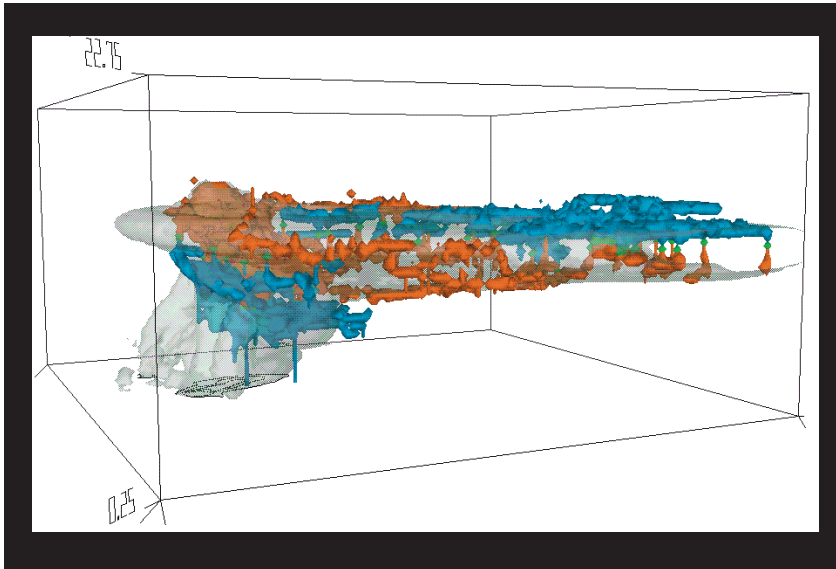


## [ Storm Electricity ]



*Results of computer simulations of lightning strikes in storms. Detailed 3D hydrodynamical simulations of a supercell thunderstorm allow modeling of how electric charges are distributed in storms and the nature of cloud to cloud and cloud to ground strikes. By better understanding lightning in storms we can use it to help mitigate the danger of severe storms.*

*The image shows lightning during a 2.5 min period in a simulation of a classic supercell storm (over 100 flashes). The volumes of lightning activity are indicated for positive leaders (blue) and negative leaders (red). The positive leaders which connect to ground indicate the occurrence of positive cloud-to-ground flashes. The line contours indicate surface precipitation.*

**T**he National Severe Storms Laboratory (NSSL), a federal research laboratory within the National Oceanic and Atmospheric Administration, is located on the north campus of the University. Two senior scientists in NSSL, Drs. MacGorman and Rust, hold adjunct positions with the department and regularly advise students. Working with NSSL provides students the opportunity to pursue a physics career with emphasis on the atmosphere, which covers a wide range of physical scales. Graduate research opportunities include the electrical properties of precipitation, lightning physics, *in situ* and remote measurements of storm parameters, storm electrification models, lightning data assimilation into weather forecast models, and climactic impacts of weather systems and lightning. More details about the range of topics for experimental and theoretical research on problems in atmospheric physics are described on the next page.



[ **Donald R. MacGorman** ]  
*adjunct professor*

**B.S. 1973 Rice University**  
**Ph.D. 1978 Rice University**

**M**y research focuses on storm electrification: How do storms become electrified? What causes lightning to occur, and what controls where it propagates? How do storm characteristics affect the lightning that is produced? What effects do lightning flashes have on the environment? These and related questions motivate the research in which I have been involved. Experiments to address these issues at NSSL usually involve collecting and analyzing data from existing systems, such as NSSL's radar and three-dimensional lightning strike mapping system, or use numerical cloud models to simulate electrified storms and lightning.

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[ **W. David Rust** ]  
*adjunct professor*

**B.S. 1966 Southwestern University**  
**Ph.D. 1973**  
**New Mexico Institute of Technology**



**G**raduate research opportunities with me are focused in the areas of making measurements of electrical parameters using both the fixed-base instruments and mobile laboratories. Examples include balloon-borne instruments to make storm electricity measurements in and near storms.

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