

CONTACT INFORMATION	School of Mathematical Sciences 3224 Gosnell Hall Rochester, NY, 14623-5602	Email: mjhsma@rit.edu people.rit.edu/mjhsma Voice: 585-420-6288
EDUCATION	University of Maryland, College Park Ph.D., Applied Mathematics and Scientific Computation Advisors: Eugenia Kalnay & James A. Carton M.S., Applied Mathematics and Scientific Computation Williams College, Williamstown, MA B.A., Mathematics and Astrophysics, Magna Cum Laude with Honors	2009 2007 2004
PROFESSIONAL EXPERIENCE	Rochester Institute of Technology Associate Professor, School of Mathematical Sciences Director, MS Graduate Program in Applied and Computational Mathematics Graduate Faculty Member, Chester F. Carlson Center for Imaging Science Director of Analytics, RIT Men's Hockey Team Atmospheric and Environmental Research Consultant Johns Hopkins University Glenadore and Howard L. Pim Postdoctoral Fellow, Department of Earth and Planetary Sciences Center for Weather Forecasts and Climate Studies (CPTEC) Visiting Specialist of the Brazilian Science and Technology Ministry	2011-Present 2016-Present 2012-Present 2016-present 2009-Present 2008
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">1. PI, AFOSR funded grant entitled <i>High-fidelity scene modeling and vehicle tracking using hyper-spectral video</i>. December 2018-November 2021, \$598,750.2. 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.3. 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.4. 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.5. PI, AFOSR funded grant entitled <i>Dynamic Modality Switching Aided Object Tracking using an Adaptive Sensor</i>. June 5, 2015 - June 4, 2017, \$150,000.6. 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.7. 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. \$57,079.8. Co-PI, NSF funded grant entitled <i>Intramural Forecasting of Cardiac Electrical dynamics</i>. October 2012 - September 2015. \$261,234. PI is Elizabeth Cherry.	

9. Co-PI, AFOSR funded grant entitled *DDAS for Object Tracking in Complex and Dynamic Environments (DOTCODE)*. September 2011 - September 2013, \$240,123. PI is Anthony Vodacek.

OTHER GRANTS AND FELLOWSHIPS

1. PI, Deans Research Initiation Grant, *Developing a cross-disciplinary research cluster studying the input, fate, and effects of plastic pollution in the Great Lakes*. December 2018, \$25,000.
2. PI, NVIDIA GPU Grant of a Titan Xp GPU. August 2018, \$1,149.99
3. 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.
4. PI, NVIDIA GPU Grant of a Titan X Pascal GPU. February 2017, \$969.80
5. 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.
6. 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.
7. 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.
8. Co-PI, RIT Interdisciplinary Teaching Grant, *Climate Change Curriculum at RIT*, November 2015, \$18,500.
9. Co-PI, RIT Connect Grant, *COMMENT: Communication and Outreach through Mentored Media Engagement and Networking Teams*, June 2015, \$8,000. PI is Callie Babbitt.
10. 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. Bachmann, C.M., R.S. Eon, C.S. Lapszynski, G.P. Badura, A. Vodacek, M.J. Hoffman, D. McKeeown, R.L. Kremens, M. Richardson, T. Bauch, and M. Foote. 2018. A Low-Rate Video Approach to Hyperspectral Imaging of Dynamic Scenes. *J. Imaging*, 5(1), 6, doi: 10.3390/jimaging5010006.
2. UzKent, 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*, 57 (1), 449-461, doi: 10.1109/TGRS.2018.2856370.
3. 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*, 28, doi: 10.1007/s11160-018-9534-1.
4. 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.
5. Hoffman M.J. and E. Hittinger. 2017. Inventory and transport of plastic debris in the Laurentian Great Lakes. *Marine Pollution Bulletin*, 155, 273-281.
6. UzKent, 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.
7. 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.

8. UzKent, 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.
9. 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.
10. 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.
11. 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.
12. 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.
13. 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.
14. 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.
15. 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.
16. 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.
17. 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. Uz Kent, 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. Uz Kent, 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
Juliette Daily, Ph.D. in Mathematical Modeling, RIT	current
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 Uz Kent, 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
Sensors
Tellus A
Monthly Weather Review
NSF Arctic Science Division
Journal of Great Lakes Research
Marine Pollution Bulletin

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

AMS Joint Meetings, Baltimore, MD	Jan. 2019
SIAM Education SIAG Conference, Portland, OR	Jun. 2018
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, Integrated analysis for agricultural management strategies , 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, Advanced School on Complexity, Adaptation, and Emergence in Marine Ecosystems , International Centre for Theoretical Physics, Trieste, Italy	Oct. 2010
	Attendee, MSRI Symposium on Climate Change: From Global Models to Local Action , Berkeley, CA	Apr. 2007
HONORS AND AWARDS	Rochester Institute of Technology	
	Finalist, Richard and Virginia Eisenhart Provost's Award for Excellence in Teaching	2015
	College of Science Fun Outside the Classroom Award	2015
	College of Science Rising Star Award	2014
	Finalist, Richard and Virginia Eisenhart Provost's Award for Excellence in Teaching	2013
	University of Maryland, College Park	
	SIAM Student Chapter Certificate of Recognition	2009
	Monroe Martin Talks Competition Winner	2009
	Seymour Goldberg Papers Competition Winner	2007
	Department of Mathematics VIGRE Travel Award	2006
	Graduate School Jacob K. Goldhaber Travel Award	2006
	International Union of Geodesy and Geophysics	
	Conference Grant	2007
PROFESSIONAL ACTIVITIES	Organizer, Session on Microplastic Pollution, IAGLR	2019
	Organizer, Session on Data Assimilation and Coupled Models, IAGLR	2019
	Organizer, Minisymposium on Mathematics of Planet Earth Education, SIAM	2018
	Organizer, RIT Conference on Sports Analytics	2018
	Organizer, Session on Data Assimilation and Coupled Models, IAGLR	2018
	Organizer, RIT Conference on Hockey Analytics	2017
	Organizer, Session on Data Assimilation and Coupled Models, IAGLR	2017
	Organizer, RIT Conference on Hockey Analytics	2016
	Organizer, RIT Conference on Hockey Analytics,	2015
	Organizer, Invited Paper Session on Climate and Geophysical Modeling, MathFest 2012	2013
	Co-Organizer, Center for Applied and Computational Mathematics Seminar	2012-2013
	President, AMSC Student Council	2008-2009
	President, SIAM UMD Student Chapter	2008-2009
	Member, AMSC Graduate Committee	2008-2009
	Graduate Student Advisor, AMSC Program	2008-2009
	Board Member, AMSC Student Council	2007-2008
	Member, AOSC/CSCAMM Committee to Enhance Campus Applied Mathematics	2008-2009
	Organizer, UMD Math Department Graduation Conference	2007-2009
	Organizer, Applied Math and Scientific Computation Student Seminar	2007-2008

PROFESSIONAL SOCIETIES	American Mathematical Society	
	Society for Industrial and Applied Mathematics	
	American Geophysical Union	
	International Association for Great Lakes Research	
SERVICE	Chair, SMS faculty search committee	2018-2019
	Member, SMS head search committee	2018-2019
	Member, GSOLS faculty search committee	2018-2019
	Chair, SMS faculty search committee	2017-2018
	Co-Chair, SMS Strategic Planning Committee	2016-present
	Director, MS Program in Applied and Computational Mathematics	2016-present
	Member, SMS Graduate Curriculum committee	2016-present
	Member, COS Graduate Curriculum committee	2016-present
	Member, Imaging Science faculty search committee	2016
	Organizer, RIT Hockey Analytics Conference	2015-present
	Data Analyst, RIT Men's Ice Hockey Team	2015-present
	Judge, IAGLR Annual Meeting Student Presentation Contest	2016
	Public Facebook Ask a Scientist participant for From Quarks to Quasars	2015
	Founder and Organizer, Conversations in Climate Change Series	2013-present
	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	