



A Short Introduction to Galaxy

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- What is Galaxy?
- Why should I use Galaxy?
- How do I use Galaxy?
- How can I connect with the Galaxy Community?

Tip: press P to view the presenter notes

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Data Intensive *analysis* for everyone

What is Galaxy?

- Data Analysis platform
- Web-based
- Easy to use
- Free and Open Source
- Many tools (~8000)
- Popular (>10.000 publications)
- Extensive tutorials available



Why use Galaxy?

- It is **easy!**
 - No installation, all you need is a browser.
 - No complex commands, just point and click!
- It is **reproducible**
 - Galaxy keeps track of all analysis details
- **Cross-domain:** bioinformatics, chemistry, ecology, climate science, ..



How do I use Galaxy?

Find a Galaxy server

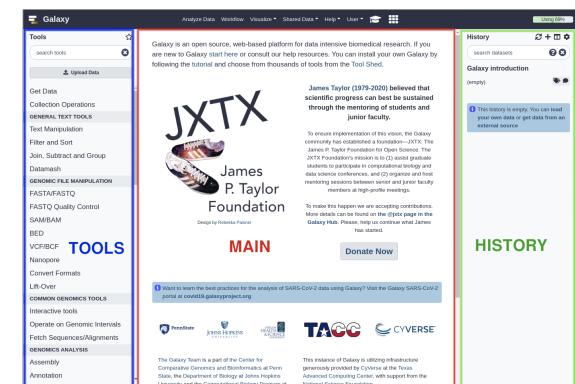
- **The Big Three:** Galaxy Main (usegalaxy.org), Galaxy Europe (usegalaxy.eu), Galaxy Australia (usegalaxy.org.au)



- Many other smaller, often domain-specific Galaxies available (125+)
 - List of all Galaxies: galaxyproject.org/use

The Galaxy Interface

- Three main panels
 - **Left:** Available Tools
 - **Middle:** View your data and run tools
 - **Right:** Full record of your analysis history

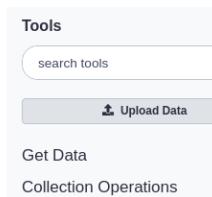


The screenshot shows the Galaxy web interface with three main panels. The left panel, titled 'TOOLS', lists various bioinformatics tools such as FASTA/RASTQ, FASTQ Quality Control, SAM/BAM, BED, VCF/BCF, Nanopore, and various file formats. The middle panel, titled 'MAIN', features a banner for the James P. Taylor Foundation and a 'Donate Now' button. The right panel, titled 'HISTORY', shows a blank history log with a note about using external data.

History

Uploading data

- Upload from **your computer**
- Import files **from URL**
- Import from **public data stores**
 - UCSC, NCBI, ENA, many more..



- Files appear in your **history**

- Three buttons
 - **View the file**
 - **Edit attributes**
 - e.g. change name
 - **Delete file**

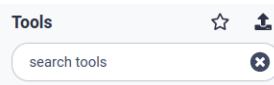
- Click to **expand**
 - file information
 - format, size, ..
 - file preview
 - file options
 - download, visualize, ..

A screenshot of the Galaxy History panel. It has a header 'My First History' with '1 shown' and '49.63 MB'. Below is a table with one row:| 1: RB01.fasta | | | |

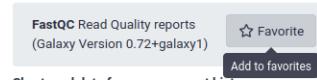
Running a tool

Finding a tool

- Explore tool panel sections
- Enter name in **Tool search** box



- **Star** your favorite tools to make them easier to find



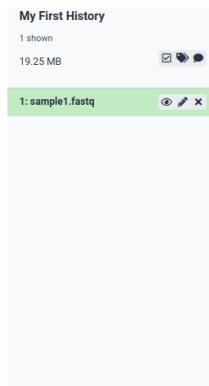
- Choose **input files**
- Set tool **parameters**
- **Execute**

- Below tool form:
 - Help information
 - Tool citation

A screenshot of the Galaxy tool configuration form for 'FastQC Read Quality reports'. The form includes fields for 'Sort Dataset' (with options for ascending or descending order, and a dropdown for dataset selection), 'with flavor' (Numerical sort), 'everything in' (Descending order), 'Column selection' (with an 'Insert Column selection' button), 'Number of header lines to skip' (0), 'Email notification' (checkboxes for 'Yes' and 'No'), and a 'Send an email notification when the job completes' checkbox. At the bottom is a large 'Execute' button.

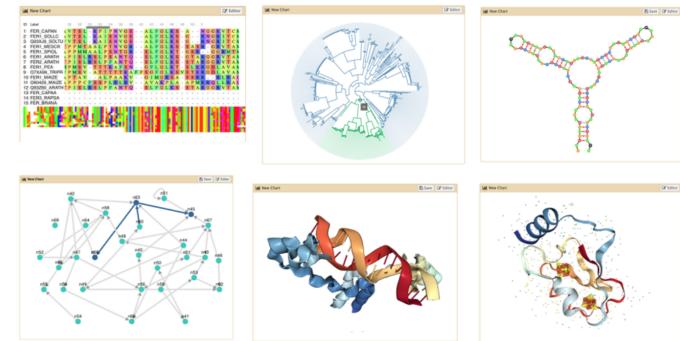
Analysis Results

- Tool outputs are added to history
- Different dataset states
 - waiting , running , success, failed
- Expand for more options
 - Download dataset
 - Information about tool run
 - Reload tool with the same parameters
 - Visualize dataset
- Red dataset?
 - Click Bug icon
 - view error message
 - submit error report



Visualisations

- Galaxy has many options to visualize data

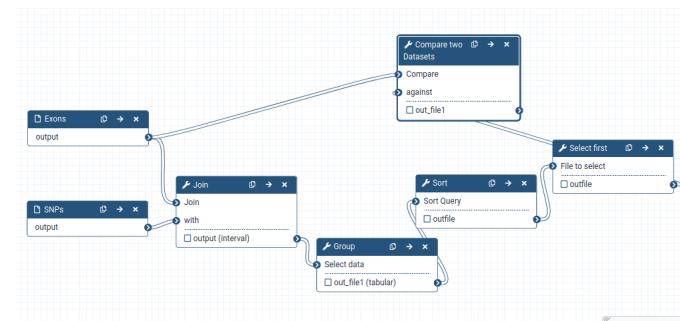


Multiple Analyses

- Starting a new analysis? Create a new history
- You can have as many histories as you want
- You can switch back and forth between histories
- Giving your histories good names will help to keep track of your analyses

Workflows

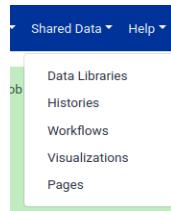
- Run end-to-end analyses with one click



- Extract from a history
- Build manually with workflow editor
- Import a shared workflow

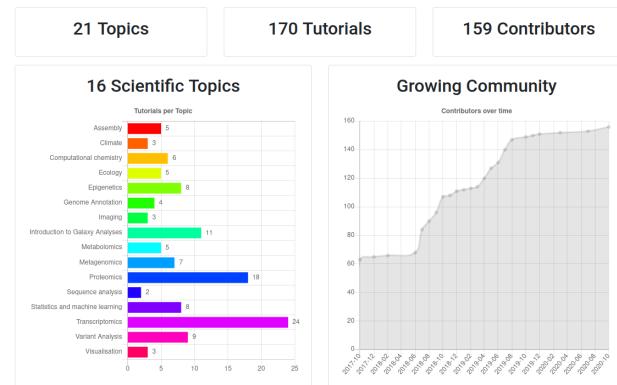
Sharing

- You can share everything you do in Galaxy
 - Histories, Workflows, Visualizations
- Sharing options
 - Share with specific users
 - Share via link
 - *Publish* to make it visible to everybody



Learning Galaxy

- Galaxy Training Materials (training.galaxyproject.org)



Getting Help

- Help Forum (help.galaxyproject.org)

A screenshot of the Galaxy Help forum website. At the top, there's a header with 'Galaxy Help', a search bar, and 'Sign Up / Log In' buttons. Below the header is a navigation bar with 'Latest', 'Top', and 'Categories' tabs. The main content area shows a list of posts. The first post is titled 'Troubleshooting resources for errors or unexpected results' and has 85 views and 7d activity. The second post is titled 'Welcome to Galaxy Community Help' and has 75 views and 15d activity.

- Gitter Chat
 - [Main Chat](#)
 - [Galaxy Training Chat](#)
 - Many more channels (scientific domains, developers, admins)

Join an event

- Many Galaxy events across the globe
- Event Horizon: galaxyproject.org/events

Date	Topic/Event	Venue/Location	Contact
October 29th 2020	Galaxy Developer Roundtable	Online	Dannon Baker, John Chilton, Marius van den Beek
October 29th 2020	Next Generation Sequencing (NGS) Introduction	Germantown, Maryland, United States	Sijung Yun
October 28th 2020	مقدمه ای در تجزیه و تحلیل نوآور ایران - آن-گلکسی اسناد و موسس با استفاده از نرم افزار گالکسی	University of Isfahan, Isfahan, Iran	Maryam Kay, Fariba Dehghanian, Alireza Khantemoori
October 27th 2020	GWAS Analysis with Galaxy on the Analysis Visualization Integrated Lab-space (AnViL)	ASHG 2020, Online	Dave Clements, Alex Ostrovsky
October 26th 2020	Functionally Assembled Terrestrial Ecosystem Simulator (FATES)	Norway, Online	Anne Fouilloux
October 26th 2020	Machine Learning in Bioinformatics using Galaxy	ISCB-LA SoiBio BioNetMX 2020, Mexico, Online	Alireza Khantemoori, Björn Grüning, Anup Kumar
October 21st 2020	Galaxy Paper Cuts Day	Global, online	Community

Thank you!

- Galaxy lets you perform complex data analysis right from your browser
- These analyses are *reproducible*; Galaxy keeps track of all the details of your analysis
- Galaxy has a very large and active user community
- There are many training materials available to learn Galaxy

This material is the result of a collaborative work. Thanks to the [Galaxy Training Network](#) and all the contributors!

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