

Interactive Visualization of Exoplanets

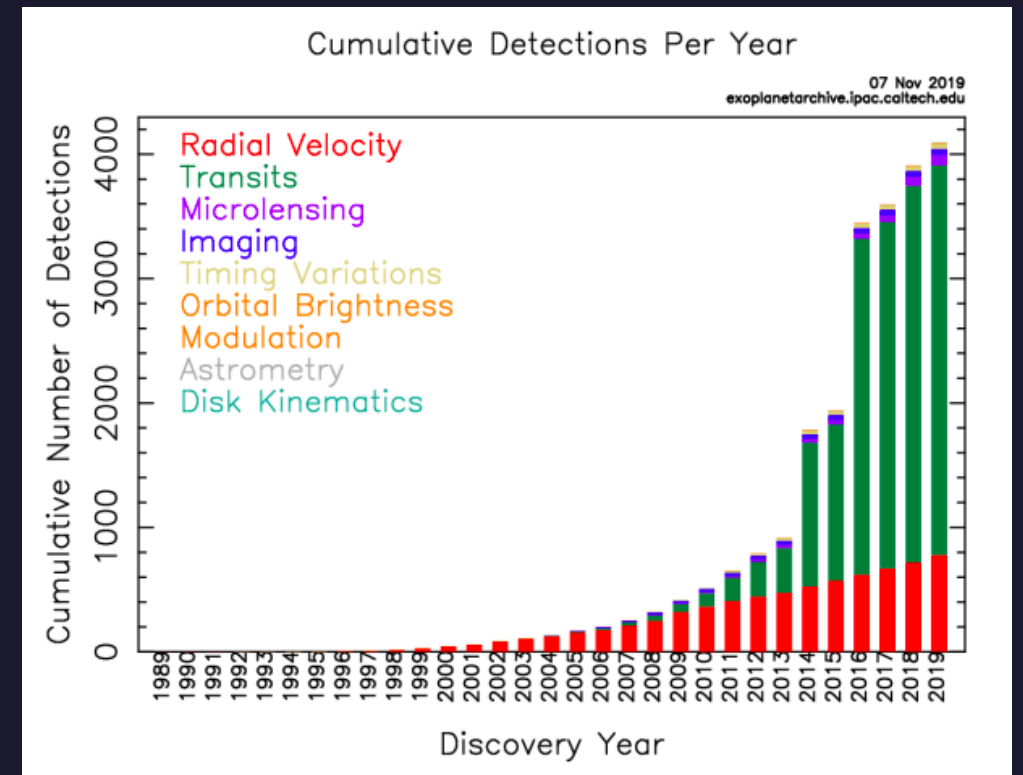
CPSC 547 2021W- Project pitch

Arash Kamyabi



Background

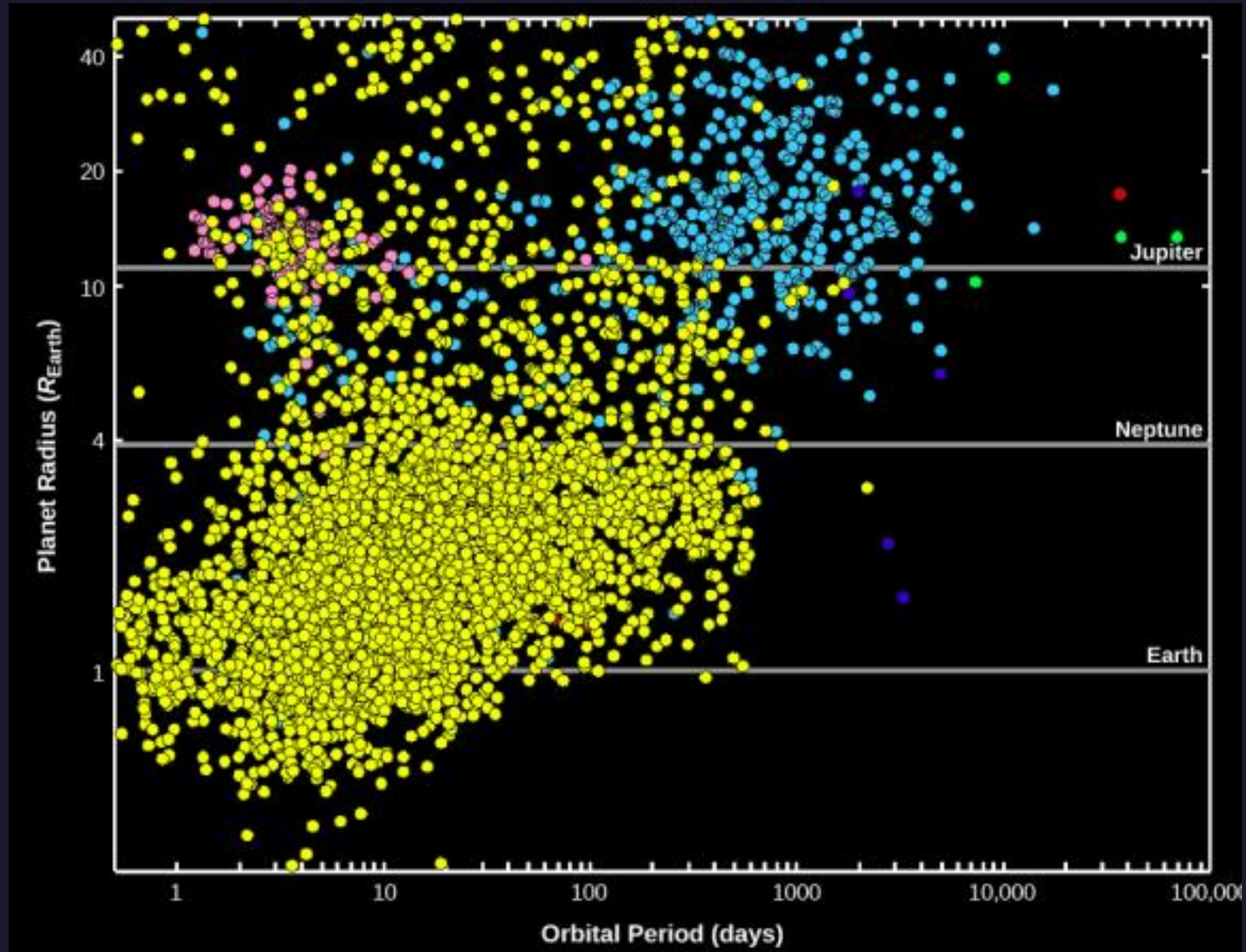
- First exoplanet wasn't discovered until 1992
- Since then, there has been a total of 4,843 confirmed exoplanets
- Studying extrasolar planetary systems reveal secrets of our own Solar System
- Search for habitable planets that could potentially support life

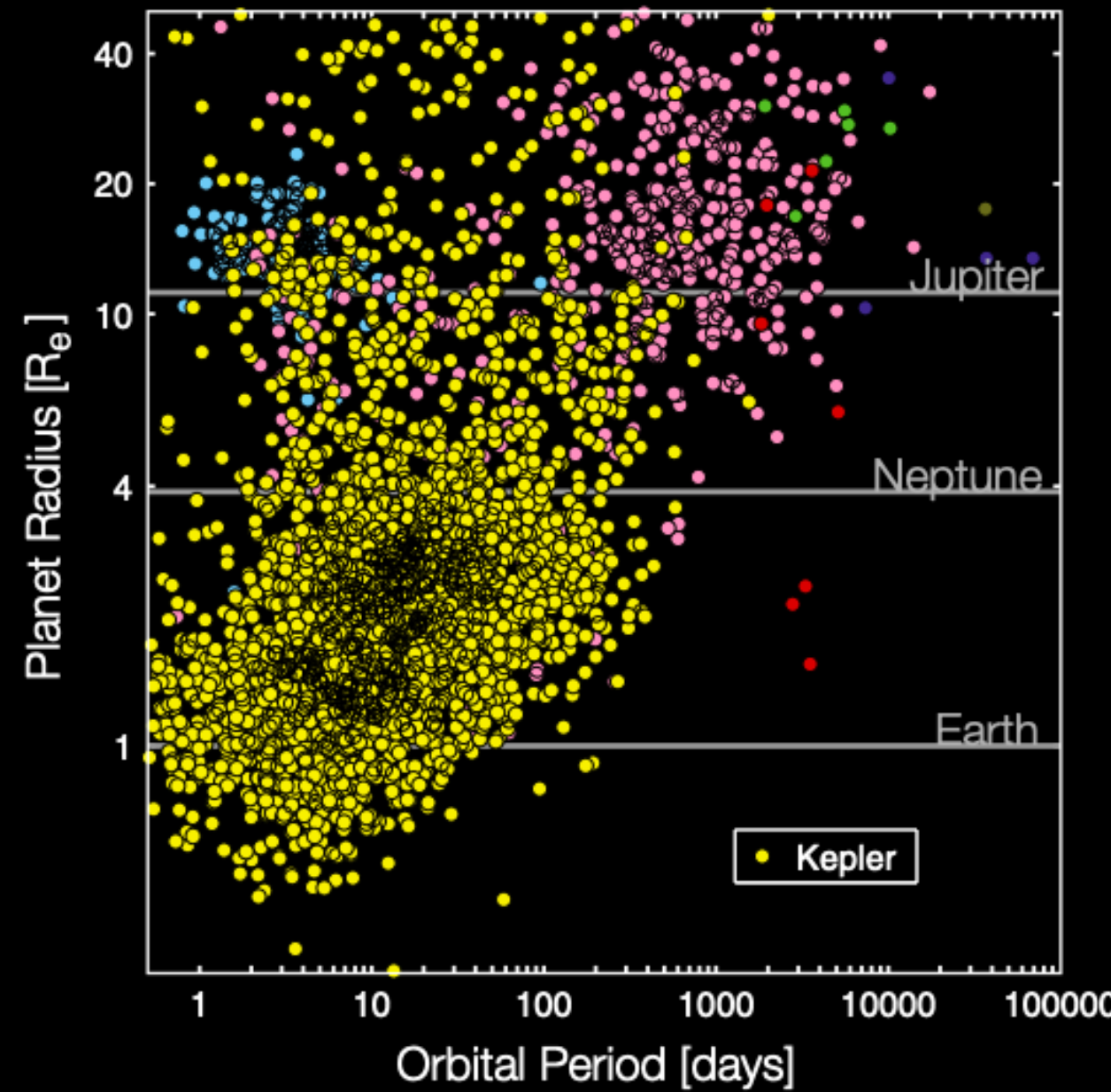
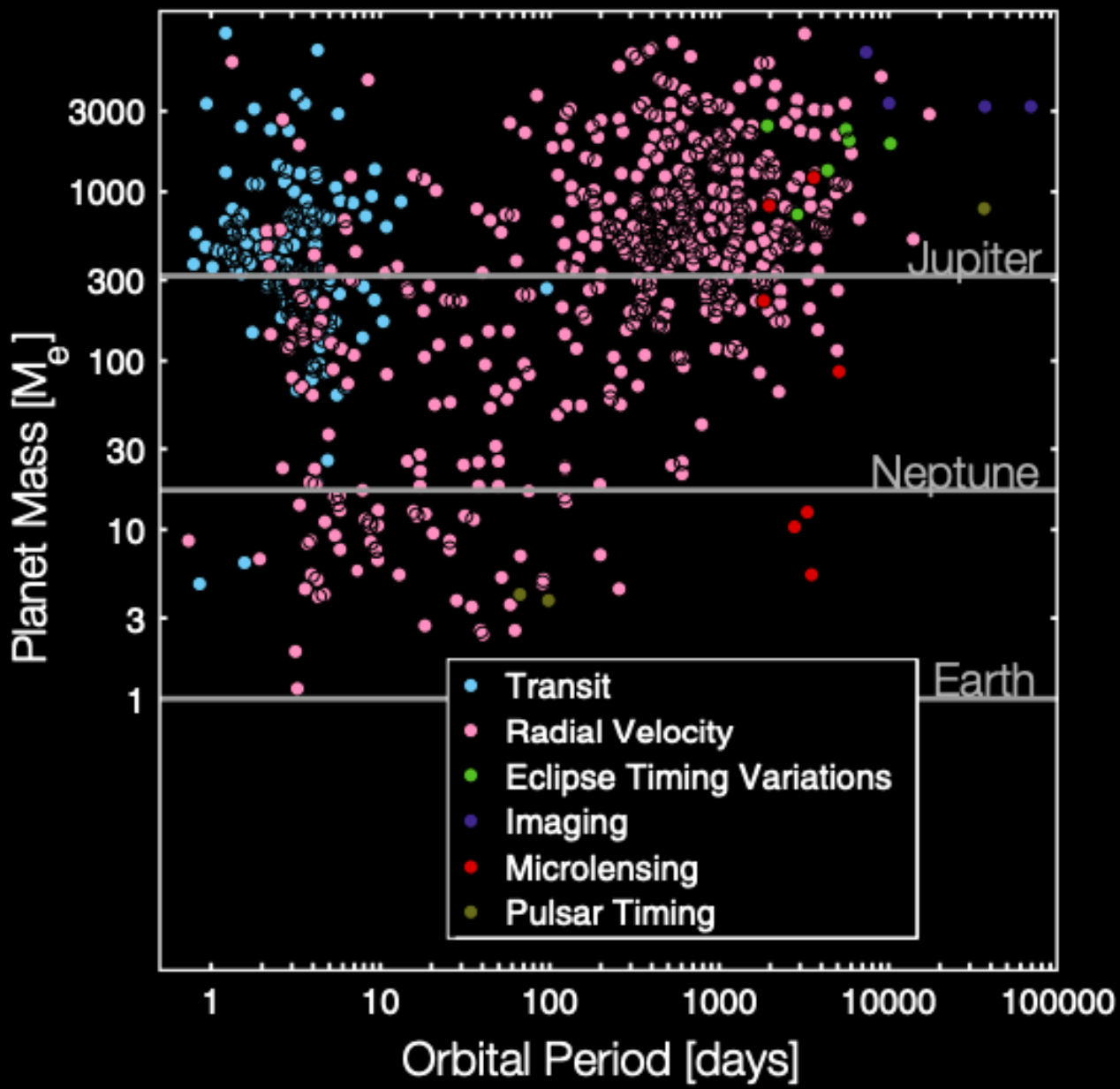


Sample Visualizations

Exoplanets have many attributes such as

- Radius
- Mass
- Planetary Temperature
- Orbital Period
- Distance to Star





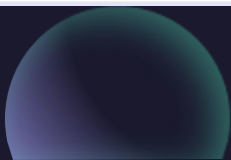
Dataset



- The Extrasolar Planets Encyclopaedia
- Established in 1995 and updated daily
- Includes data from all confirmed exoplanets and their attributes

The screenshot shows the Exoplanet.eu website interface. At the top, there is a navigation bar with the logo and links for Home, All Catalogs, Diagrams, Bibliography, Research, Meetings, and Other. Below the navigation bar is a 'Catalog' section with a search bar and filters for Status and Detection. A status message indicates 'Showing 4843 planets / 3579 planetary systems / 797 multiple planet systems'. There is a 'Show 100 entries' dropdown and a 'Planet Search' input field. The main content is a table of exoplanets with columns for Planet name, Mass (M_{Jup}), Radius (R_{Jup}), Period (day), semi-major axis (a in AU), eccentricity (e), inclination (i in deg), Angular distance (arcsec), and Discovery year.

Planet	Mass (M _{Jup})	Radius (R _{Jup})	Period (day)	a (AU)	e	i (deg)	Ang. dist. (arcsec)	Discovery
NSVS 1425 (AB) d	—	—	3317.7	3.12	0.12	—	—	2017
UZ For (AB) b	6.3	—	5800	5.9	0.04	80	—	2010
UZ For (AB) c	7.7	—	1900	2.8	0.05	—	—	2011
beta Pic c	8.89	1.2	1227	2.68	0.32	89.95	—	2019
beta Pic b	11.9	1.65	7707	9.93	0.103	89	0.440415	2008
WASP-156 b	0.1303	0.554	3.8361603	0.0451	0	88.9	—	2017
WASP-95 b	1.206	1.098	2.1846656	0.0312	0	85.94	—	2013
WASP-29 b	0.243	0.775	3.92271218	0.047	0.03	89.468	0.000571	2010
HAT-P-14 b	2.444	1.01	4.627686	0.0606	0.095	84.1167	0.00029	2010
KELT-7 b	1.24	1.293	2.734784	0.0446	—	83.92	—	2015



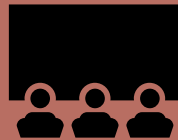
Project Goal



Problem-driven design study



Interactive visualization tool to explore patterns and attributes of exoplanets



Target End-Users: Educators

Looking for
Teammates!

