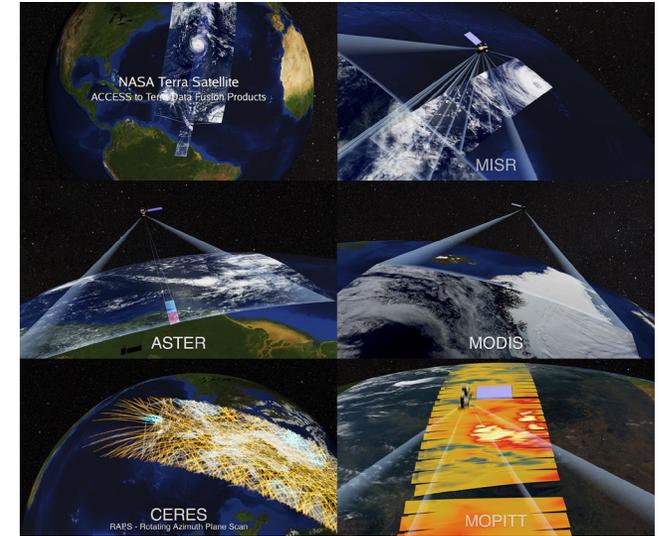




Allocation: BW Professor/210 Knh
PI: Larry Di Girolamo
University of Illinois at Urbana-Champaign
Geoscience



Images from an animation that dynamically displays and projects the radiance imageries generated from a single Terra basic fusion granule (Orbit 3671) onto Earth as observed from all 5 by Terra instruments. Video at <https://youtu.be/C2uyjRGwwOs>.

THE TERRA DATA FUSION PROJECT

Research Challenge

This work benefits users of data from NASA's Terra instrument through the fusion of data from the five Terra instruments. The need for data from Terra to accelerate analytical applications that serve the scientific community, governmental and commercial needs, and the educational community has never been greater. The goals of the Terra fusion products are to facilitate ease of use and accuracy through data fusion, reduce errors and redundancy for users of data from Terra, and to provide a framework for data fusion that could extend to other NASA projects.

Methods & Codes

- Transfer the entire Terra record (Level 1B radiance; >1 petabyte) to Blue Waters from NASA centers
- Develop software for whole-mission processing to create fusion products
- Optimize data granularity and HDF packaging for parallel I/O
- Distribute Terra fusion products through existing NASA services

Why Blue Waters

The large storage, IO bandwidth, and computing facilities of BlueWaters provides an optimum framework for large-scale processing, analytics, and mining of the entire Terra record. In addition, the BlueWaters project staff provides critically needed expertise to optimize the Terra fusion workflows.

Results & Impact

- Successfully transferred terra data from 5 NASA sites and produced 2.4 PB of Terra full-mission fused data products
- Carried out science investigations using the Terra fusion data set resulting in radically different understanding of the distributions of cloud drop sizes in our atmosphere than those previously available, and that have been verified by spot measurements in field campaigns
- Developed a tool too dynamically visualize Terra data onto 3D earth