Improving Weather and Climate Change Predictions

Christiane Jablonowski
Associate Professor, Atmospheric, Oceanica, and Space Sciences

CURRENT RESEARCH

Adaptive meshes provide fast and accurate weather predictions at the local scale

In 2005, Hurricane Katrina became one of the costliest natural disasters and deadliest hurricanes in US history. While in part it is the nature of hurricanes and blizzards to be difficult to predict, Hurricane Katrina taught the nation that a successful collaboration between scientists and policymakers is needed to save the lives of thousands of people. Dr. Christiane Jablonowski, Associate Professor of Atmospheric, Oceanic, and Space Science at the University of Michigan, pushes the frontiers of today's climate and weather models. In particular, she develops and tests variable-resolution mesh techniques, called Adaptive Mesh Refinement (AMR), that can zoom into areas of interest, like a hurricane, with very small grid spacings while keeping calm atmospheric regions at coarser grid resolutions. In other words, her models allow her to scan the broad picture of weather occurrences while zooming in on particular areas of interest. In this way, Dr. Jablonowski's models have the potential to provide accurate weather and climate information at regional and local scales which is urgently needed by many stakeholders, like farmers, emergency managers, city planners, hydrologists, and policymakers.

Dr. Jablonowski's modeling technique provides very accurate representations of hurricanes and other extreme weather events while being highly economical from a computational standpoint. The adaptive grids can be moved with the hurricane and thereby track its destructive path....

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AFFILIATION

University of Michigan

EDUCATION

- Postdoctoral Fellow, 2004 - 2006 , National Center for Atmospheric Science (NCAR) Advanced Study Program
- Ph.D., in Atmospheric Science and Scientific Computing, 2004 , University of Michigan
- B.S. & M.S., in Meterology, 1998 , Aachen University of Technology and University of Bonn, Germany

AWARDS

- Presidential Early Career Award for Scientists and Engineers (PECASE), 2011
- Department of Energy Early Career Award, 2010
- University of Michigan, Distinguished Achievement Award, 2010
- NCAR Advanced Study Program (ASP) Postdoctoral Fellowship, 2004
- NASA Earth System Science Graduate Student Fellowship, 2000

RESEARCH AREAS

Environment, Atmospheric / Space, Computational Sciences / Mathematics, Natural Disasters / Emergency

FUNDING REQUEST

Your contributions will support the continued research of Dr. Christiane Jablonowski, of the University of Michigan, as she pushes the frontiers of today's weather and climate models. Donations will fund the necessary $400K/year required for personnel, travel, and access to high-performance parallel computing platforms. In choosing to support Dr. Jablonowski's research you will play a role in ensuring that accurate weather and climate information are provided to regional and local stakeholders including farmers, emergency managers, city planners, hydrologists, and policymakers.