

CARTA

**The Cube Analysis and Rendering
Tool for Astronomy**

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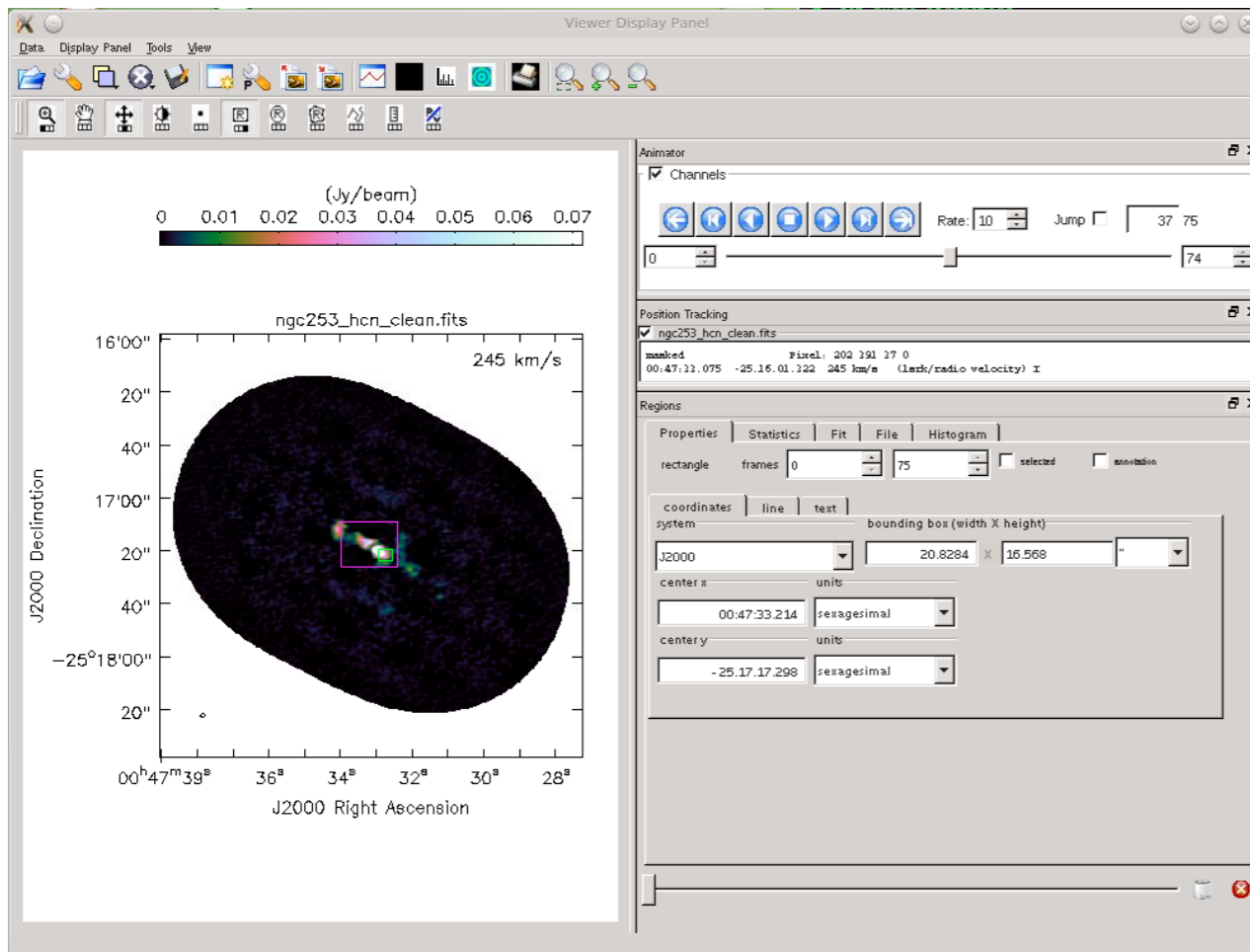
Overall Goals

- Provide a replacement for the current CASA Viewer
- Maintain functionality and meet challenges
- Plan for long-term sustainability

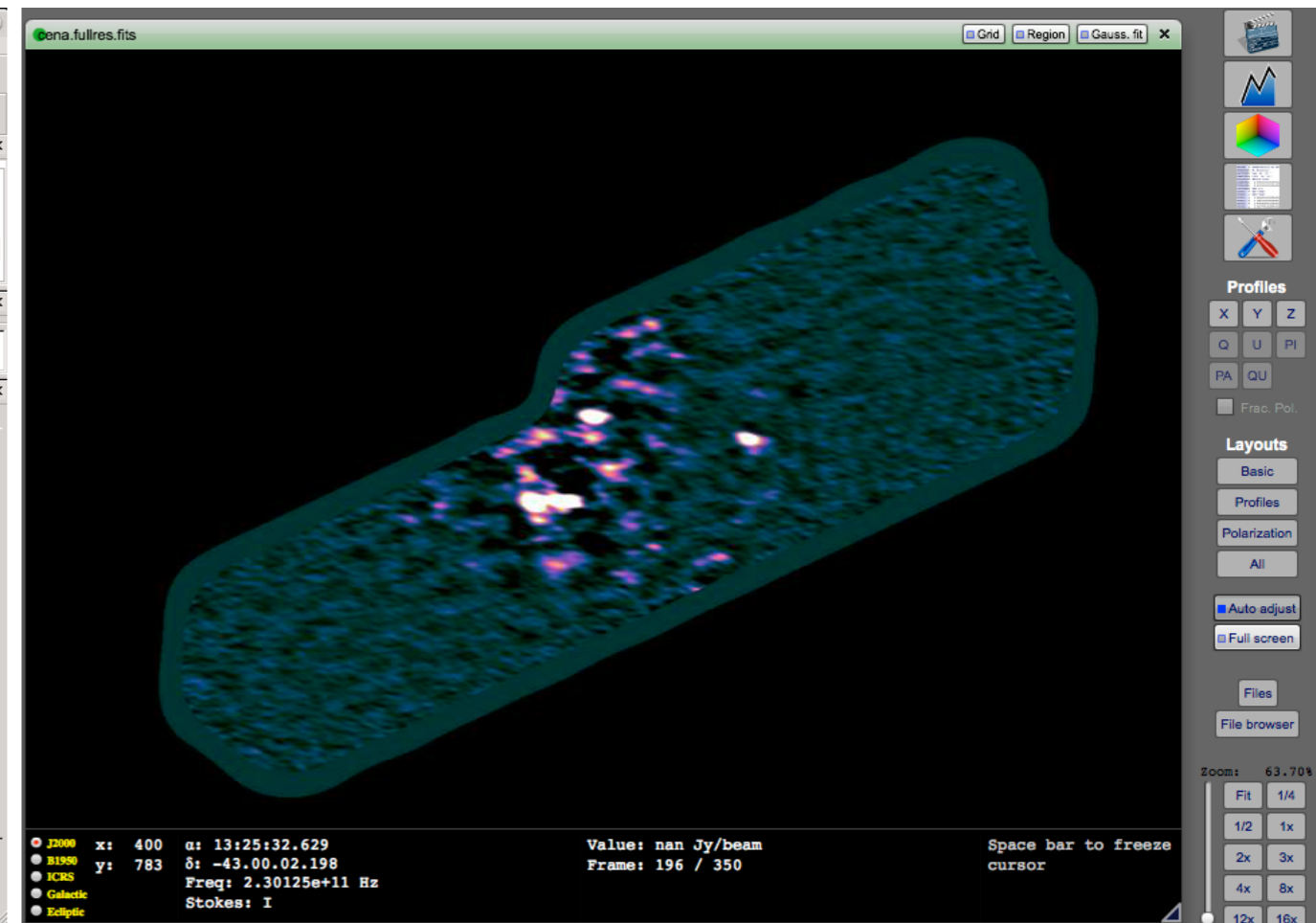
Visualization Challenges

- Big Data (50 GB to 1 TB image cubes)
 - Interactive visualization
 - Transport from archive
- Extensibility and maintenance
- Enabling community development
- Connection to HPC

Fusing Two Approaches



CASA Viewer



CyberSKA Viewer

Two Worlds

CASA Viewer

- Fully-featured
- Meets ALMA use cases
- Well-developed analytics
- Expert user-base

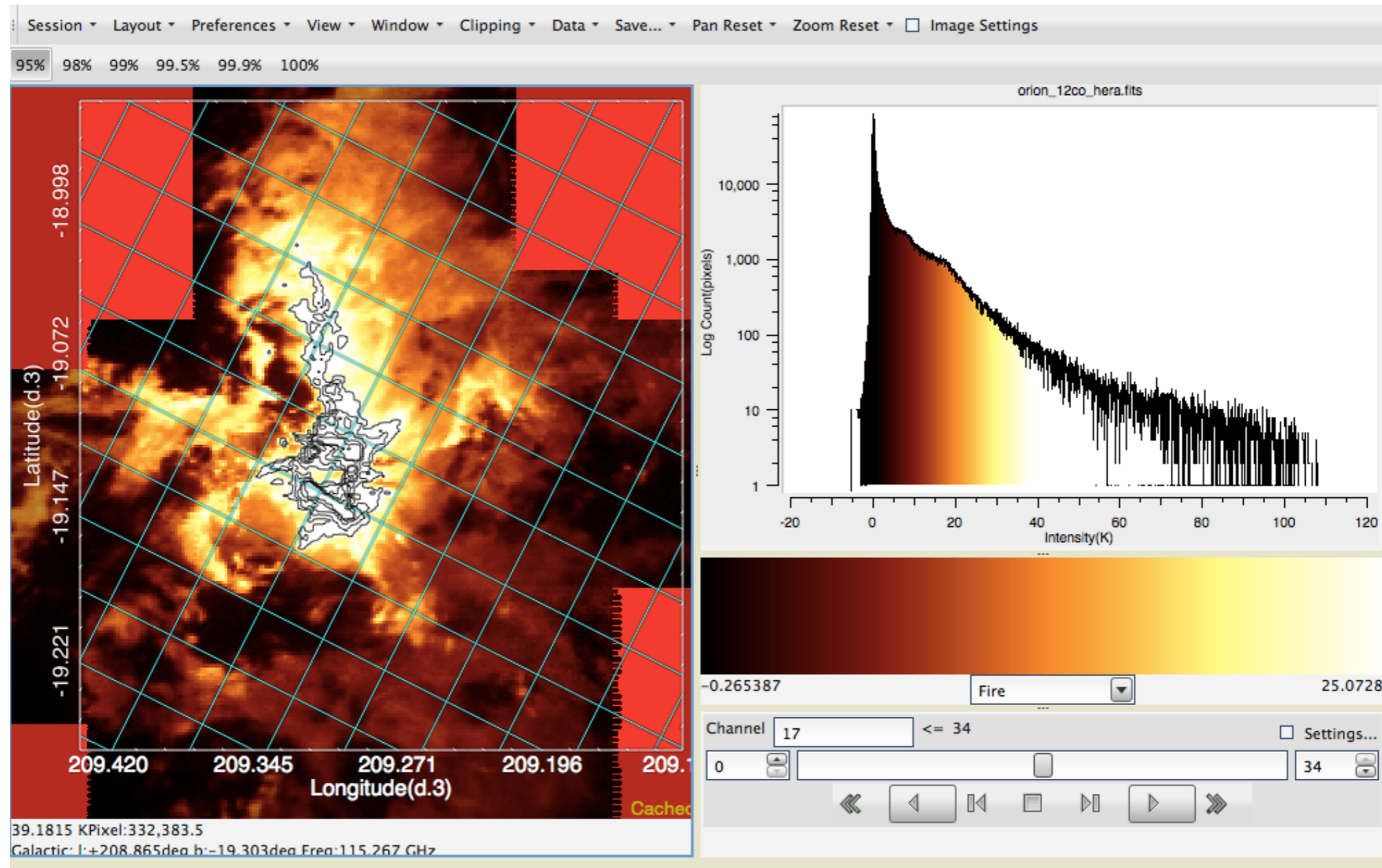
CyberSKA Viewer

- Handles Big Data
- Web-enabled
- Good user experience

None of the Above

- Easy maintenance
- Extensibility
- Fostering community contributions
- Leverage HPC

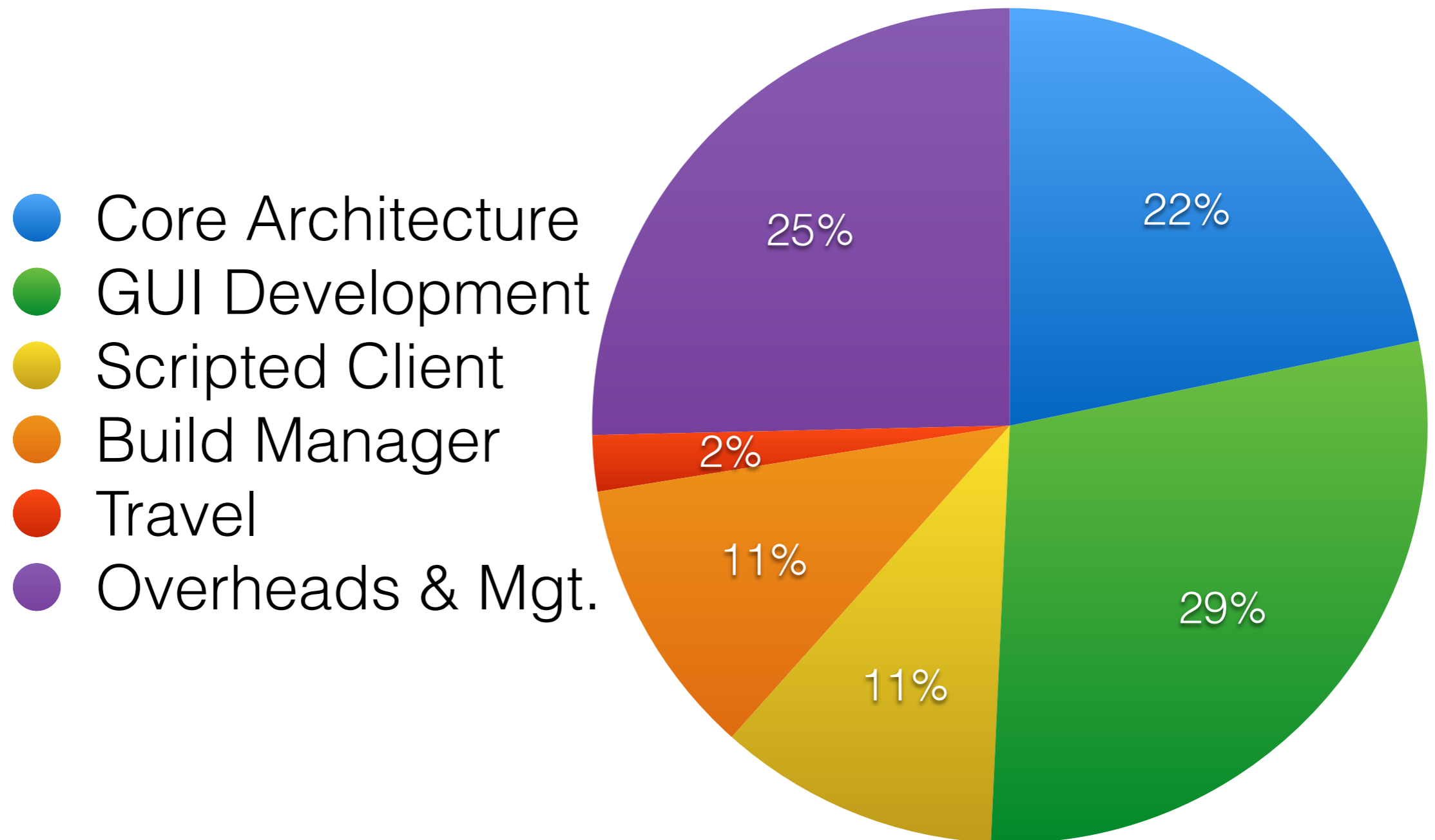
v0.6 Beta Release



Server: cartaserver.ddns.net

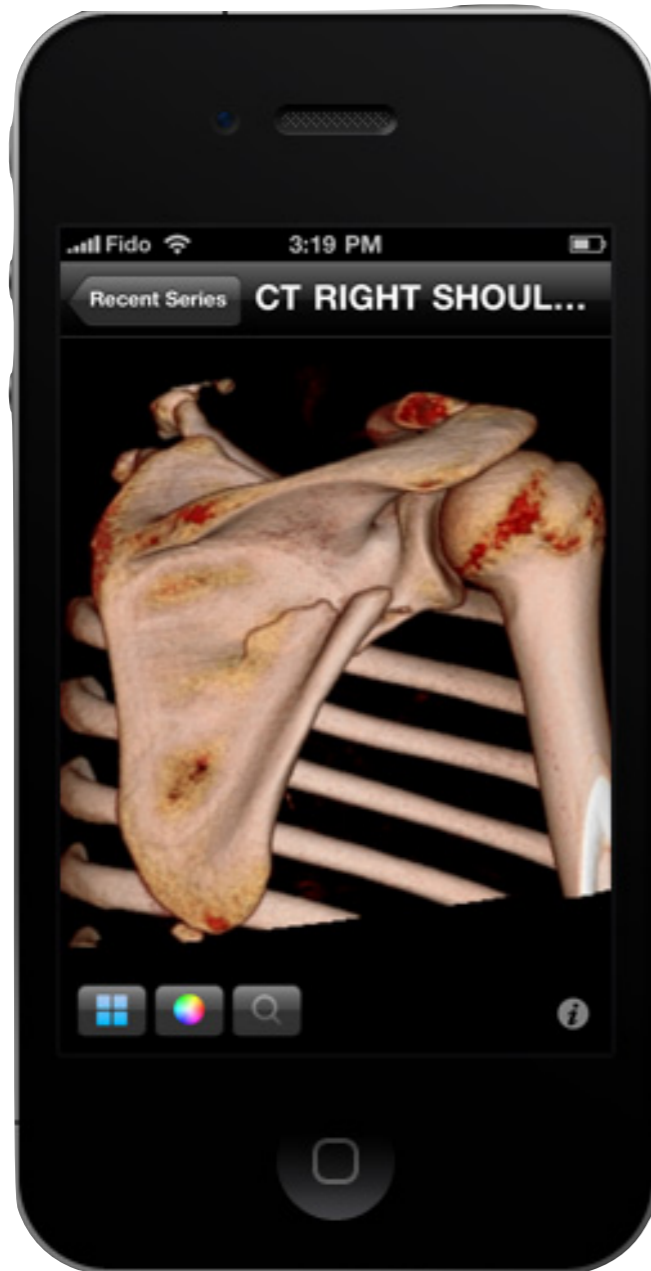
Application: cartavis.github.io

Total Project Costs: \$887,000

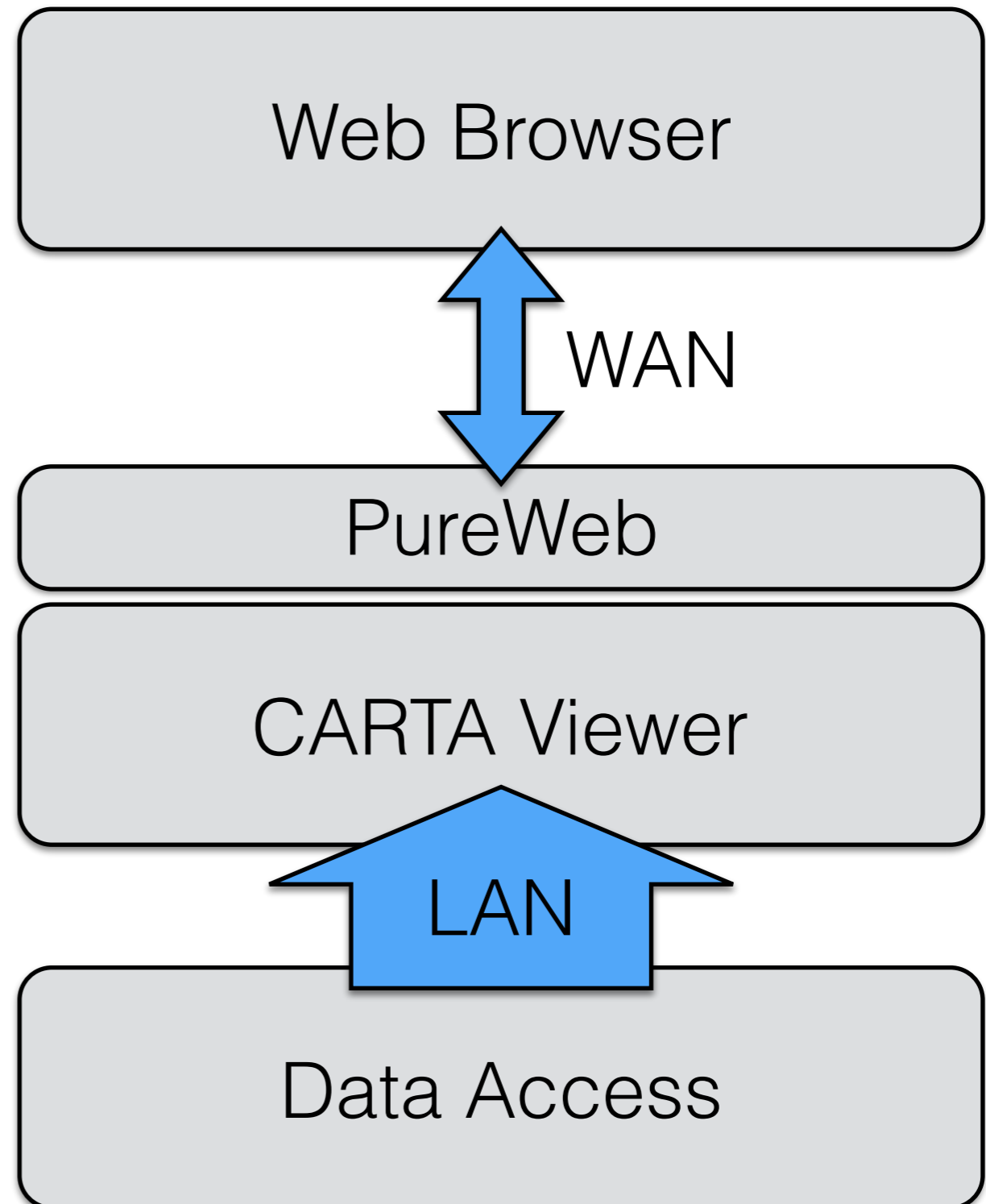


Browser Client	Integrates into the ALMA Regional Centres and provides access to the archive through the browser.
Application Client	Stand-alone application on user's computer for interactive visualization.
Scripted Client	Drives image file creation through python scripts (pipeline use case).

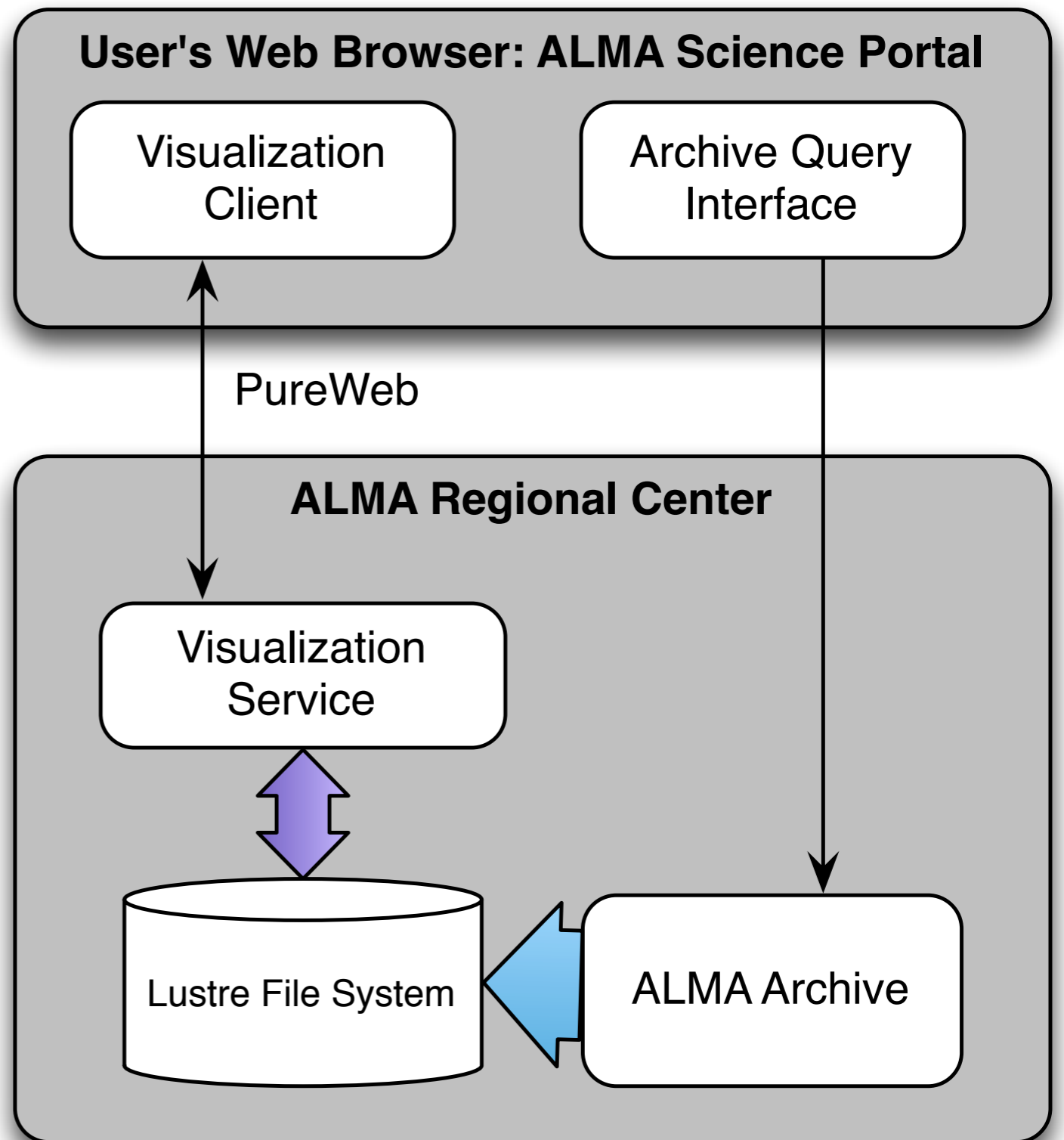
PureWeb Middleware



calgary  SCIENTIFIC
No-cost licensing for
astronomy



Archive Integration



ALMA Science Archive Query

New Button

[Query Form](#) [Result Table](#)

[Download data](#) [Visualize Data](#)

Results 1-10 of 38 (38 before filtering) sorted by RELEASE_DATE

Show 10 results per page

◀ Previous 1 2 3 4 Next ▶

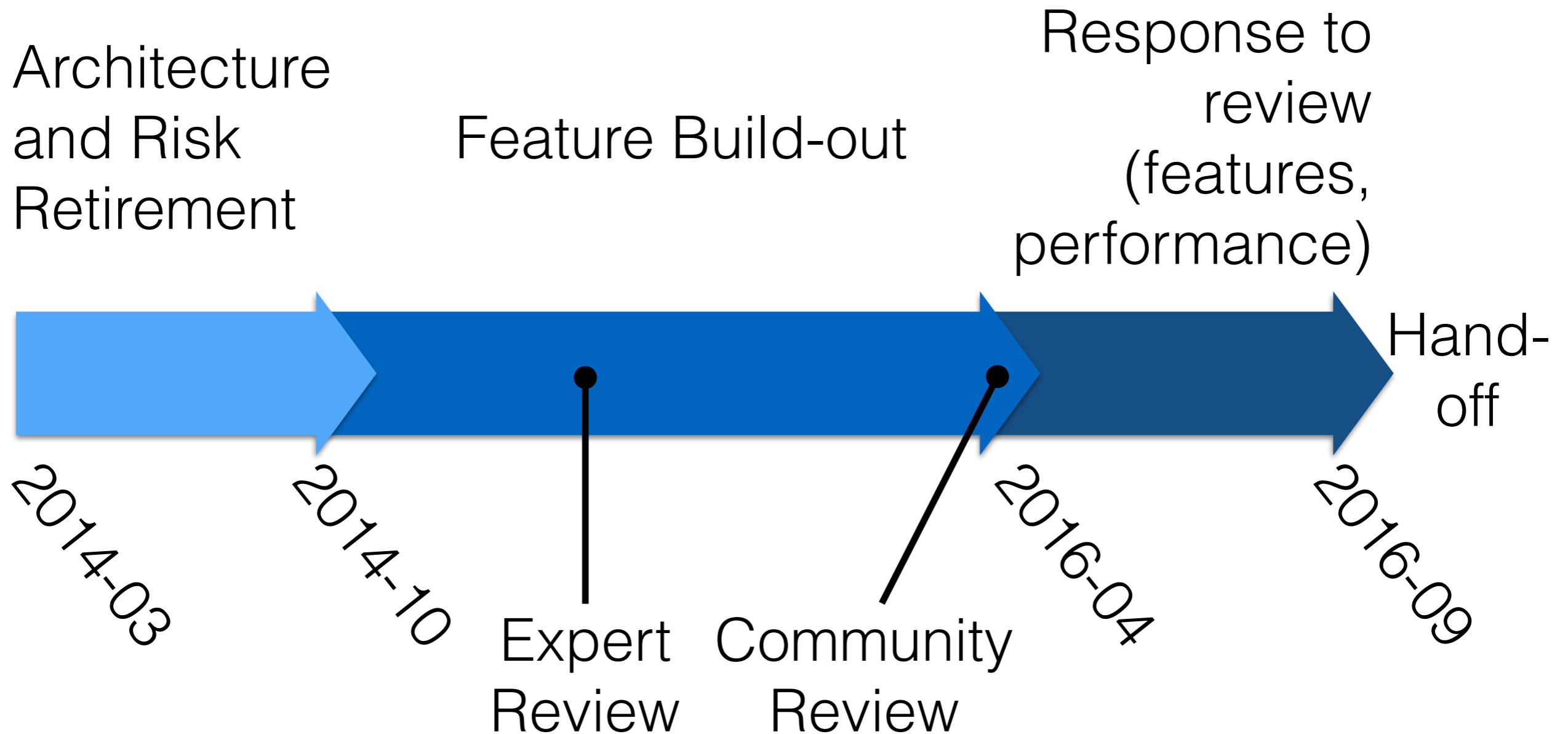
<input type="checkbox"/>	project_code	SOURCE_NAME	RA	DEC	BAND	integration	RELEASE_DATE ▲	vel_resolution	◀	▶
	String	String	Number	Number	Number	Number	String	Number		
<input checked="" type="checkbox"/>	2011.0.00061.S	NGC 253	00:47:33.31	-25:17:23.1	7	2199.442	2013-05-10 04:17:00.0	441.7036551088759		
<input type="checkbox"/>	2011.0.00061.S	NGC 253	00:47:33.31	-25:17:23.1	7	2254.581	2013-05-10 04:17:00.0	441.7036551088759		
<input type="checkbox"/>	2011.0.00172.S	NGC253	00:47:31.5	-25:17:17.5	3	2127.893	2013-06-19 19:41:00.0	1358.2490765189914		
<input type="checkbox"/>	2011.0.00172.S	NGC253	00:47:31.5	-25:17:17.5	3	2128.545	2013-06-19 19:41:00.0	1358.2490765189914		
<input type="checkbox"/>	2011.0.00172.S	NGC253	00:47:31.5	-25:17:17.5	3	2128.828	2013-06-19 19:41:00.0	1358.2490765189914		
<input type="checkbox"/>	2011.0.00172.S	NGC253	00:47:31.5	-25:17:17.5	3	2244.076	2013-06-19 19:41:00.0	1358.2490765189914		
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<input type="checkbox"/>	2011.0.00172.S	NGC253	00:47:32.33	-25:17:36.9	3	2128.545	2013-06-19 19:41:00.0	1358.2490765189914		
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Timeline



Public Release Available with Development Guides

The screenshot shows the GitHub repository page for Astroua / CARTAvis. At the top, there is a search bar for 'This repository' and navigation links for 'Pull requests', 'Issues', and 'Gist'. The repository name 'Astroua / CARTAvis' is displayed, along with 'Unwatch' (12), 'Star' (0), and 'Fork' (3) buttons. Below this, there is a section for 'Visualization Code for ALMA — Edit' with statistics: 768 commits, 11 branches, 4 releases, and 6 contributors. A branch selector shows 'Branch: master' and the repository name 'CARTAvis / +'. The main content area shows a commit by 'astrilet' titled 'Merge pull request #89 from Astroua/develop' with the latest commit hash '682337' and a timestamp of '21 hours ago'. Below the commit message, there is a list of files and their changes:

File	Change	Time
carta	Contour min/spacing interval problem.	12 days ago
.gitignore	Merged in grid code & vector graphics	4 months ago
Dockerfile	Modified Dockerfile and circle.yml	20 days ago
Externals	merge complete	8 months ago
Externals.readme	moved intellij and qtcreator files to external directory	8 months ago

On the right side, there is a sidebar with navigation links: 'Code', 'Issues' (20), 'Pull requests' (2), 'Wiki', 'Pulse', 'Graphs', and 'Settings'.

<https://github.com/Astroua/CARTAvis>

Application Priorities

- Performance and Cleanup
- Plone Documentation
- Image export
 - WYSIWYG (90%)
 - Journal quality (export to file bundle and python script)
- Interactive cleaning functionality

Sunsetting

Project development will handoff (next week!) to:

- CASA group for ongoing development. ALMA CASA Development Center in Taiwan. EWR to remain on as Project Scientist.
- NRAO Archive group for ongoing integration
- ALMA Archive group once NRAO work is done

Lessons Learned

- Software project management is hard and time estimates were optimistic (esp., architecture)
- Integration was effective through partnership with NRAO and the CASA software group
- User testing essential but happened too late
- Currency fluctuations became a major risk

Questions?

Server: cartaserver.ddns.net

Application: cartavis.github.io

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