(Exoplanets)
Process Book

(New Project Plan)

7 November 2016

As we sat down to put together our data, we realized the limited scope of our specified platform. We aimed to grasp cyber culture by assessing viral content on the Internet, and wanted to map the results to different cities around the world. We realized that our goal was very abstract, and that the methods we planned to employ didn't correlate with the overall theme of the project—there isn't accessible, tangible data for our original idea.

After finding a dataset of exoplanets in the universe, we came up with a new idea that is more compelling: visualizing space. Specifically, we have data on thousands of planets in the galaxy that pose as potential hosts for life. We are now pursing a project that will visualize the possibilities of extraterrestrial life in the universe. This idea is more rewarding to visualize than mapping internet trends, and is a promising basis for a memorable user experience. We are excited to move forward.

Preliminary inspiration (street culture):

bape.com + Add Competitors

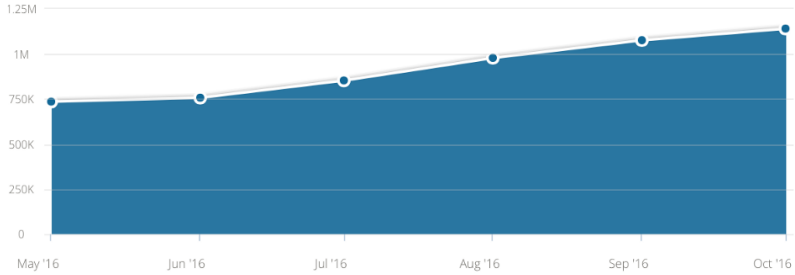
Traffic Overview

Estimated Data Claim Your Website

Total Visits

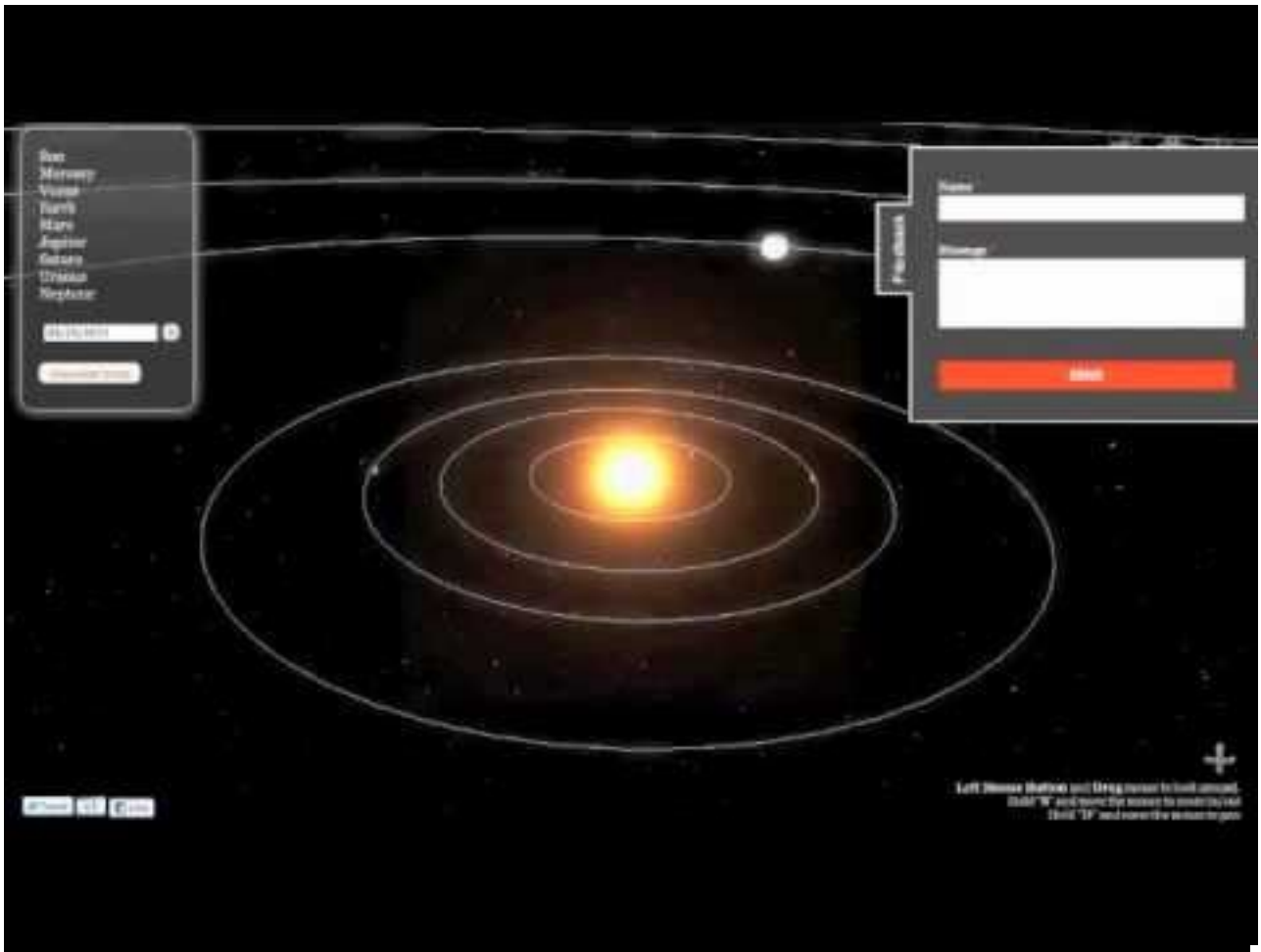
On desktop & mobile web, in the last 6 months

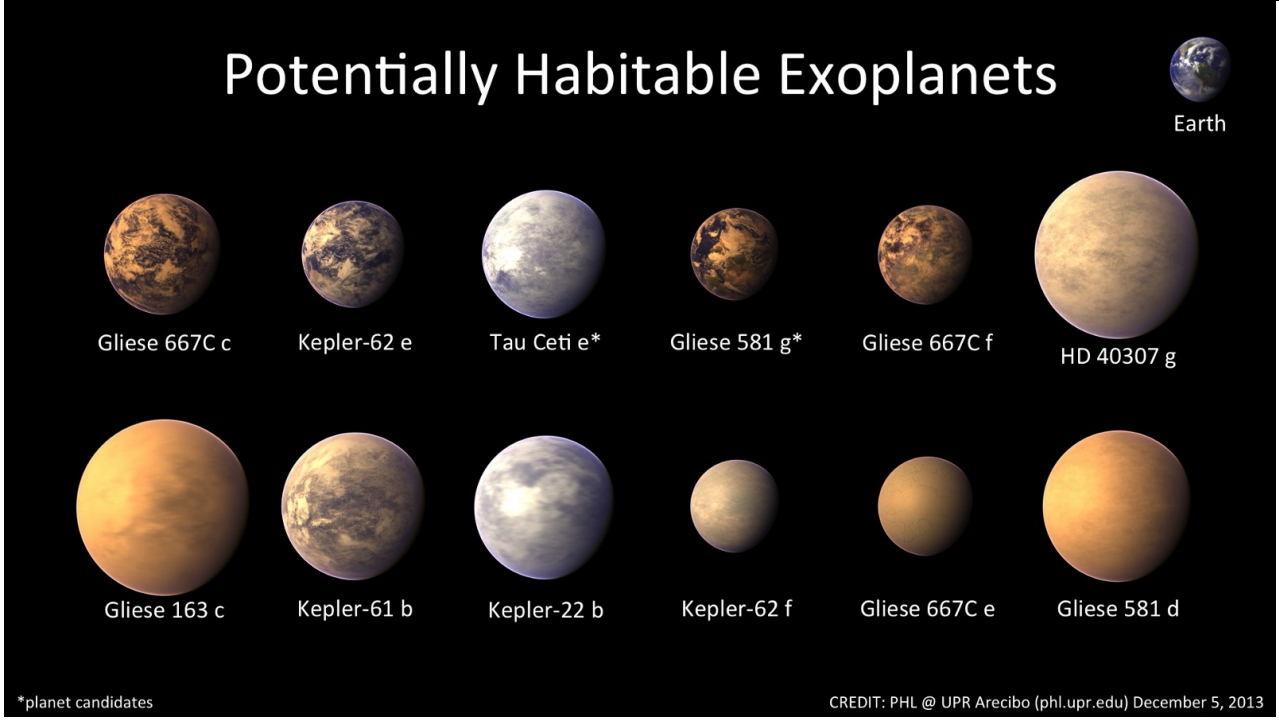
Embed Graph



Engagement

Total Visits	1.1M ▲ 5.98%
Avg. Visit Duration	00:03:30
Pages per Visit	7.46
Bounce Rate	29.00%

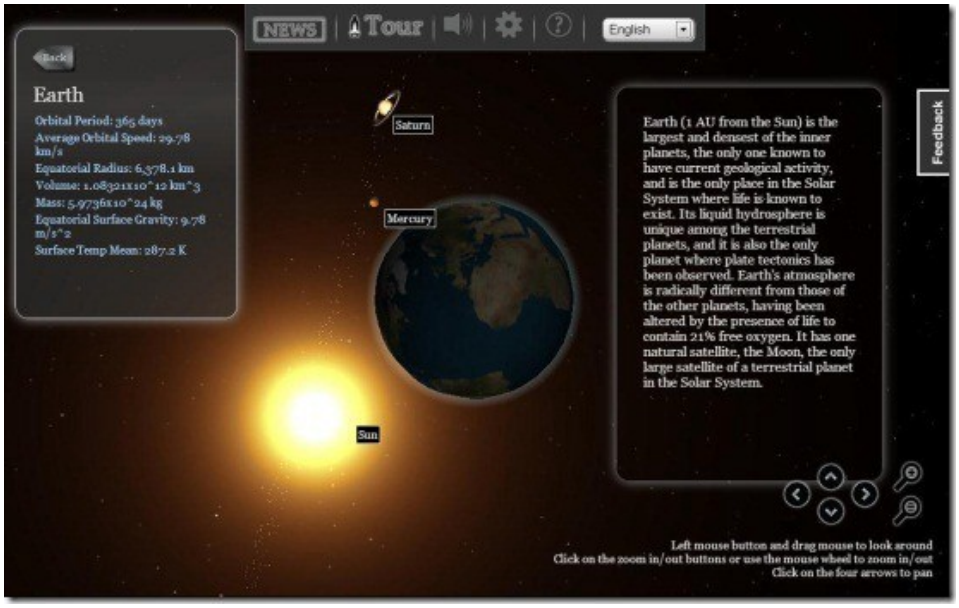



Potentially Habitable Exoplanets
Earth
Gliese 667C c
Kepler-62 e
Tau Ceti e*
Gliese 581 g*
Gliese 667C f
HD 40307 g
Gliese 163 c
Kepler-61 b
Kepler-22 b
Kepler-62 f
Gliese 667C e
Gliese 581 d
*planet candidates
CREDIT: PHL @ UPR Arecibo (phl.upr.edu) December 5, 2013

(Data Prelims & Brainstorm)

10 November 2016

In class, we explored some customization options to improve readability of visualizations that have unfriendly datasets. The example was a bar graph with extremely small and extremely large values, in which Henrik demonstrated a custom axis zoom for improved readability. We have a similar problem in one of our visualizations, which shows over 4000 planets in relation to Earth. The only problem is that planets are all extremely far (even when we use the AU system).
We need to come up with something like this:



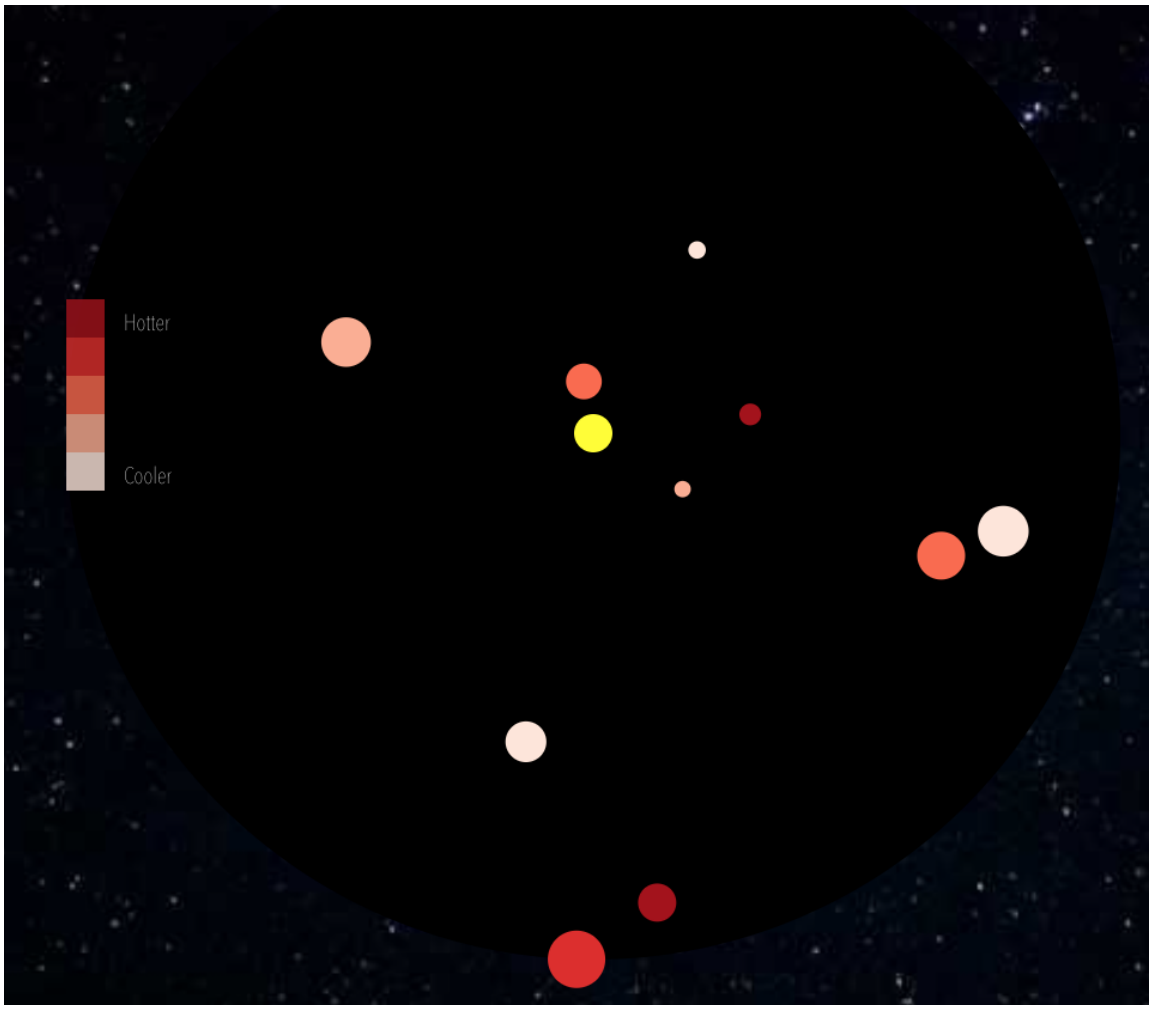
We are aiming to implement a zoom in one of two ways. The first would be to have the earth as a center, with planets rotating around based on their distance from us. The zoom would focus on subsets of the entire dataset (for zooming in) and would show the entire model when fully zoomed out. The second is to depict the galaxy, with node clusters based on location of exoplanets. Clicking on the area would show all the relevant planets in that area. This would be a more organic approach, although it would be challenging to implement.

(Orbit Visualization)

13 November 2016

We started implementing this weekend by dividing visualization between members, and one member taking care of the web skeleton. At this point in time, the project is rough, but the overall anatomy of the site will be somewhat similar to the outline we've submitted. We have the macro-view of the planets orbiting (around Earth for improved readability) and all filters all to scale. We sped up the orbital periods (some move very very very verrrrry slow) while keeping the scales proportional to give a more appropriate animation. Also, the data set was scraped and cleaned for easier use during development.

As far as the website, the colors are subject to change once we implement the pieces of the project. We are sticking to blacks, grays, and celestial colors for a resonant design, but will make final decisions on them as we progress. We plan on including a good amount of parallax and UX effects in combination with the orbiting planets, and although there is 1 dimensional parallax implemented currently, I plan on developing multi-layer parallax animations during the onboarding for higher shock value.

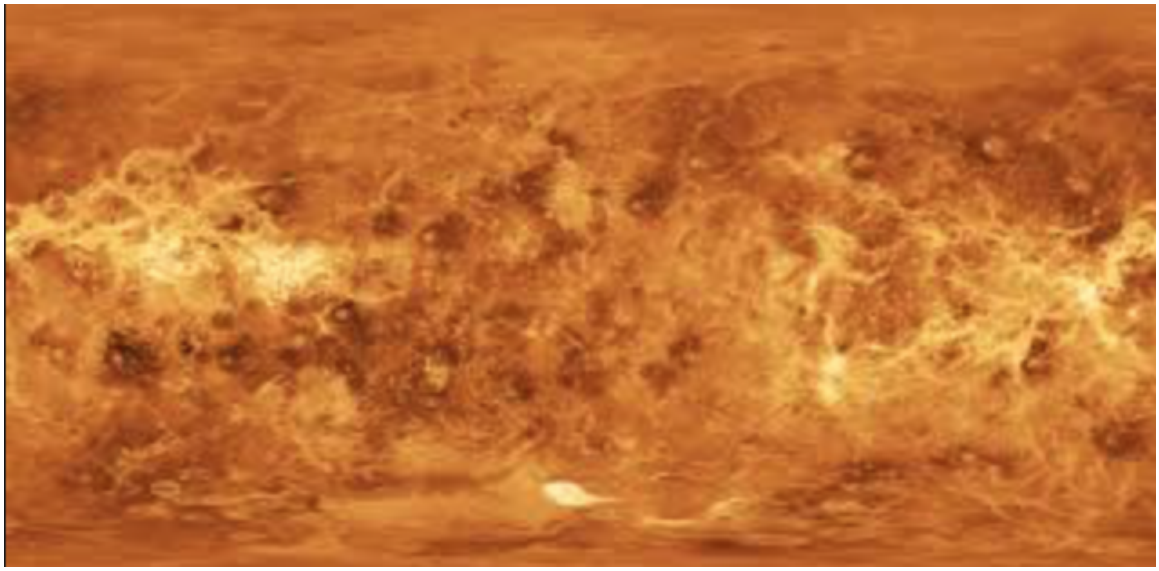


We are excited to continue the project, and narrow the scope of details as we make progress. We look forward to the second prototype.

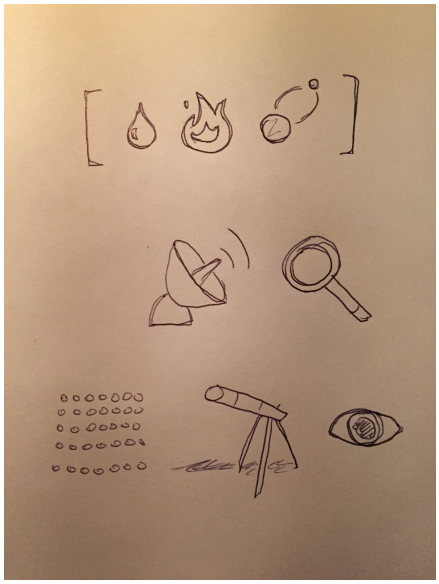
(3D Texture Maps)

28 November 2016

We've made substantial progress from our first prototype. We were able to add 3D planets in multiple areas (in the introduction and the planet profile view) to give our readers a memorable experience. We mapped textures to the surfaces, and have them orbiting with parallax stars behind for effect. We drew inspiration from three.js, as well as a web developer who rendered our local solar system. (http://learningthreejs.com/blog/2013/09/16/how-to-make-the-earth-in-webgl/)

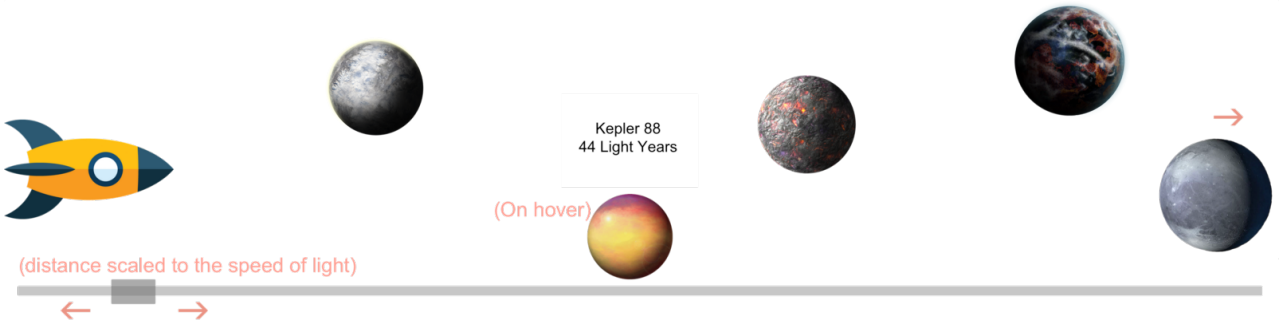


We've reordered the storytelling aspect, as new content has been implemented which calls for reorganization of the introduction. We've adopted a back-and-forth parallax and solid div pattern to keep things interesting to our users. We plan on making custom iconography, similar to the sketches done below:



By doing so, we will add a custom feel to our site, and design the iconography on Photoshop or illustrator. Since images are limited on the internet, we do not want to compromise a perfect fit through google images.
We are deciding on a few final visualizations. One will show the

realistic time it takes to reach these planets, which will segway into the ‘future exploration’ section to orient readers of the relevancy of the topic we are pursuing.

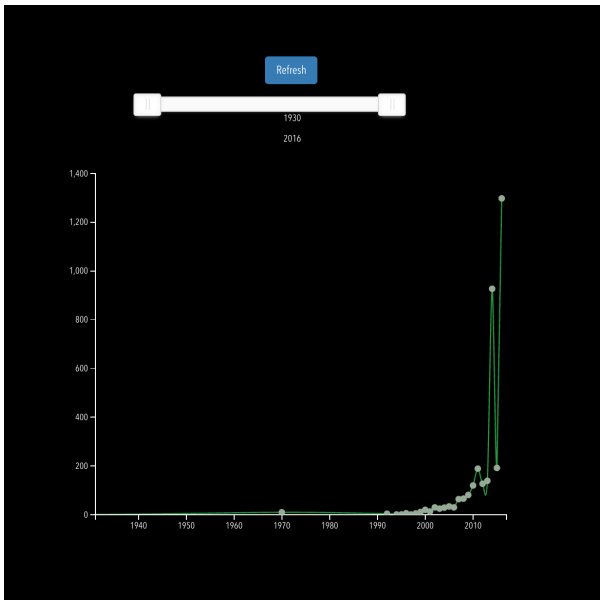


We are pretty far along, and are looking forward to implementing the last functional details before really digging deep into the design once the product is done. Looking forward to next week!

(Storytelling Onboard Strategy)

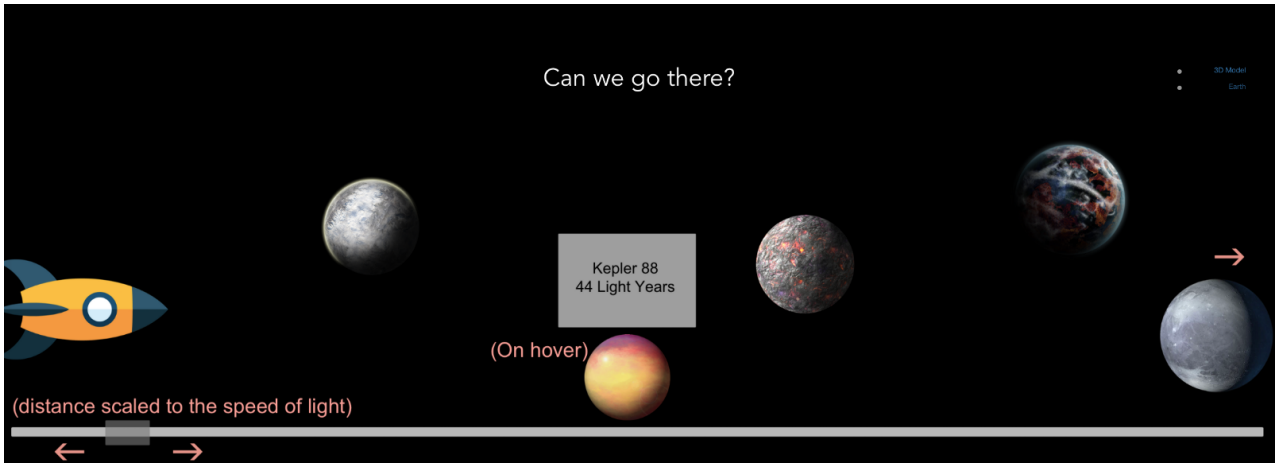
1 December 2016

After receiving feedback from section, we decided to make a few alterations to our website. Our story-telling aspect has changed on a weekly basis, depending on the content we choose to add and remove. We started off from going to specific to broad, but we are changing the intro storytelling from broad to specific. One of the most important changes was based on a comment in class about the number of exoplanets.
We moved the exploration visualization from the outro to the intro for better clarity and seamless reading:

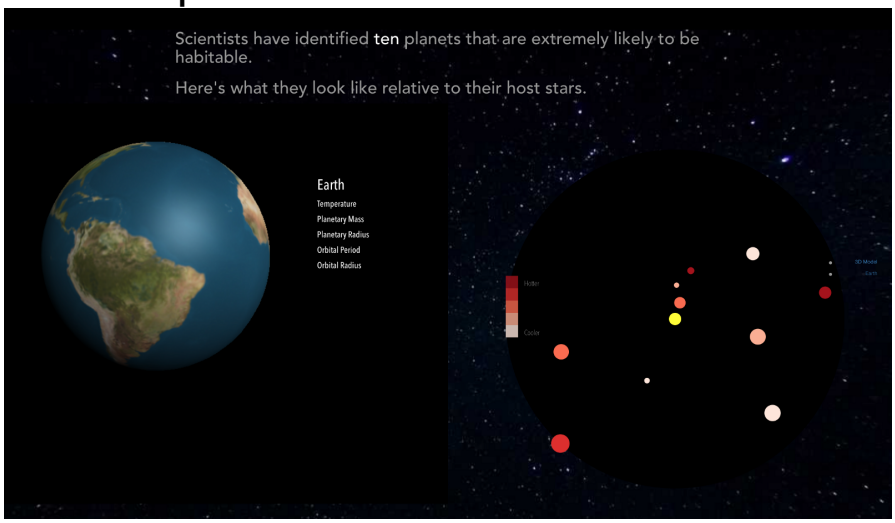


We also tentatively planned on a new visualization, one that encodes the amount of time it takes to reach of these planets. We have discussed different methods of creating the

visualization, in est. brush, slider, animation, etc., but are highly considering an animation for fluidity. We made a mockup of the visualization below:



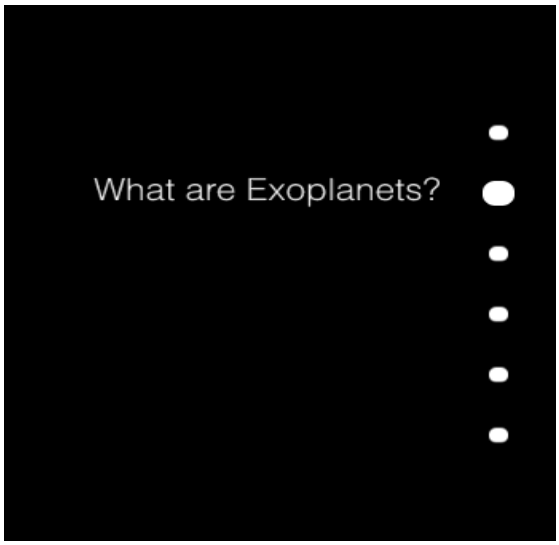
We also decided to change the main visualization to a two-layout depiction rather than an continuous scroll to display more data at a time. This was a quick bootstrap fix.



(New Web Layout)

7 December 2016

We decided to get rid of most of the parallax effects in our project. We felt that it was slightly overused and somewhat distracting with visualizations that were positioned as overlay. We are thinking about moving to a new layout; one that is simpler and more clean. We initially designed our web layout by section, with iterative parallax in between for effect. We are moving away from sections to an overall black site, which will complement the content we put in.
Also: we implemented an elevator navigation for comprehensiveness, which we are adopting in the new layout.

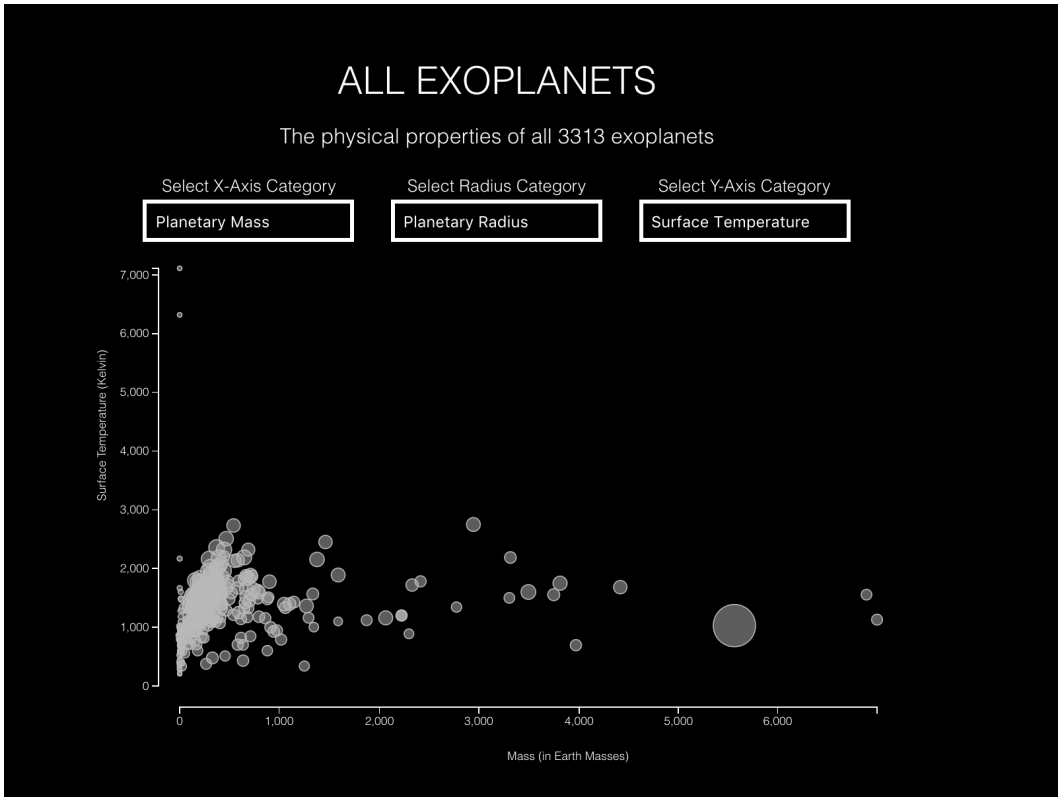


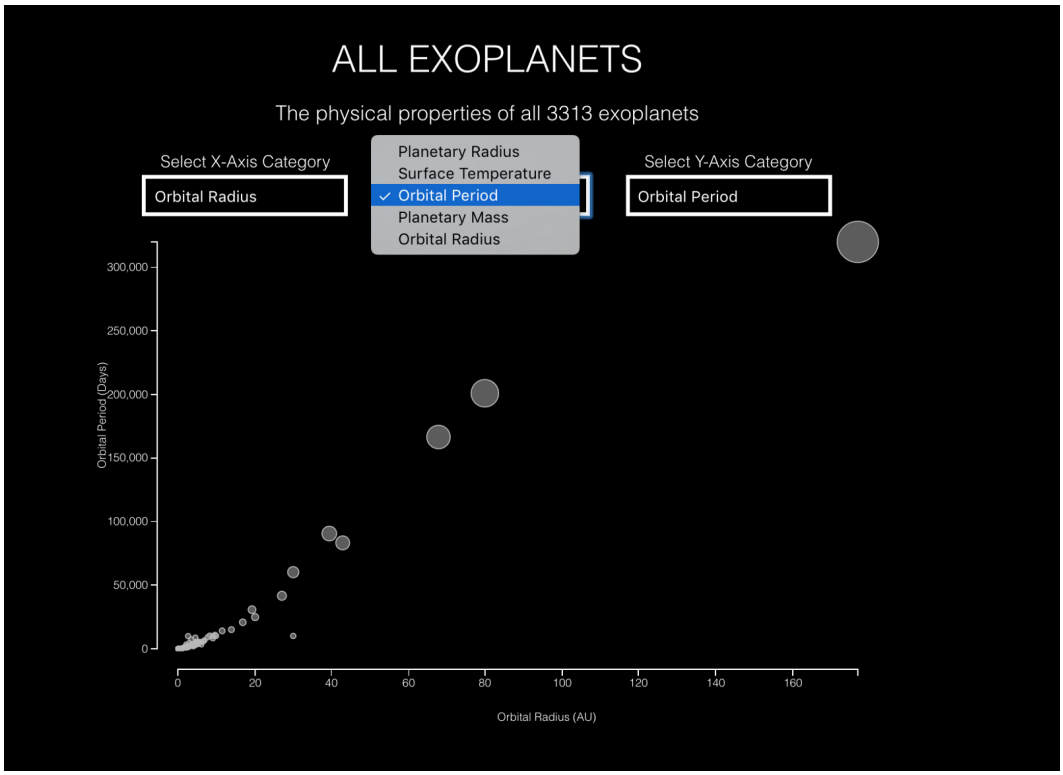
Inspiration for new layout:

(Scatterplot over Histogram)

8 December 2016

One of our visualizations was recently changed from a histogram to a scatterplot. We were aiming to depict all the characteristics of the Exoplanets (all 3000), and realized the limitations of histograms and strengths of scatterplots. By using a scatterplot, we are effectively able to encode more data: we can use 3 focus filters instead of 1, which allows a more exhaustive analysis of these exoplanets. Also, it shows characteristics in relation to other planets, which helps our users orient themselves with information that may be obscure to grasp stand-alone. By using data for the X, Y, and radius of each plot, we give a more exhaustive and compelling medium of visualization.

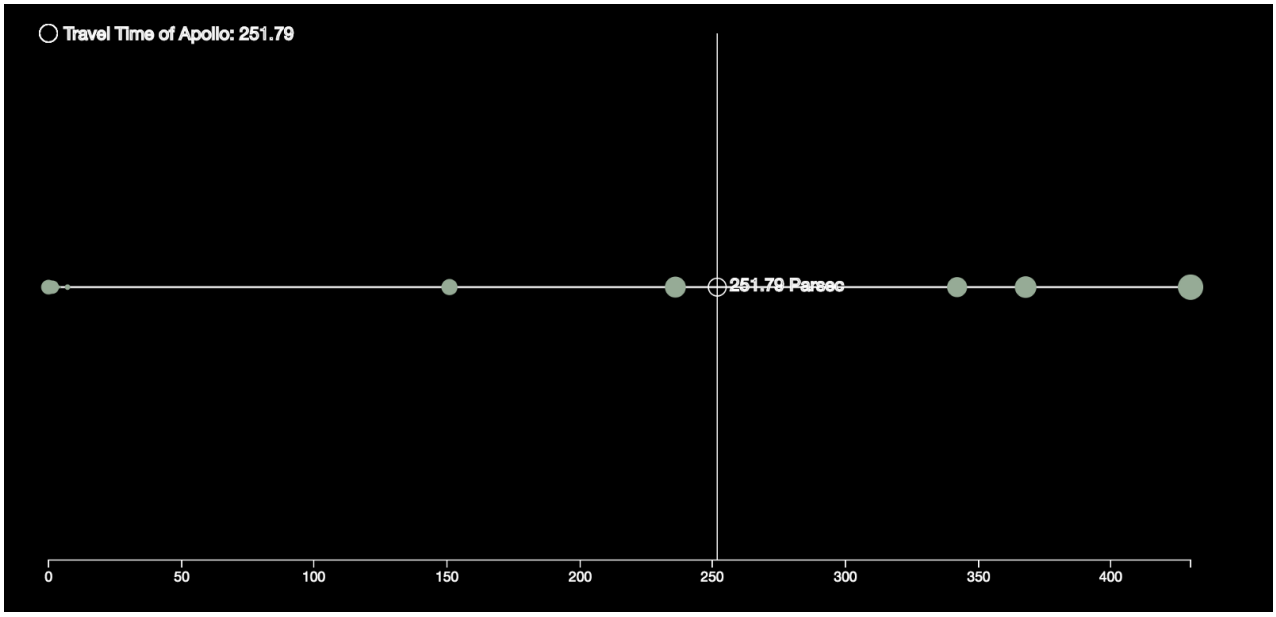

ALL EXOPLANETS
The physical properties of all 3313 exoplanets
Select X-Axis Category
Planetary Mass
Select Radius Category
Planetary Radius
Select Y-Axis Category
Surface Temperature
Surface Temperature (Kelvin)
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
0
1,000
2,000
3,000
4,000
5,000
6,000
Mass (in Earth Masses)


ALL EXOPLANETS
The physical properties of all 3313 exoplanets
Select X-Axis Category
Orbital Radius
Planetary Radius
Surface Temperature
Orbital Period
Planetary Mass
Orbital Radius
Select Y-Axis Category
Orbital Period
Orbital Period (Days)
300,000
250,000
200,000
150,000
100,000
50,000
0
0
20
40
60
80
100
120
140
160
Orbital Radius (AU)

(Spaceship Viz)

9 December 2016

While implementing the spacecraft visualization, we ran into trouble animating the spaceship along a straight line. We are instead pursuing a brush functionality, which still encodes all desired data effectively. We decided to use the world's fastest piloted ship, Apollo, as a reference for orientation while encoding distance between exoplanets.



This was adapted quickly after; we are planning on using the world's fastest satellite, Juno, to use as reference encoding distance between exoplanets. This brush will have a greater speed than Apollo,

making it easier for reader. Here is the updated implementation: