Galaxy Community Update

PAG XXV

January 18, 2017
San Diego, California, United States

Dave Clements
Johns Hopkins University
Galaxy Team / Galaxy Community

#usegalaxy @galaxyproject

GMOD

INTERNATIONAL PLANT & ANIMAL GENOME • CONFERENCE •

Galaxy PROJECT

What is Galaxy?

Keith Bradnam's definition:

"A web-based platform that provides a simplified interface to many popular bioinformormatics tools."

From

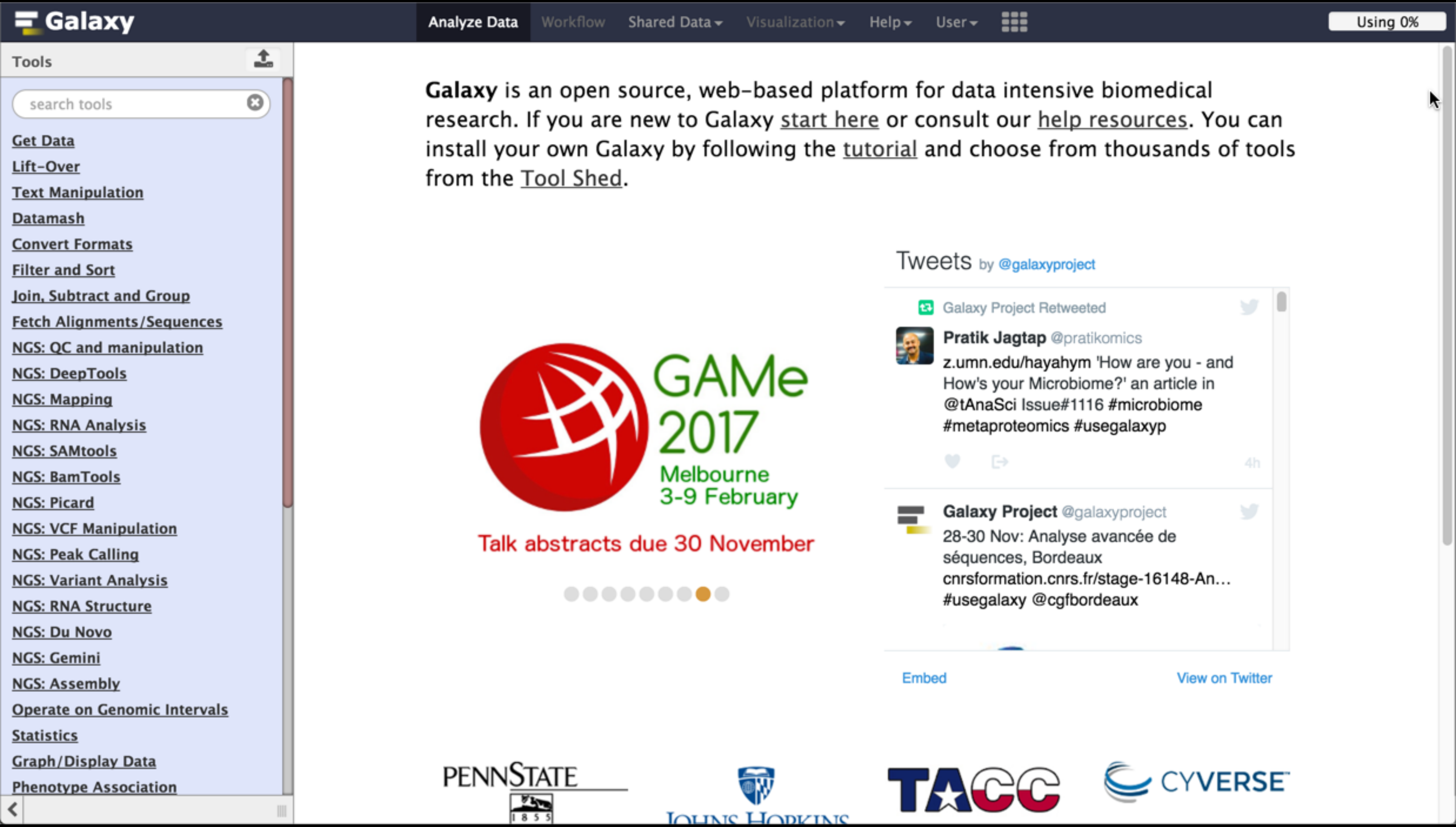
"13 Questions You May Have About Galaxy"

http://bit.ly/13questions

Galaxy is available several ways ...

http://galaxyproject.org

As a free for everyone service on the web: usegalaxy.org



Galaxy is an open source, web-based platform for data intensive biomedical research. If you are new to Galaxy start here or consult our help resources. You can install your own Galaxy by following the tutorial and choose from thousands of tools from the Tool Shed.

Galaxy Project Retweeted

Pratik Jagtap @pratikomics

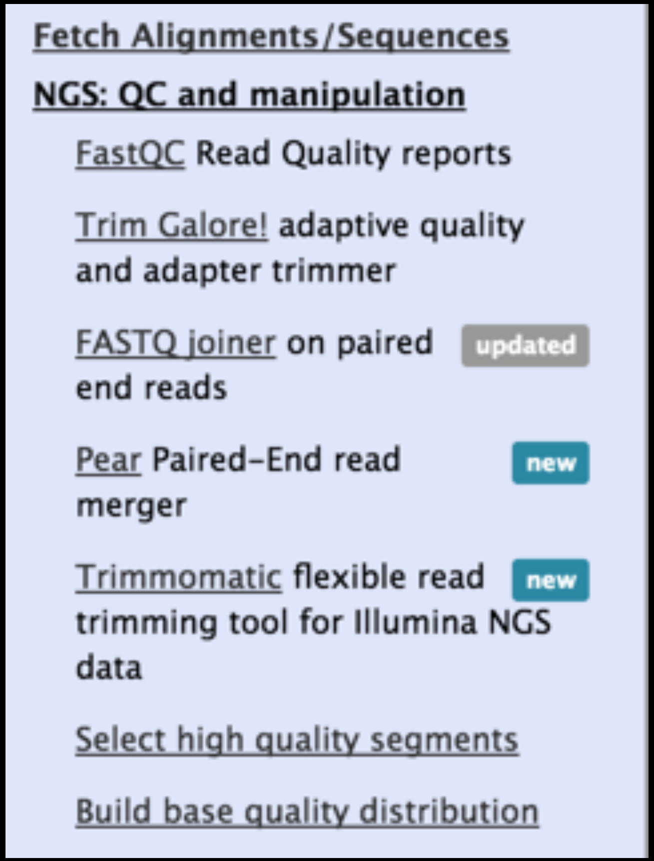
z.umn.edu/hayahym 'How are you - and How's your Microbiome?' an article in @tAnaSci Issue#1116 #microbiome #metaproteomics #usegalaxyp

4h

Galaxy Project @galaxyproject

28-30 Nov: Analyse avancée de séquences, Bordeaux cnrsformation.cnrs.fr/stage-16148-An… #usegalaxy @cgfbordeaux

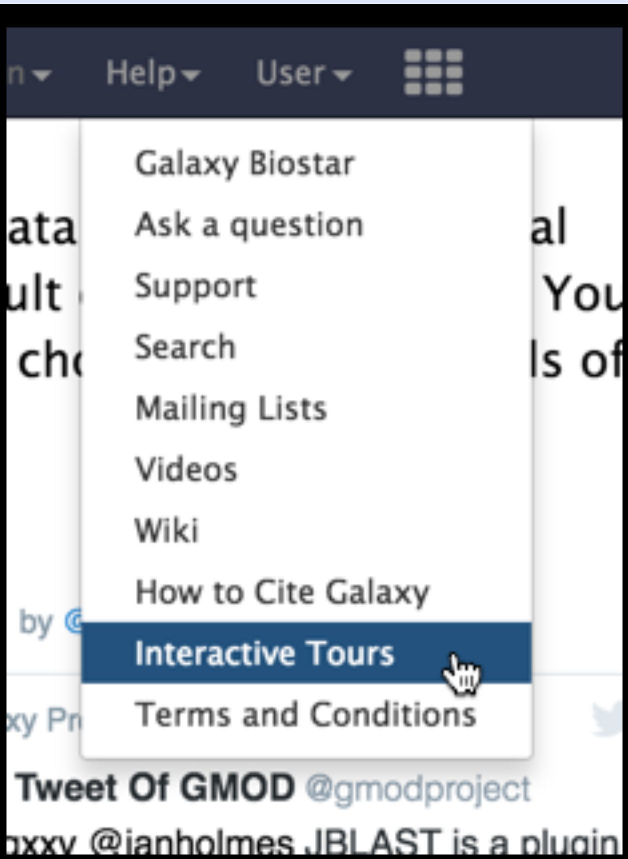
usegalaxy.org: What's new?



Fetch Alignments/Sequences

NGS: QC and manipulation

- FastQC Read Quality reports
- Trim Galore! adaptive quality and adapter trimmer
- FASTQ joiner on paired end reads
- Pear Paired-End read merger
- Trimmomatic flexible read trimming tool for Illumina NGS data
- Select high quality segments
- Build base quality distribution

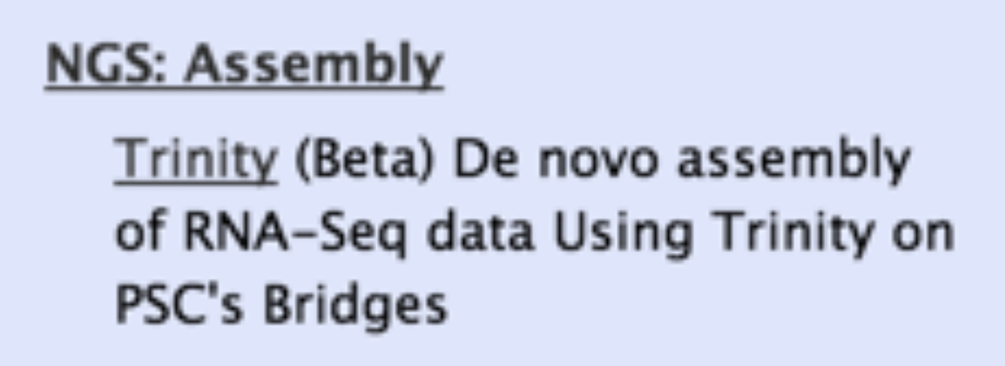


Lots of new and updated tools

Interactive tours

Workflow run forms

Trinity



NGS: Assembly

Trinity (Beta) De novo assembly of RNA-Seq data Using Trinity on PSC's Bridges

Public Galaxy servers

General Purpose (3 new, 17 total)

- Galaxy@Pasteur
- Galaxy Sigenae / BioInfo Genotoul
- Insitut Curie

Domain (4 new, 33 total)

- Alveo
- Galaxy-CEFAP
- ImmPort Galaxy
- PhenoMeNal

19 new servers in past year

Now 90 public servers

Tool Servers (12 new, 40 total)

- Apostl
- ARGs-AOP
- Bistro
- BitLAB
- Chemical Annotation Retrieval Toolkit (CART)
- Halogen Bonding
- IBERS @ Aberystwyth
- Koslicki Lab
- MGEScan
- MiModD NacreousMap
- Palfinder
- VarCap

Galaxy Services

genomics VIRTUAL LAB

cancer computer

Jetstream

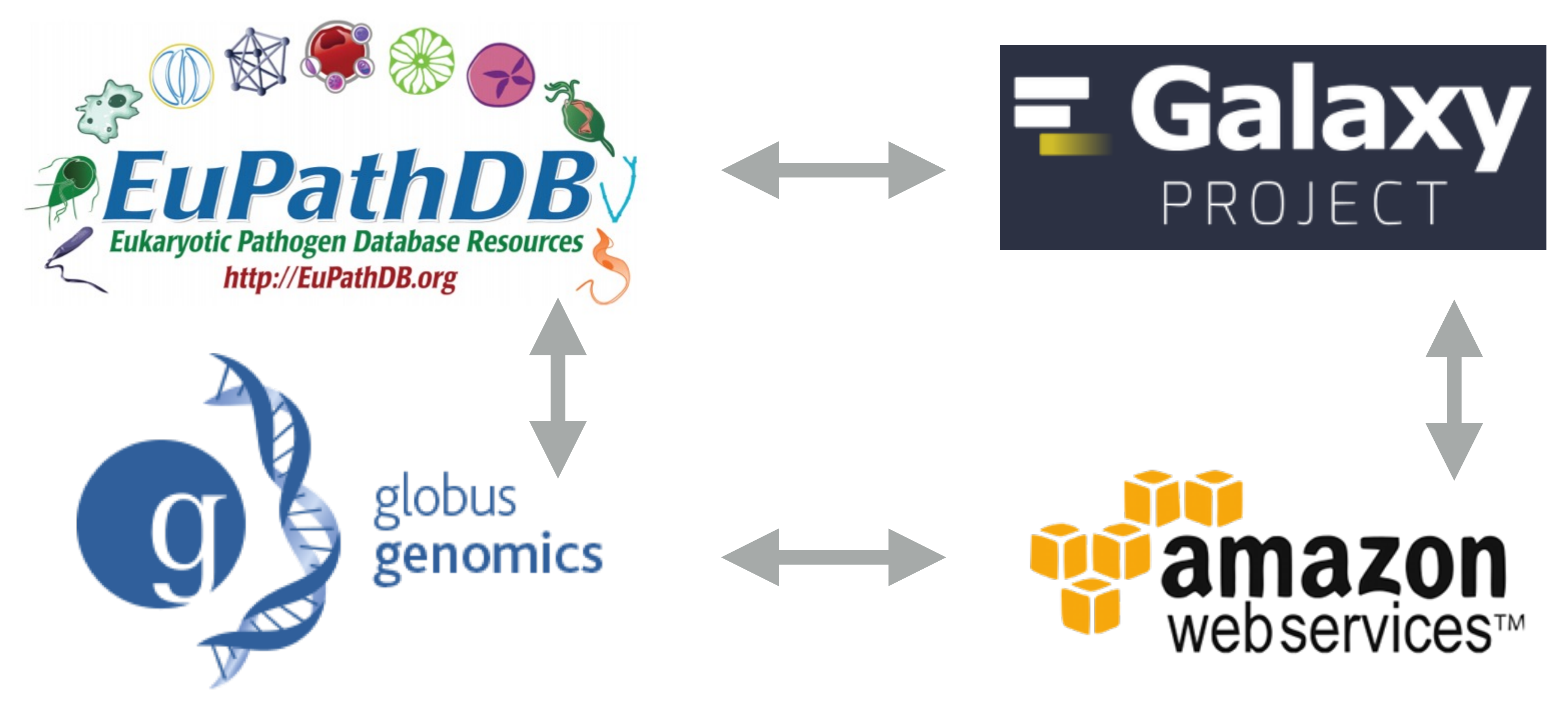
NeLS

Norwegian e-Infrastructure for Life Sciences

GenAP

PL GRID

Galaxy Services: Just added



Developed in partnership with Globus Genomics (11), workspaces offer a private analysis platform with published workflows and pre-loaded annotated genomes for the organisms we support. The workspace is accessed through the 'Analyze My Experiment' ...

EuPathDB: the eukaryotic pathogen genomics database resource Aurrecoechea et al., *Nucleic Acids Research* (29 November 2016), gkw1105, doi:10.1093/nar/gkw1105

Can't use a *service*? Galaxy is available on other Clouds

openstack™
CLOUD SOFTWARE

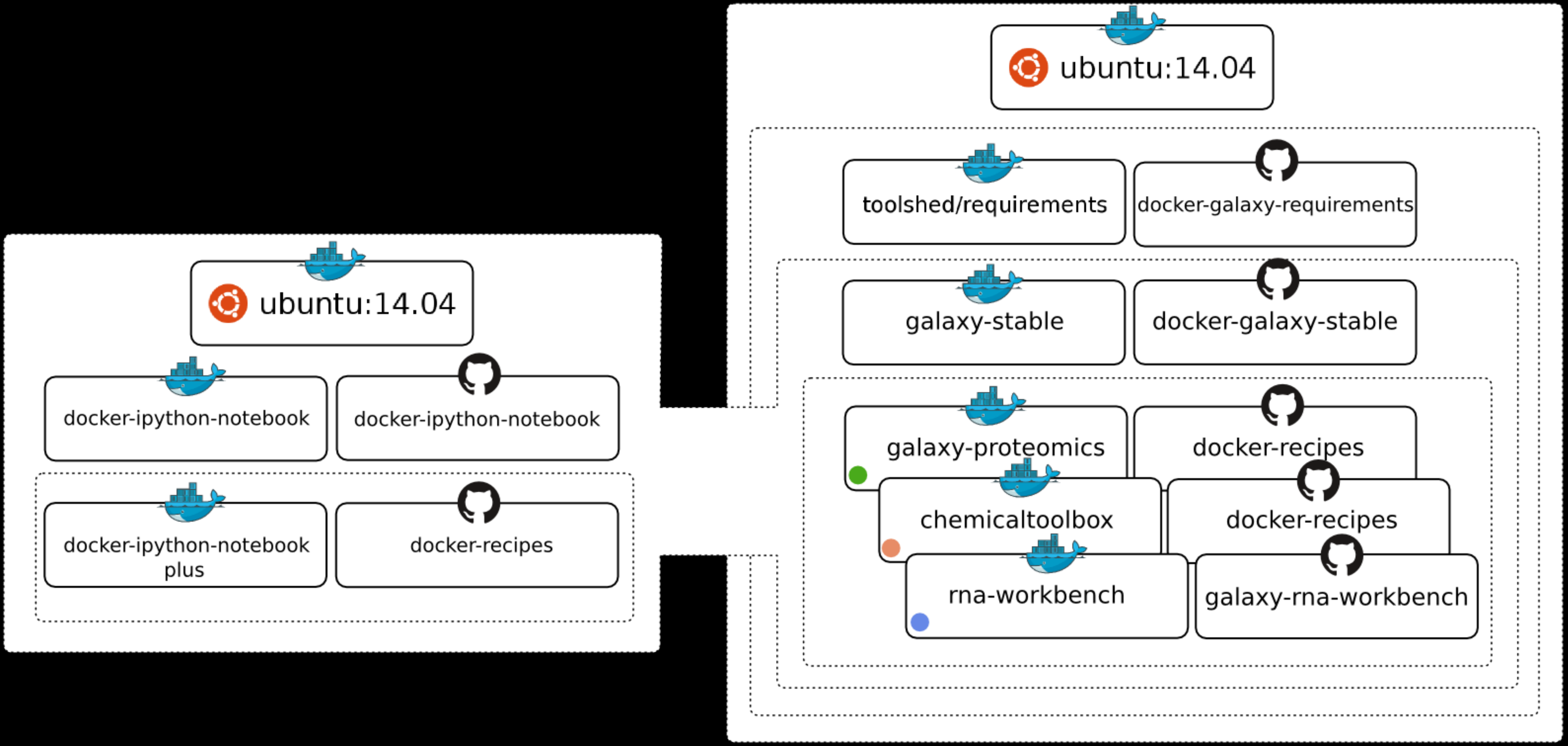
amazon
web services™

OpenNebula.org
The Open Source Toolkit for Cloud Computing

globus
genomics

http://aws.amazon.com/education
http://globus.org/
http://wiki.galaxyproject.org/Cloud
https://launch.usegalaxy.org/

Galaxy is available in Docker



https://github.com/bgruening/docker-galaxy-stable

Galaxy is available in Docker

Docker Cancer Genomics Galaxy flavor

https://github.com/morinlab/tools-morinlab/blob/master/docker/Readme.md

Galaxy tools for Constructive Solid Geometry flavor

https://github.com/gregvonkuster/galaxy-csg

Enhancing pre-defined workflows with ad hoc analytics using Galaxy, Docker and Jupyter

Björn Grüning, Eric Rasche, Boris Rebolledo-Jaramillo, Carl Eberhard, Torsten Houwaart, John Chilton, Nathan Coraor, Rolf Backofen, James Taylor, Anton Nekrutenko. *bioRxiv* (16 September 2016), 075457, doi:10.1101/075457

Galaxy is available as Open Source Software

http://getgalaxy.org

New Features in past year

We have (more or less) quarterly releases:

16.01, 16.04, 16.07, 16.10

17.01 is in the pipe

Interactive Tours (16.01)

As seen at PAG XXV!

Wheels (16.01)

Went from Eggs to PIP and Wheels for Galaxy core dependencies.

Nested Workflows (16.01)

Workflows can run other workflows as a single abstract step in the parent workflow.

New Features in past year

Tool Profile Versions (16.04)

Tools can declare which version of Galaxy they require. Tools requiring 16.04 or newer will have new default behaviors.

Dynamic tool Destinations (16.07)

Dynamic mapping of tools to destinations based on finer grained admin-specified rules.

From Canada's National Microbiology Laboratory

New Features in past year

Galaxy chat (16.07)

Admins can add the included communication server to enable users of their instance to use real-time chat within the Galaxy interface.

Conda for tool dependencies (all)

Galaxy is switching to using the Conda package manager to handle tool dependencies.

Bioconda Contribution Fest, November 2-3
Galaxy-P Conda Contribution Fest September 27-28
Conda Dependencies Codefest, April 4

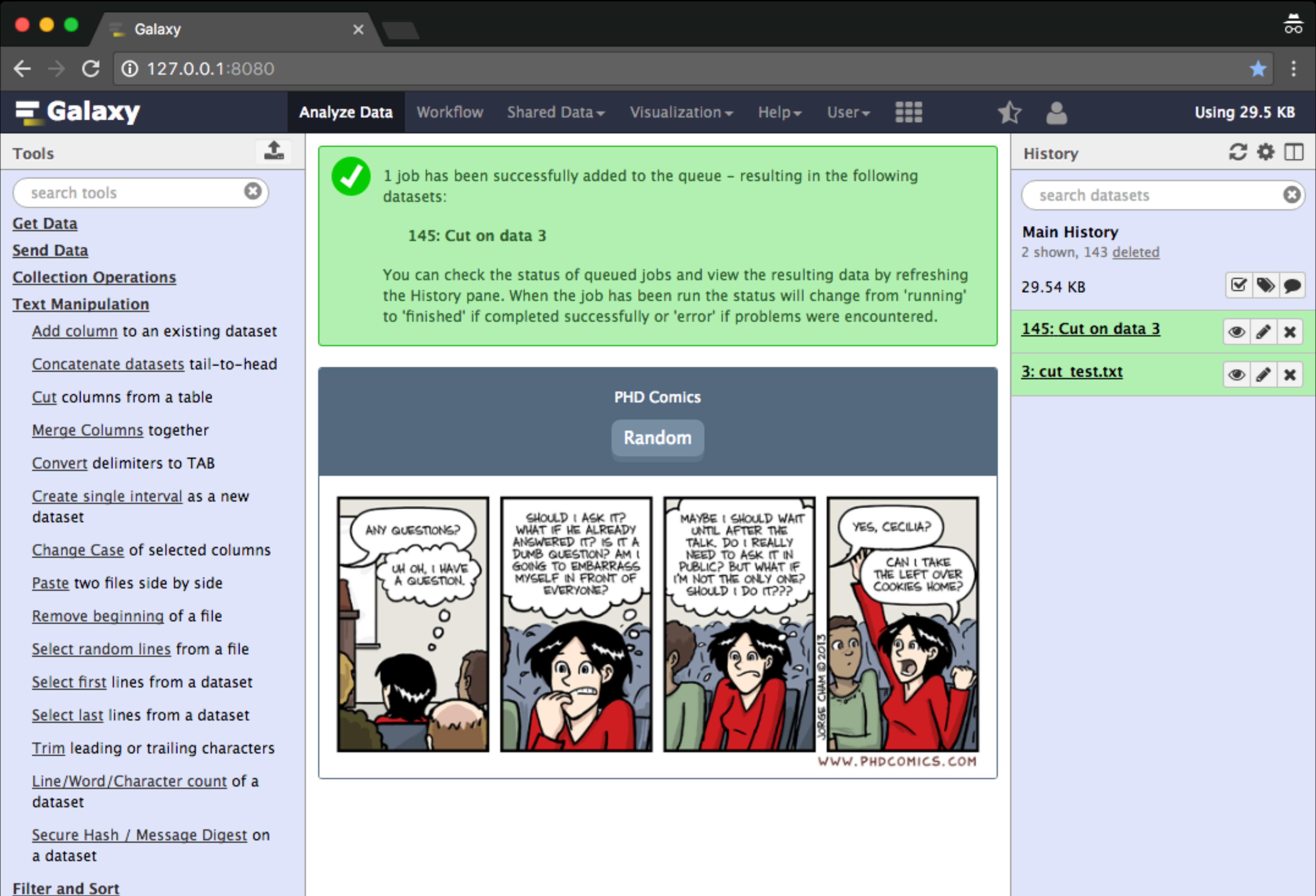
New Features in past year

Webhooks (16.10)

A simple way of inserting icons, links, or other HTML elements into predefined locations.

Work from @bgruening, @anatskiy, and @joachimwolff
https://docs.galaxyproject.org/en/master/admin/webhooks.html

Webhooks (16.10)



1 job has been successfully added to the queue – resulting in the following datasets:

145: Cut on data 3

You can check the status of queued jobs and view the resulting data by refreshing the History pane. When the job has been run the status will change from 'running' to 'finished' if completed successfully or 'error' if problems were encountered.

Other Software

Nebulizer

Command line utility for managing users, tools and libraries

From Peter Briggs

https://pypi.python.org/pypi/nebulizer

CloudBridge

Simple abstraction layer over different cloud providers.

http://cloudbridge.readthedocs.org/

CloudBridge: a Simple Cross-Cloud Python Library
Nuwan Goonasekera, Andrew Lonie, James Taylor, Enis Afgan. XSEDE16.

Other Software

blend4php

The blend4php package, a PHP wrapper for the Galaxy API.
Used in Tripal-Galaxy connection

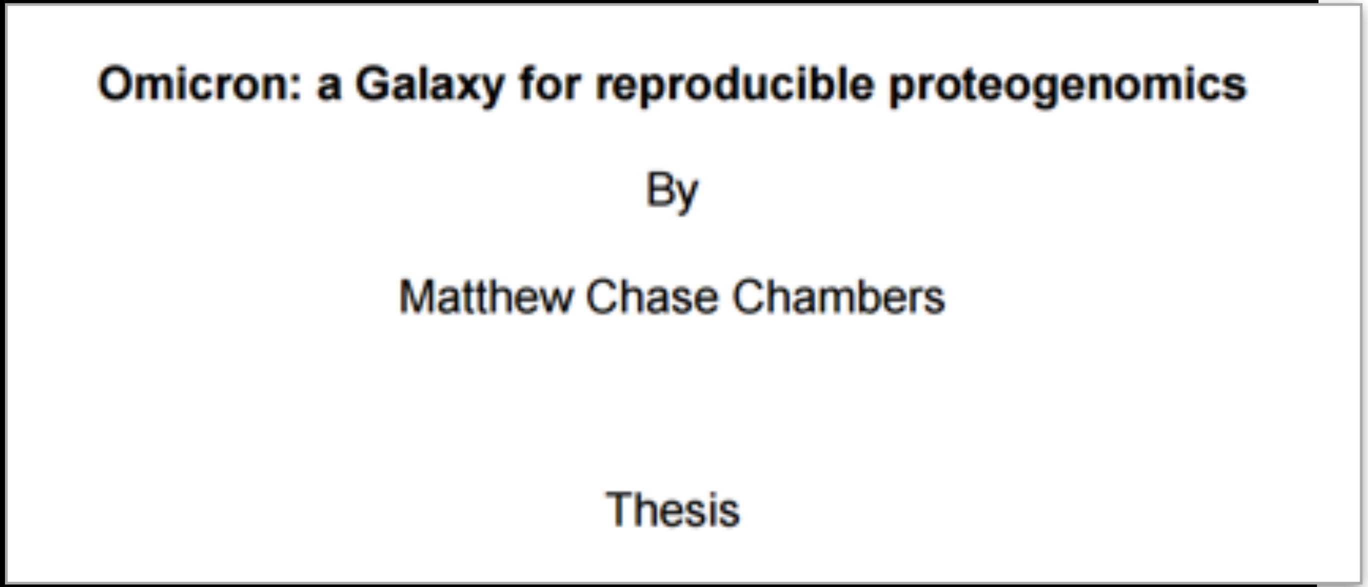
https://github.com/galaxyproject/blend4php

blend4php: a PHP API for galaxy. Connor Wytko, Brian Soto, Stephen P. Ficklin, *Database* (2017) baw154. DOI: https://doi.org/10.1093/database/baw154

Banner year for cool publications

SparkGalaxy: Workflow-based Big Data Processing

Sara Riazi
Department of Computer and Information Science
University of Oregon

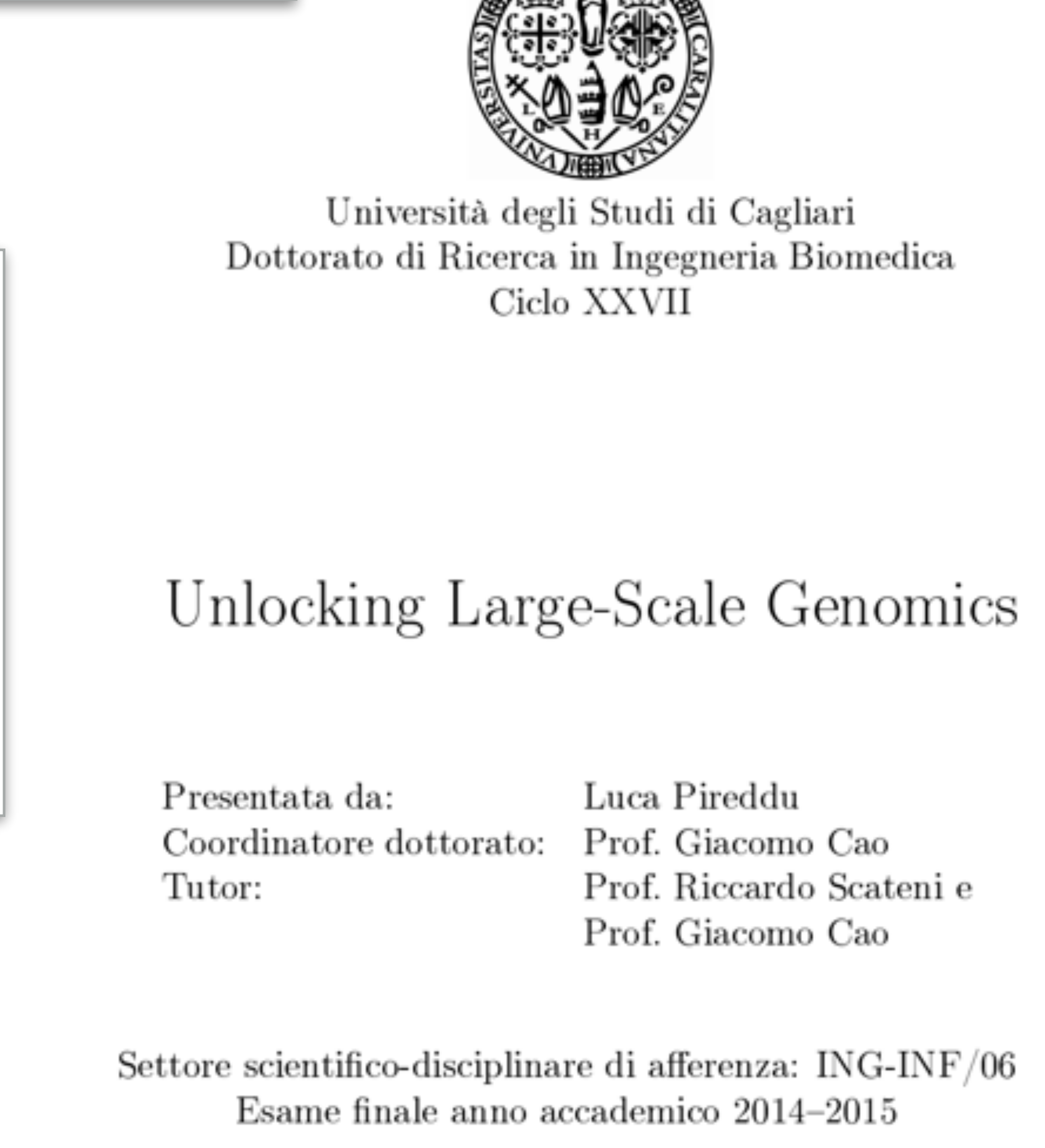


Omicron: a Galaxy for reproducible proteogenomics

By

Matthew Chase Chambers

Thesis



Università degli Studi di Cagliari
Dottorato di Ricerca in Ingegneria Biomedica
Ciclo XXVII

Unlocking Large-Scale Genomics

Presentata da:	Luca Pireddu
Coordinatore dottorato:	Prof. Giacomo Cao
Tutor:	Prof. Riccardo Scateni e Prof. Giacomo Cao

Settore scientifico-disciplinare di afferenza: ING-INF/06
Esame finale anno accademico 2014–2015

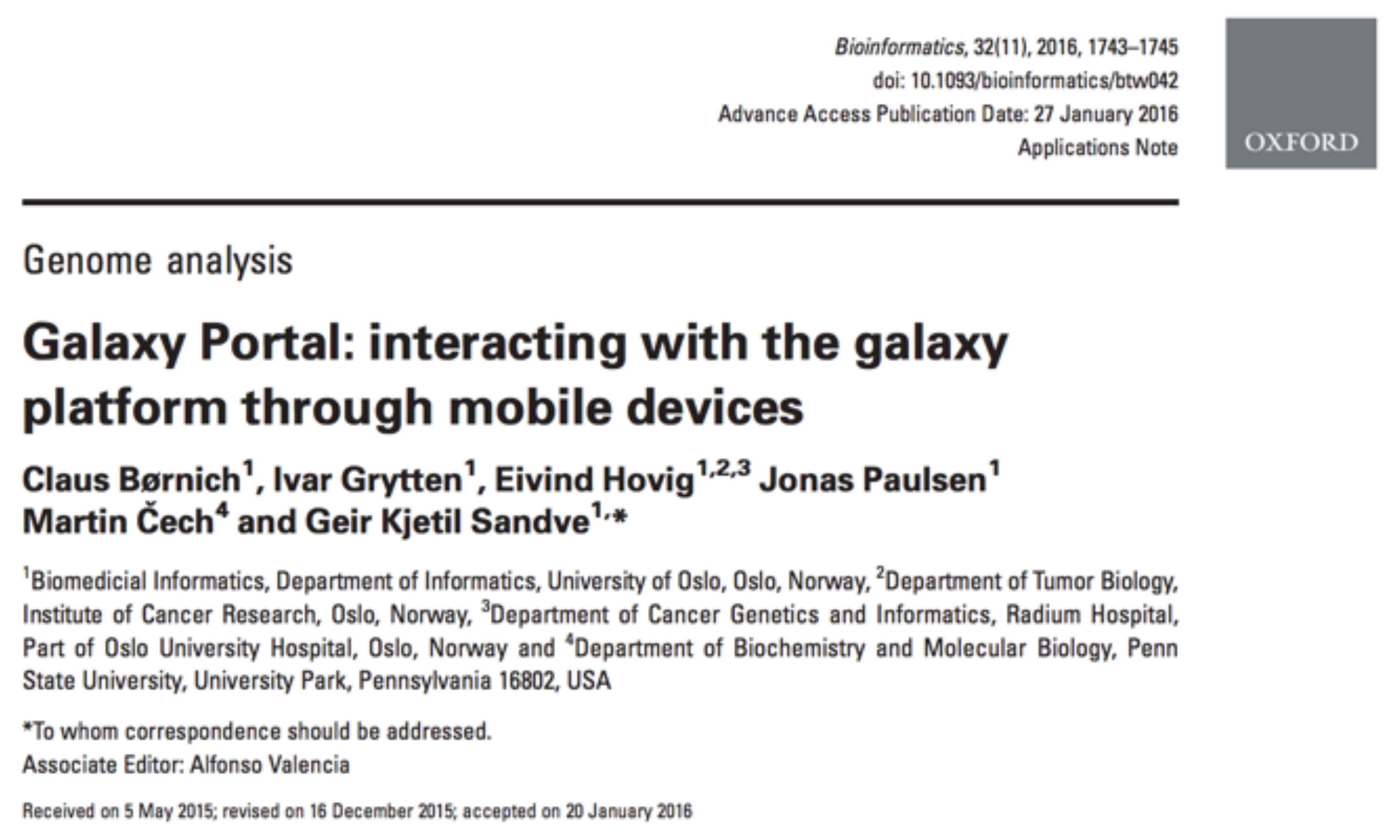
Banner year for cool publications

J Grid Computing (2016) 14:533–543
DOI 10.1007/s10723-016-9379-6

CrossMark

The Essential Components of a Successful Galaxy Service

**Annette McGrath · Steve McMahon · Sean Li ·
Joel Ludbey · Tim Ho**



Bioinformatics, 32(11), 2016, 1743–1745
doi: 10.1093/bioinformatics/btw042
Advance Access Publication Date: 27 January 2016
Applications Note

OXFORD

Genome analysis

Galaxy Portal: interacting with the galaxy platform through mobile devices

**Claus Børnich[1], Ivar Grytten[1], Eivind Hovig[1,2,3] Jonas Paulsen[1]
Martin Čech[4] and Geir Kjetil Sandve[1,*]**

[1]Biomedicial Informatics, Department of Informatics, University of Oslo, Oslo, Norway, [2]Department of Tumor Biology, Institute of Cancer Research, Oslo, Norway, [3]Department of Cancer Genetics and Informatics, Radium Hospital, Part of Oslo University Hospital, Oslo, Norway and [4]Department of Biochemistry and Molecular Biology, Penn State University, University Park, Pennsylvania 16802, USA

*To whom correspondence should be addressed.
Associate Editor: Alfonso Valencia

Received on 5 May 2015; revised on 16 December 2015; accepted on 20 January 2016

F1000Research

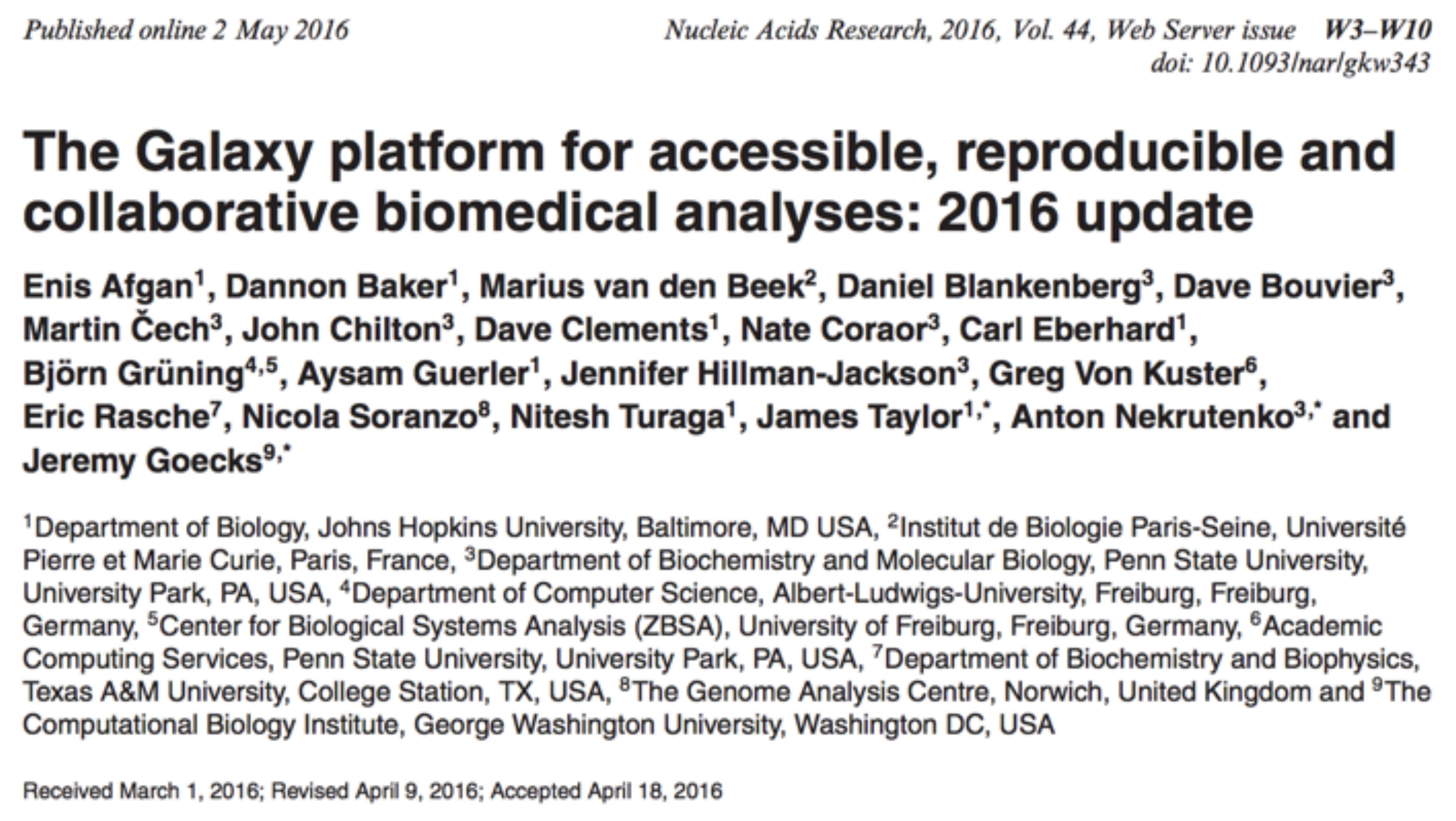
F1000Research 2016, 5:2757 Last updated: 10 JAN 2017

SOFTWARE TOOL ARTICLE

A guide and best practices for R/Bioconductor tool integration in Galaxy [version 1; referees: 1 approved, 1 approved with reservations]

Nitesh Turaga[1], Mallory A. Freeberg[1], Dannon Baker[1], John Chilton[2], Galaxy Team, Anton Nekrutenko[2], James Taylor[1]

[1]Department of Biology, Johns Hopkins University, Baltimore, USA
[2]Department of Biochemistry and Molecular Biology, Pennsylvania State University, University Park, USA



Nucleic Acids Research, 2016, Vol. 44, Web Server issue ***W3–W10***
doi: 10.1093/nar/gkw343

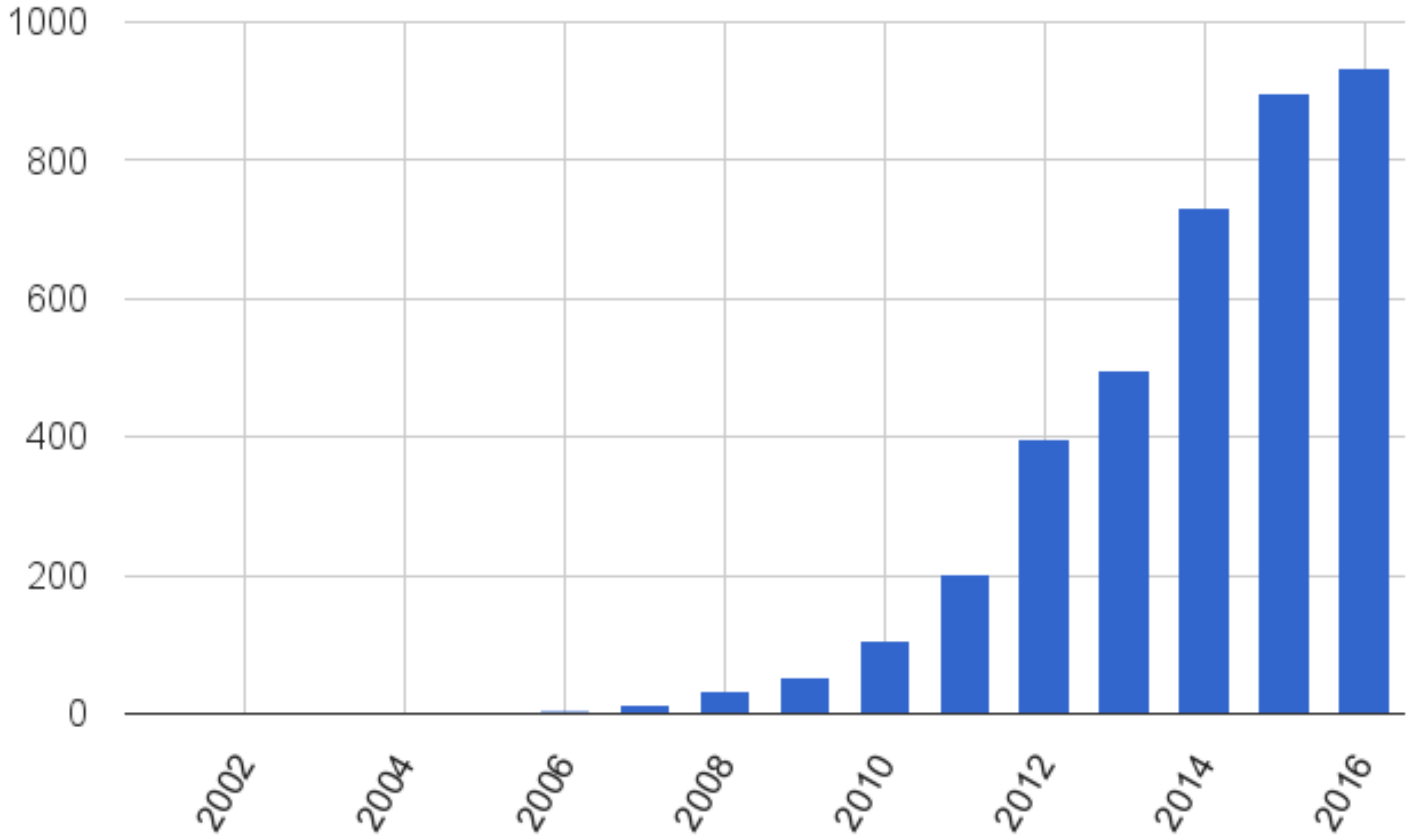
The Galaxy platform for accessible, reproducible and collaborative biomedical analyses: 2016 update

Enis Afgan[1], Dannon Baker[1], Marius van den Beek[2], Daniel Blankenberg[3], Dave Bouvier[3], Martin Čech[3], John Chilton[3], Dave Clements[1], Nate Coraor[3], Carl Eberhard[1], Björn Grüning[4,5], Aysam Guerler[1], Jennifer Hillman-Jackson[3], Greg Von Kuster[6], Eric Rasche[7], Nicola Soranzo[8], Nitesh Turaga[1], James Taylor[1,*], Anton Nekrutenko[3,*] and Jeremy Goecks[9,*]

[1]Department of Biology, Johns Hopkins University, Baltimore, MD USA, [2]Institut de Biologie Paris-Seine, Université Pierre et Marie Curie, Paris, France, [3]Department of Biochemistry and Molecular Biology, Penn State University, University Park, PA, USA, [4]Department of Computer Science, Albert-Ludwigs-University, Freiburg, Freiburg, Germany, [5]Center for Biological Systems Analysis (ZBSA), University of Freiburg, Freiburg, Germany, [6]Academic Computing Services, Penn State University, University Park, PA, USA, [7]Department of Biochemistry and Biophysics, Texas A&M University, College Station, TX, USA, [8]The Genome Analysis Centre, Norwich, United Kingdom and [9]The Computational Biology Institute, George Washington University, Washington DC, USA

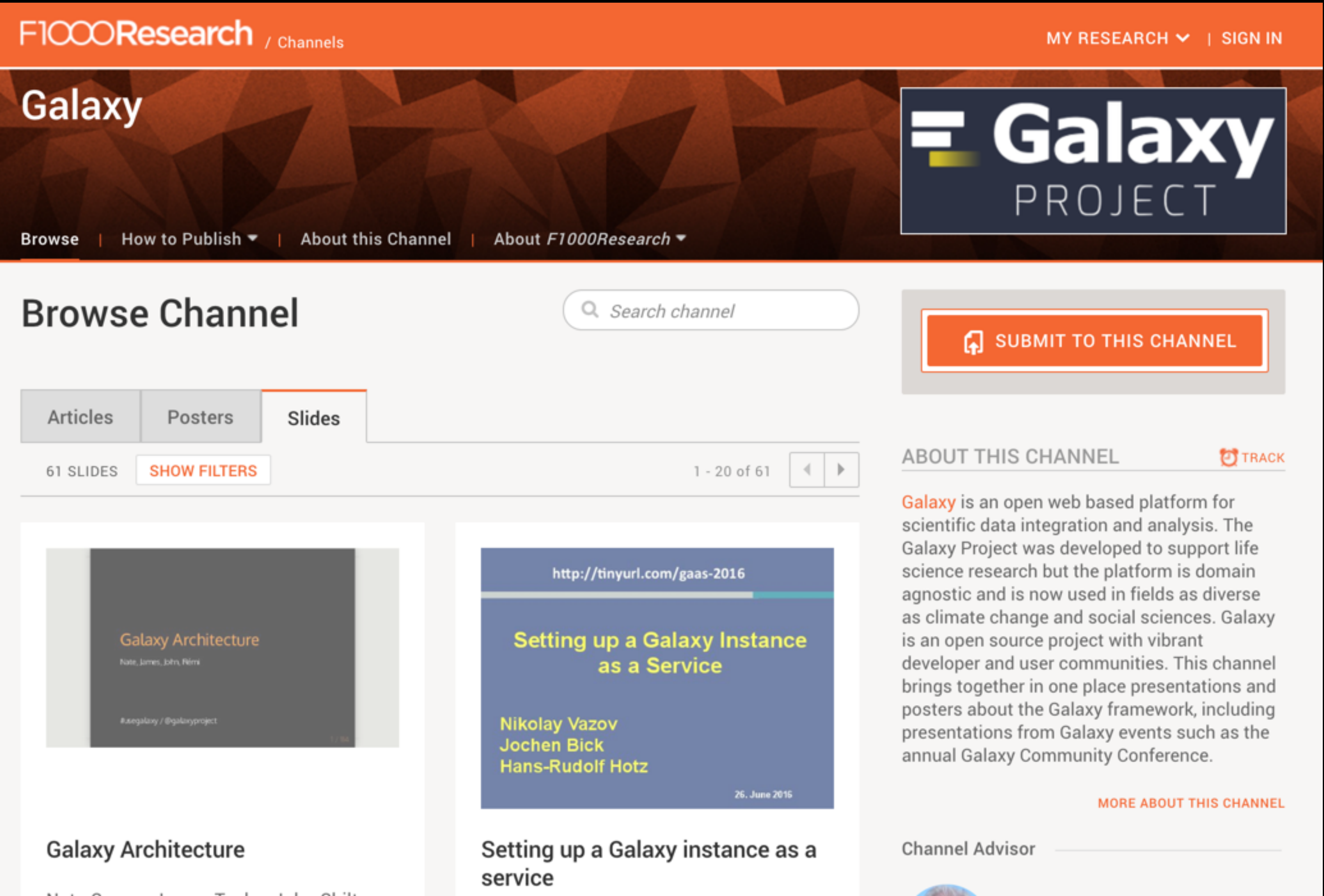
Received March 1, 2016; Revised April 9, 2016; Accepted April 18, 2016

Pubs per year topped 900 in 2016



Now 3909 papers in Galaxy CiteULike group

F1000 Research Galaxy Channel



Galaxy

Browse Channel

61 SLIDES

1 - 20 of 61

Galaxy Architecture

Nate, James, John, Rémi

#usegalaxy / @galaxyproject

http://tinyurl.com/gaas-2016

Setting up a Galaxy Instance as a Service

Nikolay Vazov
Jochen Bick
Hans-Rudolf Hotz

26. June 2016

Galaxy Architecture

Setting up a Galaxy instance as a service

ABOUT THIS CHANNEL

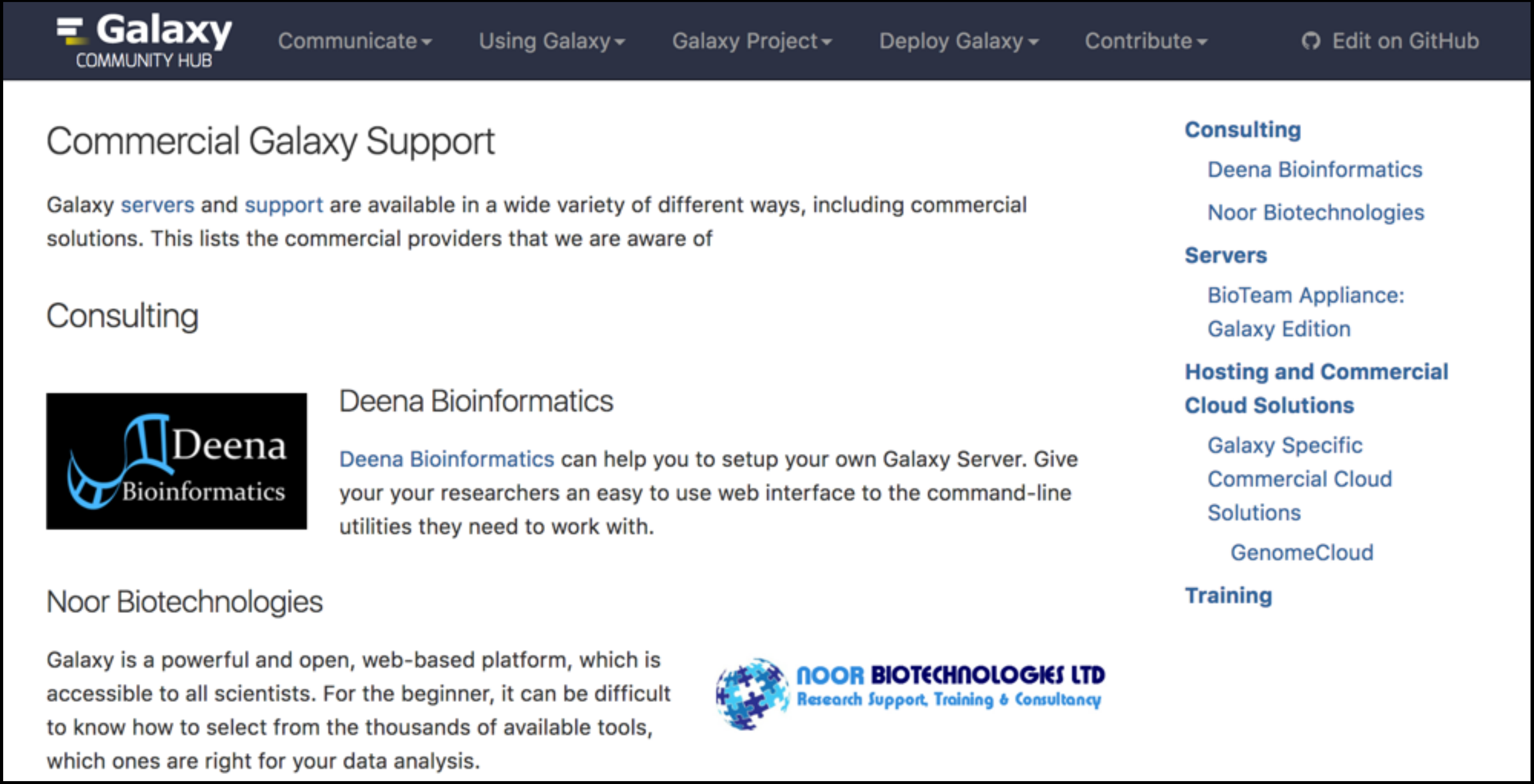
Galaxy is an open web based platform for scientific data integration and analysis. The Galaxy Project was developed to support life science research but the platform is domain agnostic and is now used in fields as diverse as climate change and social sciences. Galaxy is an open source project with vibrant developer and user communities. This channel brings together in one place presentations and posters about the Galaxy framework, including presentations from Galaxy events such as the annual Galaxy Community Conference.

Channel Advisor

Resources and Communities

New Directories

Commercial Support Directory



Commercial Galaxy Support

Galaxy servers and support are available in a wide variety of different ways, including commercial solutions. This lists the commercial providers that we are aware of

Consulting

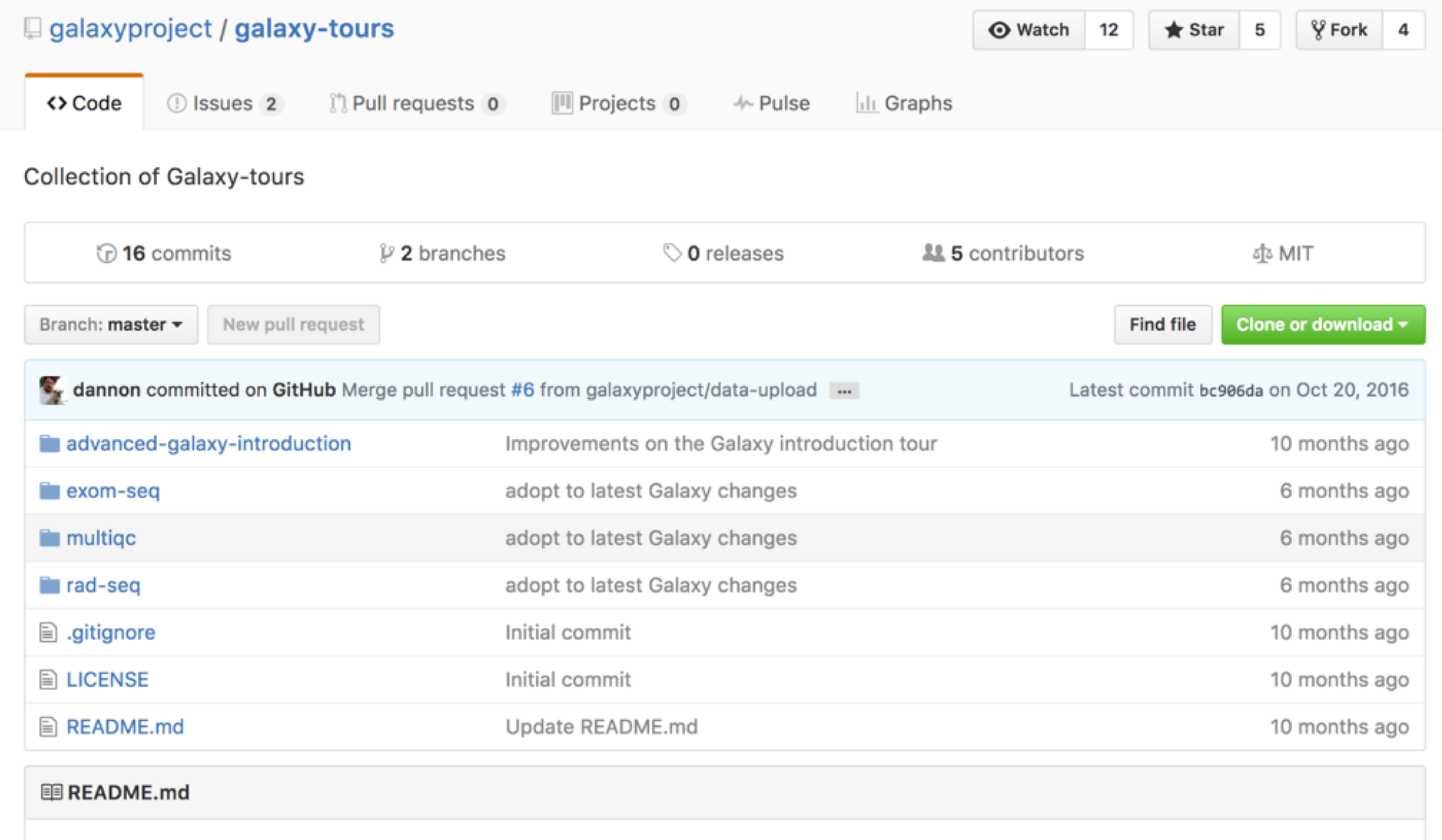
Deena Bioinformatics

Deena Bioinformatics can help you to setup your own Galaxy Server. Give your your researchers an easy to use web interface to the command-line utilities they need to work with.

Noor Biotechnologies

Galaxy is a powerful and open, web-based platform, which is accessible to all scientists. For the beginner, it can be difficult to know how to select from the thousands of available tools, which ones are right for your data analysis.

New Directories: Galaxy Tours
https://github.com/galaxyproject/galaxy-tours



galaxyproject / galaxy-tours

Watch 12 | Star 5 | Fork 4

Code | Issues 2 | Pull requests 0 | Projects 0 | Pulse | Graphs

Collection of Galaxy-tours

16 commits | 2 branches | 0 releases | 5 contributors | MIT

Branch: master | New pull request | Find file | Clone or download

dannon committed on GitHub Merge pull request #6 from galaxyproject/data-upload … Latest commit `bc906da` on Oct 20, 2016

advanced-galaxy-introduction	Improvements on the Galaxy introduction tour	10 months ago
exom-seq	adopt to latest Galaxy changes	6 months ago
multiqc	adopt to latest Galaxy changes	6 months ago
rad-seq	adopt to latest Galaxy changes	6 months ago
.gitignore	Initial commit	10 months ago
LICENSE	Initial commit	10 months ago
README.md	Update README.md	10 months ago

README.md

New Communities: Galaxy Arabic

Galaxy Arabic Community

أرشيف للقائمة البريدية جالاكسي بالعربية يحتوي على الاخبار والمناقشات والاعلانات الخاصة بمستخدمي جالاكسي من البلاد الناطقة بالعربية نرحب بانضمام أي شخص مهتم بالجلاكسي بلاتفورم

جالاكسي هي بلاتفورم لتحليل المعلومات الحيوية باستخدام أدوات برمجة أونلاين مجانا تتميز بأنها متاحة للجميع ونتائجها تتميز بالشفافية وبالقدرة على الحصول على نفس النتائج عند إجراء التحليل مرات عديدة.

السهولة : يمكن لأي شخص استخدام جالاكسي حتى لو لم تكن لديه خبرة كافية بتحليل المعلومات الحيوية

النتائج : تحصل على نفس النتائج مهما أجريت التجربة مرات عديدة وهذا يميز جالاكسي عن العديد من الأدوات الاخرى

الشفافية : يمكنك أن تشارك ما توصلت إليه مع زملائك والعالم كله ويمكنك النشر أيضا .

جالاكسي مفتوحة لكل المنظمات والسرفر الرئيسي يمكنك من إجراء تحليل على المعلومات الجينية وإيضا توجد مواد تعليمية للتدريب وأماكن العمل وخدمات النشر يمكنك استخدام جالاكسي أونلاين ويمكنك أيضا تنزيلها على الكمبيوتر الخاص بك واستخدامها

We are pleased to announce the launch of the **Galaxy Arabic community.** Galaxy Arabic supports and promotes Galaxy activity for the Arabic speaking community and in Arabic speaking regions of the world.

If you are interested in joining the community, please

- Follow @Galaxy_Arabic on Twitter
- Join the Galaxy Arabic mailing list. Regional Galaxy news will be posted here, and you can also ask fellow Arabic speakers support questions.
- Join the Galaxy Arabic Facebook group

We look forward to connecting and growing the Arabic speaking Galaxy community.

Thanks,

Abdelazeem Abdelhameed <abdelazeem_abdelhameed2015505@yahoo.com> and Dave Clements

Posted to the Galaxy News on 2016-10-27

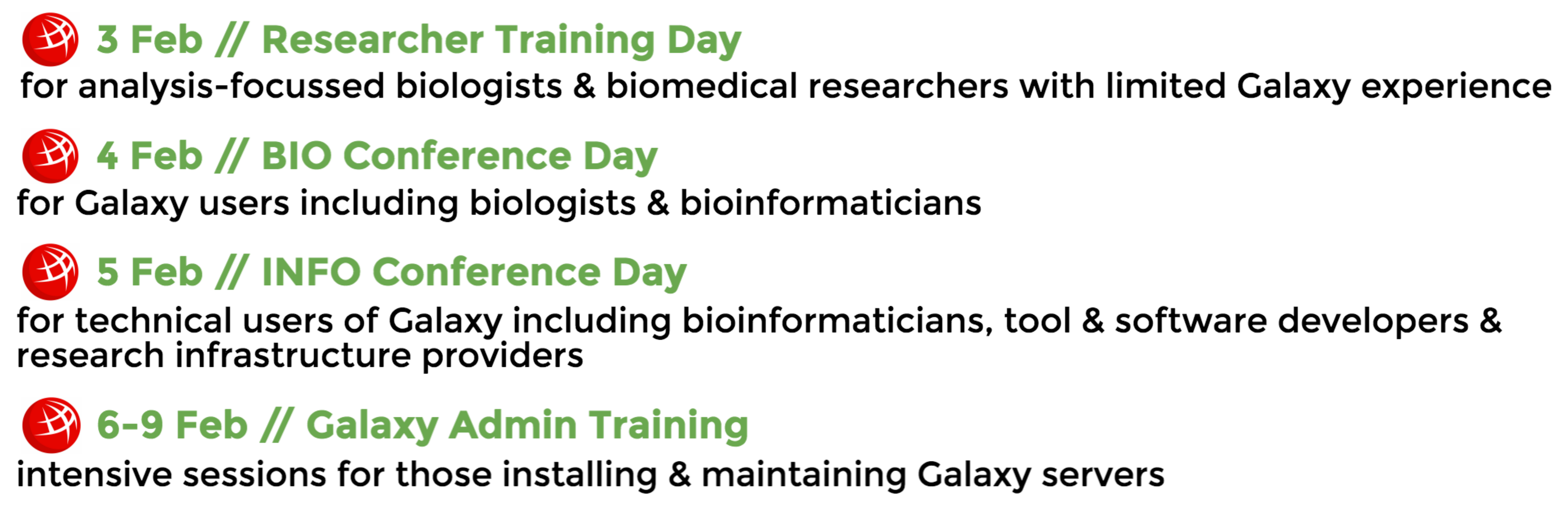
New Communities, New Events: Galaxy Australia

GAMe 2017

Galaxy Australasia Meeting

3 - 9 February, Melbourne, Australia

New Communities: Galaxy Australia, GAMe 2017



3 Feb // Researcher Training Day

for analysis-focussed biologists & biomedical researchers with limited Galaxy experience

4 Feb // BIO Conference Day

for Galaxy users including biologists & bioinformaticians

5 Feb // INFO Conference Day

for technical users of Galaxy including bioinformaticians, tool & software developers & research infrastructure providers

6-9 Feb // Galaxy Admin Training

intensive sessions for those installing & maintaining Galaxy servers

https://www.embl-abr.org.au/game2017/

New Events: Admin Training

2016
GALAXY
ADMIN TRAINING
SLC

This was fantastic. It was a huge help toward the goals that we're trying to accomplish in our group and we were grateful that the training was offered. Kudos.

Huge THANK YOU

`I learned a lot!`

This training session was exactly what I needed as far as skills-training

It was very interesting and at a perfect level for me. I learned a lot that I will be able to implement very soon.

Extremely happy with the knowledge transfer.

I also liked the fact we were a small group, this was easier to follow all the exercises and to ask questions.

6-9 Feb // Galaxy Admin Training
intensive sessions for those installing & maintaining Galaxy servers

Strasbourg
16-19 Jan

European
Galaxy Developers Workshop

elixir

26 - 30 June France

GCC 2017 Montpellier

Marilyne Summo
Jean-François Dufayard
Olivier Inizan
Christophe Caron
For the **French Institute of Bioinformatics**

https://gcc2017.sciencesconf.org/

Galaxy Wiki Migration: URLs

From
wiki.galaxyproject.org

to
new.galaxyproject.org
(work in progress)

to
galaxyproject.org

Wiki migration Technology

From
MoinMoin 1.9.x

to

Markdown
Content in GitHub
Rendering / Serving done with Metalsmith
Automatically propagate GitHub updates

http://www.metalsmith.io/
https://github.com/galaxyproject/galaxy-hub

Why?

Increasingly frustrated by inability to create/manage/reuse semi-structured data.

This is only going to get more challenging over time.

https://wiki.galaxyproject.org/Community/Logs
https://wiki.galaxyproject.org/Community/Deployments
https://wiki.galaxyproject.org/PublicGalaxyServers
https://wiki.galaxyproject.org/Teach/Trainers

Metalsmith on GitHub

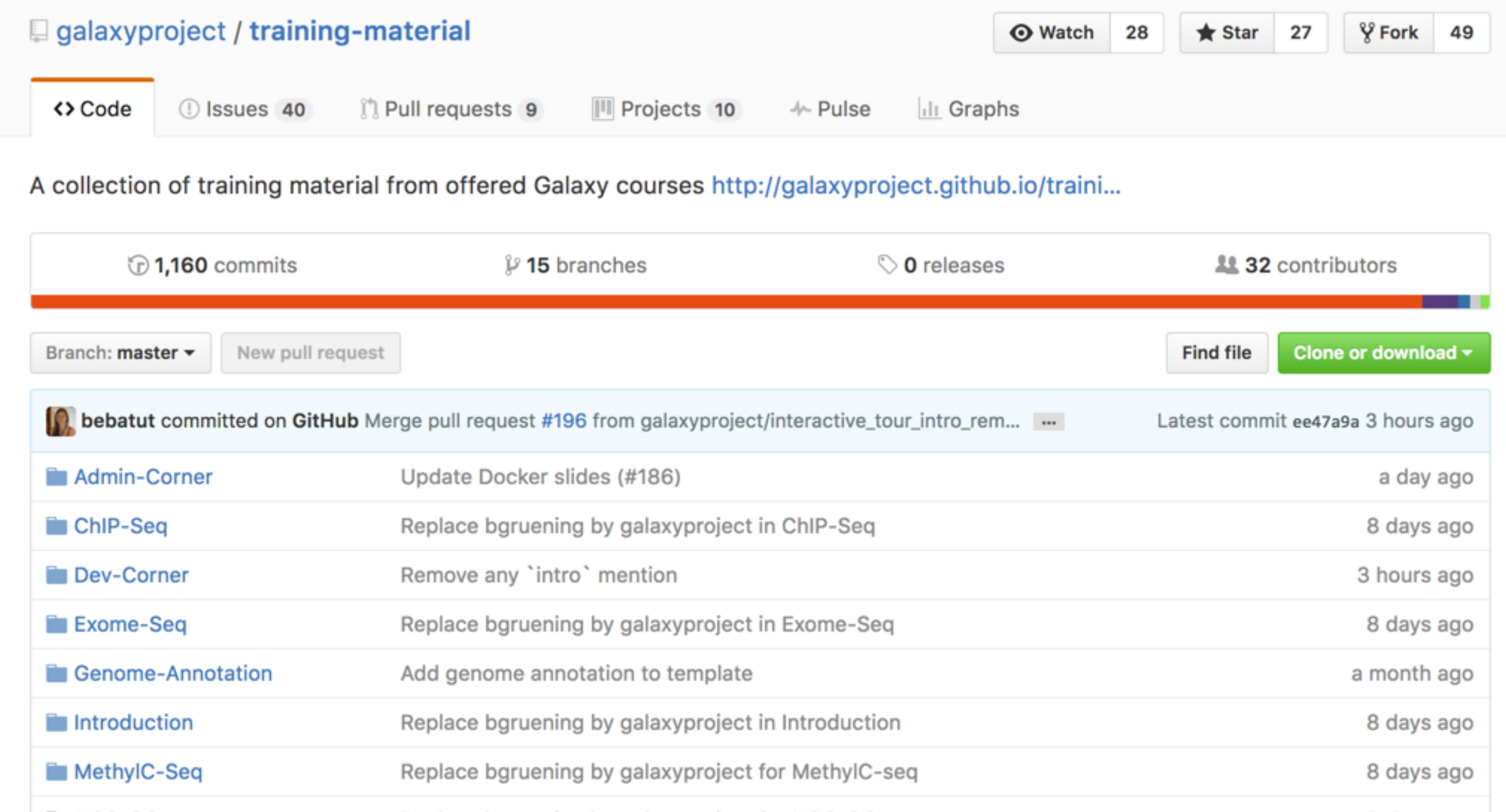
Hope is that more people will contribute if they can

- directly edit wiki content on GitHub, a platform that many are already on and familiar with
- using Markdown, a markup language that many already know.

GitHub infrastructure also makes site-wide changes easier.

Advanced users can also install Metalsmith and perform edits locally.

Training Material Paradigm Shift



A collection of training material from offered Galaxy courses http://galaxyproject.github.io/traini...

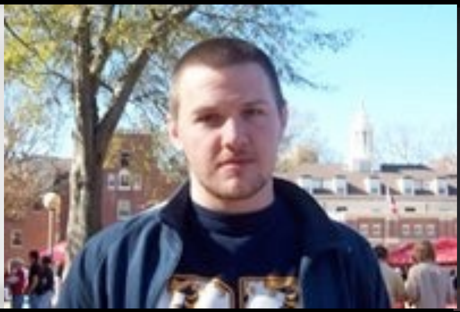
bebatut committed on GitHub Merge pull request #196 from galaxyproject/interactive_tour_intro_rem... Latest commit ee47a9a 3 hours ago

Admin-Corner	Update Docker slides (#186)	a day ago
ChIP-Seq	Replace bgruening by galaxyproject in ChIP-Seq	8 days ago
Dev-Corner	Remove any `intro` mention	3 hours ago
Exome-Seq	Replace bgruening by galaxyproject in Exome-Seq	8 days ago
Genome-Annotation	Add genome annotation to template	a month ago
Introduction	Replace bgruening by galaxyproject in Introduction	8 days ago
MethylC-Seq	Replace bgruening by galaxyproject for MethylC-seq	8 days ago

https://github.com/galaxyproject/training-material
https://bebatut-slides.github.io/swiss_german_galaxy_days_10_16/#/

The Galaxy Team


Enis Afgan


Dannon Baker


Dan Blankenberg


Dave Bouvier


Marten Cech


John Chilton


Dave Clements


Nate Coraor


Jeremy Goecks


Sam Guerler


Mo Heydarian


Jen Jackson


Vahid Jalili


Delphine Lariviere


Ross Lazarus


Anton Nekrutenko


Nick Stoler


James Taylor

https://new.galaxyproject.org/GalaxyTeam

Acknowledgements

You

Scott Cain
Jacqueline Farrell-Cambell

Björn Grüning
Bérénice Batut

NIH   NSF
Johns Hopkins University
Penn State University
Oregon Health Sciences University

Dave Clements

Galaxy Project

Johns Hopkins University

clements@galaxyproject.org

Thanks