

## Ian M. Giammanco, PhD

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Insurance Institute for Business & Home Safety (IBHS)

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IBHS Research Center

Richburg, SC 29729

### PROFESSIONAL EXPERIENCE

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| <b>Jan 2019 – present</b>  | <b>Senior Director for Product Design &amp; Lead Research Meteorologist</b><br>Insurance Institute for Business & Home Safety (IBHS)<br>IBHS Research Center<br>Richburg, SC |
| <b>Jul 2011 – present</b>  | <b>Adjunct Faculty Research Associate</b><br>National Wind Institute<br>Texas Tech University<br>Lubbock, TX   |
| <b>Apr 2014 – present</b>  | <b>Lead Research Meteorologist</b><br>Insurance Institute for Business & Home Safety (IBHS)<br>IBHS Research Center<br>Richburg, SC  |
| <b>Jan 2012 – Apr 2014</b> | <b>Research Scientist</b><br>Insurance Institute for Business & Home Safety<br>IBHS Research Center<br>Richburg, SC  |
| <b>Aug 2010 – Jul 2011</b> | <b>Post-Doctoral Research Associate</b><br>Wind Science and Engineering<br>Texas Tech University<br>Lubbock, TX  |
| <b>Aug 2009 – Aug 2010</b> | <b>Instructor</b><br>Department of Geosciences<br>Texas Tech University<br>Lubbock, TX   |

### EDUCATION

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| <b>Aug 2010</b> | <b>Ph.D. Wind Science and Engineering</b><br>Texas Tech University<br>Dissertation topic: Observational study of tropical cyclone low-level wind maxima using GPS Dropwindsondes and WSR-88D VAD wind profiles |
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**Advisor:** John Schroeder, PhD  
**National Science Foundation – Integrative Graduate Education and Research Training (IGERT) Fellow Program Internship (2007)** – NOAA Hurricane Research Division  
**Supervisor** – Mark Powell, PhD

**Aug 2005**

**M.S. Atmospheric Science**  
Texas Tech University, August 2005  
Thesis topic: Tall tower and radar profiler observations of nocturnal boundary layer low-level jets and their turbulent structure: Implications for wind energy systems.  
**Advisor:** Richard Peterson, PhD

**May 2002**

**B.S. Atmospheric Science**  
The University of Louisiana at Monroe

## Professional Affiliations

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American Meteorological Society (AMS)  
Palmetto Chapter of the AMS (AMS-Local Chapter)  
National Weather Association (NWA)  
American Association of Wind Engineers (AAWE)

## RESEARCH INTERESTS

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Science communication, weather & climate policy and its impact on the built environment.

In-situ measurement systems: Instrumentation design, measurement response characteristics, adaptive observing networks

Multidisciplinary: Impact of severe weather on the built environment, Wind engineering, material response to hail impacts, material properties of hailstones, influence of severe weather on risk transfer and mitigation.

Severe Local Storms: Physical properties of hail, polarimetric radar detection of hail

Atmospheric Boundary Layer Observations: Wind flow characterization, boundary layer characteristics, wind hazards (e.g. thunderstorms, tornadoes, hurricanes)

## SCHOLARLY ACTIVITIES

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### Refereed Publications

Allen, J.T., **I.M. Giammanco**, M.R. Kumjian, H.J. Punge, Q. Zhang, P. Groenemeijer, M. Kunz, and K. Ortega, 2019: Understanding hail in the Earth system., *Rev. Geo. Phys.*, Accepted

Jiang, Z., M.R. Kumjian, R.S. Schrom, **I.M. Giammanco**, T.M. Brown-Giammanco, H.E. Estes, B.R. Maiden, and A.J. Heymsfield, 2018: Comparisons of electromagnetic scattering properties of real hailstones and spheroids, *J. Applied Meteor. Climo.*, <https://journals.ametsoc.org/doi/abs/10.1175/JAMC-D-17-0344.1>

- Heymsfield, A.J., M. Szakall, **I.M. Giammanco**, and R. Wright, 2018: A comprehensive observational study of graupel and hail terminal velocities, mass flux, and kinetic energies, *J. Atmo. Sci.*, <https://journals.ametsoc.org/doi/abs/10.1175/JAS-D-18-0035.1>
- Giammanco, I.M.**, B.R. Maiden, H.E. Estes, T.M. Brown-Giammanco, 2017: Using 3-D laser scanning technology to create digital models of hailstones, *Bull. Amer. Meteor. Soc.*, <http://journals.ametsoc.org/doi/pdf/10.1175/BAMS-D-15-00314.1>
- Giammanco, I.M.**, J.L. Schroeder, F.J. Masters, P.J. Vickery, R. Krupar III, and J.A. Balderrama, 2016: Influences on observed near-surface gust factors in landfalling Gulf Coast hurricanes: 2004-2008. *J. Applied Meteor. Climo.* <http://journals.ametsoc.org/doi/abs/10.1175/JAMC-D-16-0053.1>
- Giammanco, I.M.**, T.M. Brown, R.G. Grant, D.A. Dewey, J. Hodel, R.A. Stumpf, 2015: Evaluating the hardness property of hail through compressive strength measurements. *J. Atmos. Ocean. Tech.*, **32**, 2100-2113. DOI: JTECH-D-15-0081.1.
- Brown, T.M., W.H. Pogorzelski, and **I.M. Giammanco**, 2015: Evaluating hail damage using property insurance claims data. *J. Wea. Climo. Soc.*, **7**, 197-210. DOI: WCAS-D-15-0011.1.
- Heymsfield, A.J., **I.M. Giammanco**, R.L. Wright, 2014: Terminal velocities and kinetic energies of natural hailstones, *Geo. Phys. Res. Lett.*, **41**, 8666-8672. DOI: 10.1002/2014GL062324.
- Giammanco, I.M.**, J.L. Schroeder, and M.D. Powell, 2013: GPS Dropwindsonde and WSR-88D observations of tropical cyclone vertical wind profiles and their characteristics. *Wea. Forecast.*, **28**, 77-99.
- Giammanco, I.M.**, J.L. Schroeder, and M.D. Powell, 2012: Observed characteristics of tropical cyclone vertical wind profiles. *J. Wind and Structures*, **15**, 65-86.
- Schroeder, J.L., B. Paulsen-Edwards, and **I.M. Giammanco**, 2009: Observed tropical cyclone wind flow characteristics. *J. Wind and Structures*, **12**, 349-382.
- Storm, B., J. Duhia, S. Basu, A. Swift, and **I.M. Giammanco**, 2009: Evaluation of the Weather Research and Forecasting model on forecasting low-level jets: Implications for short-term wind energy forecasts. *J. Wind Energy*, **12**, 81-90.

### Select Conference Presentations/Proceedings 2010-present

- Silvis, V., **I.M. Giammanco**, and F. Malik, 2020: Coastal Alabama & FORTIFIED Home: A Windstorm Resilience Success Story, 100<sup>th</sup> Annual Meeting of the American Meteorological Society, Boston, MA.
- Giammanco, I.M. and T.M. Brown-Giammanco, 2018: Comparisons of WSR-88D dual-pol hail size discrimination algorithm output with physical hail measurements and in situ impact disdrometer data, *29<sup>th</sup> AMS Conference on Severe Local Storms*, Stowe, VT.
- Sirico, R., **I.M. Giammanco**, M.R. Kumjian, and T.M. Brown Giammanco, 2018: Environmental influences on hailstone material properties, *29<sup>th</sup> AMS Conference on Severe Local Storms*, Stowe, VT.
- Jiang, Z., M.R. Kumjian, R.S. Schrom, **I.M. Giammanco**, T.M. Brown-Giammanco, H.E. Estes, R. Maiden, and A.J. Heymsfield, 2017: Comparison of scattering properties of real hailstones and spheroids, *AMS 38<sup>th</sup> Conference on Radar Meteorology*, Chicago, IL.
- Giammanco, I.M.**, H.B. Bluestein, Z.B. Wienhoff, D.W. Reif, and A.J. Heymsfield, 2016: Analysis of RaXPoI and In-Situ Hail Impact Disdrometer Data in a Hail-Producing Left-Moving Supercell in Colorado, *AMS 28<sup>th</sup> Conference on Severe Local Storms*, Portland, OR.

Estes, H.E., T.M. Brown-Giammanco, and **I.M. Giammanco**, 2016: Durability of Polymer-Modified Asphalt Shingles, *ISAP Symposium concurrent with 53<sup>rd</sup> Petersen Asphalt Research Conference*. Jackson Hole, WY. July 18-21, 2016.

**Giammanco, I.M.**, W.E. Cranford, and C.J.P. Estes, 2016: Development of a low-cost network of hail impact disdrometers. *96<sup>th</sup> Annual Meeting of the AMS*, New Orleans, LA.

Brown, T.M., **I.M. Giammanco**, and M. R. Kumjian, 2014: IBHS hail field research program 2012-2014. *AMS 27<sup>th</sup> Conference on Severe Local Storms*, Madison, WI.

Kumjian, M.R., T.M. Brown, and **I.M. Giammanco**, 2014: IBHS hail field project 2014 case studies: Comparisons of polarimetric radar observations and surface hail characteristics. *AMS 27<sup>th</sup> Conference on Severe Local Storms*, Madison, WI.

**Giammanco, I.M.**, T.M. Brown, M.R. Kumjian, and A.J. Heymsfield, 2014: Observations of hailstone shapes during the IBHS Hail Field Program: 2012-2014. *AMS 27<sup>th</sup> Conference on Severe Local Storms*, Madison, WI.

**Giammanco, I.M.** and T.M. Brown, 2014: Observation of hailstone characteristics in supercell and multicell thunderstorms. *94<sup>th</sup> Annual Meeting of the AMS, Special Symposium on Severe Local Storms*, Atlanta, GA.

**Giammanco, I.M.** and J.L. Schroeder, 2013: Observations of tropical cyclone winds in marine exposure conditions. *12<sup>th</sup> Americas Conference on Wind Engineering*. Seattle, WA.

Brown, T.M., **I.M. Giammanco**, and D.S. Robinett, 2012: Observations of hail stone characteristics using a new instrumentation platform. *AMS 26<sup>th</sup> Conference on Severe Local Storms*, Nashville, TN.

**Giammanco, I.M.**, J.A. Balderrama, J.L. Schroeder, F.J. Masters, and P.J. Vickery, 2012: Observed near-surface wind flow characteristics of Gulf Coast hurricanes: 2004-2008. *AMS 30<sup>th</sup> Conference on Hurricanes and Tropical Meteorology*, Ponte Vedra Beach, FL.

**Giammanco, I.M.**, J.L. Schroeder, M.D. Powell, and D.A. Smith, 2010: WSR-88D Observations of hurricane boundary layer vertical wind profiles. *2<sup>nd</sup> AAWE Workshop*, Marco Island, FL.

## Technical Reports

**Giammanco, I.M.**, T.M. Brown, H. Sommers, 2015: "IBHS Roof Aging Farm Measurement Program and 2014 Summary", *Insurance Institute for Business & Home Safety*, IBHS-RC01-2015, 13 pp.

**Giammanco, I.M.** and T.M. Brown, 2013: "2013 Characteristics of Severe Hail Field Project Summary". *Insurance Institute for Business & Home Safety*, IBHS-RC04-2014, 40 pp.

**Giammanco, I.M.** and T.M. Brown, 2013: "Characteristics of Severe Hail 2012 Pilot Field Study: Data Analysis Summary". *Insurance Institute for Business & Home Safety*, IBHS-RC03-2013, 46 pp.

**Giammanco, I.M.**, P.J. Vickery, and J.L. Schroeder, 2012: "Analysis of the Structure of Hurricane Winds Near and Off Shore". DeepStar, 157 pp. (Post-doctoral research)

Powell, M.D., S. Cocke, B. Annane, and **I.M. Giammanco**, 2007: Quarterly report on meteorology component of the Florida Hurricane Loss Model (FHLM). Florida Commission on Hurricane Loss Projection. 63 pp.

**Giammanco, I.M.** and J.L. Schroeder, 2006: Texas Tech's Hurricanes at landfall project: 2005. National Institute of Standards and Technology. 26 pp.

### Other Non-Refereed Publications and Reports

Heymsfield, A.J. and **I.M. Giammanco**, 2019: The 2018 North American Workshop on Hail and Hailstorms: An Overlooked Hazard, Essay, *Bull. Amer. Meteor. Soc.*, In Review

**Giammanco, I.M.**, 2013: Review of “*Lessons from Hurricane Ike*” by P.D. Bedient, *Bull. Amer. Meteor. Soc.*, **94**, 1413-1414.

Brown, T.M. and **I.M. Giammanco**, 2013: “IBHS’ Multi-faceted hail research program”. RCI, Inc. **31**, 5-8. <http://www.rci-online.org/interface/2013-02-brown-giammanco.pdf>

**Giammanco, I.M.**, 2012: “Impact of Hurricane Sandy: October 22-31, 2012”. *Insurance Institute for Business & Home Safety*, 22 pp.

**Giammanco, I.M.**, 2012: “Impact of Hurricane Isaac: August 21-30, 2012”. *Insurance Institute for Business & Home Safety*, 19 pp.

**Giammanco, I. M.**, J. L. Schroeder, and B. D. Hirth, 2007: “Hurricane Ivan Deployment Summary, Texas Tech University Hurricane Research Team,” <http://www.atmo.ttu.edu/TTUHRT/IvanSummary.pdf>, 15 pp.

**Giammanco, I. M.**, J. L. Schroeder, and B. D. Hirth, 2006: “Hurricane Rita Deployment Summary, Texas Tech University Hurricane Research Team,” <http://www.atmo.ttu.edu/TTUHRT/RitaSummary.pdf>, 17 pp.

**Giammanco, I. M.**, J. L. Schroeder, and B. D. Hirth, 2006: “Hurricane Katrina Deployment Summary, Texas Tech University Hurricane Research Team,” <http://www.atmo.ttu.edu/TTUHRT/KatrinaSummary.pdf>, 19 pp.

### SELECTED INVITED PRESENTATIONS (2010–present)

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“*Hail Damage in the United State: What Happened and Can we Bend Down the Loss Curve*”, 3<sup>rd</sup> European Workshop on Hail and Hailstorms, Karlsruhe, Germany March 18-21, 2020.

“*Hail: The No Respect Tour*”, *Geoscience panel, Reinsurance Association of America Annual Conference*, Orlando, FL, February 26-28, 2019.

“*Hailstorms and Hailstones: Challenges and Opportunities*”, CPCU Society Annual Meeting, San Diego, CA, October 16, 2018. Co-presenter with Robert Galbraith (USAA).

“*Hail Kinetic Energies and Test Protocols: Where are we & where are we going?*” 2018 North American Workshop on Hail and Hailstorms, Boulder, CO, August 15, 2018. Co-presenter with Andrew Heymsfield, PhD (NCAR) and Robert Wright (Wright and Associates Engineering).

“*Fire & Ice: Applied Research to Bend the Curve on Costly Storms*”, RMS Exceedance, Miami, FL. May 25, 2018. Co-Presenter with Steve Quarles, PhD (IBHS).

“*The Billion Dollar Loss: Reducing the Cost of Hail through Insurance and Science*”, National Tornado Summit, February 27, 2018. Co-presenter with Robert Galbraith (USAA).

“*Hail No! Putting the Newest Weather Science to Work*” Property Insurance Report Annual Conference, Palm Springs, CA, November 14, 2017.

“*IBHS Insights: Hail*”, National Association of Mutual Insurance Companies (NAMIC) Annual Conference, Denver, CO, September 26, 2017.

*"New Insights into Hail Characteristics and Kinetic Energies"* Roofing Industry Committee on Weather Issues (RICOWI) Annual Meeting, Boulder, CO, October 10, 2016. Co-presenter with Andrew J. Heymsfield (NCAR) and Tanya M. Brown-Giammanco (IBHS)

*"The IBHS Research Center: Turning the Knobs on Wind, Hail, and Wildfire"* South Carolina Wind and Hail Underwriters Association, Myrtle Beach, SC, June 18, 2015.

*"Using Real-World Science to Replicate the Effect of Extreme Weather on Full-Scale Building Systems"*, 43<sup>rd</sup> AMS Conference on Broadcast Meteorology, Raleigh, NC, June 11, 2015.

*"Field measurements and polarimetric radar observations of hail"*, Risk Management Solutions, Newark, CA, December 17, 2014.

Panelist, *"Understanding the Science Behind Sandy"* Northeast Risk and Resiliency Leadership Forum hosted by RenaissanceRe, Stamford, CT, October 8, 2014.

*"Understanding Trends in Severe Weather: The Current State of the Science"*, Inland Marine Underwriters Association Southeast Regional Conference, Atlanta, GA, October 6, 2014.

*"Evaluating the Characteristics of Hail through Field Observations and Unique Measurement Systems"*, National Center for Atmospheric Research – Earth Observing Laboratory, Boulder, CO, June 16, 2014.

*"Hail and Tornadoes: Emerging Elephants in the Room"* Casualty Actuarial Society Annual Conference, Chicago, IL, September 30, 2013.

*"The Insurance Institute for Business and Home Safety's Applied Science and Engineering Laboratory"* Upstate Local Chapter of the American Meteorological Society, March 22, 2013.

*"Experimental and In-Situ Investigation of Hydrometeors and their Influence on Building Envelope Performance"* Department of Physics and Astronomy 2012-2013 Colloquia, College of Charleston, Charleston, SC. October 4, 2012.

*"Observed Characteristics of Tropical Cyclone Vertical Wind Profiles"* NOAA/AOML Hurricane Research Division, Miami, FL. July 9, 2010

## TEACHING RESPONSIBILITIES – Texas Tech University

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<b>Summer 2010</b>	Atmospheric Science 1300 - Introduction to Atmospheric Science
<b>Spring 2010</b>	Atmospheric Science 1300 - Introduction to Atmospheric Science
<b>Fall 2009</b>	Atmospheric Science 1300 - Introduction to Atmospheric Science Guest Lecturer – Atmospheric Science 5354: Tropical Cyclones (graduate-level)

## SERVICE ACTIVITIES

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<b>2016 – 2019</b>	National Weather Association, Publications Committee (3-year term) Journal of Operational Meteorology
<b>Jan 2019</b>	Temporary editor of the Journal of Operational Meteorology (during Federal Government shutdown)
<b>2017-2018</b>	Steering committee co-chair 2018 North American Workshop on Hail & Hailstorms (Co-PI, support from National Science Foundation)

- 2013 – 2017** American Meteorological Society Committee on Weather and Climate Financial Risk Management.
- Social media coordinator
  - Instructor: Short-course. *“Weather to Risk it or Not: Fundamentals of Weather/Climate Risk Management”* 94<sup>th</sup> Annual Meeting of the AMS, Atlanta GA.
  - Session moderator and organizer: 4<sup>th</sup> Symposium on the Weather, Water and Climate Enterprise: *Utilizing Financial Tools for Weather Risk Transfer in Business Continuity, Supply Chain, and Capital Markets*. 96<sup>th</sup> Annual Meeting of the AMS, New Orleans, LA.
- Jan 2015** Panel discussion participant, “Conversations with Professionals” AMS Student Conference at AMS Annual Meeting.
- 2012 – 2014** Mentor and program developer, Chester High School and IBHS Research Center Research Experience for High School Seniors

## Peer Review Service Activities

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### JOURNAL REVIEWS

Electronic Journal of Severe Storms Meteorology  
Journal of Applied Meteorology and Climatology  
Journal of Boundary Layer Meteorology  
Journal of Natural Hazard Mitigation  
Journal of Wind and Structures  
Journal of Wind Engineering and Industrial Aerodynamics  
Journal of Operational Meteorology  
Journal of Theoretical and Applied Climatology  
Monthly Weather Review  
Oxford Research Encyclopedia of Climate Science

### BOOK REVIEWS

Oxford University Press  
AMS