

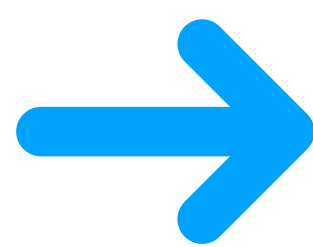
# CARTA: Cube Analysis and Rendering Tool for Astronomy

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Check **P4-5** for more details !



## Primary goals of CARTA

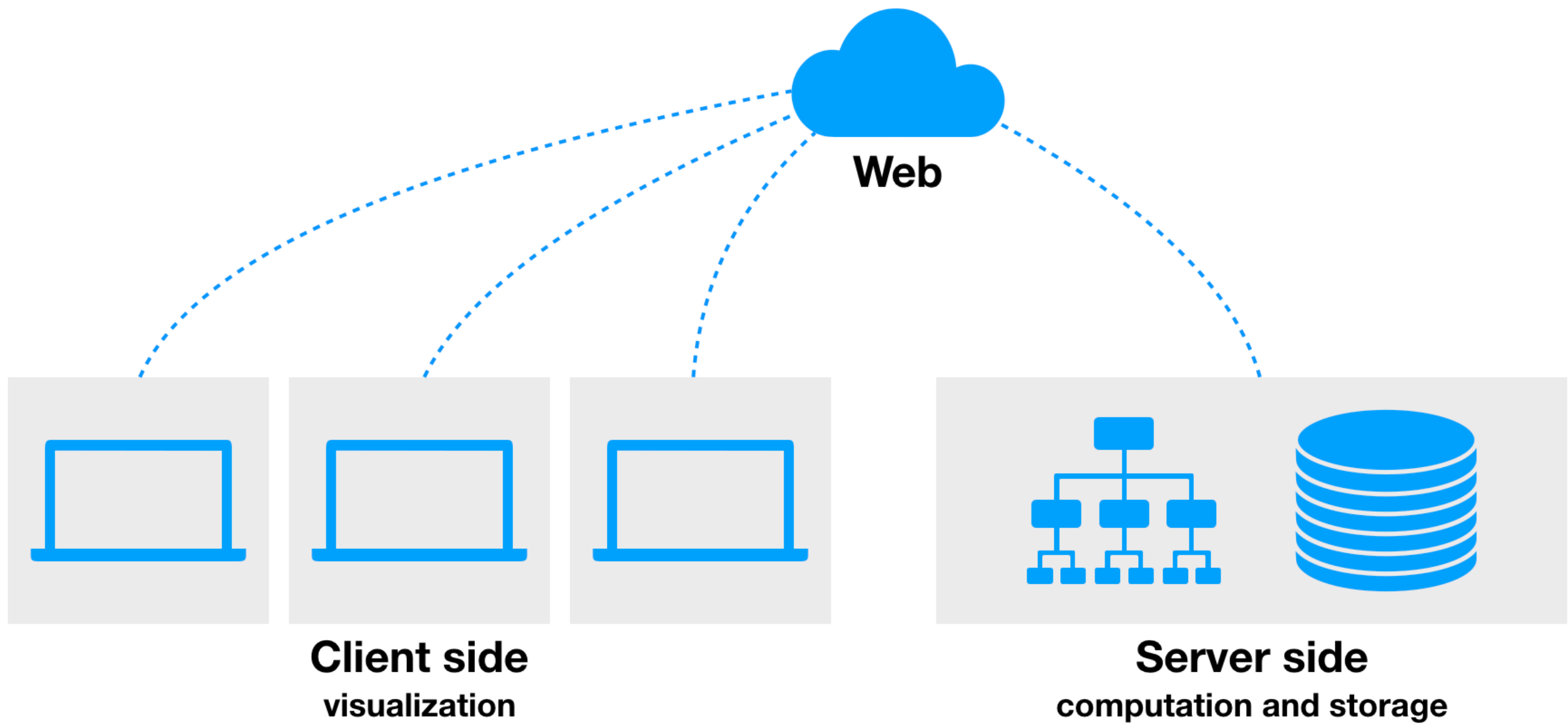
- Provide efficient way to visualize and analyze large image cubes from ALMA, VLA, MeerKAT, and ASKAP, etc.
- Ensure the scalability for future telescopes, such as ngVLA, SKA, JWST, LSST, etc.
- Provide pleasant user experience
- Serve as the new image viewer of CASA
- Serve as the remote viewer of image archives (ALMA)

## Development team

The development of the CARTA project is a joint effort from ASIAA, IDIA, NRAO, and the Department of Physics, University of Alberta.



## Client-server architecture



The server side prepares *just sufficient* amount of data for the client side to display to users with GPU accelerated rendering techniques.

## Key features (Check **P4-5** for more details!)

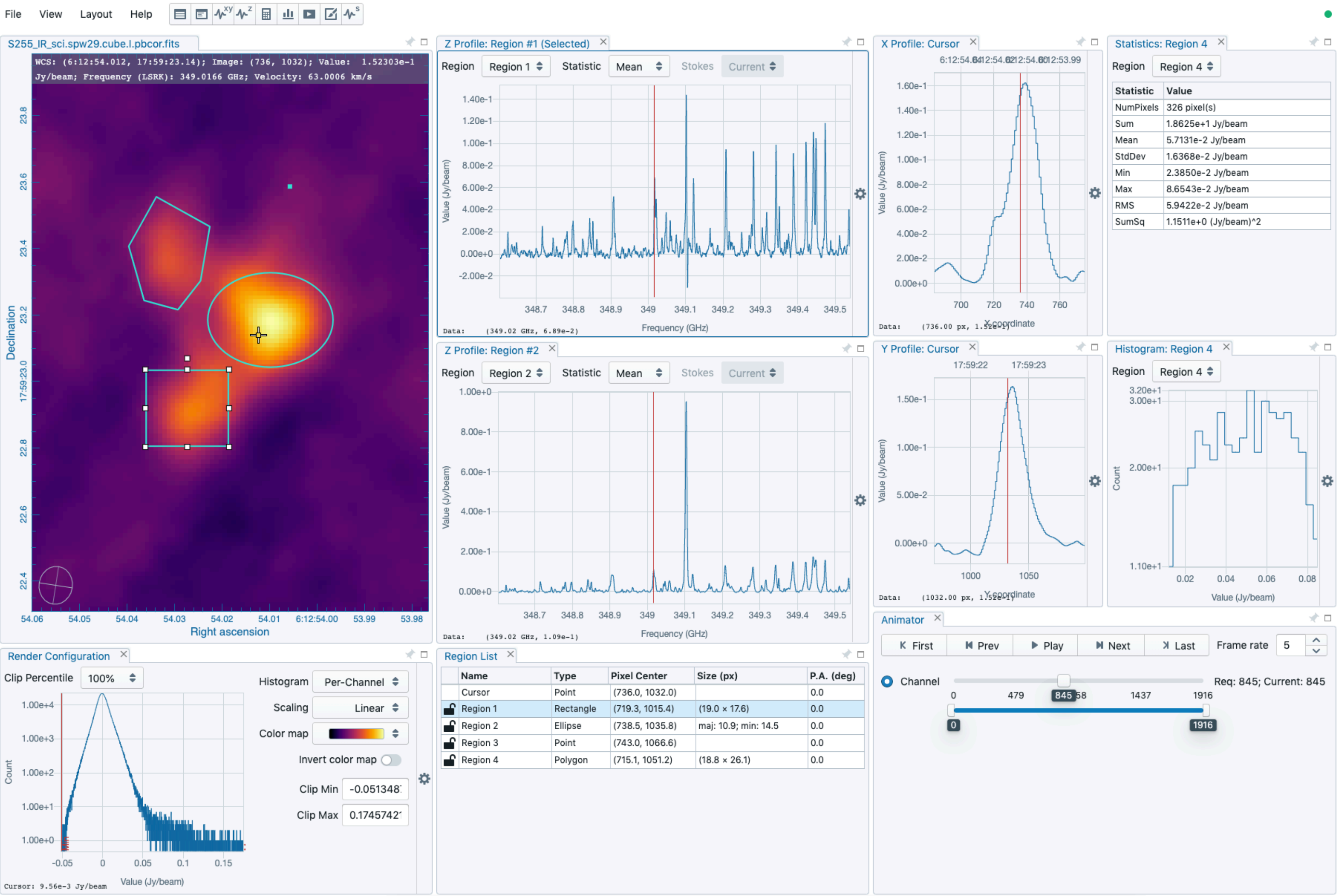
### Latest version v1.2

- Memory efficient  
*With 1 GB of RAM, a 16000x16000 pixel image can be loaded and a 16000x16000x1000(channel) image cube (1TB!) can be loaded too.*
- Highly customizable and reusable GUI  
*Plenty of GUI options including layouts are configurable and reusable to fit users' tastes.*
- GPU accelerated rendering at client side  
*WebGL enabled.*
- Parallelization at server side  
*I/O bounded threading control.*
- Responsive and progressive update of spectral profile  
*Once a region spectral profile is requested, CARTA updates partial profile to users shortly and the request is interruptible at any time.*
- Tiled rendering of raster image  
*Image data are broken into tiles with multiple resolutions and delivered to the client side dynamically according to zoom level and screen resolution. Tiles are cached to reduce network usage.*
- Efficient visualization with HDF5 (IDIA schema) image  
*Acceleration with pre-calculated statistics and rotated image data.*

### Planned features

- Image overlay in WCS
- Efficient contour rendering
- Image analysis tools
- Scripting interface
- Interactive CLEAN with CASA
- Catalogue overlay support
- Shared screen for collaborative image analysis
- Channel maps
- Multi-panel view
- Volume rendering
- Session resuming
- ...

Send us your wishes via [carta\\_helpdesk@asiaa.sinica.edu.tw](mailto:carta_helpdesk@asiaa.sinica.edu.tw)



## What does CARTA support?

- Desktop version:  
macOS, Ubuntu Linux, Redhat Enterprise Linux
  - Standalone App
  - Remote mode (more efficient than ssh+x11 or vnc)
- Server version:  
Ubuntu Linux, Redhat Enterprise Linux
  - Supported web browsers:  
Chrome, Safari, Firefox
- Image format:  
CASA, FITS, MIRIAD, HDF5 (IDIA schema)

## More info!

Github  
(<https://github.com/CARTAVIS>)



Download and homepage  
(<https://cartavis.github.io>)

User manual  
(<https://carta.readthedocs.io/en/latest/>)

Helpdesk ([carta\\_helpdesk@asiaa.sinica.edu.tw](mailto:carta_helpdesk@asiaa.sinica.edu.tw))



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