GraphSpace: Stimulating interdisciplinary collaborations in network biology

Aditya Bharadwaj, Divit P. Singh, Anna Ritz, Allison N. Tegge, Christopher L. Poirel, Pavel Kraikivski, Neil Adames, Kurt Luther, Shiv D. Kale, Jean Peccoud, John J. Tyson and T. M. Murali

Bioinformatics, in press, 2017

July 22nd, 2017

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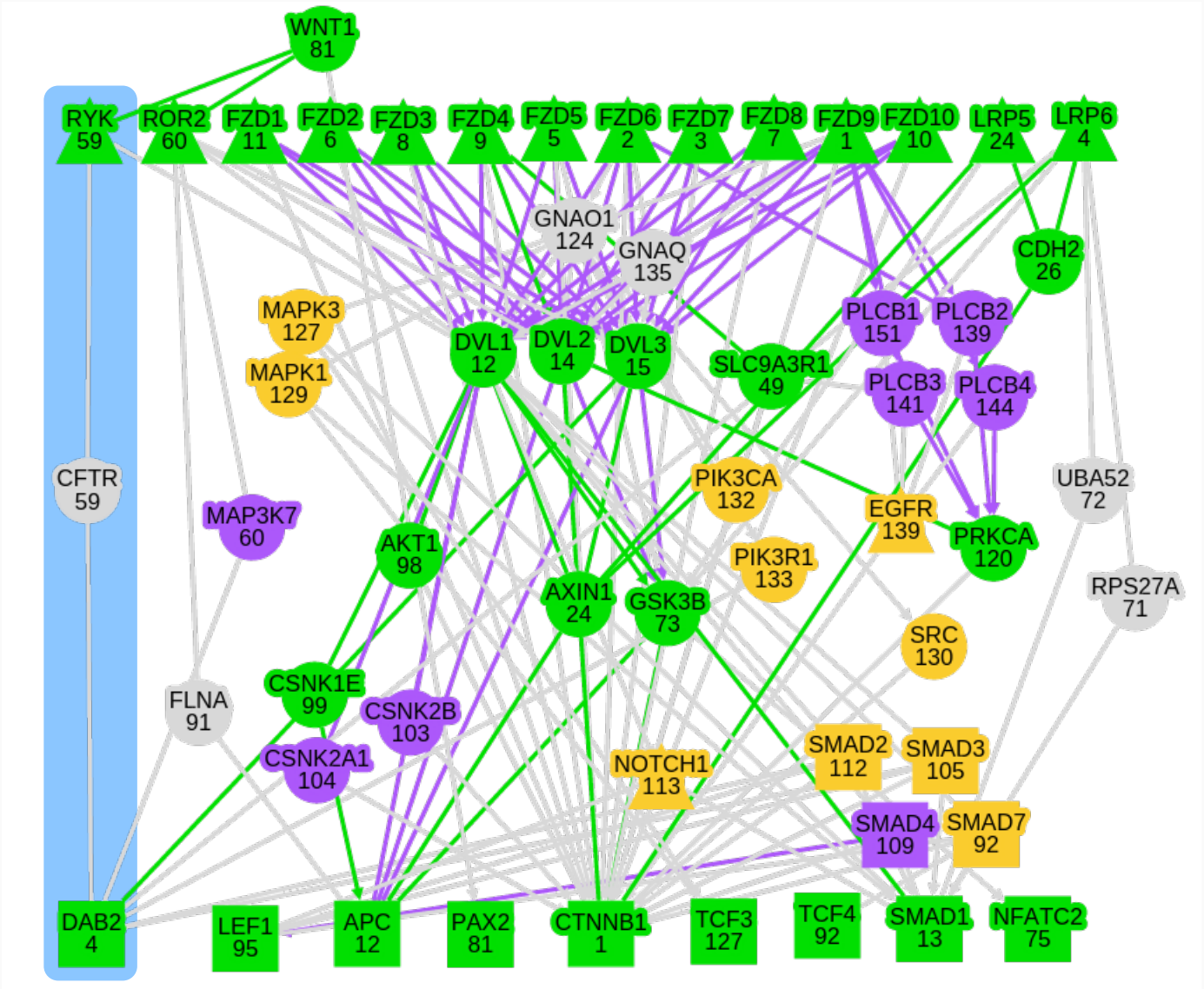
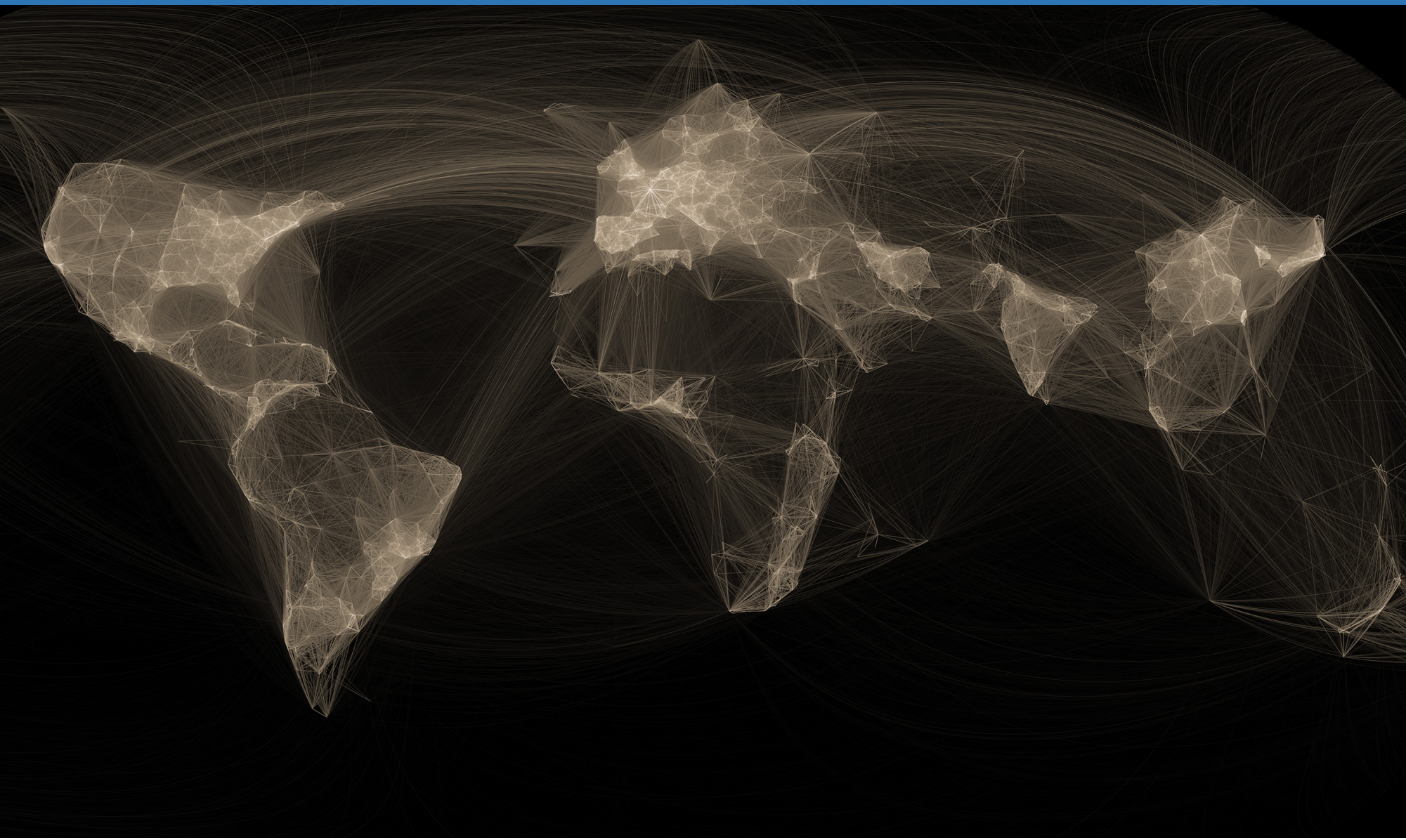
Virginia Tech, Blacksburg, USA

Networks are Ubiquitous in Systems Biology



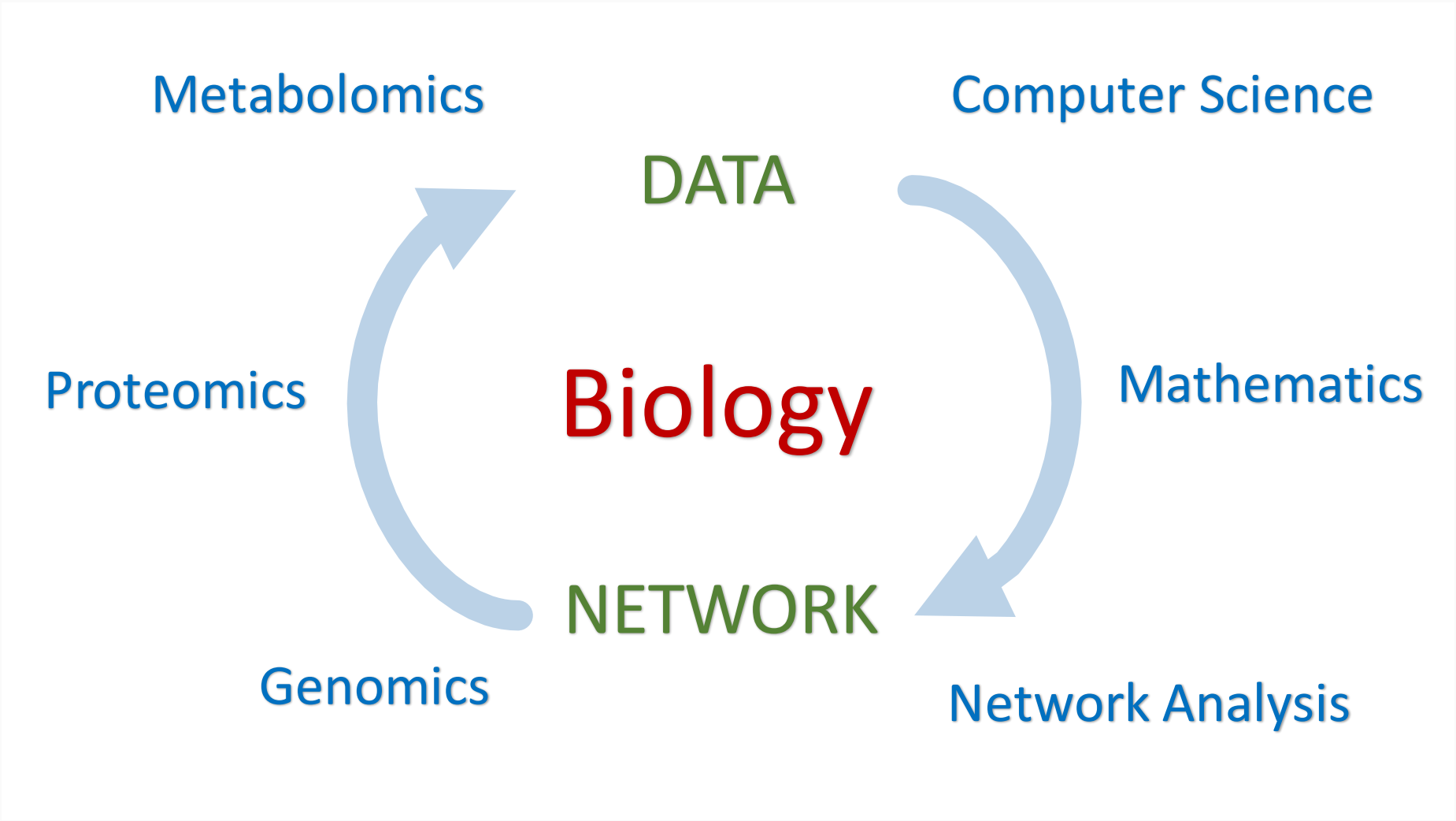
Ritz et al., Pathways on demand: automated reconstruction of human signaling networks. npj Systems Biology and Applications, 2 (2016): 16002.

Research is increasingly collaborative

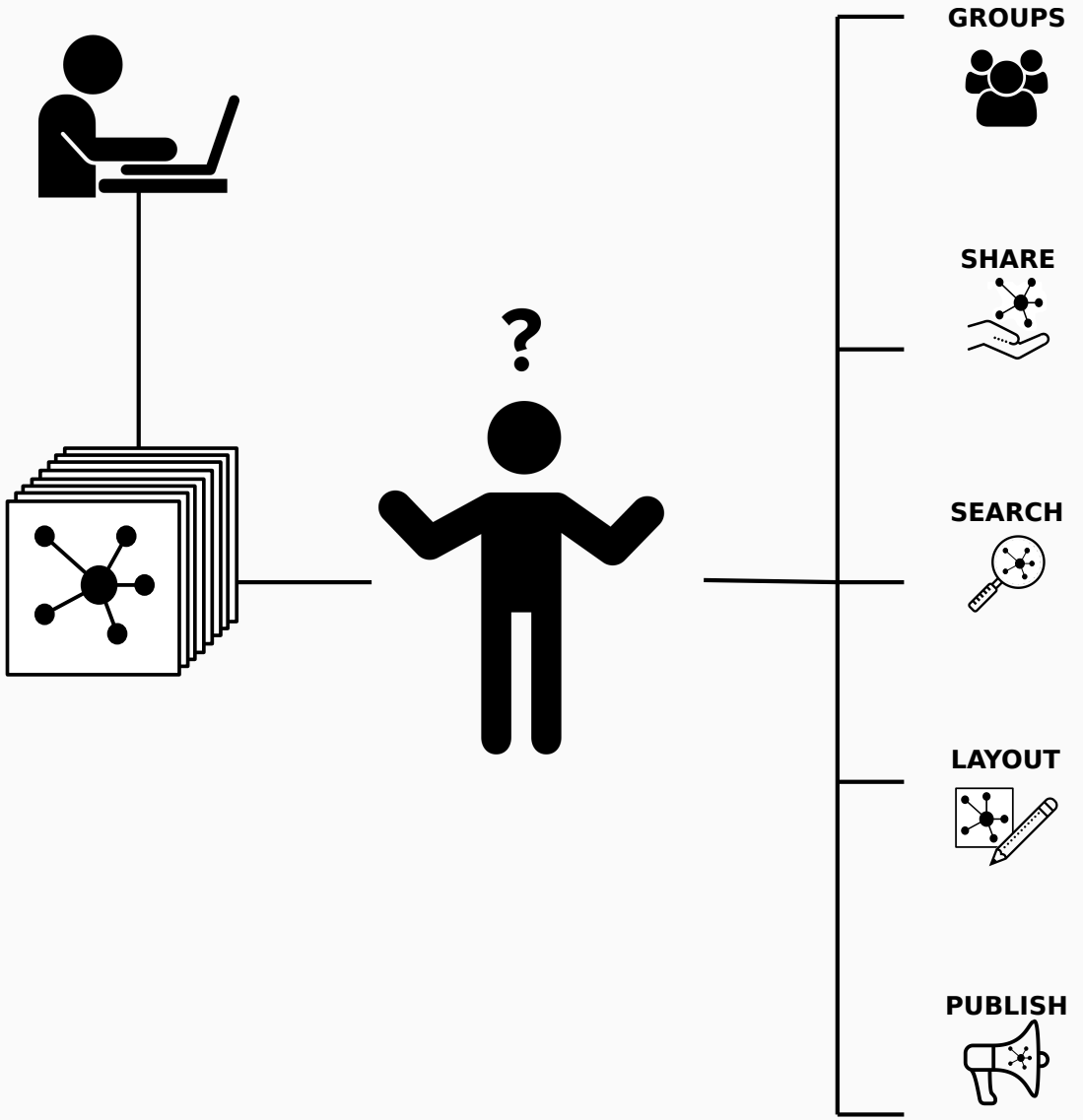


Olivier H. Beauchesne, Map of scientific collaboration (Redux!), 2008-2012

Research is increasingly interdisciplinary

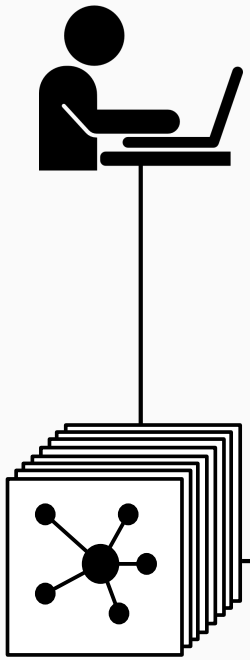


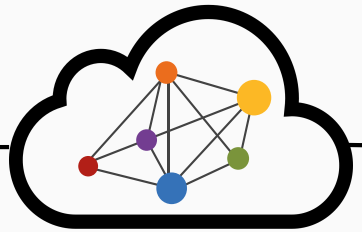
But collaboration is still painful!



Challenges faced by interdisciplinary research teams in network biology

GraphSpace Features





graphspace.org

GROUPS

Create groups and add/invite your collaborators.

SHARE

Share your networks and layouts with one or more groups.

SEARCH

Search for networks with a given property or that contain a specific node or collection of nodes.

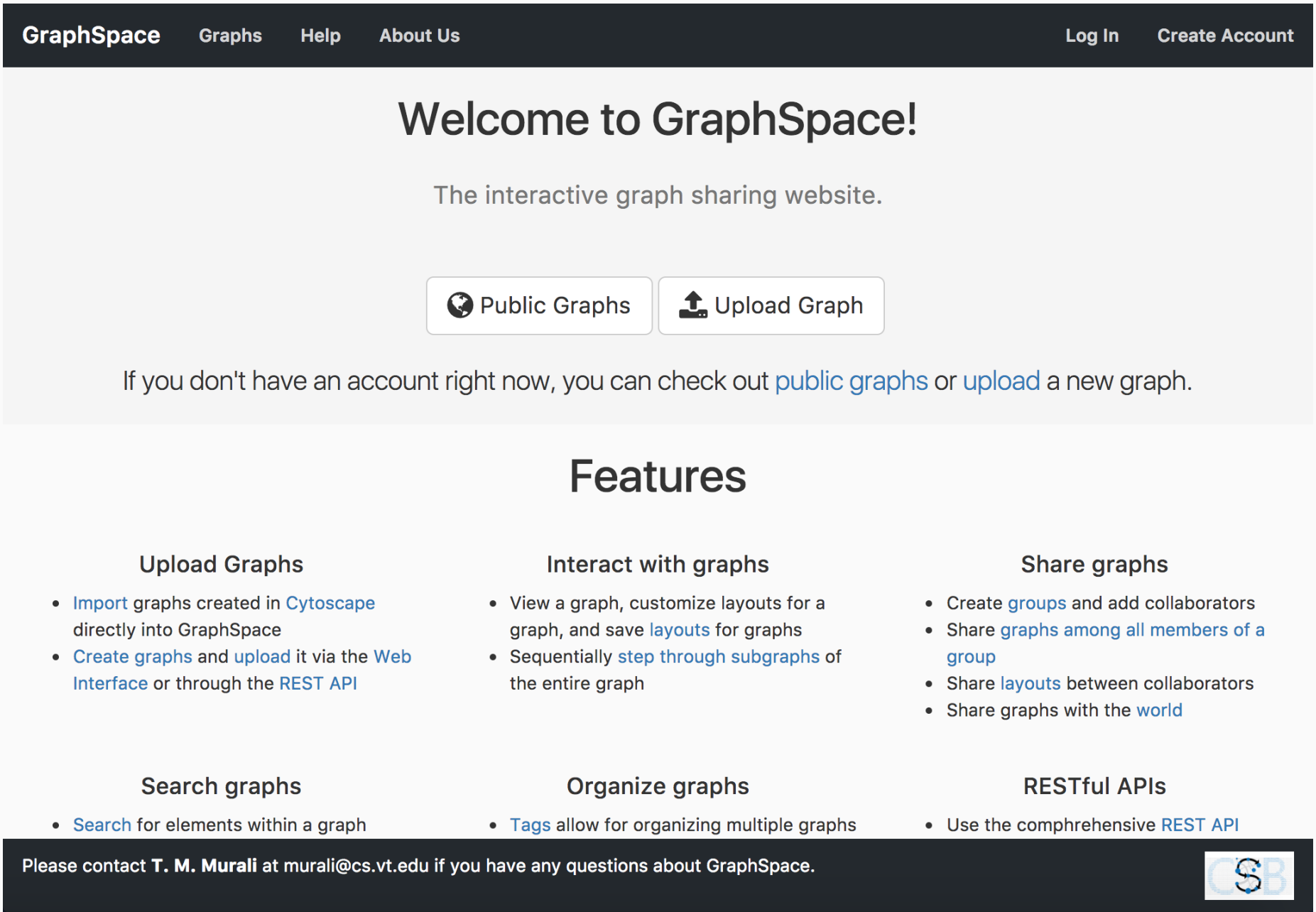
LAYOUT

Use a powerful layout editor to move nodes, edit network style and save new layouts.

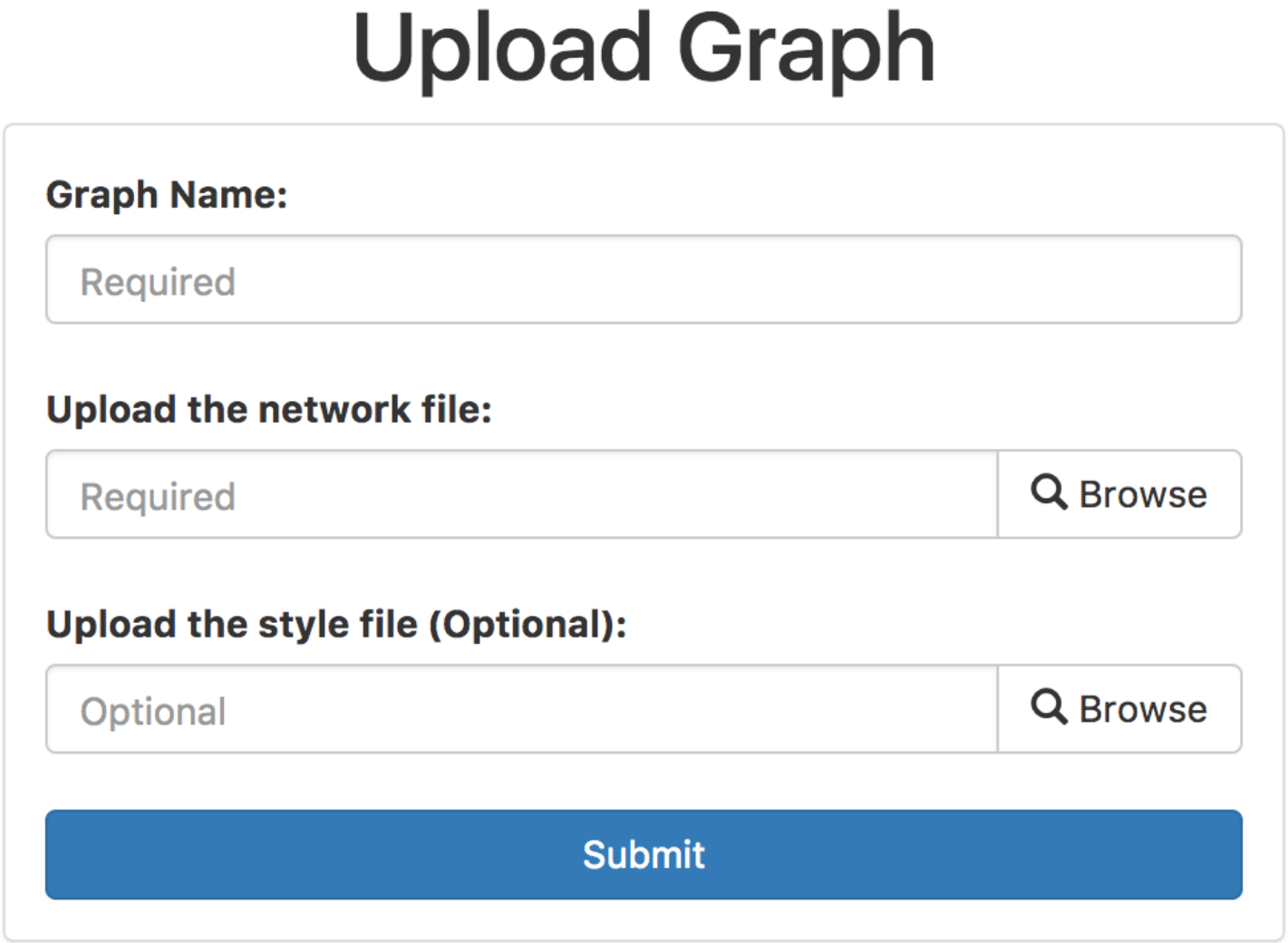
PUBLISH

Share your networks with the scientific community.

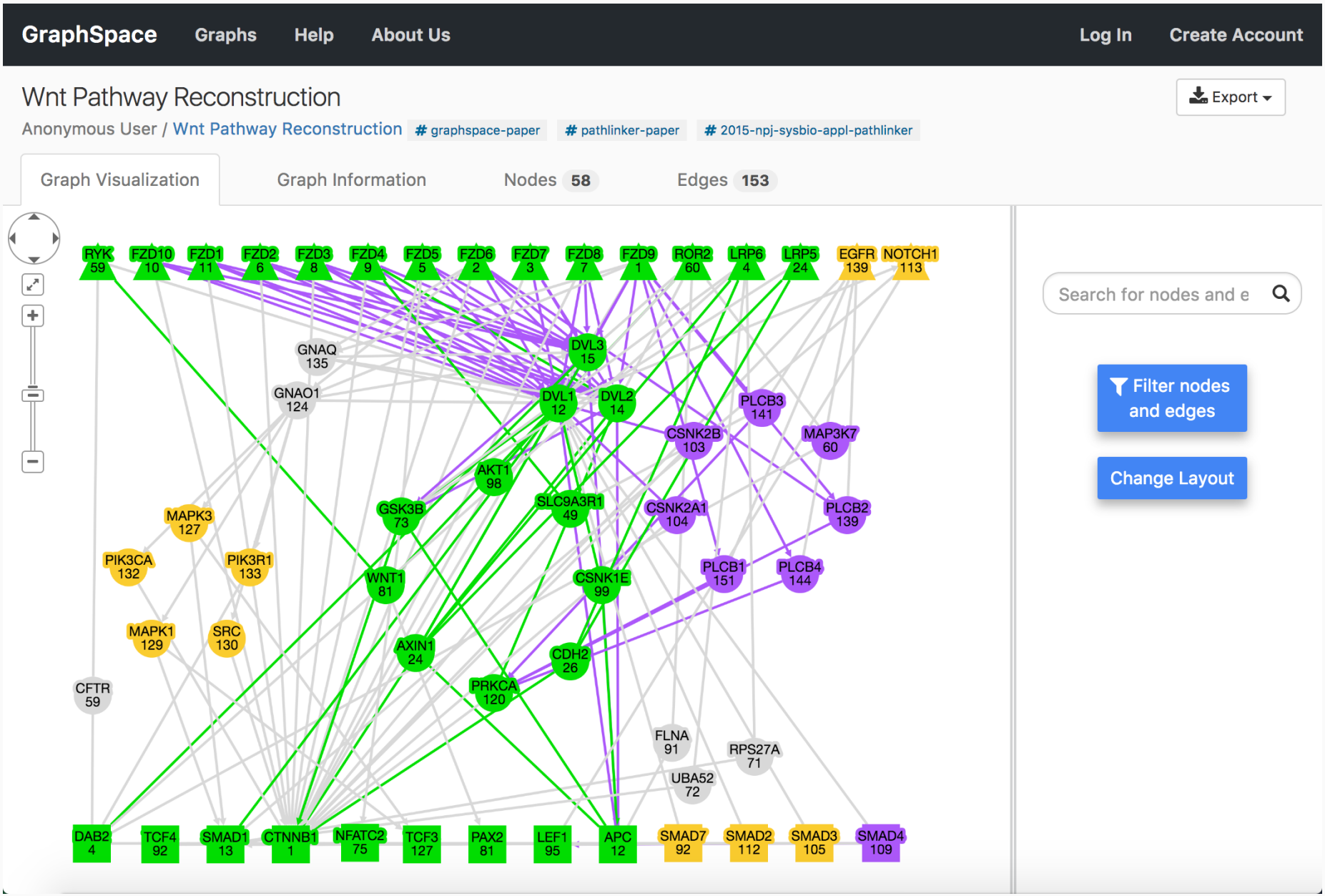
Free to use at www.graphspace.org



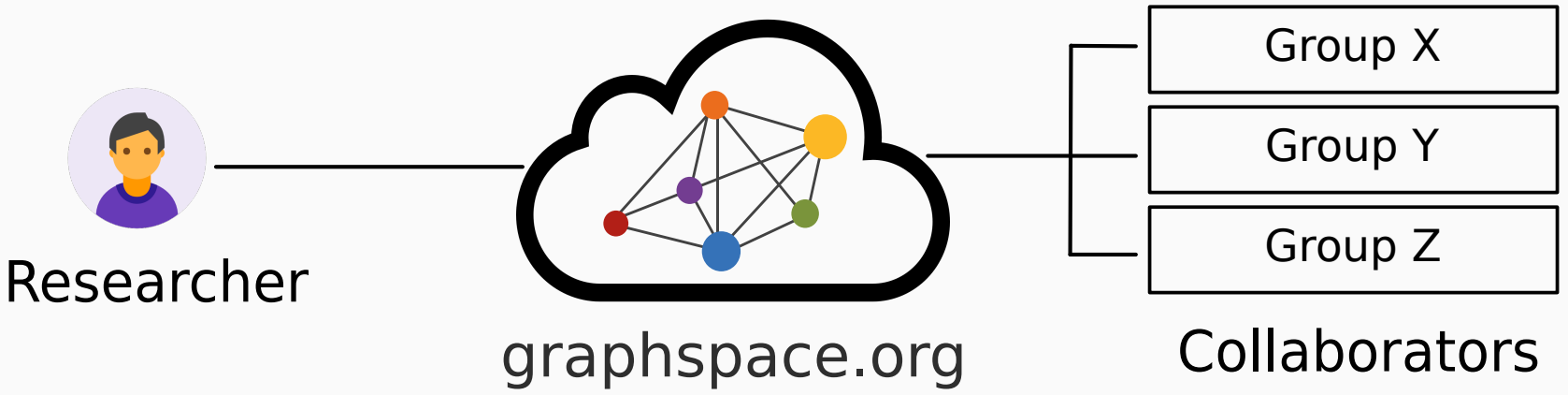
Easy to upload graphs



Access networks via unique URLs



Create groups



Group Name:

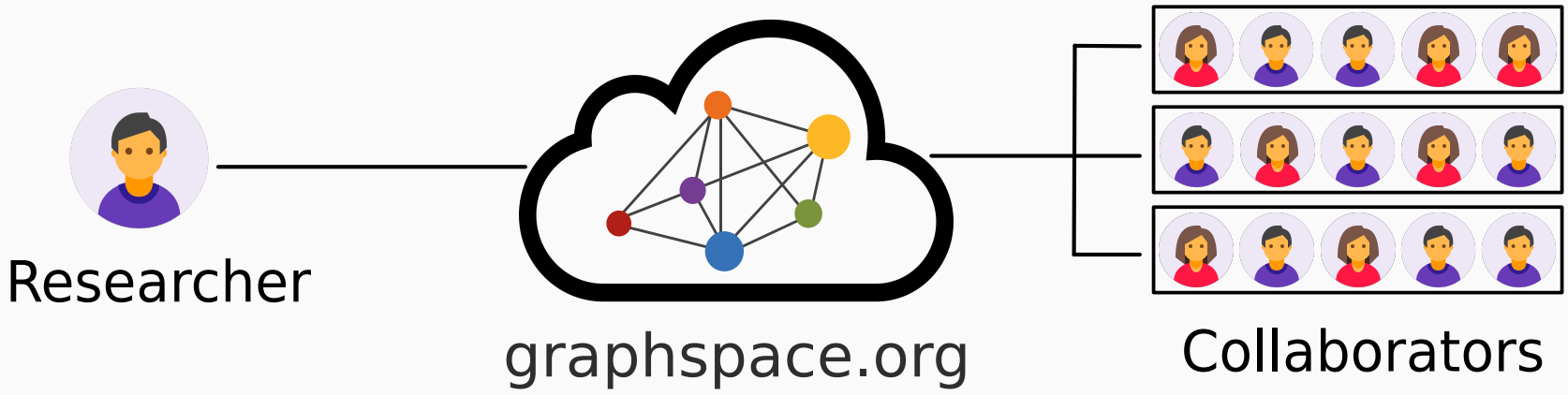
2015 PathLinker Reconstructions

Group Description:

PathLinker reconstructions for the Nature Methods

Create Group

Add/Invite collaborators



Add group member by email id

Enter email id.....

Submit

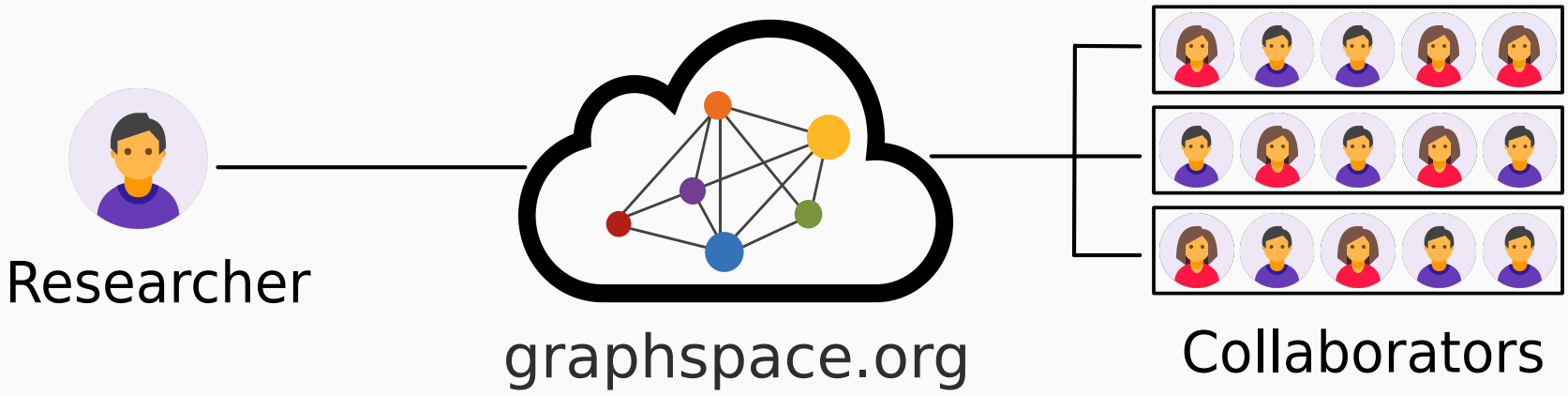
OR

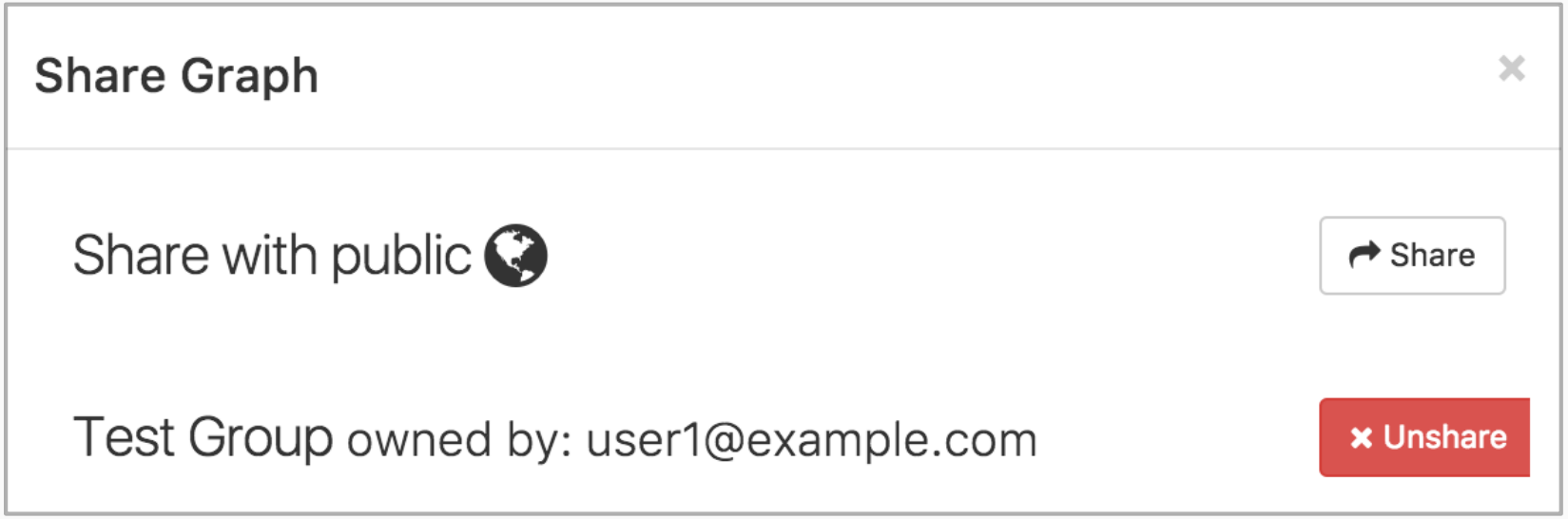
Send this signup link to your group members

Using the following link, new members can join this group on GraphSpace.

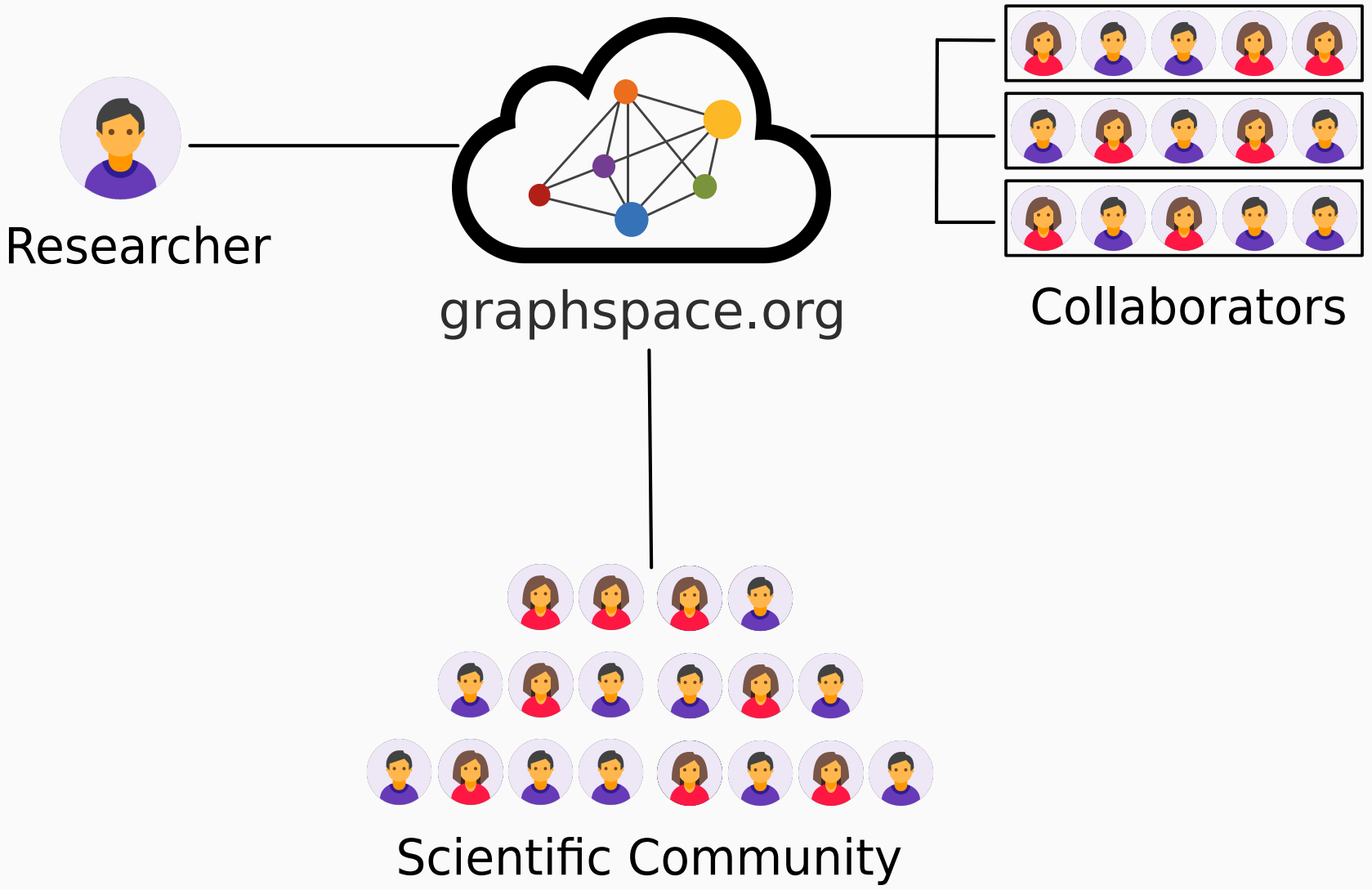
`http://graphspace.org/groups/46/join/?code=FHCY?U7PF7`

Share networks

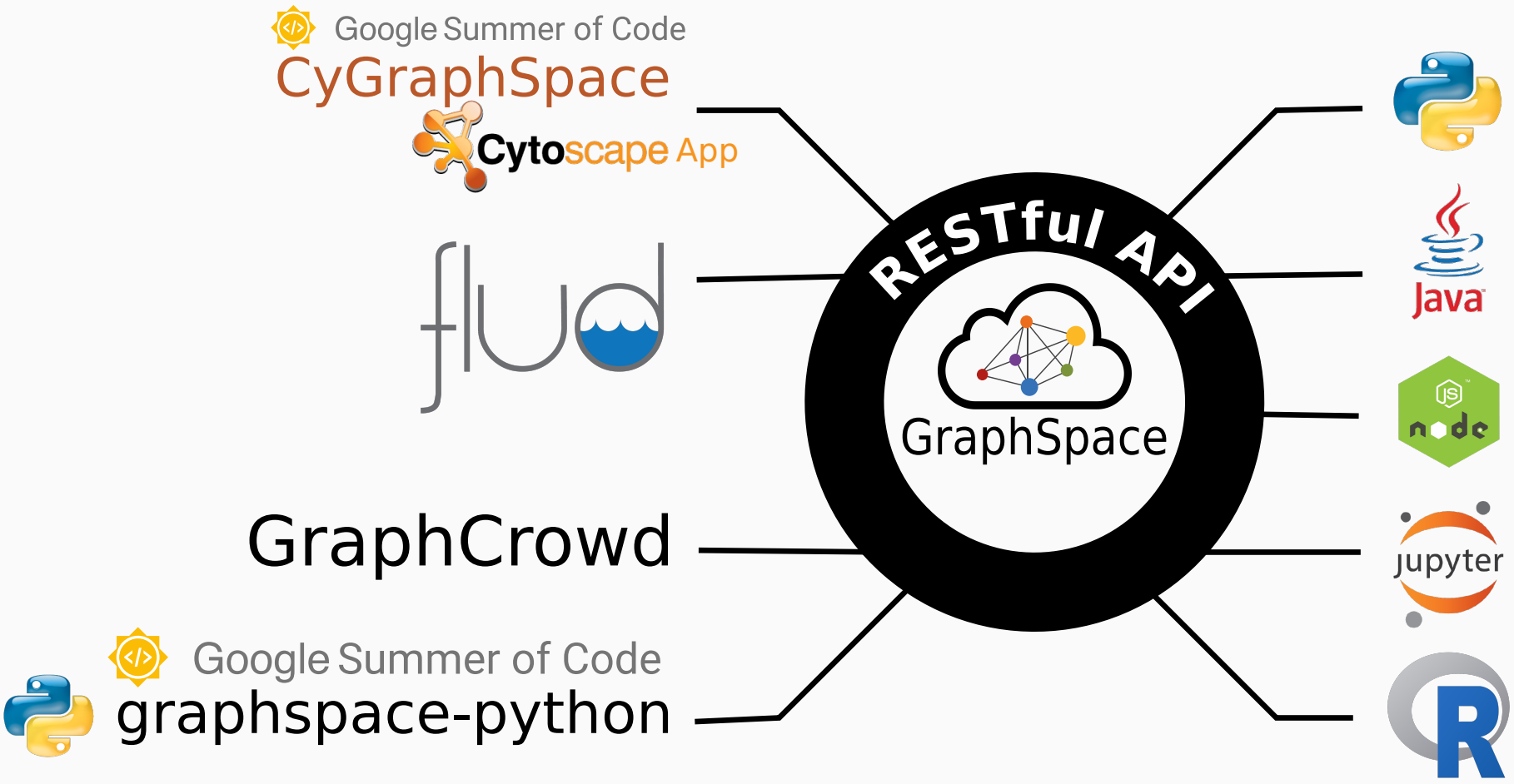




An online collaborative platform



Use GraphSpace as a service



Poster A-151

GraphSpace is growing

- 21000+ Graphs
- 300+ Users
- 90+ Groups

Contact Information

- **Mail**: adb@vt.edu
- **Website**: adityabharadwaj.in

GraphSpace
www.graphspace.org

Stimulating interdisciplinary collaborations in network biology

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Collaboration among

VirginiaTech *Invent the Future*

BACKGROUND

Despite the existence of several software systems and interfaces to analyze and view networks, interdisciplinary research teams in network biology find it challenging to share, explore, and interpret computed networks in their collaborations.

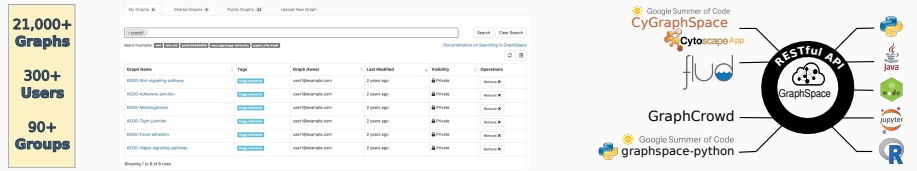
GraphSpace is a web-based platform that fosters team science by allowing collaborators to easily store, share, interact with, and lay out networks.

GRAPHSPACE FEATURES

STORE Save your networks online and access them anytime, anywhere, and on any device

SEARCH Search for networks with a given property or that contain a specific node or collection of nodes

SERVICE GraphSpace exposes its functionality via easy-to-use RESTful APIs



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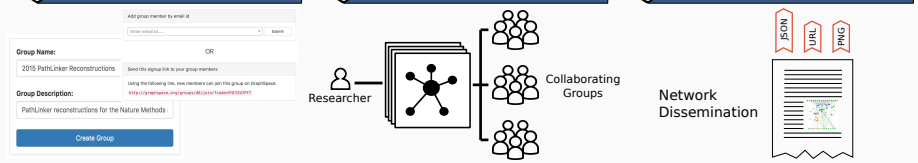
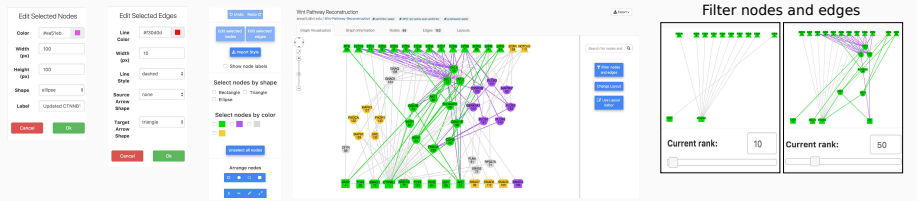


LAYOUT Use a powerful layout editor to move nodes, edit network styles, and save new layouts

VISUALIZE Visually explore your network

INTERACT Sequentially step through subgraphs of the entire network



FUTURE DIRECTIONS

- **Plug and play algorithms** providing a single platform for algorithm development.
- **Automated personalized layouts** generated by learning user preferences from previous layouts.
- **Crowdsourced layouts** generated by citizen scientist via integration with plaforms like Zooniverse and MTurk.

FUNDING

DBI 1062380

R01 GM095955, UH2CA203768

GET INVOLVED

- Web: http://bioinformatics.cs.vt.edu/ murali/
- Email: murali@cs.vt.edu
- Github: https://github.com/Murali-group/GraphSpace/

ACKNOWLEDGEMENTS

We would like to thank **NRNB** and **Google Summer of Code**.

Google Summer of Code NRNB