

CONTACT INFORMATION	School of Mathematical Sciences 3224 Gosnell Hall Rochester, NY, 14623-5602	Email: <a href="mailto:mjhsma@rit.edu">mjhsma@rit.edu</a> <a href="http://people.rit.edu/mjhsma">people.rit.edu/mjhsma</a> Voice: 585-420-6288
EDUCATION	<p><b>University of Maryland, College Park</b> Ph.D., Applied Mathematics and Scientific Computation 2009 Advisors: Eugenia Kalnay &amp; James A. Carton M.S., Applied Mathematics and Scientific Computation 2007</p> <p><b>Williams College, Williamstown, MA</b> B.A., Mathematics and Astrophysics, Magna Cum Laude with Honors 2004</p>	
PROFESSIONAL EXPERIENCE	<p><b>Rochester Institute of Technology</b> Associate Professor, School of Mathematical Sciences 2011-Present Director, MS Graduate Program in Applied and Computational Mathematics 2016-Present Graduate Faculty Member, Chester F. Carlson Center for Imaging Science 2012-Present Director of Analytics, RIT Men's Hockey Team 2016-present</p> <p><b>Atmospheric and Environmental Research</b> Consultant 2011</p> <p><b>Johns Hopkins University</b> Glenadore and Howard L. Pim Postdoctoral Fellow, Department of Earth and Planetary Sciences 2009-Present</p> <p><b>Center for Weather Forecasts and Climate Studies (CPTEC)</b> Visiting Specialist of the Brazilian Science and Technology Ministry 2008</p>	
RESEARCH INTERESTS	Data Assimilation, Applied Mathematics, Ocean and Ecosystem Modeling, Martian Atmosphere and Climate, Breeding, Ensemble Kalman Filter, Scientific Computation	
RECENT EXTERNAL FUNDING	<ol style="list-style-type: none"> <li>1. Co-PI, NSF funded grant entitled <i>Collaborative Research: Developing a quantitative three-dimensional understanding of cardiac arrhythmias</i>. May 2018 - April 2021, \$234,989. PI is Elizabeth Cherry.</li> <li>2. Co-PI, NSF Improving Undergraduate STEM Education grant entitled <i>Collaborative Research: Data Integration in Undergraduate Mathematics Education</i>. July 1, 2017, \$253,052. PI is Paul Wenger.</li> <li>3. Co-PI, Defense University Research Instrumentation Program/AFOSR funded grant entitled <i>Hyperspectral Video System</i>. August 15, 2015, \$311,882. PI is Charles Bachmann.</li> <li>4. PI, AFOSR funded grant entitled <i>Dynamic Modality Switching Aided Object Tracking using an Adaptive Sensor</i>. June 5, 2015 - June 4, 2017, \$150,000.</li> <li>5. Co-PI, NSF funded grant entitled <i>REU Supplement to Collaborative Research: Intramural forecasting of cardiac electrical dynamics</i>. June 1, 2015 - August 7, 2015, \$5,000. PI is Elizabeth Cherry.</li> <li>6. PI, NOAA funded grant entitled <i>Comparison of 4DVAR and LETKF in Assimilating JPSS-Derived Sea-Surface Temperature in the Chesapeake Bay Operational Forecasting System</i>. March 1 2013- June 30, 2015. \$57,079.</li> <li>7. Co-PI, NSF funded grant entitled <i>Intramural Forecasting of Cardiac Electrical dynamics</i>. October 2012 - September 2015, \$261,234. PI is Elizabeth Cherry.</li> <li>8. Co-PI, AFOSR funded grant entitled <i>DDDAS for Object Tracking in Complex and Dynamic Environments (DOTCODE)</i>. September 2011 - September 2013, \$240,123. PI is Anthony Vodacek.</li> </ol>	

## OTHER GRANTS AND FELLOWSHIPS

1. PI, NVIDIA GPU Grant of a Titax Xp GPU. August 2018, \$1,149.99
2. PI, XSEDE computing allocation entitled *Ensemble Kalman Filter Data Assimilation for Forecasting and 3D Transport Modeling in Lake Erie*. June 2018 - May 2019, \$822.77.
3. PI, NVIDIA GPU Grant of a Titax X Pascal GPU. February 2017, \$969.80
4. PI, XSEDE computing allocation entitled *Improving Temperature and Salinity Estimates in the Chesapeake Bay Operational Forecasting System Using Satellite Sea-Surface Temperature*. August 2016 - August 2017, \$8,693.00.
5. PI, XSEDE computing allocation entitled *Correcting Temperature and Salinity in the Chesapeake Bay Operational Forecasting System Using Satellite Sea-Surface Temperature*. August 2015 - August 2016, \$7,655.94.
6. Co-PI, XSEDE computing allocation entitled *The Role of Anatomical Structure in Ventricular and Atrial Arrhythmias*. August 2015 - August 2016, \$18,035.90. PI is Elizabeth Cherry.
7. Co-PI, RIT Interdisciplinary Teaching Grant, *Climate Change Curriculum at RIT*, November 2015, \$18,500.
8. Co-PI, RIT Connect Grant, *COMMENT: Communication and Outreach through Mentored Media Engagement and Networking Teams*, June 2015, \$8,000. PI is Callie Babbit.
9. PI, Deans Research Initiation Grant, *Modeling and Assimilation System Development for Lake Ontario*. June 2013, \$10,000.

## JOURNAL PAPERS

\* indicates undergraduate or M.S. student      # indicates Ph.D. student

1. Uz Kent, B.#, A. Rangnekar#, and M.J. Hoffman. 2018. Tracking in Aerial Hyperspectral Videos using Deep Kernelized Correlation Filters. *IEEE Transactions on Geoscience and Remote Sensing*, In Press.
2. Lobyrev, F. and M.J. Hoffman. 2018. A morphological and geometric method for estimating the selectivity of gill nets. *Reviews in Fish Biology and Fisheries*, doi: 10.1007/s11160-018-9534-1.
3. LaVigne, N.S.\*, N. Holt\*, M.J. Hoffman, and E.M. Cherry. 2017. Effects of model error on cardiac electrical wave state reconstruction using data assimilation. *Chaos*, 27.
4. Hoffman M.J. and E. Hittinger. 2017. Inventory and transport of plastic debris in the Laurentian Great Lakes. *Marine Pollution Bulletin*, 155, 273-281.
5. Uz Kent, B.#, M.J. Hoffman, and A. Vodacek. 2016. Integrating Hyperspectral Likelihoods in a Multi-dimensional Assignment Algorithm for Aerial Vehicle Tracking. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, 99, 1-9.
6. Hoffman, M.J., N.S. LaVigne\*, S.T. Scorse\*, F.H. Fenton, and E.M. Cherry. 2016. Reconstructing three-dimensional reentrant electrical wave dynamics using data assimilation. *Chaos*, 26, 013107.
7. Uz Kent, B.#, M.J. Hoffman, A. Vodacek, and B. Chen. 2014. Feature Matching with an Adaptive Optical Sensor in a Ground Target Tracking System. *IEEE Sensors Journal*, 99.
8. Urquhart, E.#, M.J. Hoffman, R.R. Murphy, and B.F. Zaitchik. 2013. Geospatial Interpolation of MODIS-Derived Salinity and Temperature in the Chesapeake Bay. *Remote Sensing of the Environment*, 135, 167-177.
9. Greybush, S.J.#, E. Kalnay, M.J. Hoffman, R.J. Wilson. 2013. Identifying Martian atmospheric instabilities and their physical origins using bred vectors. *Q. J. Roy. Meteor. Soc.*, 123 (672), 639-653.

10. Hoffman, M.J., T. Miyoshi, T. Haine, K. Ide, R. Murtugudde, and C.W. Brown. 2012. An advanced data assimilation system for the Chesapeake Bay. *J. Atmos. and Oceanic Tech.*, 29, 1542-1557.
11. Urquhart, E.#, M.J. Hoffman, B.F. Zaitchik, S. Guikema, and E.F. Geiger. 2012. Remotely Sensed Estimates of Surface Salinity in the Chesapeake Bay. *Remote Sensing of the Environment*. 123, 522-531.
12. Greybush, Steven J.#, R. J. Wilson, R.N. Hoffman, M.J. Hoffman, T. Miyoshi, K. Ide, T. McConnochie, and E. Kalnay. 2012. Ensemble Kalman Filter Data Assimilation of Thermal Emission Spectrometer Temperature Retrievals into a Mars GCM. *J. Geophys. Res.*, 117, E11008.
13. Hoffman, M.J., J. Eluszkiewicz, D. Weisenstein, G. Uymin, and J.-L. Moncet. 2012. A Critical Assessment of Mars Atmospheric Temperature Retrievals from the Thermal Emission Spectrometer Measurements. *Icarus*, 220 (2), 1031-1039.
14. Hoffman, M.J., S.J. Greybush, R.J. Wilson, G. Gyarmati, R.N. Hoffman, E. Kalnay, K. Ide, E. Kostelich, T. Miyoshi, I. Szunyogh. 2010. [An ensemble Kalman filter data assimilation system for the Martian atmosphere: Implementation and simulation experiments](#). *Icarus*, 209, 470-481.
15. Hoffman, M.J., E. Kalnay, J.A. Carton, and S.C. Yang. 2009. [Use of breeding to detect and explain instabilities in the global ocean](#). *Geophys. Res. Lett.*, 36, L12608.
16. Gibbons, K.S., M.J. Hoffman, and W.K. Wootters. 2004. [Discrete phase space based on finite fields](#). *Phys. Rev. A*, 70, 062101.

PEER REVIEWED  
CONFERENCE  
PAPERS

1. Uzkent, B.#, A. Rangnekar#, and M.J. Hoffman. 2017. Aerial Vehicle Tracking by Adaptive Fusion of Hyperspectral Likelihood Maps., *CVPR Workshop: Perception Beyond the Visible Spectrum*, July 2017.
2. Uzkent, B.#, M.J. Hoffman, and A. Vodacek. 2016. Real-time Vehicle Tracking in Aerial Video using Hyperspectral Features. *CVPR Workshop: Moving Cameras Meet Video Surveillance*, June 2016.
3. Uzkent, B., M.J. Hoffman, and A. Vodacek, 2015. Spectral Validation of Measurements in a Vehicle Tracking DDDAS. *Procedia Computer Science*, 51, pp. 2493-2502.
4. Uzkent, B., M.J. Hoffman, and A. Vodacek, 2015. Efficient integration of spectral features for vehicle tracking utilizing an adaptive sensor. *Proc. SPIE 9407, Video Surveillance and Transportation Imaging Applications 2015*, 940707 (March 4, 2015).
5. Uzkent, B., M.J. Hoffman, A. Vodacek, J. P. Kerekes, and B. Chen, 2013. Feature Matching and Adaptive Prediction Models in an Object Tracking DDDAS. *Procedia Computer Science*, 18, 1939-1948.
6. Vodacek, A., J. P. Kerekes, and M.J. Hoffman. 2012. Adaptive optical sensing in an object tracking DDDAS. *Procedia Computer Science*, 9, 1159-1166.

CONFERENCE  
PAPERS

1. Uzkent, B., M.J. Hoffman, A. Vodacek, and B. Chen., 2015. Background image understanding and adaptive imaging for vehicle tracking. *Proc. SPIE 9460, Airborne Intelligence, Surveillance, Reconnaissance (ISR) Systems and Applications XII*, 94600F (May 19, 2015).
2. Uzkent, B., M.J. Hoffman, E. Cherry, and N. Cahill, 2014. 3-D MRI Cardiac Segmentation using Graph Cuts. *Proc. IEEE Western New York Image Processing Workshop*, pp. 47-51, November 2014.

THESIS STUDENTS	Name	Grad. Year
	Aneesh Rangnekar, Ph.D. in Imaging Science, RIT	current
	Emily Thomas, M.S. in Applied and Computational Mathematics, RIT	current
	Rebecca Knauff, M.S. in Applied and Computational Mathematics, RIT	current
	Michelle Gonzalez Castro, M.S. in Applied and Computational Mathematics, RIT	current
	Calvin Floyd, B.S./M.S. in Applied and Computational Mathematics, RIT	2017
	Burak Uzkent, Ph.D. in Imaging Science, RIT	2016
	Derek Cabone, B.S./M.S. in Applied and Computational Mathematics, RIT	2016
	Stephen Scorse, B.S./M.S. in Applied and Computational Mathematics, RIT	2014
	Jessica Beiter, B.S./M.S. in Applied and Computational Mathematics, RIT	2013
RESEARCH STUDENTS	Name	Year of Work
	Samuel Wohl, Physics,	2018-2019 Capstone
	Derek Cabone, Applied Mathematics, RIT	Summer 2013
	Joel Newbolt, Physics, RIT	Summer 2013
	Cesar Reynoso, Biomedical Engineering, RIT/Vanderbilt	Spring 2013
JOURNALS OR PROGRAMS REVIEWED FOR	PLOS ONE Remote Sensing of the Environment IEEE Sensors AFOSR DDDAS Program Journal of Climate Journal of Geophysical Research-Oceans Journal of Geophysical Research-Planets Geoscientific Model Development Icarus Weather and Forecasting Remote Sensing Tellus A Monthly Weather Review NSF Arctic Science Division	
INVITED LECTURES	Keynote Speaker, Texas Undergraduate Mathematics Conference, Nacogdoches, TX 2018 University of Rochester Sustainability Series, Rochester, NY 2018 Keynote Speaker, RIT Engineers for a Sustainable World Winter Banquet, Rochester, NY 2017 Applied Math Seminar, University of Buffalo, Buffalo, NY 2017 University of Rochester Sustainability Series, Rochester, NY 2017 Rochester Science Cafe, Rochester, NY 2017 NOAA Great Lakes Environmental Reserach Laboratory Seminar, Ann Arbor, MI 2016 CIS Digital Imaging and Remote Sensing Group Meeting, Rochester, NY 2016 NOAA Joint Polar Satellite System Seminar, Silver Spring, MD 2015 IEEE Geoscience and Remote Sensing Chapter section meeting, Rochester, NY 2015 Predictability in Earth Systems Processes Hot Topic Workshop, IMA, Minneapolis, MN 2013 SMS Conversations in Mathematics Seminar, Rochester, NY 2013 Science and Math Colloquium, Houghton College 2013 Environmental Engineering & Science Seminar, University of Buffalo 2012 Astrophysical Sciences and Technology Colloquium, Rochester Institute of Technology 2012 Center for Imaging Science Colloquium, Rochester Institute of Technology 2011 Mathematics Department Faculty Seminar, Williams College 2010 Center for Environmental and Applied Fluid Mechanics, Johns Hopkins University 2010 Mathematics Department Colloquium, Stephen F. Austin University 2010 Mathematics Department Colloquium, University of Vermont 2010	

Center for Weather Forecasts and Climate Studies (CPTEC), Brazil	2009
Mathematics Graduation Conference, University of Maryland	2009
Meteorology Department Seminar, University of São Paulo, Brazil	2008
Center for Weather Forecasts and Climate Studies (CPTEC), Brazil	2008
National Institute of Space Studies (INPE), Brazil	2008

CONTRIBUTED  
PRESENTATIONS

\* indicates student coauthor

AFOSR DDDAs PI Meeting, Dayton, OH	Sep. 2017
HABs State of the Science Webinar Series	Aug. 2016
SIAM Conference on the Life Sciences, Boston, MA*	Jul. 2016
SIAM Annual Meeting, Boston, MA	Jul. 2016
Summer Mathematics Institute, Rochester, NY	Jun. 2016
International Conference on Great Lakes Research, Guelph, Canada	Jun. 2016
International Conference on Great Lakes Research, Guelph, Canada*	Jun. 2016
AFOSR DDDAS PI Meeting, Washington, DC	Jan. 2016
SPIE Defense and Commercial Sensing, Baltimore, MD*	Apr. 2015
New York Conference on Applied Mathematics, Troy, NY	Oct. 2013
MathFest 2013, Hartford, CT	Aug. 2013
RIT COS Faculty Research Symposium, Rochester, NY	Sep. 2013
Summer Mathematics Institute, Rochester, NY	Jun. 2013
Chesapeake Modeling Symposium, Annapolis, MD	May 2012
AGU Ocean Sciences Meeting, Salt Lake City, UT	Feb. 2012
American Mathematical Society Annual Meeting, Boston, MA	Jan. 2012
SIAM Conference on the Applications of Dynamical Systems, Snowbird, UT	May 2011
CEAFM/Burgers Symposium, Johns Hopkins University, Baltimore, MD	May 2011
Mars Atmosphere Workshop: Modeling and Observations, Paris, France	Feb. 2011
American Meteorological Society Annual Meeting, Seattle, WA	Jan. 2011
Division for Planetary Sciences Annual Meeting, Pasadena, CA	Oct. 2010
Atmosphere-Ocean Science Days, College Park, MD	May 2010
Chesapeake Modeling Symposium, Annapolis, MD	May 2010
American Meteorological Society Annual Meeting, Atlanta, GA	Jan. 2010
Division for Planetary Sciences Annual Meeting, Fajardo, PR	Oct. 2009
CEAFM/Burgers Symposium, Johns Hopkins University, Baltimore, MD	May 2009
AMSC Student Seminar	Sep. 2008
SMALL 10th Anniversary Mini Conference, Williams College, Williamstown, MA	Jun. 2008
Chesapeake Modeling Symposium, Annapolis, MD	May 2008
AMSC Student Seminar	Oct. 2007
International Union of Geodesy and Geophysics XXIV General Assembly, Perugia, Italy	Jul. 2007

## POSTERS

Dynamics Days, Houston, TX	Jan. 2015
AGU Ocean Sciences Meeting, Honolulu, HI	Feb. 2014
MathFest 2013, Hartford, CT	Aug. 2013
Division for Planetary Sciences Annual Meeting, Pasadena, CA	Oct. 2010
American Geophysical Union Fall Meeting, San Francisco, CA	Dec. 2008
American Meteorological Society Meeting, San Antonio, TX	Jan. 2007
American Geophysical Union Fall Meeting, San Francisco, CA	Dec. 2006

## WORKSHOPS

Participant, <a href="#">Integrated analysis for agricultural management strategies</a> , American Institute of Mathematics, Palo Alto, CA	May 2015
Invited Speaker, Predictability in Earth Systems Processes Hot Topic Workshop, Institute for Mathematics and its Applications, Minneapolis, MN	Nov. 2013
Attendee, <a href="#">Advanced School on Complexity, Adaptation, and Emergence in Marine Ecosystems</a> , International Centre for Theoretical Physics, Trieste, Italy	Oct. 2010

	Attendee, <a href="#">MSRI Symposium on Climate Change: From Global Models to Local Action</a> , Berkeley, CA	Apr. 2007
HONORS AND AWARDS	<b>Rochester Institute of Technology</b> Finalist, Richard and Virginia Eisenhart Provost's Award for Excellence in Teaching College of Science Fun Outside the Classroom Award College of Science Rising Star Award Finalist, Richard and Virginia Eisenhart Provost's Award for Excellence in Teaching	2015 2015 2014 2013
	<b>University of Maryland, College Park</b> SIAM Student Chapter Certificate of Recognition Monroe Martin Talks Competition Winner Seymour Goldberg Papers Competition Winner Department of Mathematics VIGRE Travel Award Graduate School Jacob K. Goldhaber Travel Award	2009 2009 2007 2006 2006
	<b>International Union of Geodesy and Geophysics</b> Conference Grant	2007
PROFESSIONAL ACTIVITIES	Organizer, Minisymposium on Mathematics of Planet Earth Education, SIAM Organizer, RIT Conference on Sports Analytics Organizer, RIT Conference on Hockey Analytics Organizer, Session on Data Assimilation and Coupled Models, IAGLR Organizer, RIT Conference on Hockey Analytics Organizer, RIT Conference on Hockey Analytics, Organizer, Invited Paper Session on Climate and Geophysical Modeling, MathFest 2012 Co-Organizer, Center for Applied and Computational Mathematics Seminar President, <a href="#">AMSC Student Council</a> President, SIAM UMD Student Chapter Member, AMSC Graduate Committee Graduate Student Advisor, AMSC Program Board Member, <a href="#">AMSC Student Council</a> Member, AOSC/CSCAMM Committee to Enhance Campus Applied Mathematics Organizer, UMD Math Department <a href="#">Graduation Conference</a> Organizer, <a href="#">Applied Math and Scientific Computation Student Seminar</a>	2018 2018 2017 2017 2016 2015 2013 2012-2013 2008-2009 2008-2009 2008-2009 2008-2009 2007-2008 2008-2009 2007-2009 2007-2008
PROFESSIONAL SOCIETIES	American Mathematical Society Society for Industrial and Applied Mathematics American Geophysical Union International Association for Great Lakes Research	
SERVICE	Member, SMS head search committee Member, GSOLS faculty search committee Chair, SMS faculty search committee Co-Chair, SMS Strategic Planning Committee Director, MS Program in Applied and Computational Mathematics Member, SMS Graduate Curriculum committee Member, COS Graduate Curriculum committee Member, Imaging Science faculty search committee Organizer, RIT Hockey Analytics Conference Data Analyst, RIT Men's Ice Hockey Team Judge, IAGLR Annual Meeting Student Presentation Contest Public Facebook Ask a Scientist participant for From Quarks to Quasars Founder and Organizer, Conversations in Climate Change Series	2018-2019 2018-2019 2017-2018 2016-present 2016-present 2016-present 2016-present 2016 2015-present 2015-present 2016 2015 2013-present

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Member, SMS Undergraduate Curriculum committee	2014-present
Co-Head, PiRIT Student Mathematics Club	2013-present
Chair, Ph.D. in Mathematical Modeling development committee	2012-2015
Co-Organizer, SMS ImagineRIT exhibits	2013-present
Member, SMS Committee on Technology in the Classroom	2013-2014
Member, SMS faculty search committee	2013
Co-Organizer, RIT Center for Applied and Computational Mathematics Seminar	2012-2013
Organizer, Invited Paper Session on Climate and Geophysical Modeling MathFest 2013	2013
Member, Speakers Bureau for the Math of Planet Earth 2013 Program	2013
Judge, MathFest 2013 Undergraduate Paper Competition	2013

**SKILLS**

Computer Languages: Fortran 90/95/03, Matlab,  $\LaTeX$ , GrADS, Shell Scripts  
Languages: English, Proficient in Portuguese and Spanish