

The Pale Blue Dot Project

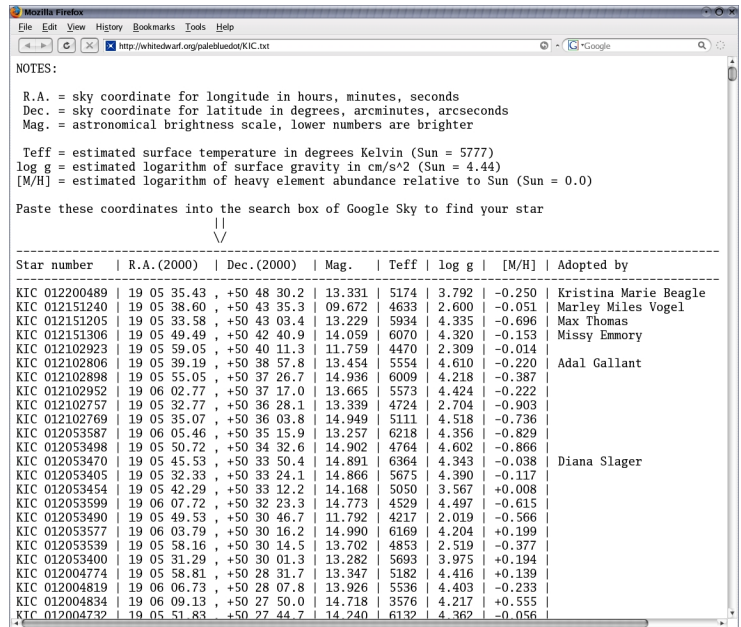
an adopt-a-star program to fund research

Travis S. Metcalfe,  White Dwarf Research Corporation

ABSTRACT: In March 2009, NASA is scheduled to launch the Kepler satellite – a mission designed to discover habitable Earth-like planets around distant Sun-like stars. The satellite consists of a 0.95-m telescope with an array of digital cameras that will monitor the brightness of 100,000 solar-type stars with a few parts-per-million (ppm) precision for between 4-6 years. Inspired by the grassroots Internet fundraising success of several recent political campaigns, we have initiated an adopt-a-star program to support the research efforts of the Kepler Asteroseismic Science Consortium (KASC), which does not receive funding from NASA. Through the project website (<http://whitedwarf.org/palebluedot/>) stars can be selected either visually with Google Sky or by catalog number in our simplified text version of the Kepler Input Catalog. For a \$10 donation, sponsors receive a "certificate of adoption" by email and updates when any planets are discovered around their adopted star. On our website we tag each target with the name of the donor, so no two people can adopt the same star. If most of the Kepler target stars are ultimately adopted, the resulting endowment is expected to provide significant research support to KASC throughout the lifetime of the mission.

A non-profit alternative: Many private companies offer deceptive "name a star" services for \$19.95. By contrast, the Pale Blue Dot project is an outreach and fundraising program that allows donors to "adopt" a star that might host a planetary system for just \$10. The adopt-a-star program is hosted by a non-profit organization (White Dwarf Research Corporation) and 100% of the proceeds are used to support scientific research on the stars that the donors actually adopt.

A search for habitable planets: In March 2009, NASA will launch the Kepler satellite – a mission designed to discover Earth-like planets around distant Sun-like stars. The satellite will monitor the brightness of more than 100,000 stars in the constellation Cygnus with high quality digital cameras for up to 6 years. Scientists will be looking for tiny dips in the amount of light received by the telescope, the possible signature of a planet passing in front of the star. The Pale Blue Dot project supports the analysis that will allow astronomers to determine the physical size of the planet, through the research efforts of the Kepler Asteroseismic Science Consortium, an international collaboration of scientists.



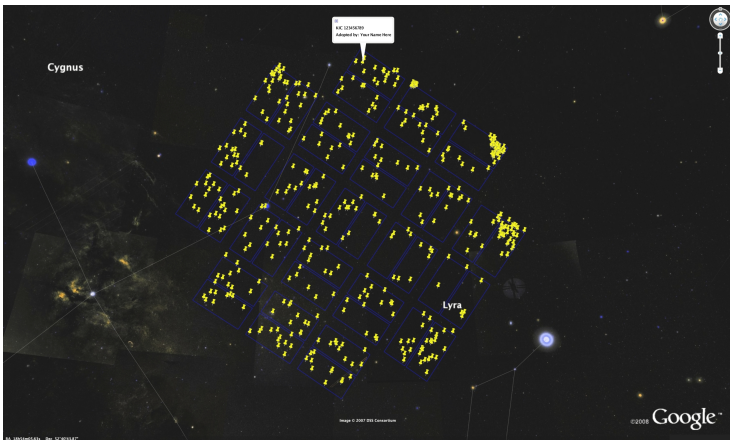
NOTES:

R.A. = sky coordinate for longitude in hours, minutes, seconds
 Dec. = sky coordinate for latitude in degrees, arcminutes, arcseconds
 Mag. = astronomical brightness scale, lower numbers are brighter

Teff = estimated surface temperature in degrees Kelvin (Sun = 5777)
 log g = estimated logarithm of surface gravity in cm/s² (Sun = 4.44)
 [M/H] = estimated logarithm of heavy element abundance relative to Sun (Sun = 0.0)

Paste these coordinates into the search box of Google Sky to find your star

Star number	R.A. (2000)	Dec. (2000)	Mag.	Teff	log g	[M/H]	Adopted by
KIC 012200489	19 05 35.43	+50 48 30.2	13.331	5174	3.792	-0.250	Kristina Marie Beagle
KIC 012151240	19 05 38.60	+50 43 35.3	09.672	4633	2.600	-0.051	Marley Miles Vogel
KIC 012151205	19 05 33.58	+50 43 03.4	13.229	5934	4.335	-0.696	Max Thomas
KIC 012151306	19 05 49.49	+50 42 40.9	14.059	6070	4.320	-0.153	Missy Emory
KIC 012102923	19 05 59.05	+50 40 11.3	11.759	4470	2.309	-0.014	
KIC 012102806	19 05 39.19	+50 38 57.8	13.454	5554	4.610	-0.220	
KIC 012102898	19 05 55.05	+50 37 26.7	14.936	6009	4.218	-0.387	Adal Gallant
KIC 012102952	19 06 02.77	+50 37 17.0	13.665	5573	4.424	-0.222	
KIC 012102757	19 05 32.77	+50 36 28.1	13.339	4724	2.704	-0.903	
KIC 012102769	19 05 35.07	+50 36 03.8	14.949	5111	4.518	-0.736	
KIC 012053587	19 06 05.46	+50 35 15.9	13.257	6218	4.356	-0.829	
KIC 012053498	19 05 50.72	+50 34 32.6	14.902	4764	4.602	-0.866	
KIC 012053470	19 05 45.53	+50 33 50.4	14.891	6364	4.343	-0.038	Diana Slager
KIC 012053405	19 05 42.29	+50 33 24.1	14.866	5675	4.390	-0.117	
KIC 012053454	19 05 42.29	+50 33 12.2	14.168	5050	3.567	+0.008	
KIC 012053599	19 06 07.72	+50 32 23.3	14.773	4529	4.497	-0.615	
KIC 012053490	19 05 49.53	+50 30 46.7	11.792	4217	2.019	-0.566	
KIC 012053577	19 06 03.79	+50 30 16.2	14.990	6169	4.204	+0.199	
KIC 012053539	19 05 58.16	+50 30 14.5	13.702	4853	2.519	-0.377	
KIC 012053400	19 05 31.29	+50 30 01.3	13.282	5693	3.975	+0.194	
KIC 012004774	19 05 58.81	+50 28 31.7	13.347	5182	4.416	+0.139	
KIC 012004819	19 06 06.73	+50 28 07.8	13.926	5536	4.403	-0.233	
KIC 012004834	19 06 09.13	+50 27 50.0	14.718	3576	4.217	+0.555	
KIC 012004732	19 05 51.83	+50 27 44.7	14.240	6132	4.362	-0.056	



3 What donors receive: Everyone who adopts a star receives a personalized certificate by email (see image below). Donors are acknowledged by name in our text version of the catalog, as well as in the placemark for their adopted star in Google Sky. A special group of "early adopters" who made their donations prior to the release of the Kepler Input Catalog are listed on our website and will have their names included in the acknowledgments section of a future scientific publication. The first planets discovered by Kepler are expected to be announced 3-6 months after the beginning of the mission. Any donor who adopts a star that is found to host a planet will be featured on a special section of our website and will receive an email with information on where to learn more about the discovery. The smallest planets in Earth-like orbits will not be discovered until later in the mission, so the project will continue making updates throughout the lifetime of the Kepler mission.

1 Selecting a star: To prepare for the mission, NASA sponsored a survey to produce the Kepler Input Catalog, which contains basic data about each of the stars to be targeted by the mission. Donors can select any star that has not already been adopted. They can either browse the catalog through Google Sky if they want to adopt two stars near each other or a star of a certain color (see image directly above), or they can select a star based on its catalog number or physical characteristics in a special text version of the catalog if they want the number to commemorate a special date or the properties to be similar to the Sun (see image above on the right).

2 Adopting the star: Donors just specify a donation amount (\$10 per star) and click on one of several donation systems (Google Checkout, PayPal, or the Network for Good). They enter the number of the star they would like to adopt along with their name in a "designation" field. If they would like to adopt a star on behalf of someone else, they just enter a different name for the "designation". Anonymous donations can be made through the Network for Good website, though without an email address there is no way to send the certificate or notify the donor if a planet is discovered around the star they adopted. All donations are tax-deductible, and help fund the research of the KASC.

