied Mathematics</i> , 307:162–169, 2016 |

Awards

- University of North Carolina at Chapel Hill

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| 2015 – 2016 | Off Campus Dissertation Fellowship |
| 2013 | Future Faculty Fellowship Program |
- University of Oregon

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| 2010 – 2011 | Phi Beta Kappa Alpha of Oregon – Oregon Six Elect |
| 2010 – 2011 | Mathematics Department DeCou Prize |
| 2010 – 2011 | Donald DuShane IV, College of Arts and Science Scholarship |
| 2009 – 2010 | Mathematics Department Stevenson Prize |
- Lane Community College

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| 2007 – 2008 | Social Science Shining Star Scholarship |
| 2006 – 2007 | Liberty Bank Making a Difference Scholarship |

Languages

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| English | Native |
| Spanish | Limited Working Proficiency |
| Python, Matlab & LaTeX | Proficient |
| Bash, Javascript, HTML & CSS | Passable |

Codebase

<https://github.com/cgrudz>

Teaching

- Masters Students

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| June - Aug. 2017 | Armand Vic, École Normale Supérieure de Rennes Supervised Erasmus Plus Research Training Internship in mathematics at NERSC. |
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- Lecturer, University of North Carolina at Chapel Hill

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| 2013 | Math 190, Topics in Mathematics: A Climate of Uncertainty Designed original curriculum and led course under the HHMI First Year Seminar program. Lesson plans and resources archived at: https://aclimateofuncertainty.web.unc.edu |
| 2012 | Math 252, Calculus II |
- Teaching Assistant, University of North Carolina at Chapel Hill

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| 2015 | Math 657, Dynamical Systems with Applications in Climate |
| 2013 | Masc 783, Mathematical Modeling: Climate Modeling |
| 2013 | Math 67, Topics: The Mathematics of Climate Change |
| 2012 | Math 541, Advanced Calculus |
| 2011 | Math 383, Ordinary Differential Equations |
| 2011 | Math 381, Discrete Mathematics |
| 2011 | Mathematics Help Center – Tutor |
- Educator Training, University of North Carolina at Chapel Hill

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| 2013 | Future Faculty Fellowship Program |
| 2011 | Math 920, Graduate TA Teaching Seminar |
- Tutor & Grader, University of Oregon

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| 2010 – 2011 | Grader: Math 307, Introduction to Proof |
| 2010 – 2011 | Tutor: Math 213, Fundamentals of Elementary Mathematics |

Extended Research Visits

- Statistical and Applied Mathematical Sciences Institute – Durham, North Carolina
Principal Investigator: Amit Apte
 - Jan. – April 2018
- Center for Nonlinear Studies, Los Alamos National Laboratory – Los Alamos, New Mexico
Principal Investigator: Michael Chertkov
 - Oct. – Nov. 2016
- International Centre for Theoretical Science, TIFR – Bangalore, India
Principal Investigator: Amit Apte
 - Nov. 2015 – Dec. 2015
 - Dec. 2014 – Jan. 2015
 - Dec. 2013 – Jan. 2014

- Nansen Environmental and Remote Sensing Center – Bergen, Norway

Principal Investigator: Alberto Carrassi

– Oct. 2105 – Nov. 2015

Selected Talks

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| April 2018 | SIAM Conference on Uncertainty Quantification Garden Grove, California |
| Oct. 2017 | Numerical Modeling, Predictability and Data Assimilation in Weather, Ocean and Climate Bologna, Italy |
| Sept. 2017 | SIAM Conference on Mathematical and Computational Issues in the Geosciences Erlangen, Germany |
| April 2017 | European Geophysical Union General Assembly, Vienna, Austria |
| Nov. 2016 | Department of Meteorology Data Assimilation Research Centre Seminar, University of Reading – Reading, England |
| May 2015 | SIAM Conference on Applications of Dynamical Systems Salt Lake City, Utah |
| April 2015 | SIAM Central States Section First Annual Meeting Rolla, Missouri |
| March 2014 | IIMAS Coloquio de Matemáticas Aplicadas, Universidad Nacional Autónoma de México – México City, México |

Workshops & Trainings

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| March 2017 | Emerging Applications of Data Assimilation in the Geosciences, Lorentz Center – Leiden, Netherlands |
| Sept. 2016 | Distributed Control and Decision Making Over Networks Institute for Mathematics and its Applications – Minneapolis, Minnesota |
| March 2015 | Data4Decisions Conference and Exposition, Raleigh, North Carolina |
| Dec. 2014 | Climate Variability: From Models to Decisions, Lorentz Center – Leiden, Netherlands |
| April 2014 | Careers and Opportunities in Industry for Mathematical Scientists, Institute for Mathematics and its Applications – Minneapolis, Minnesota |
| Feb. 2014 | Algebraic Topology in Dynamics, Differential Equations and Experimental Data, Institute for Mathematics and its Applications – Minneapolis, Minnesota |
| May 2013 | Community Earth System Model (CESM) Tutorial National Center for Atmospheric Research – Boulder, Colorado |

Service

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| 2015 – 2016 | Math & Climate Research Network – Hubadministrator Led trainings, curated meta-data and created resources for using the MCRN Hub. Video tutorials are available at https://mcrn.hubzero.org/resources/606 |
| 2012 – 2013 | UNC-CH Graduate Mathematics Association Seminar Coordinator |
| 2012 – 2013 | UNC-CH Graduate & Professional Student Federation Senator |
| 2003 – 2011 | City of Eugene Libraries, Parks & Recreation – Lifeguard Eugene, Oregon |