



# Trackster

(The Galaxy Track Browser)

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# Why another genome browser?

## Galaxy

- ✦ tool integration framework
- ✦ heavy focus on usability
- ✦ sharing, publication framework

## Genome Browser

- ✦ physical depiction of data
- ✦ visually identify correlations
- ✦ find interesting regions, features



Trackster

The diagram consists of three light blue rounded rectangular boxes on a black background. On the left, there are two boxes stacked vertically. The top box is titled 'Galaxy' and contains three bullet points: '✦ tool integration framework', '✦ heavy focus on usability', and '✦ sharing, publication framework'. The bottom box is titled 'Genome Browser' and contains three bullet points: '✦ physical depiction of data', '✦ visually identify correlations', and '✦ find interesting regions, features'. To the right of these two boxes is a larger light blue rounded rectangular box titled 'Trackster'. Two orange curved arrows point from the right side of the 'Galaxy' box and the right side of the 'Genome Browser' box towards the 'Trackster' box, indicating that Trackster incorporates or builds upon the features of both Galaxy and Genome Browser.

# Trackster

User-friendly, Web-based visualization for NGS

Integrates visualization and analysis

Can share & publish working visualizations

# NGS datasets on the Web

# So. Much. Data.

NGS datasets are often GBs, so cannot load them all at once

Need to load data on demand

- ✦ IGV and Savant on the desktop...  
...and now Trackster on the Web

# Viewing and Navigating

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Trackster automatically indexes via Galaxy

Complete customization

- ✦ custom builds!

Continuous and smooth scrolling

# Integrating Analysis and Visualization



# NGS Analysis Challenges

Complex tools, parameter dependent

Analysis and visualization not integrated

Want to be able to experiment

# Experimentation in Trackster

# Experimentation in Trackster

Tools integrated in visualization environment

Dynamically filter:

- ✦ visually identify features that match ranges
- ✦ on whole dataset

Run tools:

- ✦ quickly on visible region
- ✦ on whole dataset

# Compatible Tools

Filtering tools

Genomic interval tools

Modified Cufflinks

Key requirement:

- ✦ local model
- ✦ access to global model

# Your Tools with Trackster

## local model

- ✦ ready to go!

## global model

- ✦ store and retrieve global model
- ✦ support filtering -- decorate data with attributes

# Sharing and Publishing

# Visualization as Communication

Communication paramount

- ✦ biomedical/genomics research is big
- ✦ majority of publications use visualization

“A picture is worth a 1000 words.”

***A fully-interactive visualization is worth many more words***

# Sharing Trackster Visualizations



# Sharing Trackster Visualizations

Uses Galaxy's sharing/publication framework

Via URL or can be embedded in a Page

Visualization is fully functional

# Looking Forward

## Scalability

- ✦ Very large datasets
- ✦ many tracks at once

## General visual interface for running tools

- ✦ alternative way to view Galaxy history
- ✦ easier experimentation

# Trackster Summary

User-friendly, Web-based visualizations for NGS

Experimentation with tools, parameter values  
to improve analyses

Can share & publish visualizations to the Web

# Thanks! Questions?

**[http://main.g2.bx.psu.edu/visualization/list\\_published](http://main.g2.bx.psu.edu/visualization/list_published)**

<http://main.g2.bx.psu.edu/u/jeremy/v/gcc2011-1-viewing-and-navigating>

<http://main.g2.bx.psu.edu/u/jeremy/v/gcc2011-2-dynamic-filtering>

<http://main.g2.bx.psu.edu/u/jeremy/v/gcc2011-3-running-tools>