

Development FAIR image analysis workflows and RDM pipelines in Galaxy

Riccardo Massei¹, Beatriz Serrano-Solano², Anne Fouilloux³, Björn Grüning⁶, Jan Bumberger¹, Matthias Bernt¹,
Diana Chiang⁶, Yi Sun⁴, Leonid Kostykin⁵



¹ Helmholtz Center for Environmental Research – UFZ, Leipzig, Germany ² Euro-Biolmaging ERIC Bio-Hub, EMBL Heidelberg, Germany,
³ Simula Research Laboratory, Oslo, Germany, ⁴ Data Science Centre, EMBL Heidelberg, Germany, ⁵ Biomedical Computer Vision Group, Heidelberg
University, BioQuant, IPMB, Heidelberg, Germany, ⁶ Department of Computer Science, University of Freiburg, Freiburg, Germany



Galaxy (<https://galaxyproject.org>) is an online computational platform used by a global community of thousands of scientists for processing of large-scale data. This collective effort includes the development of the Galaxy software framework, the integration of analysis tools and visualizations, and the operation of public servers that provide access to Galaxy through web browsers (usegalaxy.eu)

(source: <https://doi.org/10.1093/nar/gkaa554>)

Threshold image with scikit-image (Galaxy Version 0.18.1+galaxy3)

Galaxy increases the FAIRness of data analysis pipelines by providing versioned tools and workflows that can be annotated, shared and published.

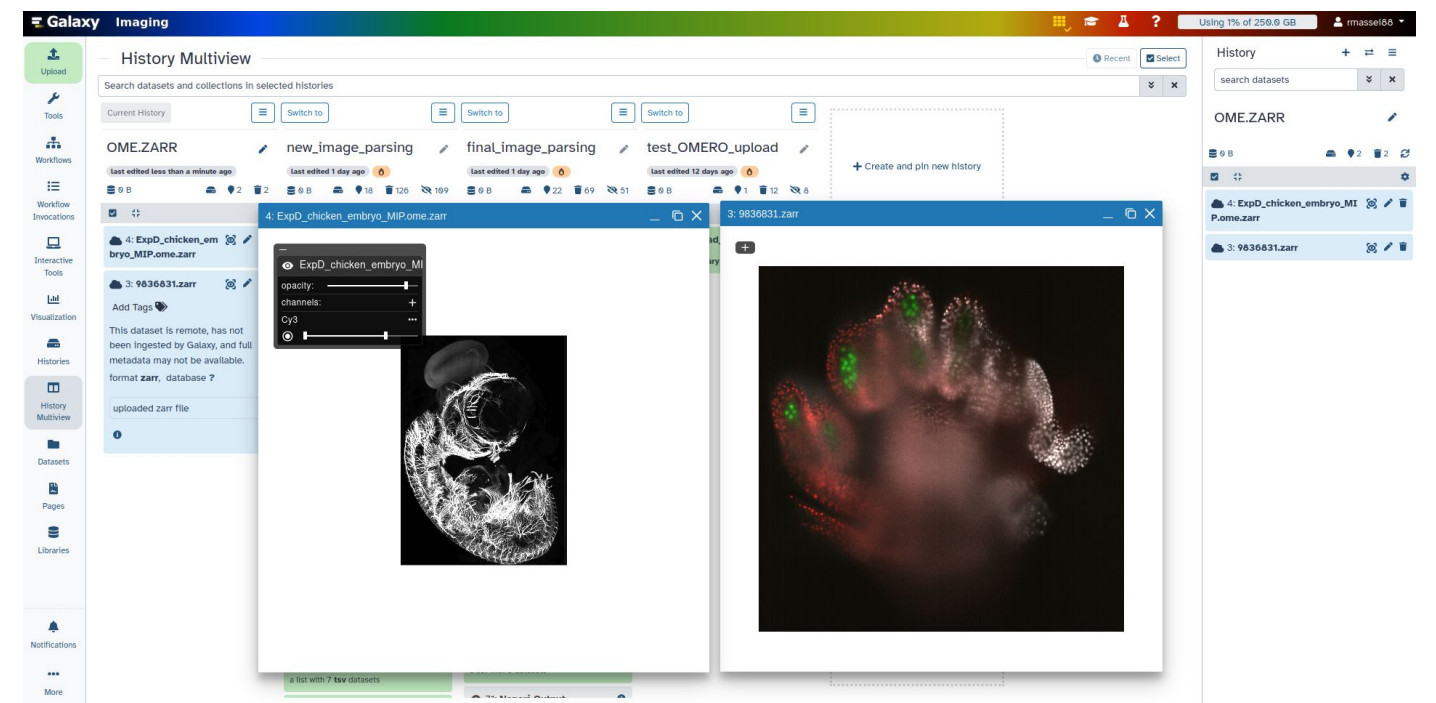


Upload images and metadata in OMERO using Galaxy

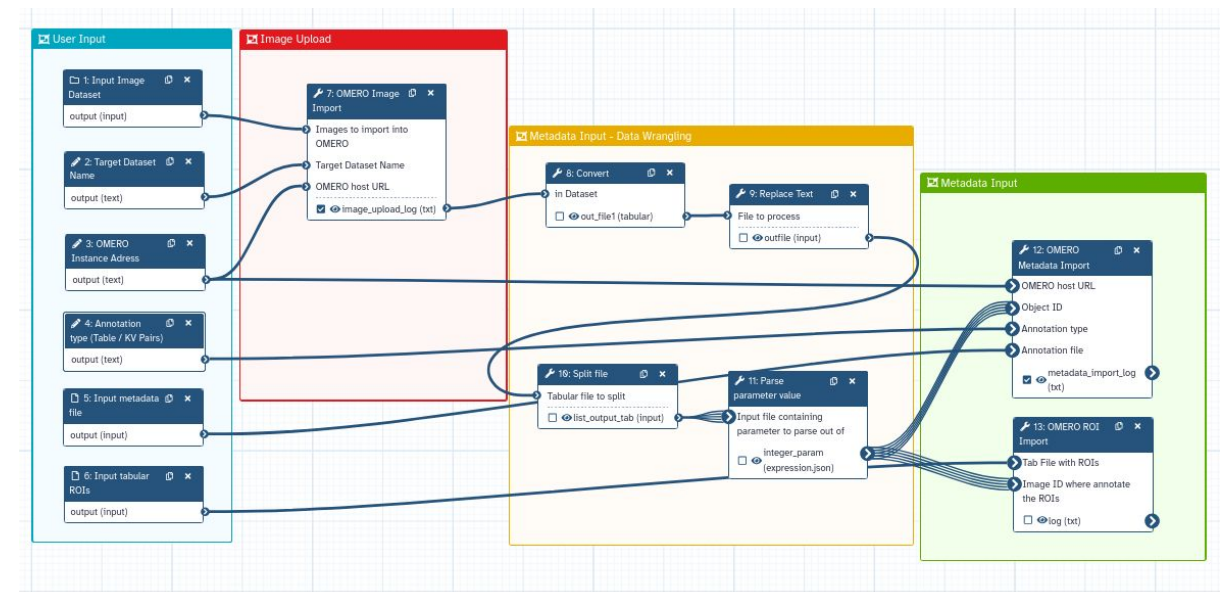
The Galaxy OMERO-suite is based on the Python packages omero-py and ezomero. It allows to build pipelines for uploading/fetching image data in an arbitrary OMERO server using a Galaxy workflow.

Images can automatically be enriched with metadata (i.e. key-value pairs, tags, raw data, regions of interest) and uploaded to an OMERO server. The tools give the possibility to the user to intuitively fetch images from the local server and perform image analysis.

Galaxy Imaging Flavor A dedicated Galaxy interface for image data analysis



Galaxy has a dedicated interface for image data analysis—imaging.usegalaxy.eu—providing a comprehensive suite of tools and workflows tailored specifically for imaging scientists. (ome-zarr stored in IDR and visualized using the interactive tool Vizarr)



A Galaxy pipeline to upload images and metadata into OMERO
Training: <https://training.galaxyproject.org/training-material/topics/imaging/tutorials/omero-suite/tutorial.html>

Integration with Research Data Management Tools, Jupyter Notebooks and Cloud Object Storage

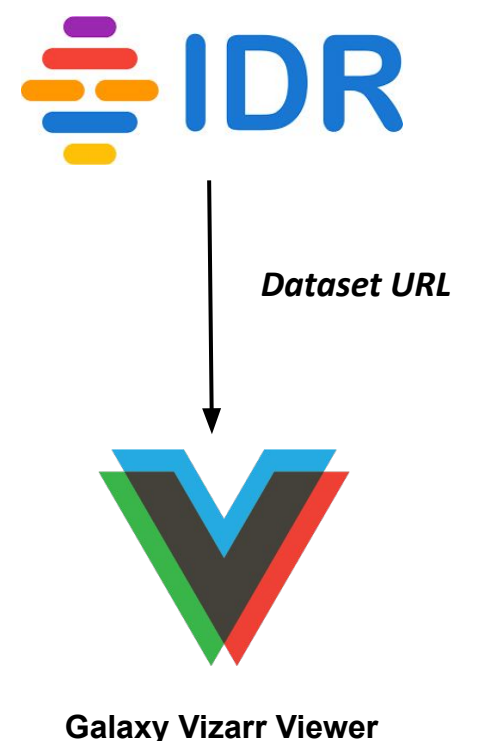
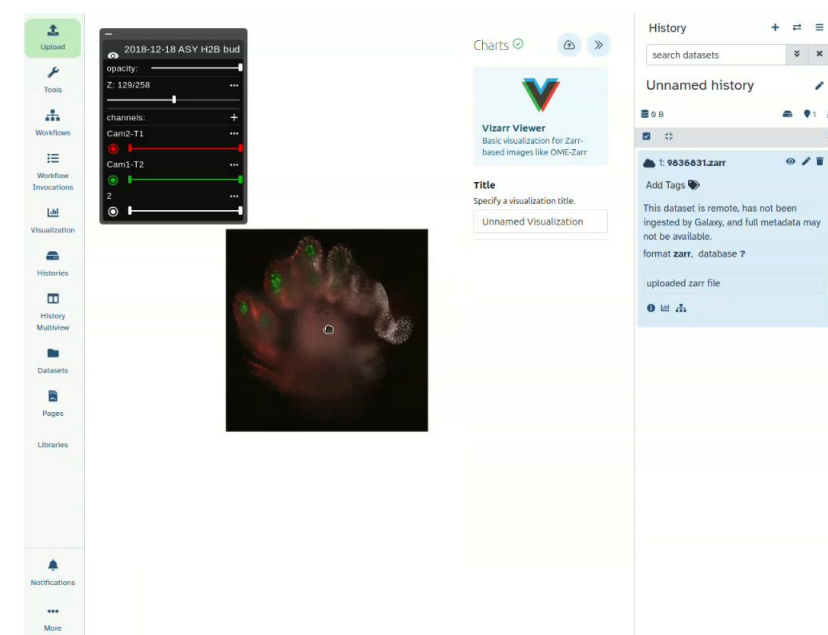


Workflow RSpace:Galaxy
Galaxy for image analysis



Vizarr Viewer - OME-Zarr Interactive Visualization

Galaxy infrastructure works to support Zarr! The Image Analysis Community in Galaxy supports zarr-based visualization through tools like vizarr, helping bring this dream of cross-discipline interoperability to life.



Do you want to know more about Image Analysis Community in Galaxy? Scan the QR Code!



Check out Training and Tutorials on image analysis tools!



<https://training.galaxyproject.org/training-material/topics/imaging/>