

31st Annual Iowa State University Atmospheric Science Undergraduate Research Symposium

Monday, December 4, 2023

Sun Room, Memorial Union

The Senior Thesis Program is designed to provide in-depth experience with guided professional inquiry for all atmospheric science graduates. The program consists of original research done in collaboration with a mentor who may be a faculty member or other professional meteorologist or researcher. The students' findings are reported in the written theses and are presented orally at the Iowa State University Atmospheric Science Undergraduate Research Symposium. Presentations are open to the general public. Faculty, staff, and students are encouraged to attend. Family and friends of presenters are especially welcome.

- 9:00 AM** **Symposium Opening Remarks**
Dr. Kristie J. Franz, Chair, Department of Geological and Atmospheric Sciences
- 9:10 AM** **Asymmetry in the Diurnal Cycle of Solar Radiation Over Land**
Benjamin C. Jablonski
Mentor: Dr. Ian N. Williams
- 9:25 AM** **The Influence of Climate Variability and Change on Atlantic Hurricane Season Length**
Grace Hansen
Mentors: Dr. Christina M. Patricola and Dr. Ana C. T. Sena
- 9:40 AM** **Anticipating Cyclic vs Steady State Mesocyclogenesis in Supercells**
Hunter Fowkes
Mentors: Dr. Cameron Nixon and Dr. William A. Gallus Jr.
- 9:55 AM** **Future Changes in Downdraft Convective Available Potential Energy Across the Continental United States**
Gwendolyn Nicole Fieweger
Mentor: Dr. Ian N. Williams
- 10:10 AM** **A Comparison of Poorly-Predicted and Correctly-Predicted Progressive Derechos**
Ryan Dreesezen
Mentor: Dr. William A. Gallus Jr.
- 10:25 AM** **Break**

- 10:45 AM** **Re-examining Derecho Climatology Across Iowa and The Cornbelt**
Joshua David Franson
Mentors: Michael Fowle and David Flory
- 11:00 AM** **The Role of Shear Instabilities in Mesoscale Convective Systems and Severe Wind Events**
Mary Jurgensen
Mentor: Dr. Ian N. Williams
- 11:15 AM** **Effects of Precipitation on Appalachian Cold Air Damming**
Anthony J. Rickman
Mentor: Dr. William Gutowski
- 11:30 AM** **Linking Changes in Canadian Boreal Forests to Cold Air Outbreaks in the United States**
Brooke Gabrielle Beran
Mentor: Dr. Ian N. Williams
- 11:45 AM** **The Role of Soil Moisture on Corn Planting Progress in Iowa**
Nicolas Sanchez
Mentors: Dr. Andrew VanLoocke and Bryan Petersen
- 12:00 PM** **Lunch**
- 1:00 PM** **Future Changes in Rainfall Intensity across the United States**
Nicole Maureen Skalicky
Mentor: Dr. William A. Gallus Jr.
- 1:15 PM** **Synoptic Patterns and Corresponding Surface Conditions Representative of Enhanced Fire Danger Across Iowa**
Nicholas Francis
Mentors: Mike McClure and Dave Flory
- 1:30 PM** **Tropical Cyclone Genesis Mechanisms in the Absence of African Easterly Waves in a Regional Climate Model**
Kyle Alan Curry
Mentors: Dr. Christina M. Patricola, Dr. Emily Bercos-Hickey, and Dr. Derrick Danso
- 1:45 PM** **Relationship Between Dual-Polarization Radar Products and Anomalous Cloud-to-Ground Lightning in Mesoscale Convective Systems**
Zachary McDaniel
Mentors: Dr. Elise Schultz and Dave Flory

- 2:00 PM** **Forecasting Temperature Errors in the GFS and NAM as a Function of Snow Cover**
Lucas Prokosch
Mentor: Dr. William A. Gallus Jr.
- 2:15 PM** **Break**
- 2:35 PM** **Student Responses to Winter Weather at Iowa State University**
Kameron B. Clark
Mentor: Dr. Lindsay C. Maudlin
- 2:50 PM** **Comparing the 16 January 2023 Iowa Cold-Core Tornado Event to an Updated Climatology of Cold-Core Low Tornadoes**
Samual David Johnson
Mentor: Dr. William A. Gallus Jr.
- 3:05 PM** **Sensitivity of Precipitation to Microphysics Parameterizations in Convection-Permitting Simulations of Hurricane Ian**
Jonathan Wolf-Wainggai
Mentors: Dr. Christina M. Patricola and Dr. Xiaoqing Wu
- 3:20 PM** **Evaluation of Parameter Ability to Forecast Severe Nocturnal Bow Echo Winds**
Erin A. Brunsen
Mentor: Dr. William A. Gallus Jr.
- 3:35 PM** **Examination of Missed and False Alarm Mesoscale Convective Systems Predicted by the High-Resolution Rapid Refresh Model**
Nathan D. Sonntag
Mentors: Samuel B. Ritter and Dr. William A. Gallus Jr.
- 3:50 PM** **Symposium Closing Remarks and photo**
Dr. William A. Gallus Jr., Associate Chair, Department of Geological and Atmospheric Sciences