

# de.NBI-epi RNA Bioinformatics Center

## University of Freiburg

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## Description of de.NBI-epi

The de.NBI-epi project in Freiburg offers:

Visualization, normalization and quality assessment:

- Hi-C data analysis
- MethylC-Seq data analysis
- ChIP-Seq
- Bisulfite sequencing analysis pipelines

Training and user support:

- Galaxy HTS data analysis workshops
- Self learning material on [training.galaxyproject.org](https://training.galaxyproject.org)
- Direct user support via gitter, GitHub or guest researcher

Available on:

- All in one Gateway: <https://galaxy.uni-freiburg.de>
- Your computer with virtualized and personalized instances

## General information on the project

As part of the de.NBI-epi project in Freiburg, Joachim Wolff and Björn Grüning, are working closely with the RBC, de.NBI and ELIXIR to deliver high-class services for epigenetic research.

## de.NBI services

### Community based infrastructure

#### BIOCONDA

Bioconda is a conda channel which provides software for biomedical research.

- 14,475 commits on GitHub
- 287 contributors
- > 2,700 packages

#### Biocontainers

BioContainers provides system-agnostic executable environments for bioinformatics software.

- Based on Docker & rkt
- > 2,900 Images
- Automatic builds from Bioconda

#### Galaxy

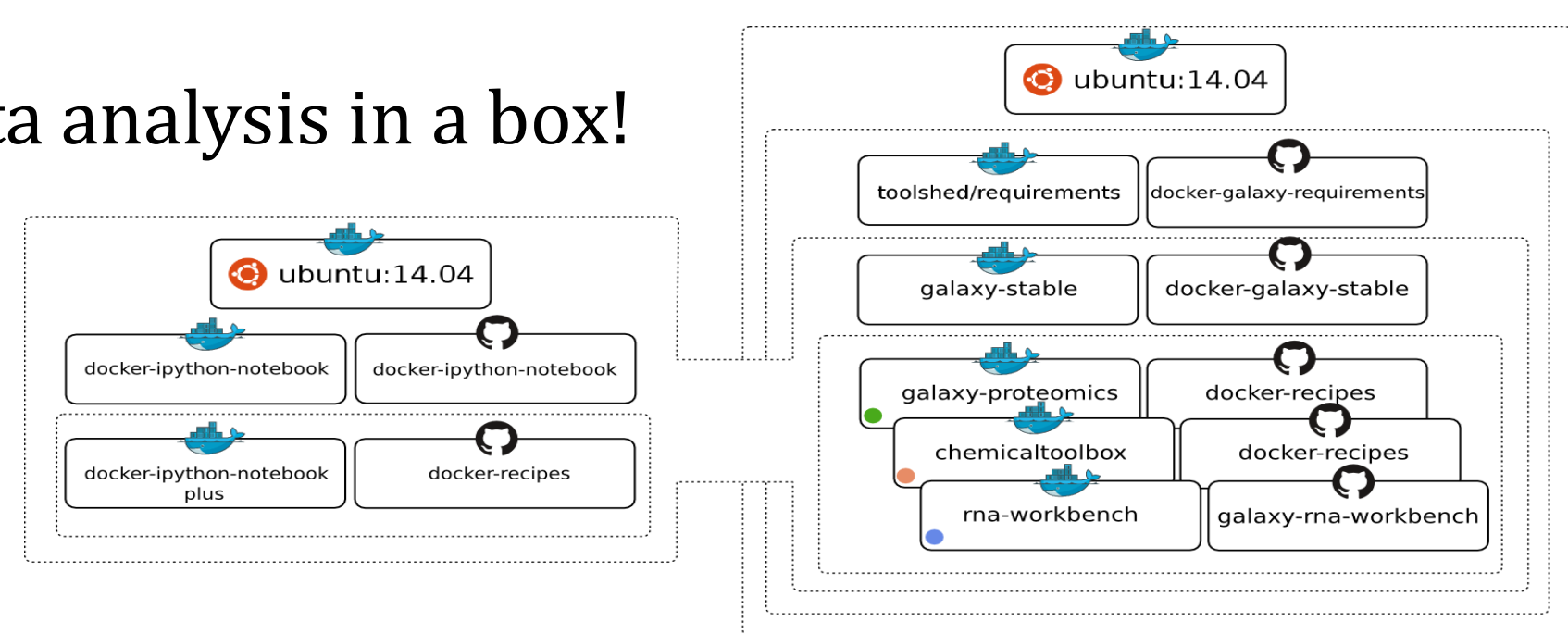
Galaxy is an open, web-based platform for data intensive research.

- 29,588 commits
- 163 contributors
- One of the biggest Galaxy instances available for de.NBI in Freiburg

### The Galaxy Docker Project

The Galaxy Docker Image is an easy distributable full-fledged Galaxy installation, that can be used for testing, teaching and presenting new tools and features.

Portable data analysis in a box!



Based on the main Galaxy Docker virtualisation, a dedicated flavor for epigenetics was developed: [github.com/bgruening/docker-galaxy-epigenetic](https://github.com/bgruening/docker-galaxy-epigenetic)

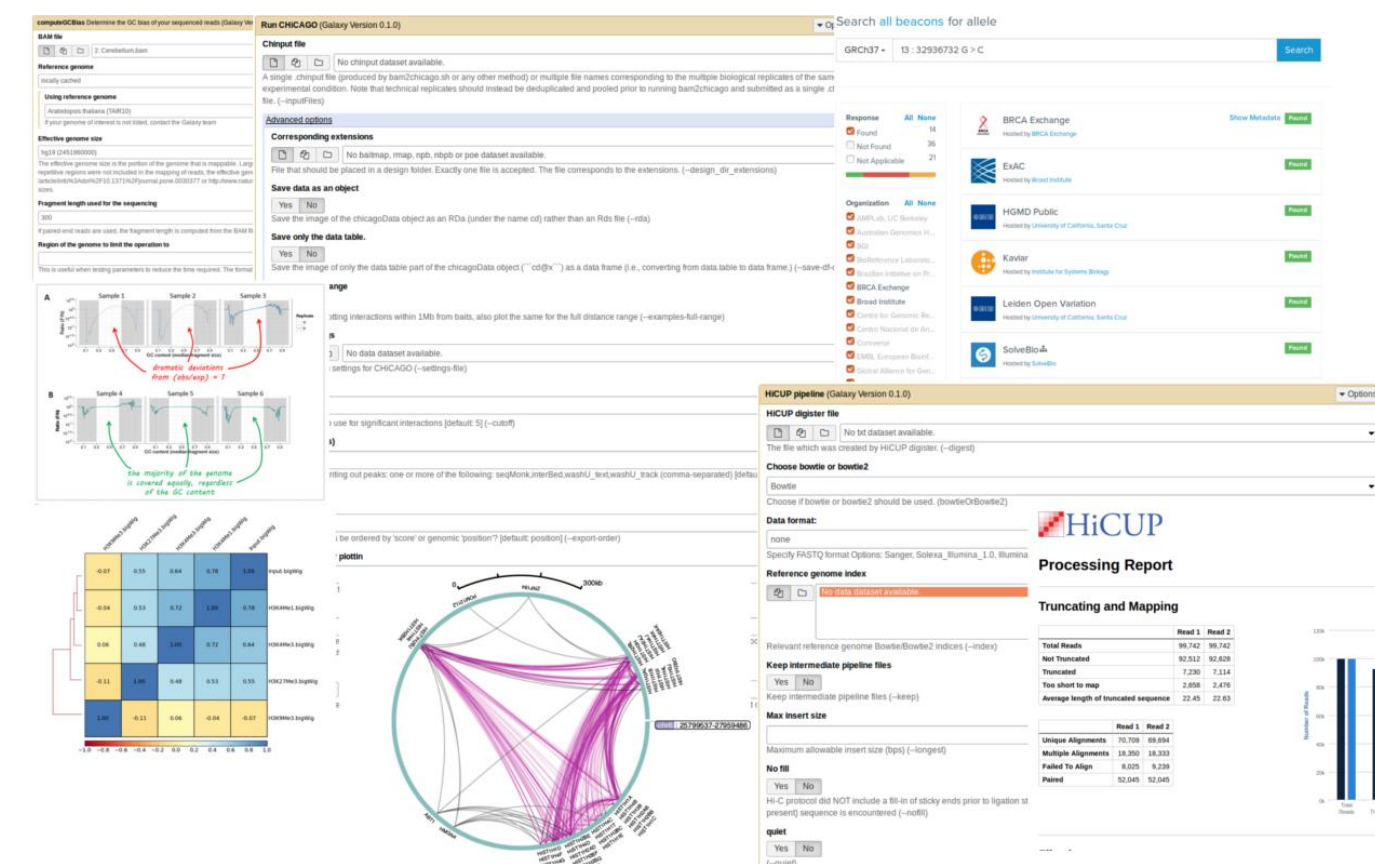
## Publications

- High-resolution TADs reveal DNA sequences underlying genome organization in flies.  
doi: 10.1101/115063
- Jupyter and Galaxy: Easing entry barriers into complex data analyses for biomedical researchers.  
doi: 10.1371/journal.pcbi.1005425
- The RNA workbench: best practices for RNA and high-throughput sequencing bioinformatics in Galaxy  
doi: 10.1093/nar/gkx409
- BioContainers: an open-source and community-driven framework for software standardization  
doi: 10.1093/bioinformatics/btx192

## de.NBI services

Maintenance, development and integration of software into Galaxy to provide easy access for epigenetic analysis software:

- deepTools
- Bismark
- HiCUP
- CHiCAGO
- Methyldackel
- Methtools
- HiCExplorer



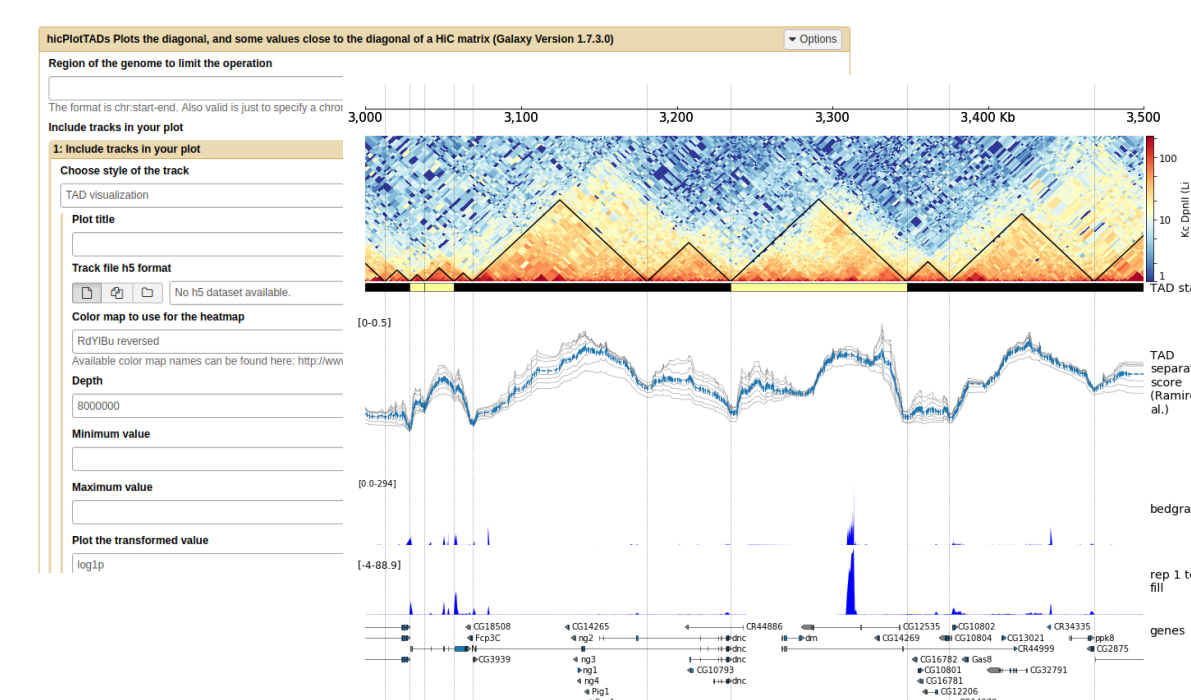
- Galaxy
- Container: Docker, rkt, Singularity

## Progress report

Development and maintenance of software for Hi-C data analysis.

### HiCExplorer:

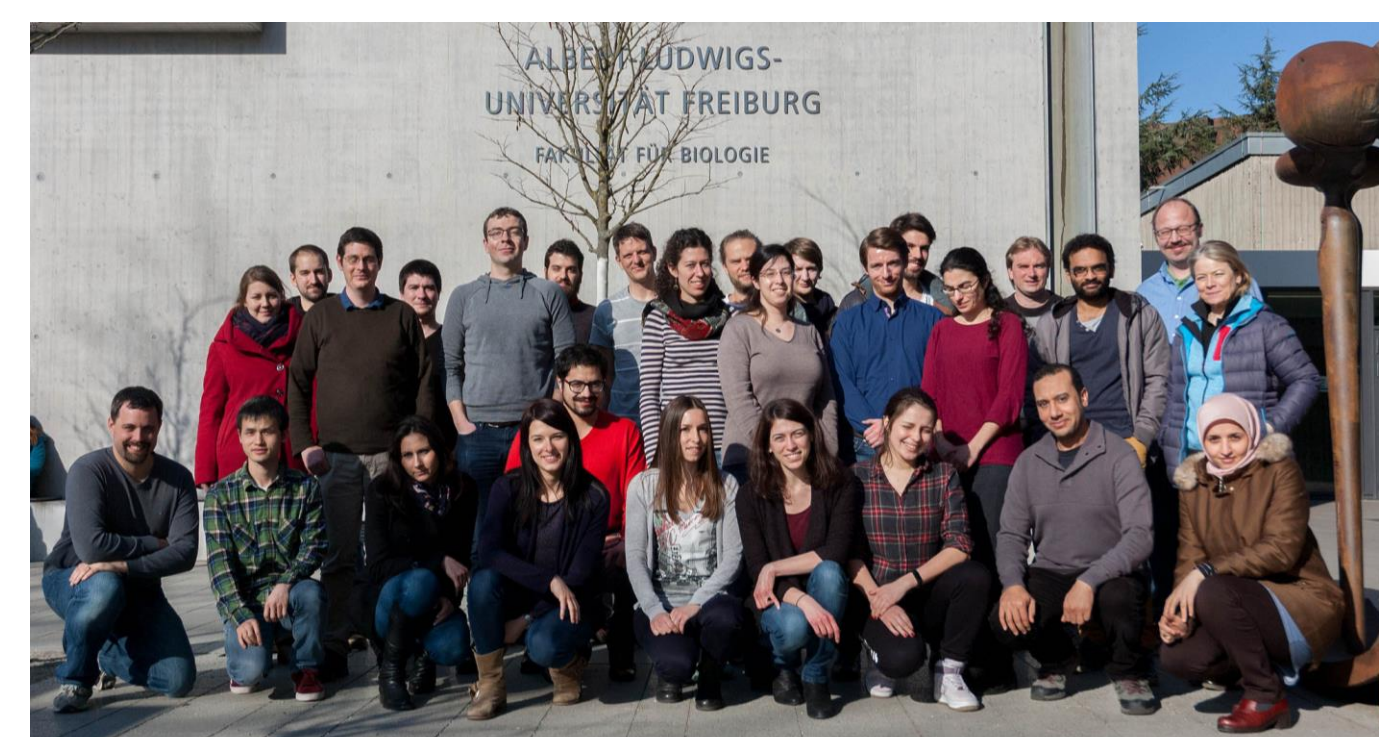
- Interaction matrix creation 3x faster
- Improved training material: [hicexplorer.readthedocs.io](https://hicexplorer.readthedocs.io)
- New Galaxy wrappers for a better user experience
- Docker integration
- Release 2.0 will have:
  - Python 3 support
  - 'Cool' format support
  - A/B compartments
  - Improved visualization



## de.NBI training and education

Hands-on training material for self-study available on [training.galaxyproject.org](https://training.galaxyproject.org)

- Introduction to HTS
- RNA-Seq
- ChIP-Seq
- Proteomics
- MethylC-Seq
- ...and many more!



### 2016 / 2017 past events

15 <sup>th</sup> – 16 <sup>th</sup> Dec 2016	Galaxy RNA-Seq analysis workshop	Freiburg
09 <sup>th</sup> – 10 <sup>th</sup> Jan 2017	Online contribution fest QIIME	
16 <sup>th</sup> – 19 <sup>th</sup> Jan 2017	European Galaxy Developer workshop	Strasbourg
06 <sup>th</sup> – 09 <sup>th</sup> Feb 2017	Galaxy Admin workshop	Melbourne
13 <sup>th</sup> – 17 <sup>th</sup> Feb 2017	Galaxy HTS data analysis workshop	Freiburg
04 <sup>th</sup> – 05 <sup>th</sup> Apr 2017	ELIXIR – de.NBI AAI workshop	Freiburg
22 <sup>nd</sup> – 24 <sup>th</sup> May 2017	ELIXIR – training hackathon	Cambridge
18 <sup>th</sup> – 22 <sup>nd</sup> Sep 2017	Galaxy HTS data analysis workshop	Freiburg

### 2017 / 2018 planned events

06 <sup>th</sup> – 07 <sup>th</sup> Nov 2017	VFU based on containers	Freiburg
08 <sup>th</sup> – 12 <sup>th</sup> Jan 2018	Galaxy Admin workshop	Oslo
19 <sup>th</sup> – 23 <sup>rd</sup> Feb 2018	Galaxy HTS data analysis workshop	Freiburg
Jan 2018	Freiburg Galaxy user meeting	Freiburg
Mid 2018	Hi-C and epigenetics workshop	Freiburg