Interactive Visualizations of the Sky

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Visualizing the Sky

- ## The Problem

  - ⋆ How do we visualize 40GB of imaging, maps and and meta-data on the sky?
  - ⋆ Need large dynamic range to handle survey data and pointed observations, from 4π steradians to arcsecond scales.
  - ⋆ Need to display multiple observations simultaneously – data discovery and time domain
  - ⋆ The interface must be interactive, flexible and expandable from the client and server sides.
  - ⋆ In the end, it should be tied to data sources so that data retrieval and viewing is seamless.
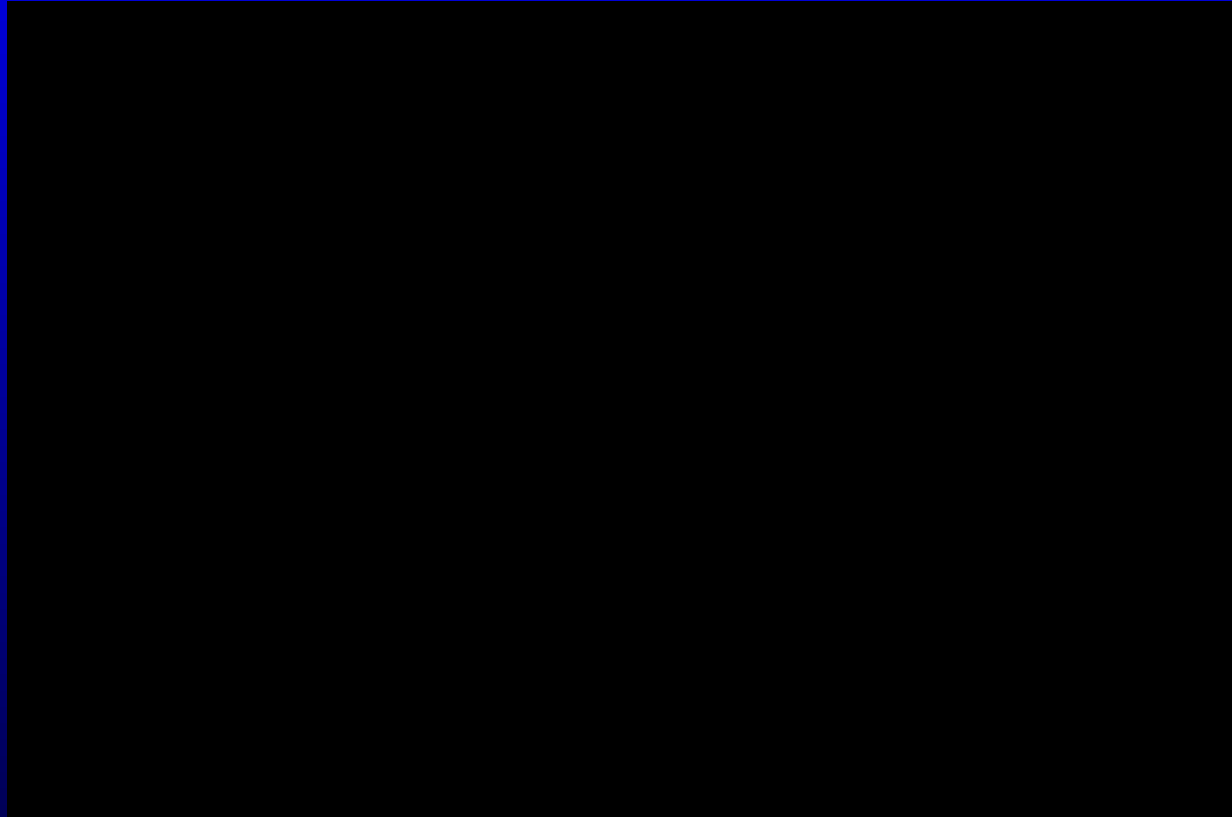
Our Solution
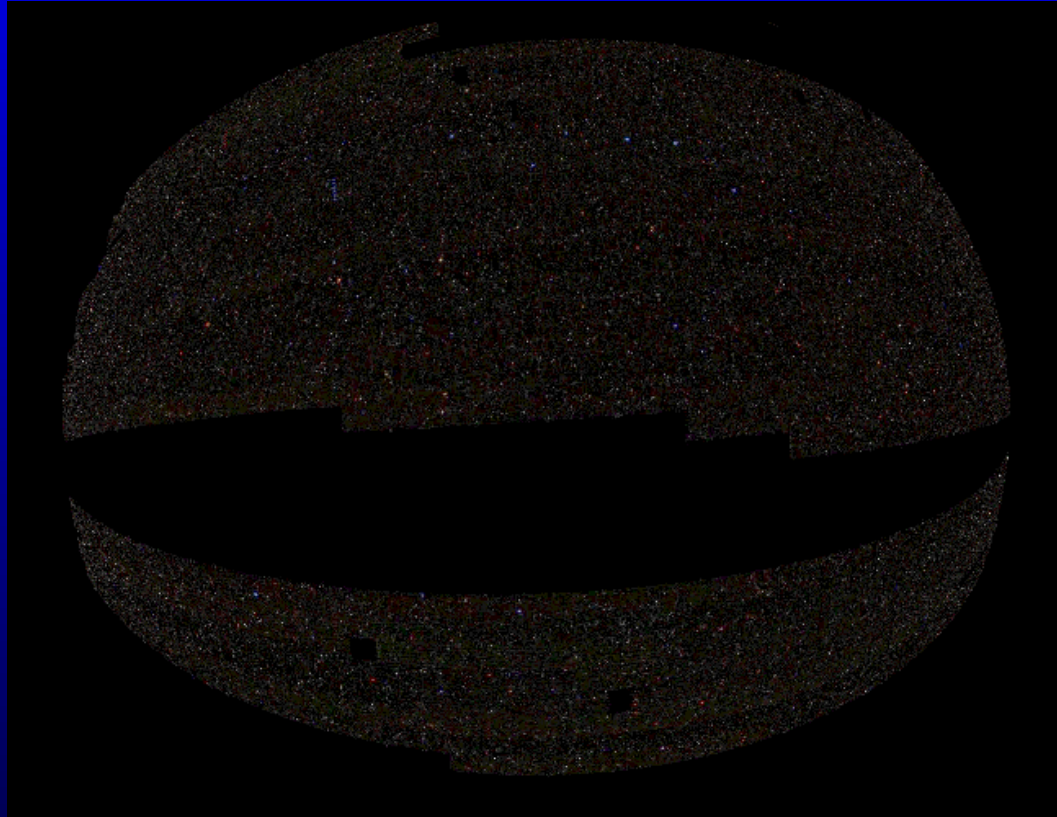
- Imaging data ingested (reprojected & tiled) into World Map Server (WMS) from FITS images & WCS

Our Solution
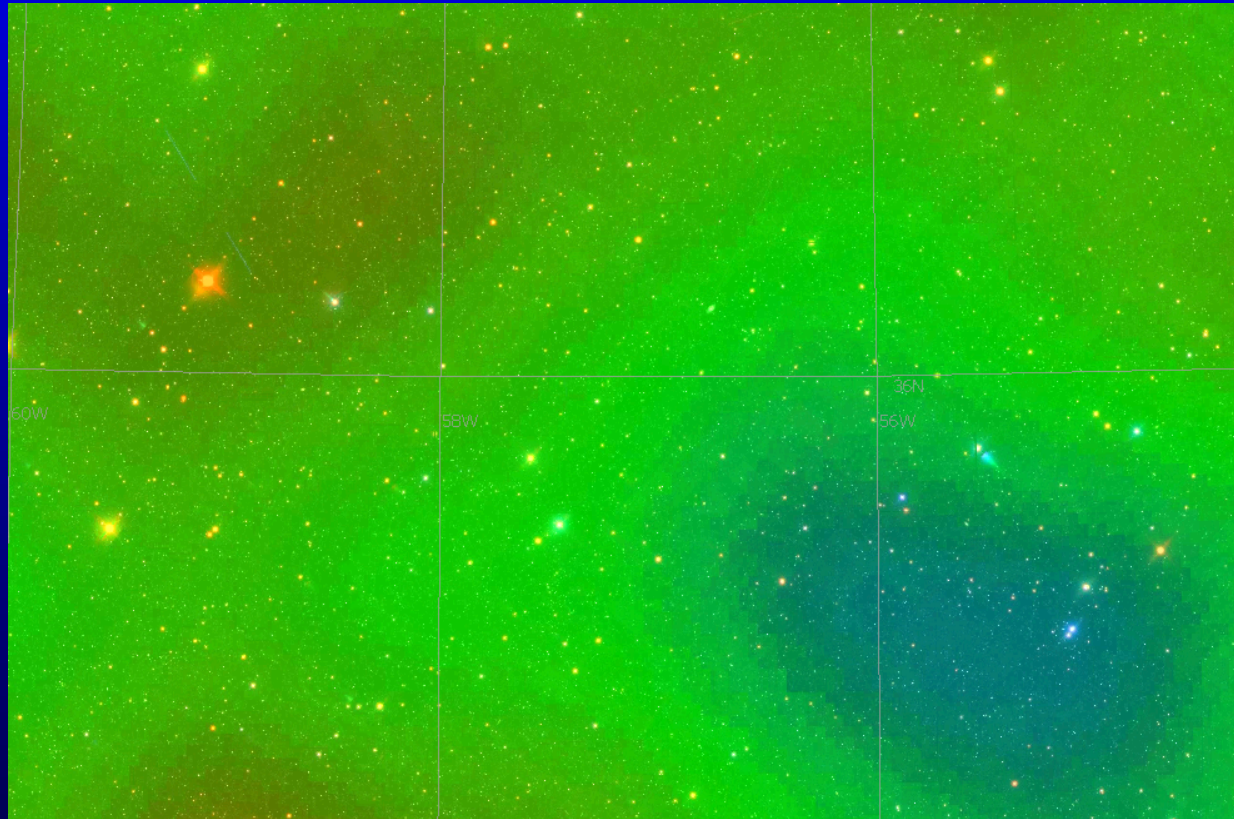
- Survey meta-data and maps generated by **STOMP** footprint server
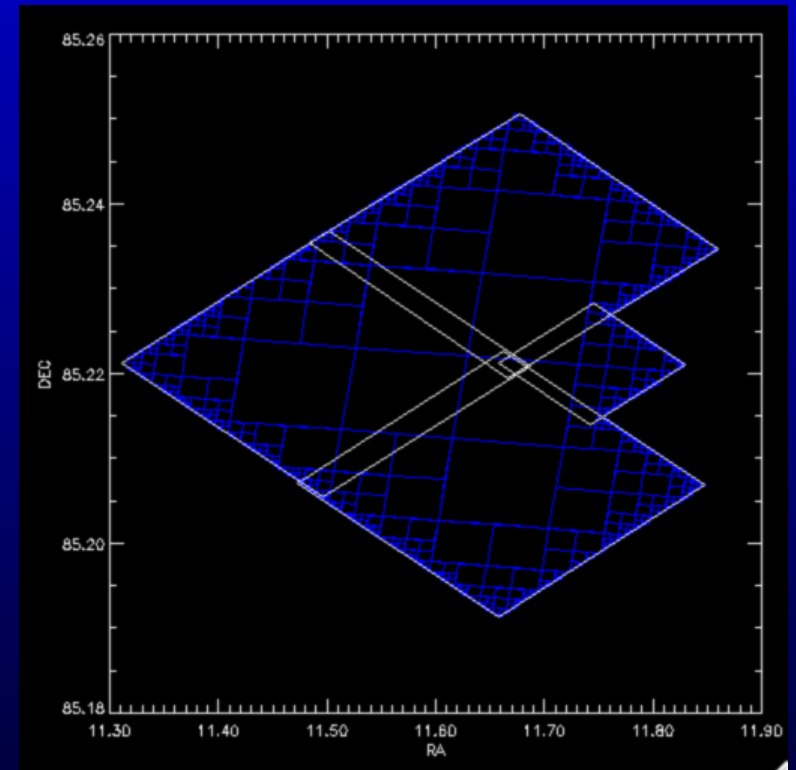
Our Solution

- **World Wind** connects to our WMS to dynamically retrieve and reproject imaging data based on user's vantage point (image pyramids)
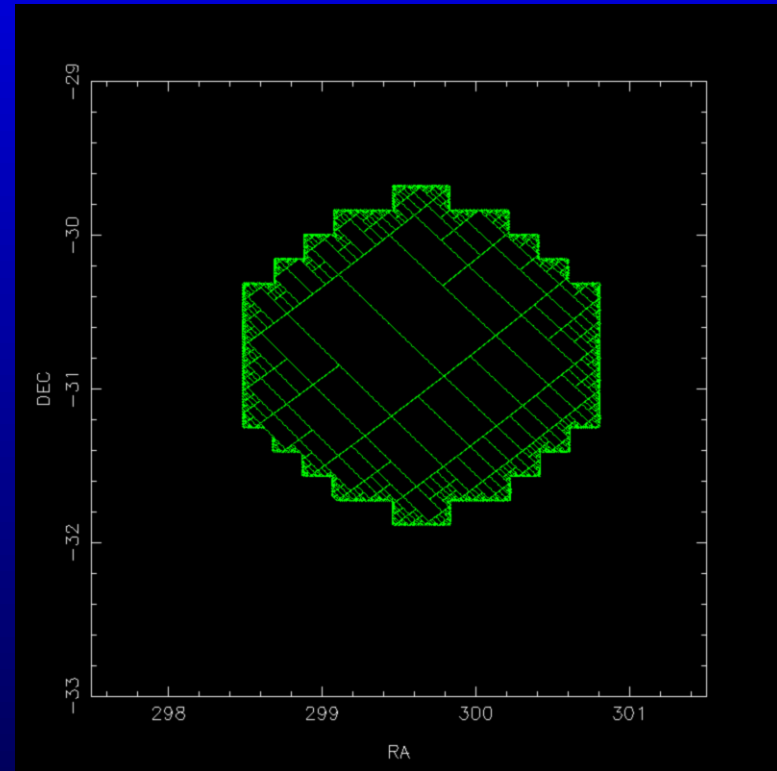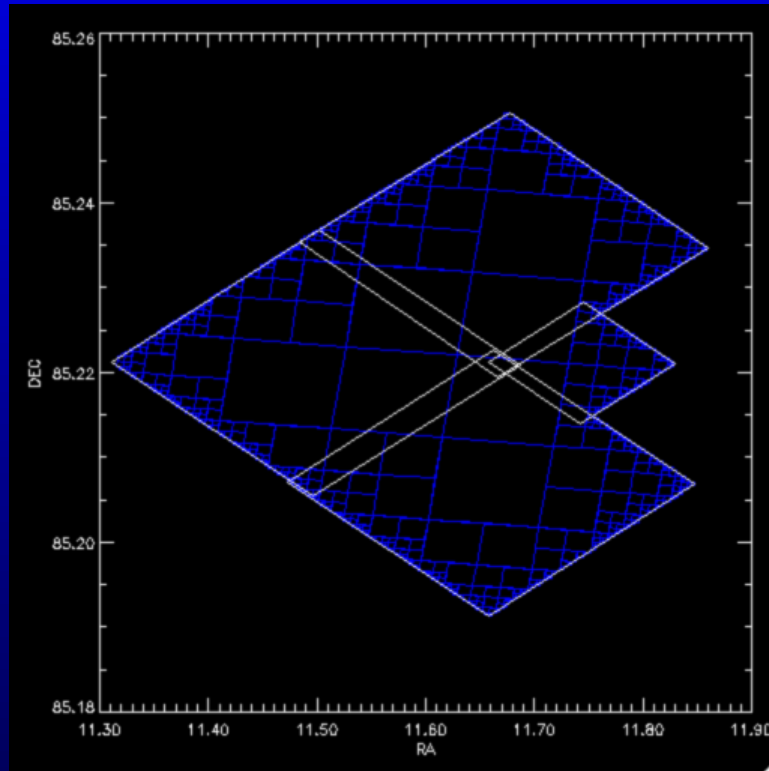
STOMP: Space and Time Ordered Mapping Package
http://nvogre.phyast.pitt.edu/gestalt/

- All astronomical statistics are measurements of spatial properties (area, angular distance, density, etc.).

- Describe complex geometries on the sphere and possibly spatial variations

- Find unions, intersections, and overlaps between multiple observations

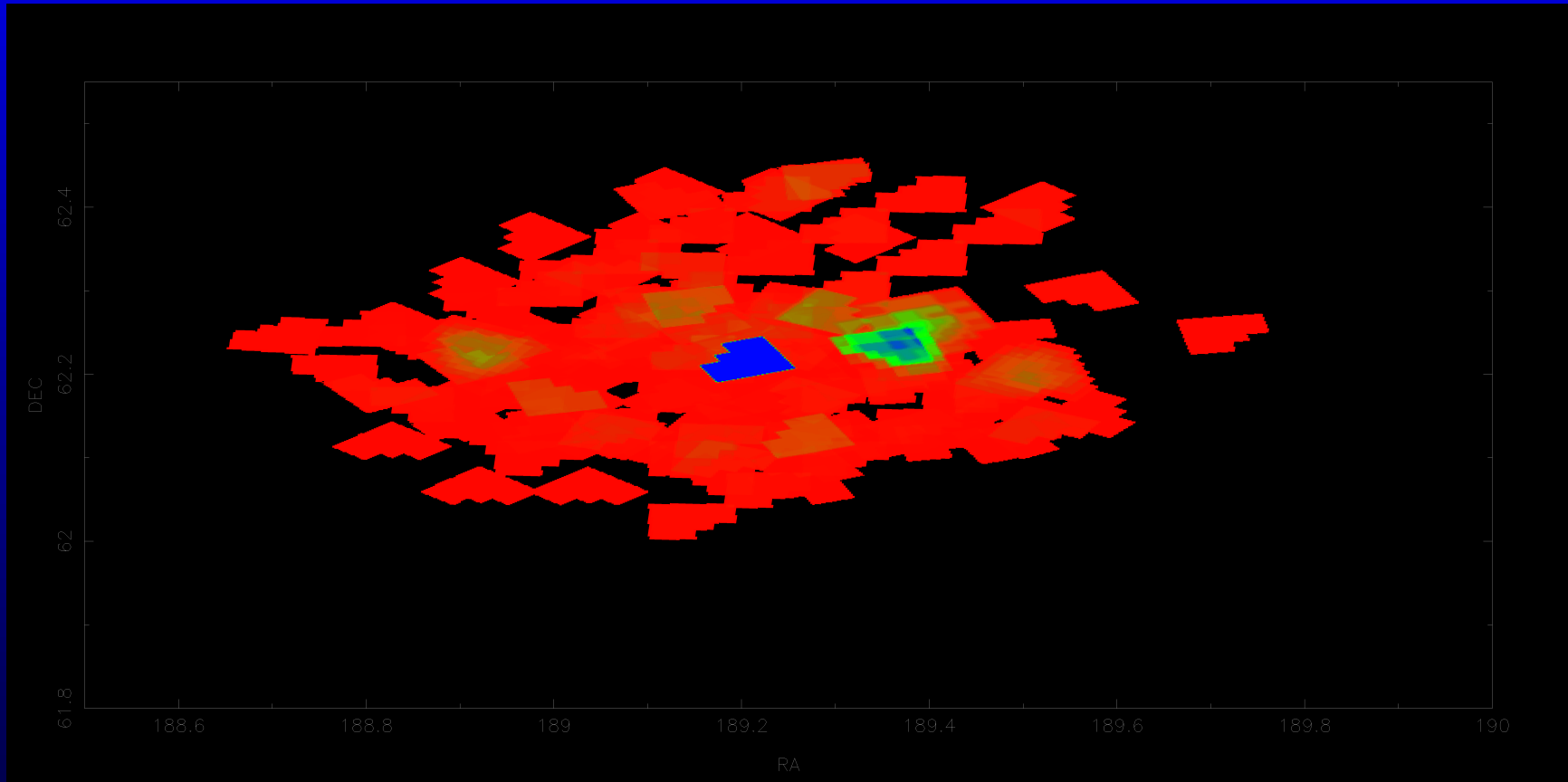- Wrap database interactions and map making software in simple Java interface
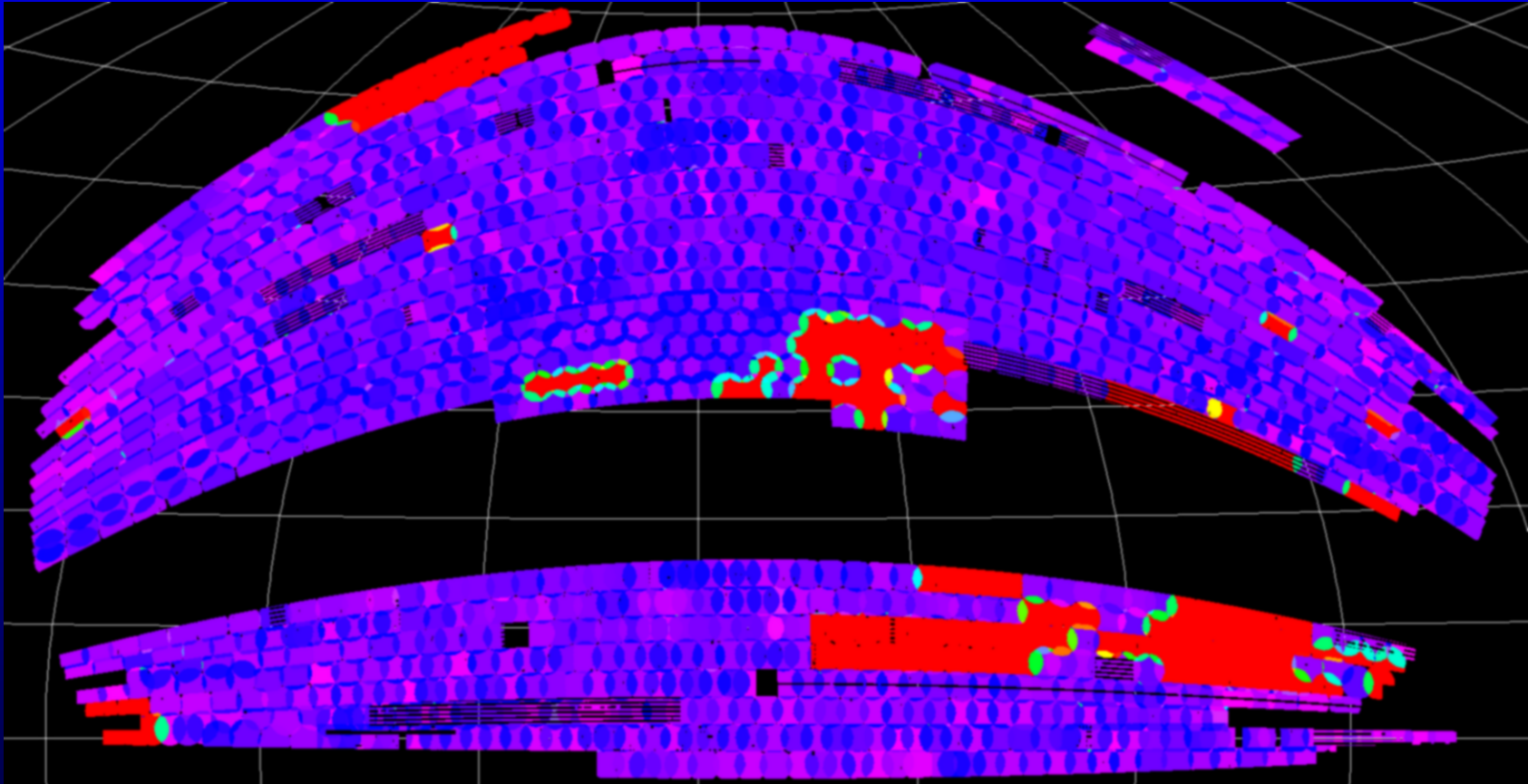
STOMP: Space and Time Ordered Mapping Package

- Pixelized survey footprints with 1" resolution

- Hierarchical scheme: extremely rapid localization & efficient angular statistics.

STOMP: Space and Time Ordered Mapping Package

- Map unions, intersections and overlaps are simple and fast

STOMP: Space and Time Ordered Mapping Package

- Spatial variations are easily encoded