

# EXPLORE SCIENCE Citizen Scientists/Open Source Scientists

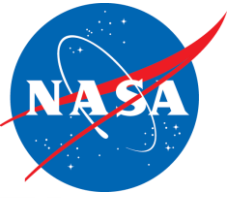
Marc Kuchner, Citizen Science Officer, SMD

October 13, 2021

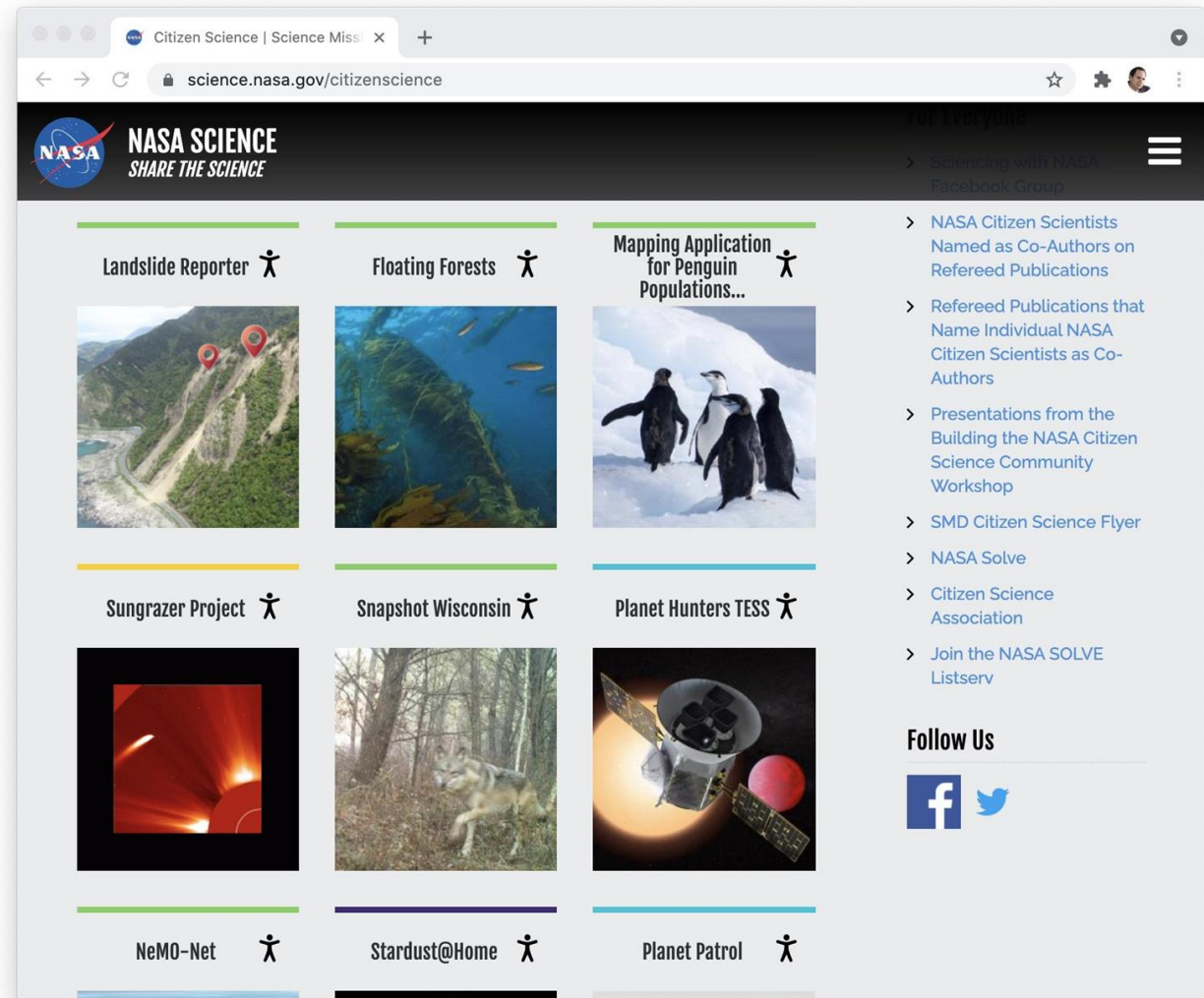


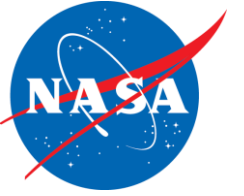
NASA's citizen science projects are  
**science projects that rely on volunteers.**

# science.nasa.gov/citizenscience



## 25 active NASA projects online





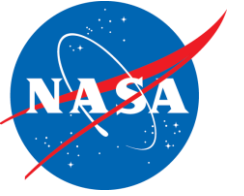
NASA's citizen science projects now **dominate** their scientific fields. They have discovered:

- **Most** of the known comets
- **All** of the known samples of interstellar material
- **Half** of the ultracool brown dwarfs
- **Most** of the long period (>2 yr) extrasolar planets



# NASA citizen scientists have discovered:

- The first extreme T subdwarfs
- Zika virus in Peruvian cemetery vases
- The oldest white dwarf debris disk
- The “Dipper” star phenomenon
- The “Peter Pan” disk phenomenon
- The star-forming regions called “yellowballs”.
- 400,000 Martian seasonal fans
- 283,000 emperor penguin nests
- 8,900 mosquito breeding sites
- 7 meteorites
- One new *kind* of aurora named STEVE



191 NASA  
Citizen Scientists  
Have Become  
**Named Co-  
Authors** on  
Scientific Papers

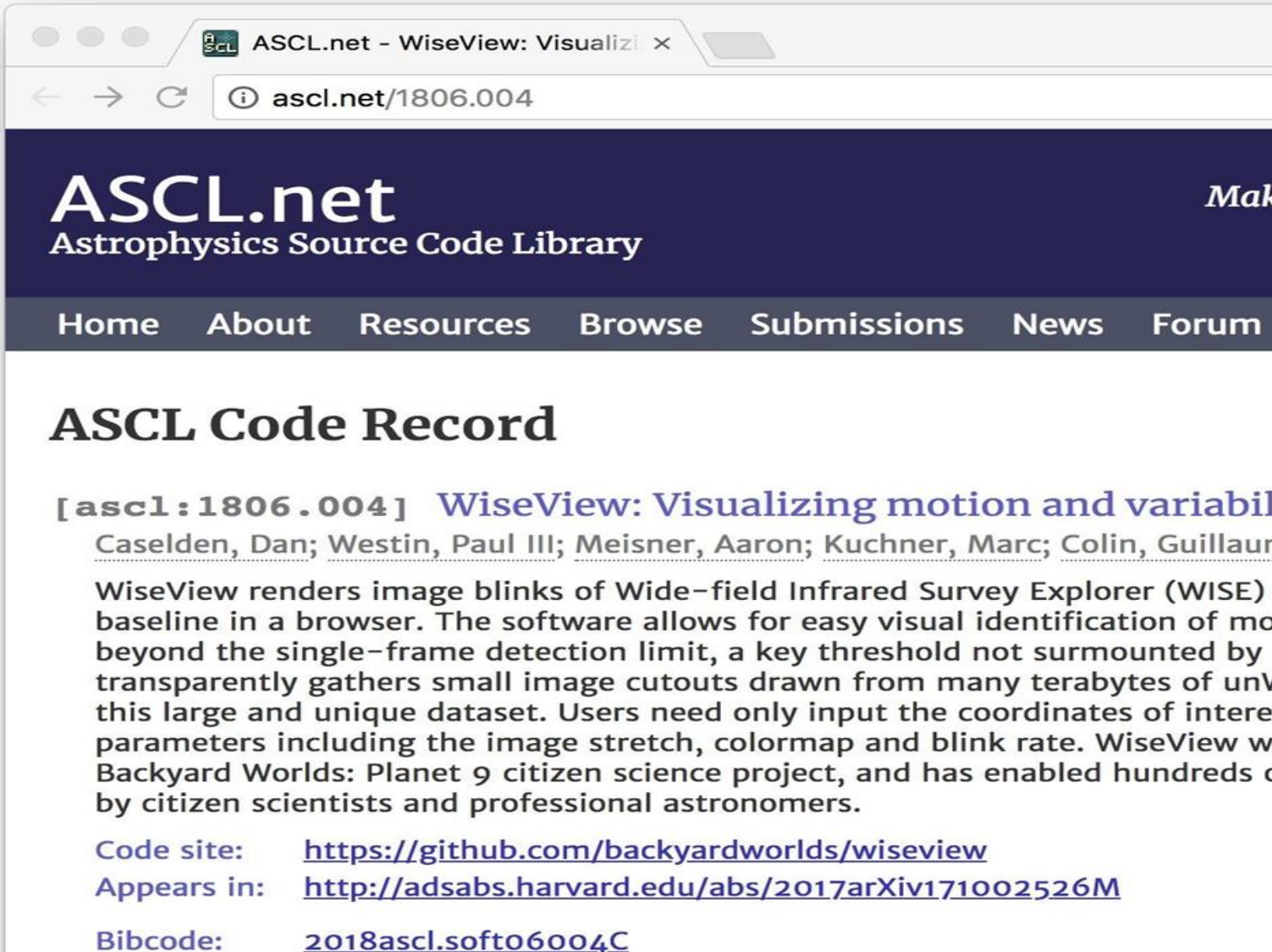
NASA citizen science involves > 1.5 million volunteers including

**~90,000 people with graduate degrees.**



# Our Citizen Scientists Write Codes!

Dan Caselden



ASCL.net - WiseView: Visualizi x

ascl.net/1806.004

## ASCL.net

Astrophysics Source Code Library

Home About Resources Browse Submissions News Forum

### ASCL Code Record

[[ascl:1806.004](#)] [WiseView: Visualizing motion and variability](#)  
Caselden, Dan; Westin, Paul III; Meisner, Aaron; Kuchner, Marc; Colin, Guillaume

WiseView renders image blinks of Wide-field Infrared Survey Explorer (WISE) data on a baseline in a browser. The software allows for easy visual identification of motion beyond the single-frame detection limit, a key threshold not surmounted by most blink software. WiseView transparently gathers small image cutouts drawn from many terabytes of unWISE coadds, facilitating access to this large and unique dataset. Users need only input the coordinates of interest and can interactively tune parameters including the image stretch, colormap and blink rate. WiseView was developed in the context of the Backyard Worlds: Planet 9 citizen science project, and has enabled hundreds of brown dwarf candidate discoveries by citizen scientists and professional astronomers.

Code site: <https://github.com/backyardworlds/wiseview>  
Appears in: <http://adsabs.harvard.edu/abs/2017arXiv171002526M>  
Bibcode: [2018ascl.soft06004C](#)





# Our Citizen Scientists Write Codes!



**Tom Bolton**

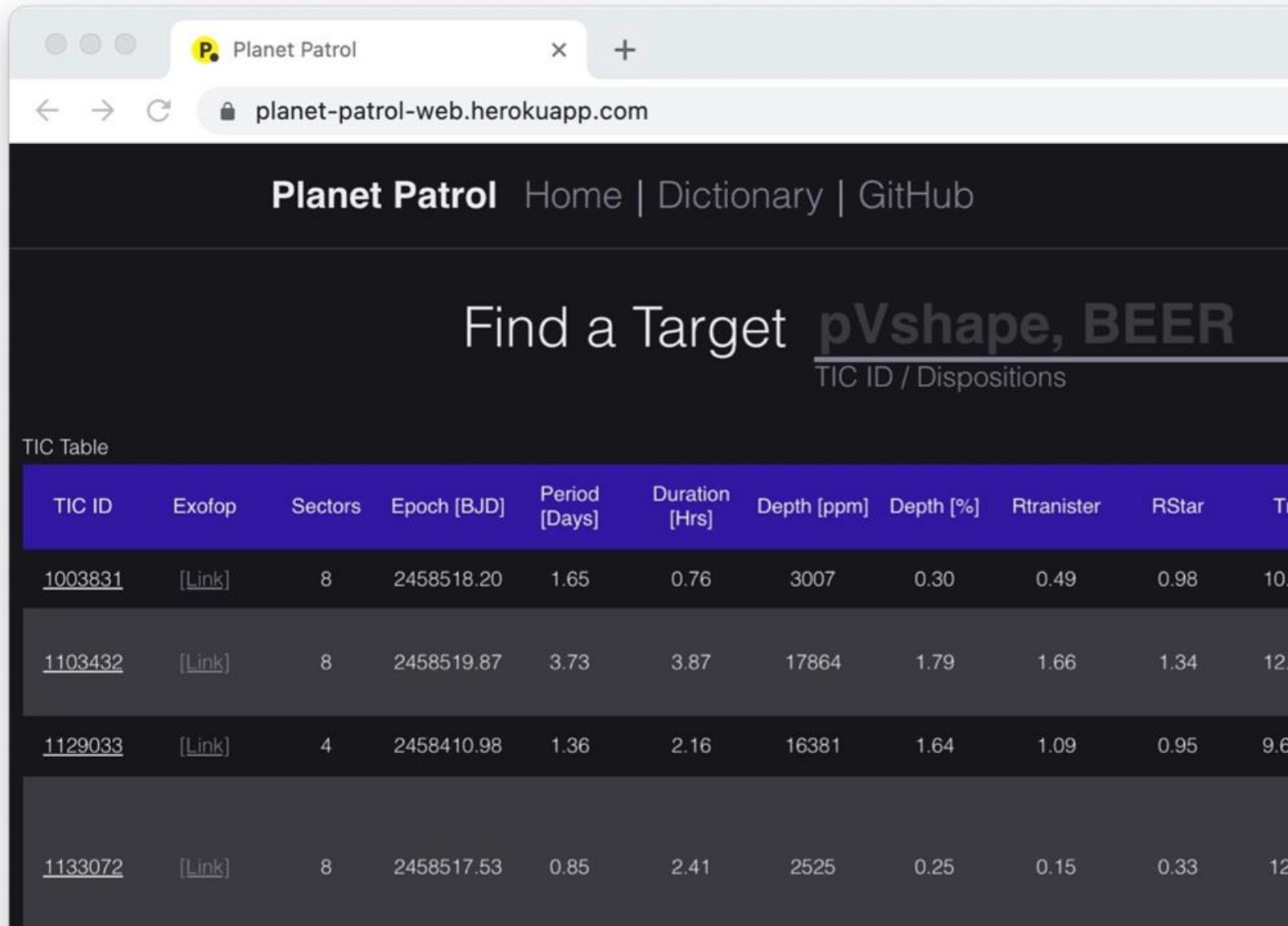
Physics Ph.D. student.  
His penguin population dynamics model outperformed the model created by ecologists.



# Our Citizen Scientists Write Codes!

High School student  
**Ryan Salik**

Wrote vetting tool for  
Planet Patrol



The screenshot shows a web browser window with the URL `planet-patrol-web.herokuapp.com`. The page title is "Planet Patrol" and it includes navigation links for "Home", "Dictionary", and "GitHub". A search bar contains the text "Find a Target" and "pVshape, BEER" with a sub-label "TIC ID / Dispositions". Below this is a table titled "TIC Table" with the following columns: TIC ID, Exofop, Sectors, Epoch [BJD], Period [Days], Duration [Hrs], Depth [ppm], Depth [%], Rtranister, RStar, and TIC. The table contains four rows of data.

TIC ID	Exofop	Sectors	Epoch [BJD]	Period [Days]	Duration [Hrs]	Depth [ppm]	Depth [%]	Rtranister	RStar	TIC
<a href="#">1003831</a>	<a href="#">[Link]</a>	8	2458518.20	1.65	0.76	3007	0.30	0.49	0.98	10
<a href="#">1103432</a>	<a href="#">[Link]</a>	8	2458519.87	3.73	3.87	17864	1.79	1.66	1.34	12
<a href="#">1129033</a>	<a href="#">[Link]</a>	4	2458410.98	1.36	2.16	16381	1.64	1.09	0.95	9.6
<a href="#">1133072</a>	<a href="#">[Link]</a>	8	2458517.53	0.85	2.41	2525	0.25	0.15	0.33	12



However, citizen scientists:

- don't know our jargon.
- don't know our culture
- don't know where to find our data and tools

90,000 NASA citizen scientists with graduate degrees.

**Keep them in mind as you work to open science!**

