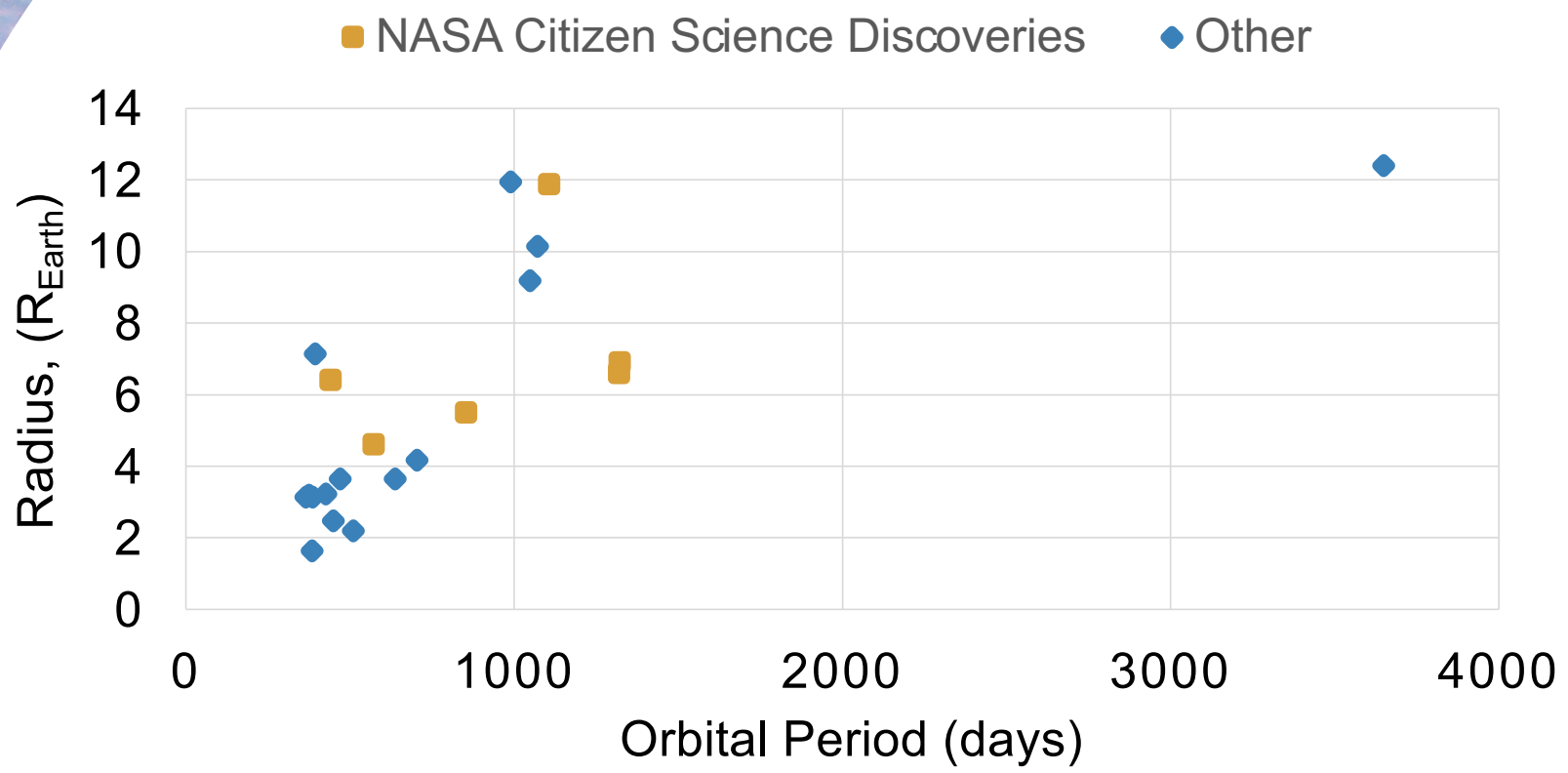
Citizen Science & Exoplanets

Marc Kuchner, Citizen Science Officer, SMD

January 10, 2022

EXOPLANETS WITH ≥1 YEAR PERIODS AND KNOWN RADII

1/7/2022



Cit Sci Planets from Wang et al. 2015, Kostov et al. 2016

Others from Giles+ 2018, Kipping+ 2016, Beichman+ 2018, Dalba+ 2021, Kipping+ 2014, Schmitt+ 2017. Morton+ 2016, Jenkins+ 2015

NASA citizen scientists discovered:

- A transiting planet in a quadruple star system (Schwamb+ 2013)
- The star-forming regions called “yellowballs” (Kerton+ 2015)
- “Dipper” stars (Boyajian+ 2016)
- “Peter Pan” disks (Silverberg+ 2016)
- Transiting exocomets in Kepler Data (Rappaport+ 2017)
- A six-planet transiting system (Christiansen+ 2018)
- The oldest white dwarf debris disk (Debes+2019)
- The Extreme T subdwarfs (Schneider et al. 2020)
- Planetary-mass brown dwarfs (Bardalez-Gagliuffi+2020)

NASA's citizen science projects are **science projects that rely on volunteers.**

SMD Citizen Science Policy
SPD-33

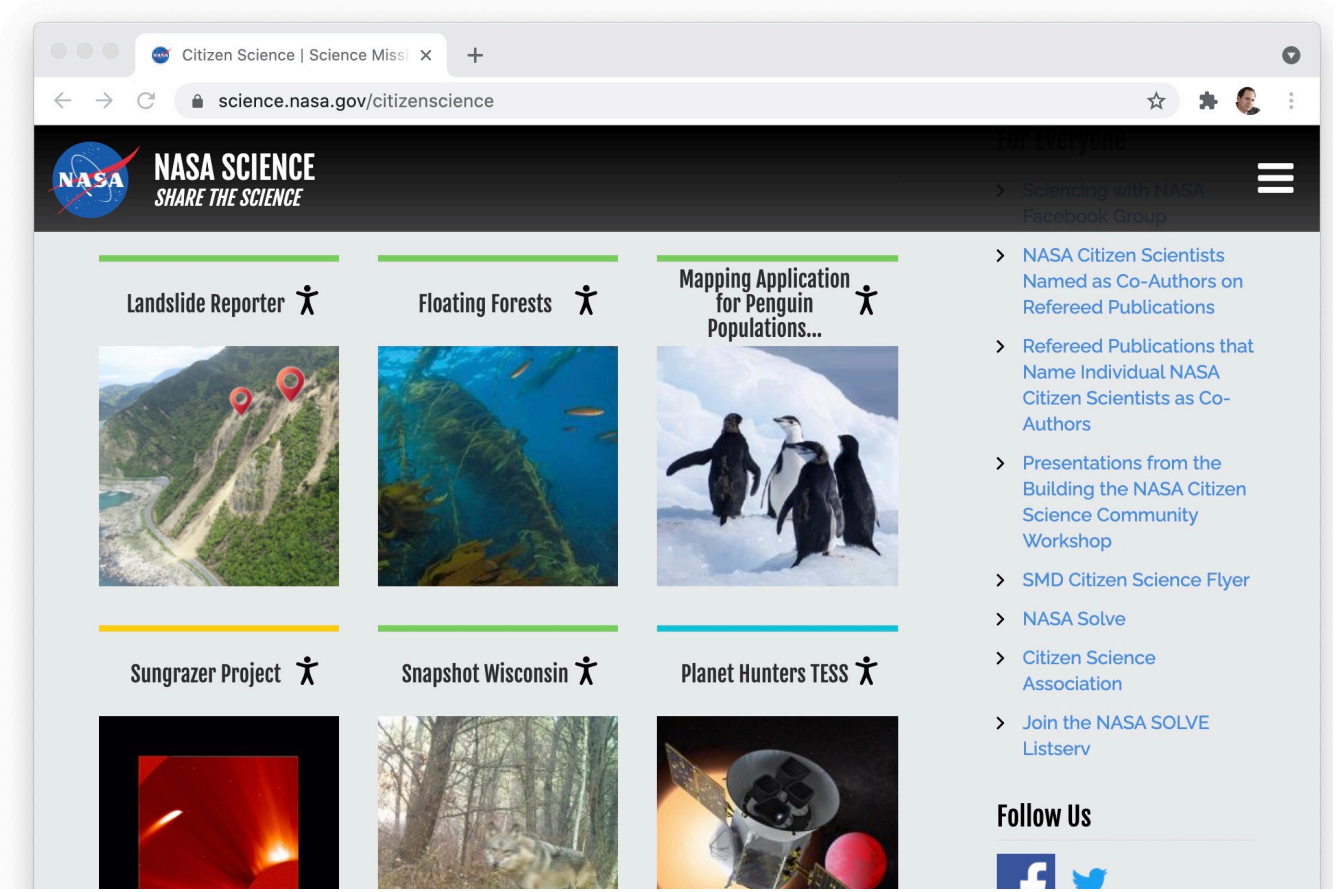
"All NASA citizen science projects shall be designed and implemented to meet the **same rigorous standards as any NASA science program**…"

NASA Citizen Science Policy
NPD 1090.2

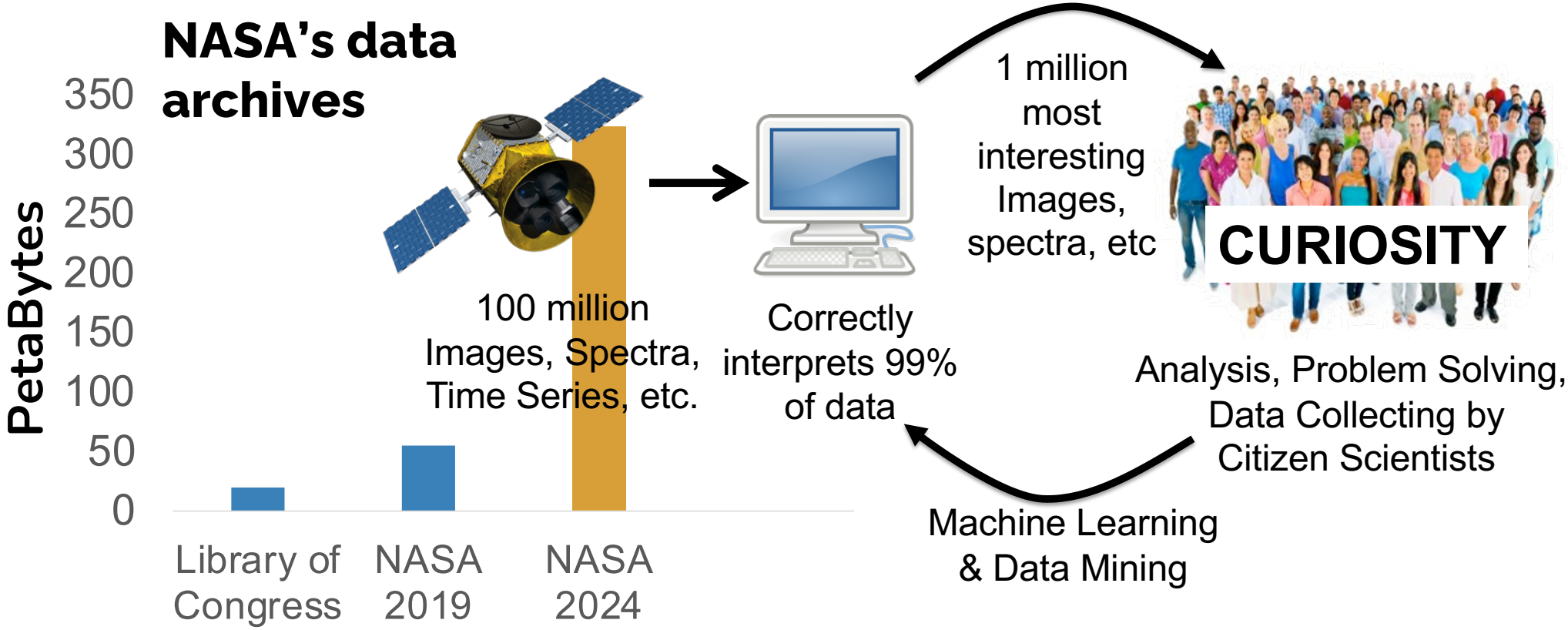
science.nasa.gov/citizenscience

26 active NASA projects online

15 of these can be done by anyone, anywhere



Present and Future of NASA Science



Inclusion added to list of NASA core values 7/20

Safety, Integrity, Teamwork, Excellence + Inclusion!

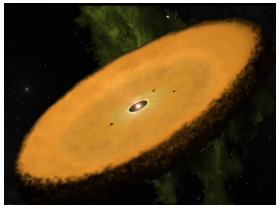
Shaw University students doing NASA's Floating Forests Citizen Science project.

2 million+ volunteers

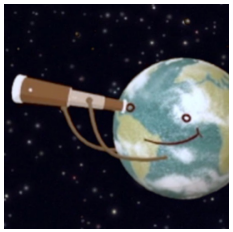
~140,000 with advanced degrees!

>200 NASA Citizen Scientists Are **Named Co-Authors** on Scientific Papers

Planet Hunters
Fischer+ 2012
Schwamb+ 2012



Disk Detective
Kuchner+2016



Backyard Worlds: Planet 9
Kuchner+2017

Exoplanet Explorers
Christiansen+2018

Planet Patrol
Kostov+ 2022

Exoplanet Watch
Zellem+ 2020

Planet Hunters TESS
Eisner+2019

2012 2014 2016 2018 2020 2022

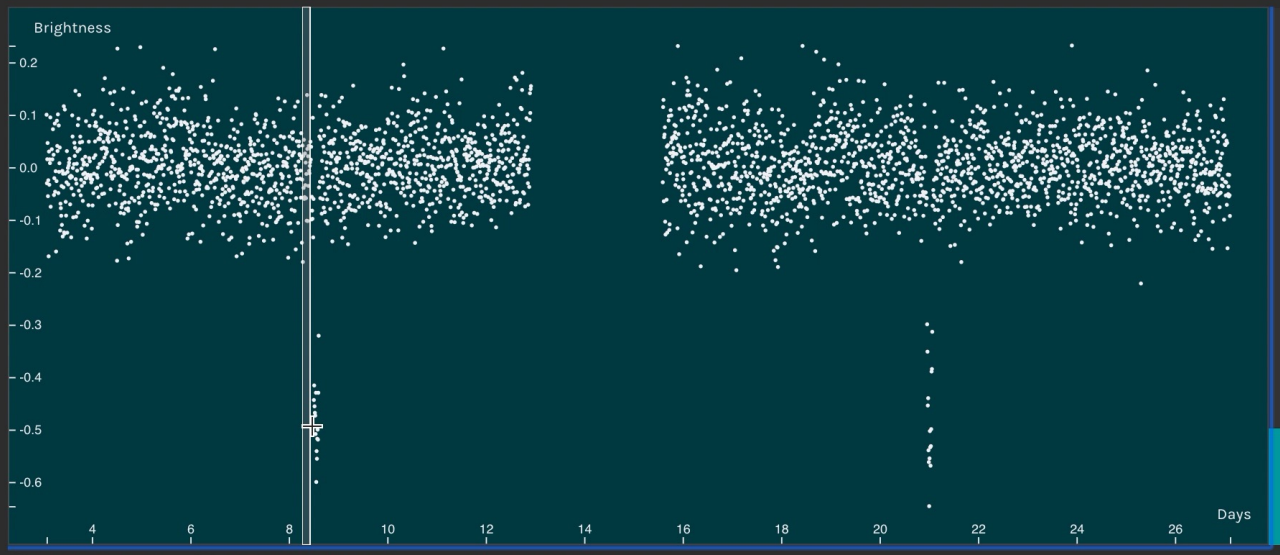
PROJECTS ABOUT GET INVOLVED TALK BUILD

NOTIFICATIONS MESSAGES NORA.EISNER

Planet Hunters TESS

ABOUT CLASSIFY TALK COLLECT RECENTS

PLANET HUNTERS TESS



FIELD GUIDE

SUBJECT INFO ADD TO FAVOURITES ADD TO COLLECTIONS

TASK TUTORIAL

Do you spot a transit? If so, please mark it on the lightcurve to the left!

If you don't see any transits, continue by clicking Done or Done & Talk.

Transit?

NEED SOME HELP WITH THIS TASK?

Done & Talk Done

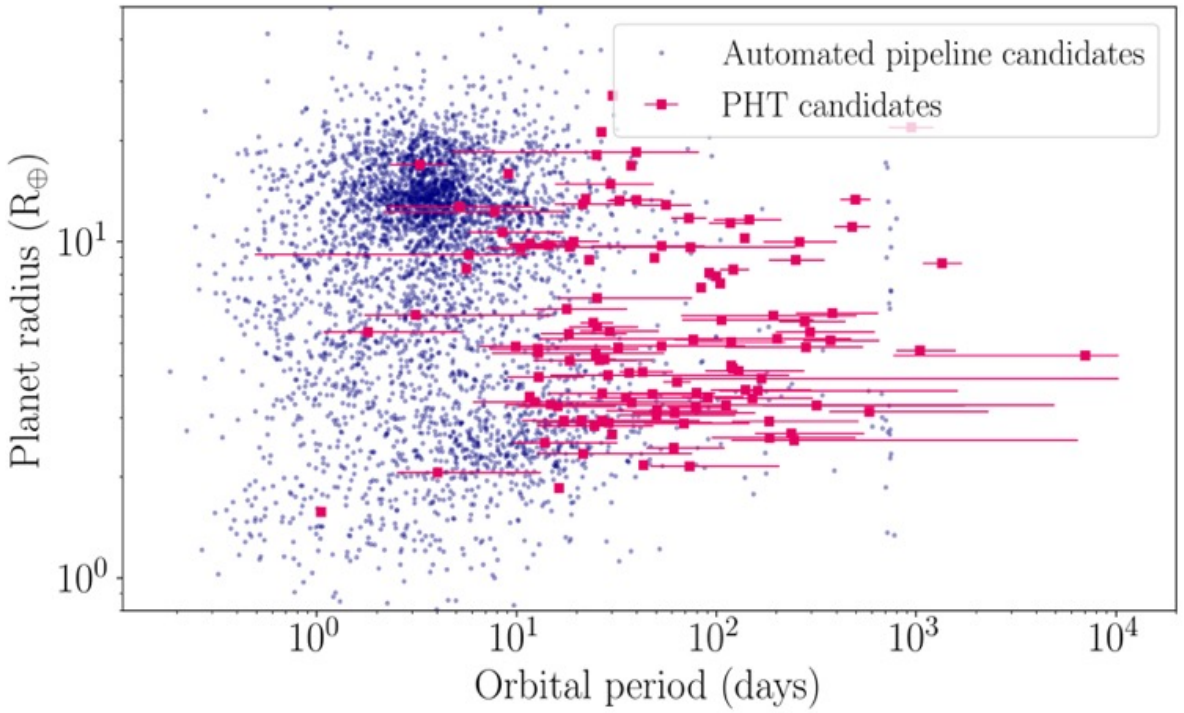
SWITCH TO LIGHT THEME

Finished for the day?

Your answers are saved for the research team while you're working. See the project stats and return to the Planet Hunters TESS home page.

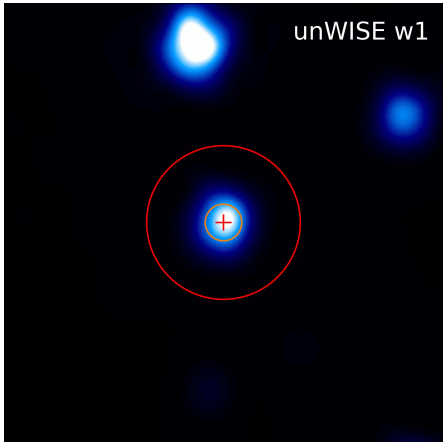
Planet Hunters TESS

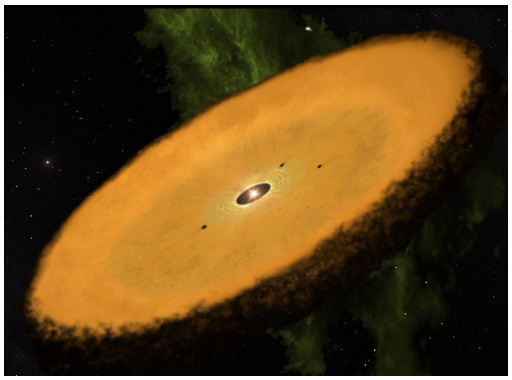
- > **20 million** classifications since December 2018
- **> 30 thousand** registered volunteers
- WATCH FOR PRESS RELEASE THIS WEEK!!

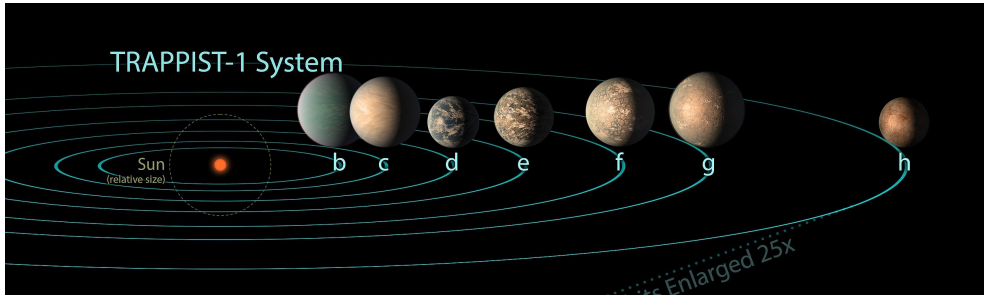


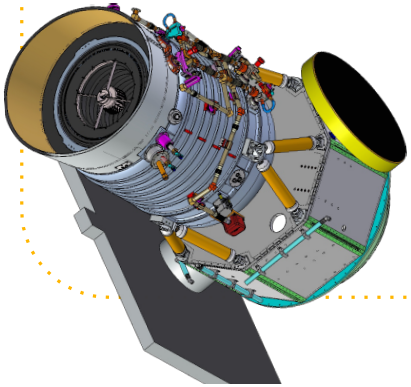
Jenkins et al. 2016, Eisner et al. 2021a (arXiv:2011.13944)

DiskDetective.org









"Peter Pan" Disks
20-50 Myr **Gas-Rich** Protoplanetary Disks

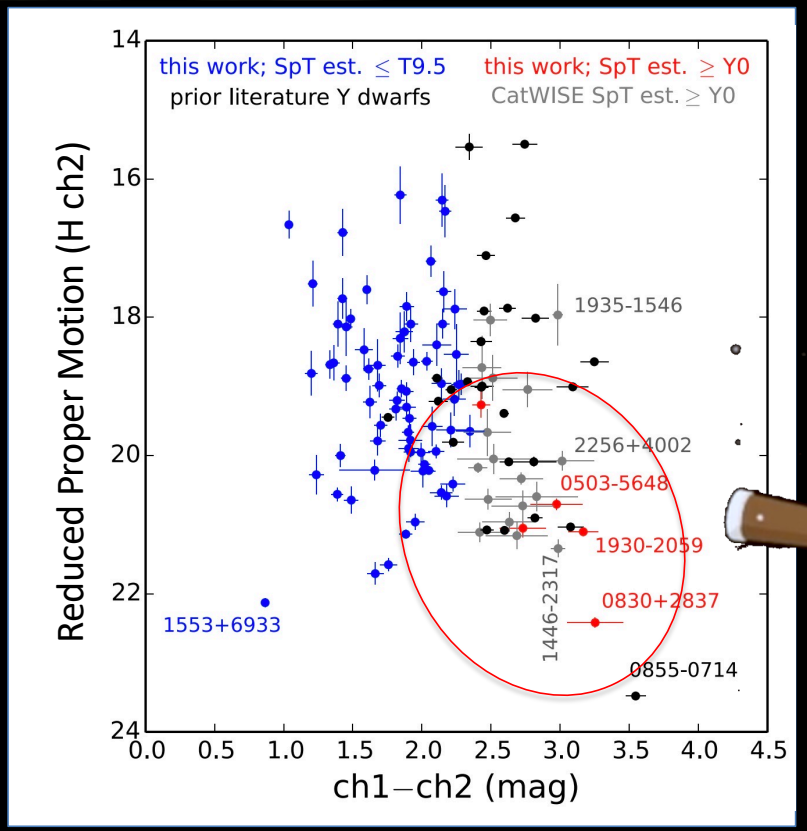
BACKYARD WORLDS: PLANET 9

www.backyardworlds.org

Finding planetary mass objects in Wide-field Infrared Survey Explorer (WISE) images.

J0830+2837 4-13 $M_{Jupiter}$ (Bardalez-Gagliuffi et al. 2020)

Upcoming JWST Cycle 1 Program

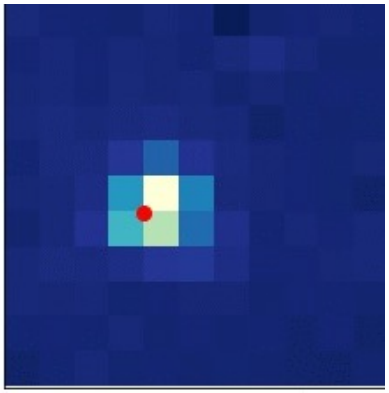


Meisner et al. 2020

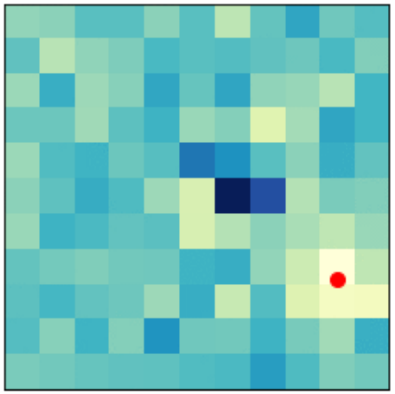
Planet Patrol Zooniverse Portal

exoplanetpatrol.org

NASA's TESS mission



Good Candidate

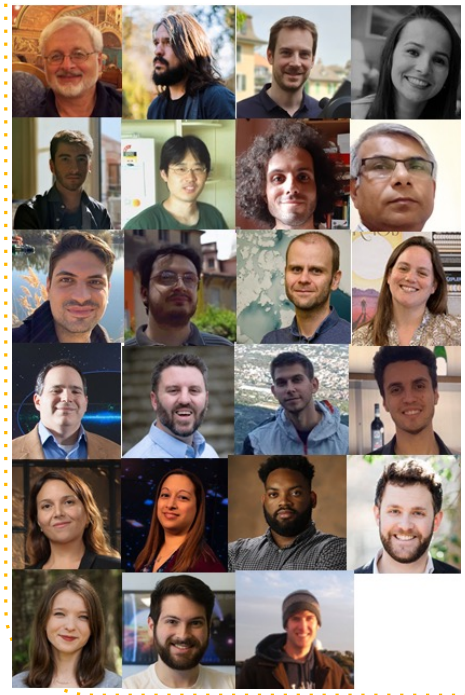


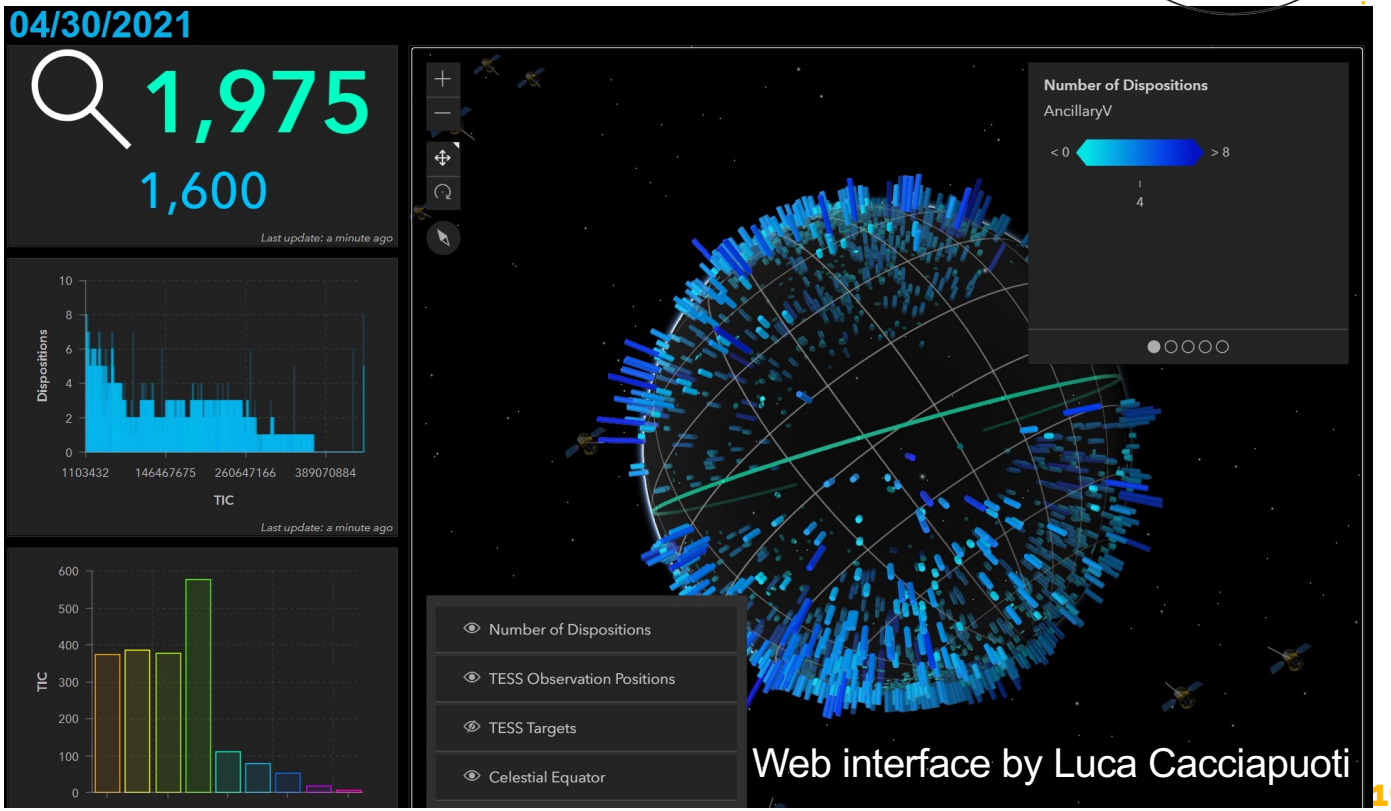
Imposter

First batch of 20K subjects completed.
Stay tuned for more!

Planet Patrol: Now

Vetting ELEANOR light curves using the full DAVE vetting tool!



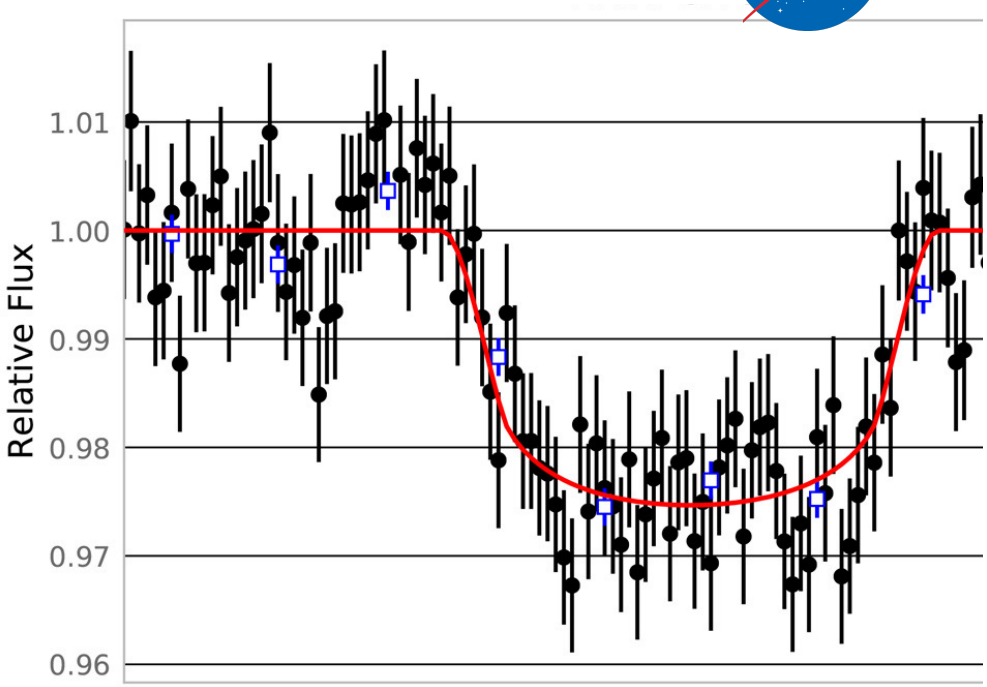


Exoplanet Watch

NASA's TESS mission

+

Your Backyard Telescope



Help with the beta test at exoplanets.nasa.gov/exoplanet-watch !

Exoplanet Citizen Science Beyond NASA

AAVSO www.aavso.org

PANOPTES projectpanoptes.org

Unistellar unistellaroptics.com

Planet Hunters NGTS ngts.planethunters.org

MicroFUN Microlensing Follow-Up Network cgi.astronomy.osu.edu/microfun/

SETI@home setiathome.berkeley.edu

Your Helpers at HQ

Astrophysics Division

Hashima Hasan
Cit. Sci. Lead

Office of the Chief Scientist

Maria Santos
Cit. Sci. Comms Lead

Science Engagements & Partnerships Division

Sarah Kirn
Gulf of Maine Research Institute
NASA Cit. Sci. Strategist

Marc Kuchner
Citizen Science Officer

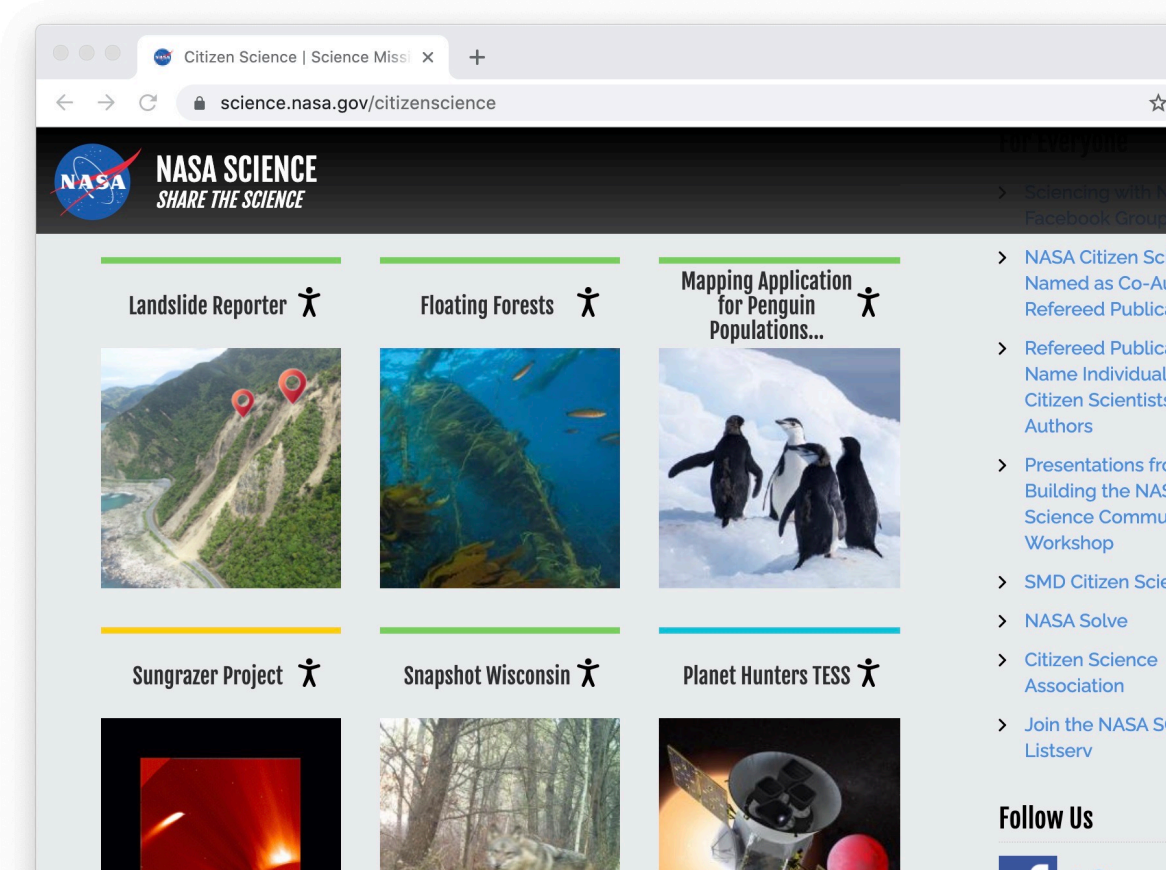
Citizen Science Seed Funding Program (CSSFP) In Year 2!

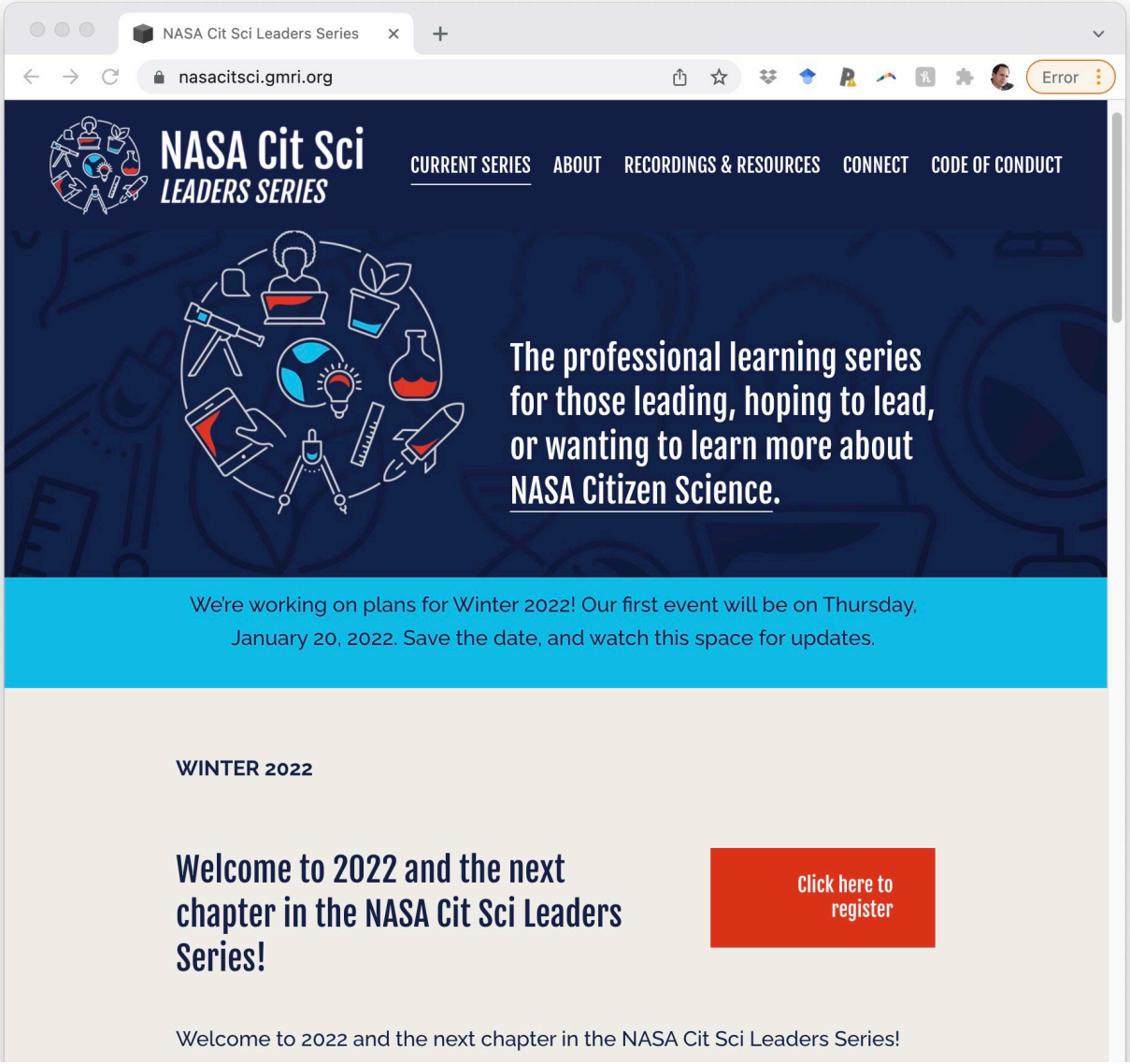
- For "incubating citizen science projects as they are being conceived or during critical transitions."
- Any science division but Earth Science.
- Page limit for Sci/Tech/Management section: 6 pages
- One year of funding.
- Average award: $80K
- Due January 21, 2022

science.nasa.gov/citizenscience

Join our email list!

Send me a note at Marc.Kuchner@nasa.gov





Workshop Series

Starts again January 20!

Alternate Thursdays 3:30-5

See nasacitsci.gmri.org

What could **you** accomplish with help from 100,000 people?

Hint, hint: