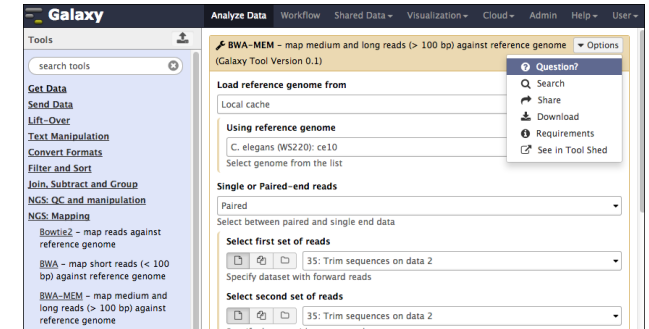


# Galaxy – Bioinformatics Computing Platform



Manuel Pasioka (VBCF), Andreas Sommer (VBCF)

24. 09. 2018



# Pilot project introduction



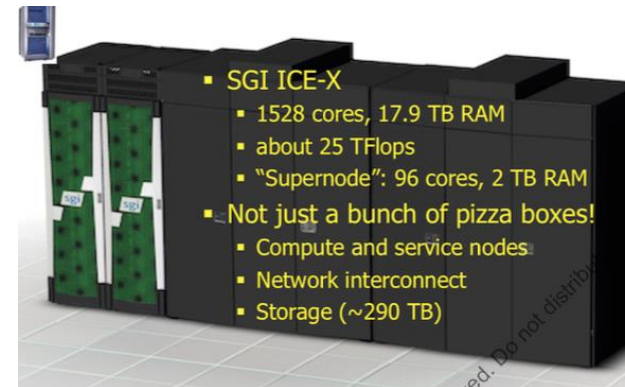
## Project Partners

- Jan Oppelt ( CEITEC )
- Sini Junntila, Ido Tamir and Manuel Pasieka ( VBCF )



## Equipment used

- Mendel – GMI High performance cluster system



# Pilot project introduction



## Project concept

Enable researchers to perform their own data analysis and develop their specific galaxy workflows and pipelines.

## Project Goal

Cover data analysis demand of biotech companies and academia by providing state-of-the-art computational tools.

## Potential end-users

### • Academia

- GMI Groups (Mittelsten Scheid, Djamei, Berger, ...)
- FMPL Groups (Foisner, Ogris, ...)
- IMBA Groups (Ikeda, Mendjan, ...)

### • Biotec

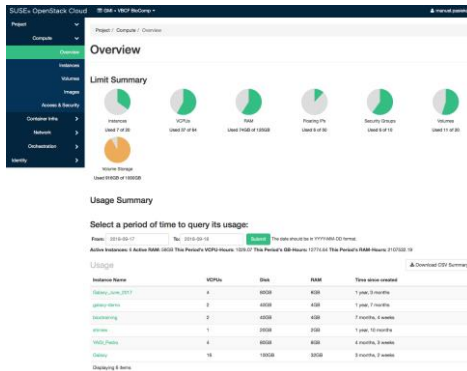
- Accanis
- Evelique
- Phagomed



# Project implementation



- Decentralized system of independent Galaxy instances
- Based Pre-configured Virtual Machine Instances that can be tailored for each client/customer
- Applying state of the art infrastructure-as-a-service (IaaS)
- Hosted on the openstack cloud computing software on Mendel (GMI)



Instance Name	Power State	IP Address	Size	Key Pair	Status	Availability Zone	Task	Phase	Time since created	Actions
galaxy	Running	10.10.10.10	m1.xlarge	galaxy	Active	us-east-1a	None	Done	2 months, 2 weeks	Shutdown
galaxy_2017	Running	10.10.10.11	m1.xlarge	galaxy	Active	us-east-1a	None	Running	3 months	Shutdown
galaxy_2017	Running	10.10.10.12	m1.xlarge	galaxy	Active	us-east-1a	None	Done	7 months, 2 weeks	Shutdown
galaxy_2017	Running	10.10.10.13	m1.xlarge	galaxy	Active	us-east-1a	None	Done	2 months, 2 weeks	Shutdown
galaxy_2017	Running	10.10.10.14	m1.xlarge	galaxy	Active	us-east-1a	None	Done	1 year, 7 months	Shutdown
galaxy_2017	Running	10.10.10.15	m1.xlarge	galaxy	Active	us-east-1a	None	Running	1 year, 10 months	Shutdown



Galaxy



Galaxy



Galaxy



Galaxy



# Benefits



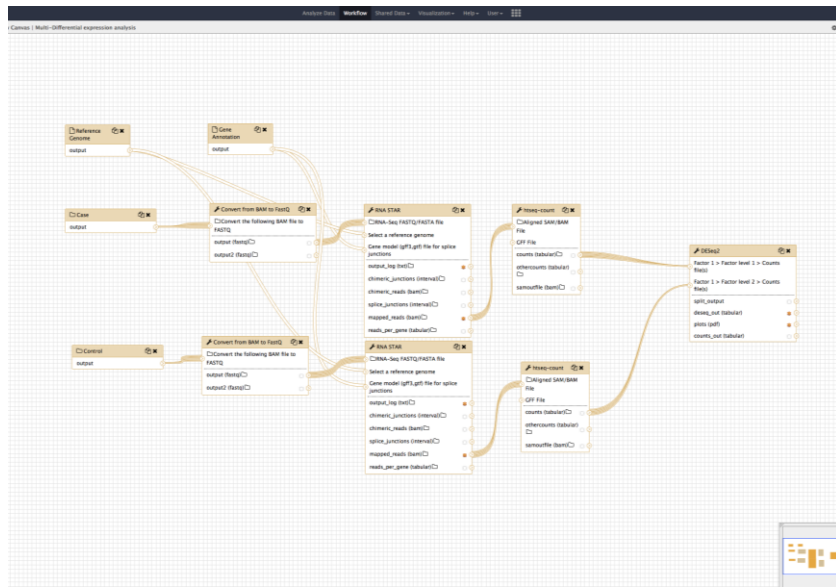
- Easy to scale (number of instances, and instance size)
- Easy to monitor and bill (instances are dedicated to specific groups or customers)
- No conflicting interest and dependencies
- Research groups / customers can take their instance with them
- Instances can be hosted on external / 3<sup>rd</sup> party cloud providers



# Project results

Easy to use web interface providing

- most common bioinformatics tools
- user defined workflows
- installation support for additional tools (toolshed)
- visualization
- reports



Gene	Base mean	log2FC	lfcSE	negLog10P	P-adj
HES6	2.01774901974	-1.11441242845	0.195149847667	41.77161299297	0
HES7	378.84921344929	-5.66493383404	2.9263841788613	13.94342948934	2.065122174371e-14
HES8	1661.646629181	-2.96664870531	2.210446137613	13.01444613761	2.012744701311e-14
HES9	186.71352497481	-3.524294585155	0.3187921399449	11.03397153113	4.021022998877e-28
HES10	484.51131308864	-2.191744418809	0.207712446504	10.31036191746	1.713441174138e-24
HES11	155.96724026879	-5.348052479248	0.3188488973815	10.58385521925	4.282146804323e-28
HES12	1177.0297301128	-2.141138179029	0.241097321128	9.71139513101	1.7471731817467e-21
HES13	564.6452821656	-2.111681587815	0.224882222986	9.60622248864	2.22472021598e-21
HES14	527.645893613	-3.211613073761	0.215022195175	9.24039496101	2.04242427094e-20
HES15	339.6467031884	-1.2182401831801	0.1317892191801	8.131046120674	4.028840498947e-17
HES16	964.79714848813	-2.029210207387	0.224761382322	8.06214422272	1.892718838774e-19
HES17	252.4108876112	-1.248770204570	0.243891881001	8.07763388644	3.928388918282e-18
HES18	151.7339413588	-2.44410971212	0.314795811818	8.761013120668	1.866478182477e-18
HES19	228.8427488214	-1.315707204479	0.134969305497	8.07873103588	3.288498192721e-18
HES20	16021.1786170949	-0.16664511568	0.1110651767274	8.134259598311	8.1224672961762e-17
HES21	133.1021328626	-2.41479388709	0.302188189193	7.866144822297	1.89938810201e-15
HES22	74.48242812094	-2.887717948122	0.32147131772	8.01168449111	1.902778862796e-17
HES23	487.72882329518	-2.04811811811	0.2848871789273	7.88095801613	3.920649683101e-15
HES24	791.32020913503	1.556241019481	0.201761137274	8.186138481718	1.48491401541e-15
HES25	313.0470184219	-2.36868102183	0.3071222199128	-7.81397285481	5.38149591875e-15
HES26	88.2149188112	-1.21192481812	0.121113177851	-7.51681818812	1.78819179421e-13
HES27	224.2388291312	-1.287681781616	0.282837848811	-7.89118913516	1.7200214828918e-12
HES28	75.72491474621	-2.402211744819	0.324744822919	-7.82242449224	1.97132176071e-14
HES29	264.7359282791	-1.94661761201	0.261848432115	-7.86726488418	1.55051212220e-13
HES30	50.24831488815	-2.170281188484	0.241787488881	-7.89144444418	1.872118622881e-13
HES31	51.14811021813	-2.11038448819	0.241110111112	-7.81561121213	1.64887787878e-13
HES32	318.0174881618	-2.242221024818	0.24178748881	-7.81561121213	1.277961007118e-13
HES33	198.4817738182	-2.28961841813	0.24178748881	-7.81561121213	1.277961007118e-13
HES34	288.0174881618	-2.242221024818	0.24178748881	-7.81561121213	1.277961007118e-13
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HES36	187.1881881817	-1.938891021238	0.222107188187	-7.81561121213	1.277961007118e-13
HES37	141.1881881817	-1.91710881817	0.24178748881	-7.81561121213	1.277961007118e-13
HES38	181.87841881817	-1.938891021238	0.222107188187	-7.81561121213	1.277961007118e-13
HES39	471.1418177121	1.31877481817	0.3187921399449	8.1818181817	4.422102181771
HES40	798.44661308117	1.3187921399449	0.2073801824128	8.54880510318	3.9718684829e-11
HES41	11.7881881817	1.3187921399449	0.2073801824128	8.54880510318	3.9718684829e-11
HES42	148.1881881817	-1.9448181817	0.282107188187	-8.2478481817	1.277961007118e-13
HES43	792.7241881817	0.912221024818	0.121113177851	8.41877241881	1.41477781481e-13
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HES47	184.1881881817	-1.9448181817	0.282107188187	-8.2478481817	1.277961007118e-13
HES48	184.1881881817	-1.9448181817	0.282107188187	-8.2478481817	1.277961007118e-13
HES49	184.1881881817	-1.9448181817	0.282107188187	-8.2478481817	1.277961007118e-13
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HES60	184.1881881817	-1.9448181817	0.282107188187	-8.2478481817	1.277961007118e-13

Hello and welcome to the GM!

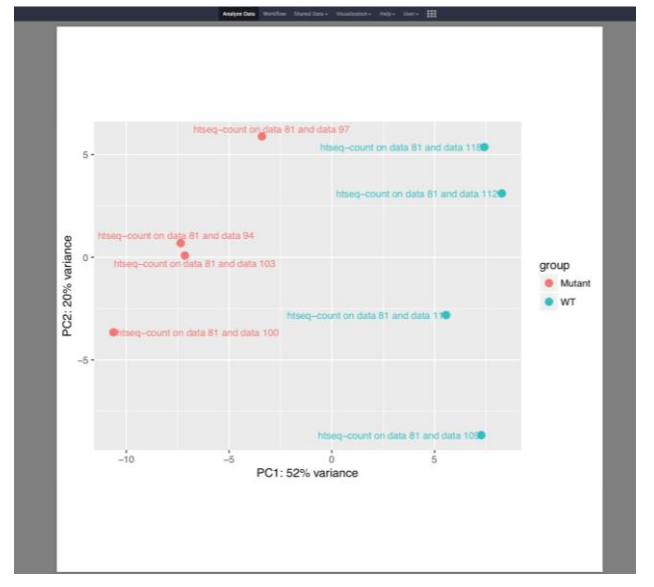
Galaxy is an open source, web-based platform for data intensive biomedical research. It enables scientists without informatics or programming expertise to perform computational analyses through the web. You will be able to upload and run analysis on your data through the browser, without having to install any tools or deal directly with the underlying computational infrastructure at the GM! (i.e. high performance computing and network storage).

This instance of Galaxy is running locally on the GM's servers. It was installed and configured by the Bioinformatics and Scientific Computing facility of the VBCF. For questions or requests, you can contact the [galaxy-admin](#).

GM! bioComp VBCF European Union Interreg Austria-Czech Republic

New to Galaxy? You may also want to take some of our interactive tours: [Galaxy 101](#) [History](#) [Screenshots](#).

About Galaxy Galaxy is developed by the Galaxy Team with the support of many contributors. The Galaxy Project is supported in part by the European Union, the Czech Republic, the Ministry of Education, Youth and Sports of the Czech Republic, and the Austrian Science Fund FWF.



Galaxy – Bioinformatics Computing Platform

# Staff exchange



Person	Organizing project partner	Date	Monitoring period	No of participants	No of person-days
Manuel Pasieka to CEITEC-MU	VBCF	29.09. - 02.10.2017	3	1	2
Attila Gyenesei, Bence Galik, Sini Junntila, Andras Aszodi, Pedro Serrano, Manuela Pasieka to CEITEC-MU	VBCF	23.-24.08.2018	4	6	12
Jan Oppelt to VBCF	CEITEC-MU	20. - 27. 11. 2017	3	1	8