SOCIÉTÉ ASTRONOMIQUE DE FRANCE

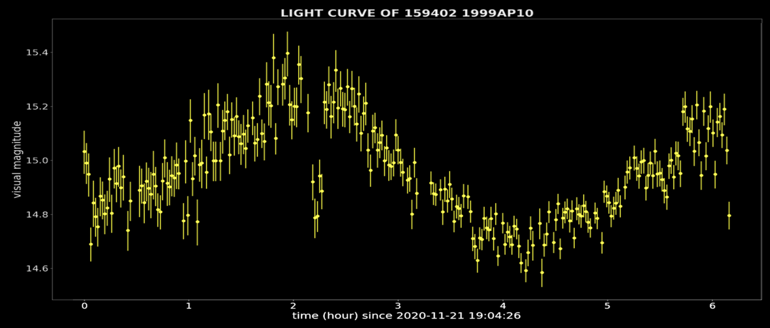
réunion CT2A

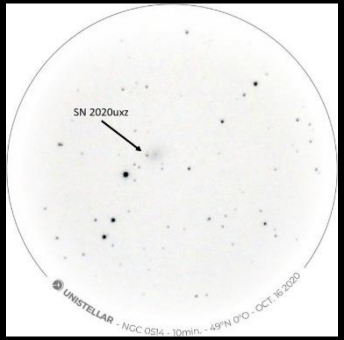
« retour d'expérience sur les eVscopes »

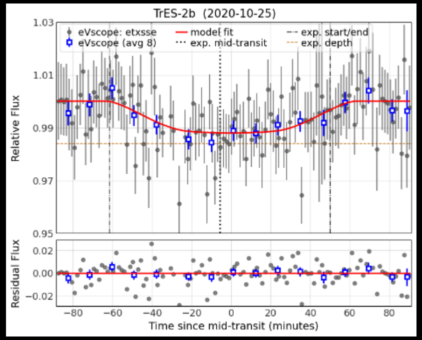
14/01/2022

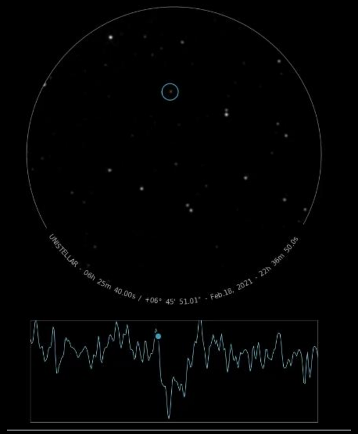
Observations et sciences participatives avec un eVscope

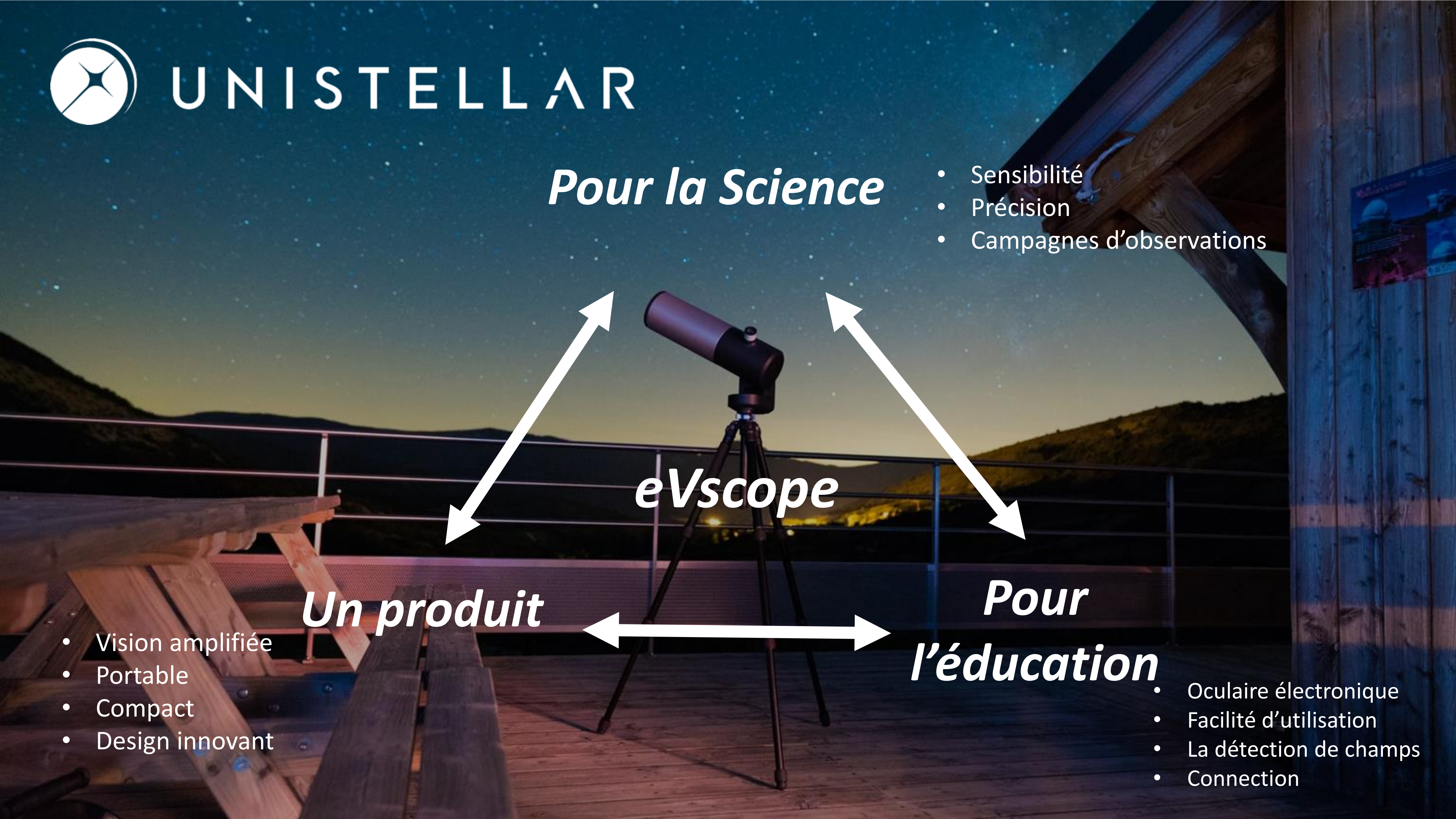
Bruno Guillet











UNISTELLAR

Pour la Science

- Sensibilité
- Précision
- Campagnes d'observations

eVscope

Un produit

- Vision amplifiée
- Portable
- Compact
- Design innovant

Pour l'éducation

- Oculaire électronique
- Facilité d'utilisation
- La détection de champs
- Connection

eVscope - THE ENHANCED VISION TELESCOPE

- Vision améliorée
- Détection de champ automatique
- Miroir de 11.4 cm
- Monture Alt-Az
- Une App pour contrôler le télescope
- Portable (10 hr d'autonomie, 9 kg)
- Un ordinateur à bord

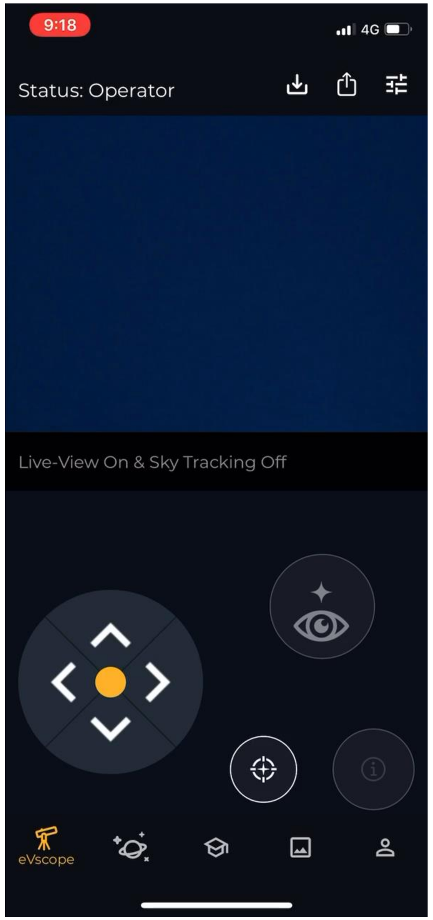
eVscope 1 / eQuinox	eVscope 2
37' x 28' FOV; 1.72 "/pix	45' x 34' FOV; 1.33 "/pix
Sony IMX224	Sony IMX347

Images uploaded to Unistellar cloud storage via WiFi.

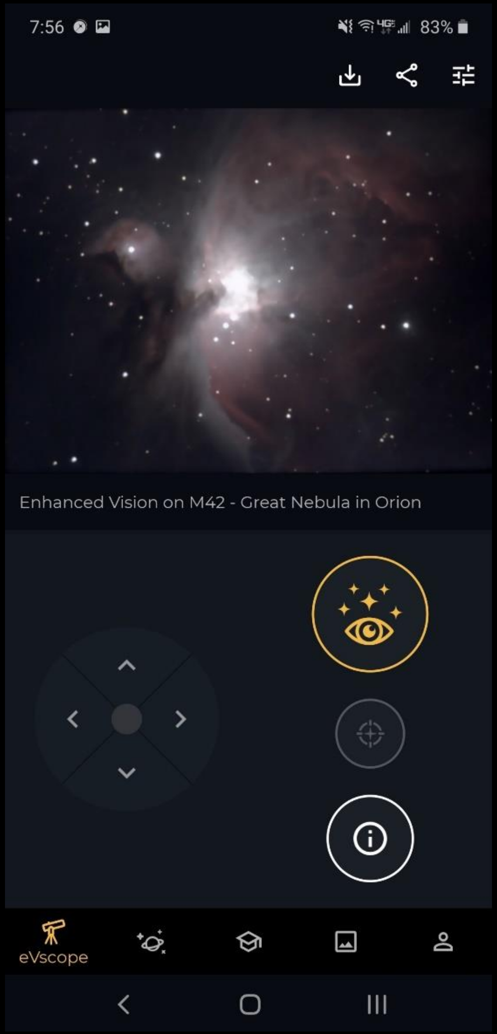
SETI cloud pipeline processes data in < 2 hours per data set.

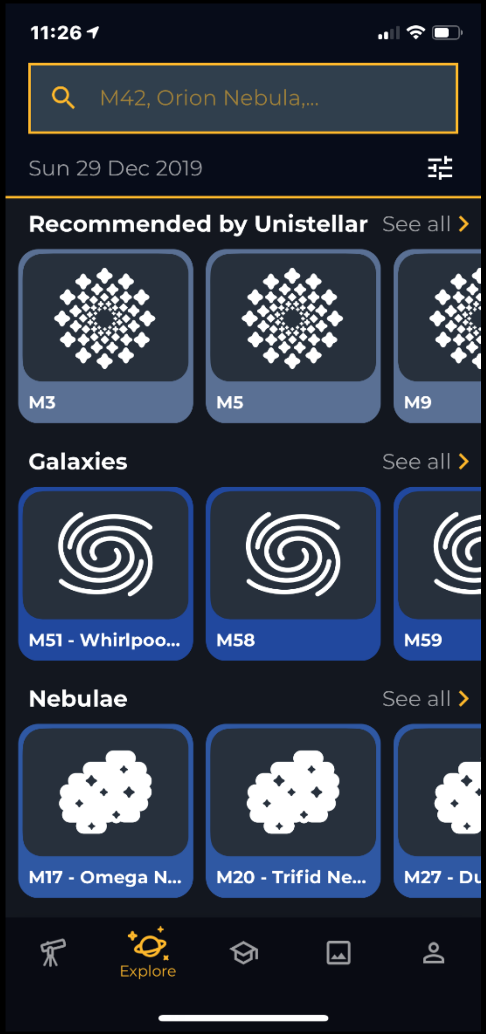

UNISTELLAR

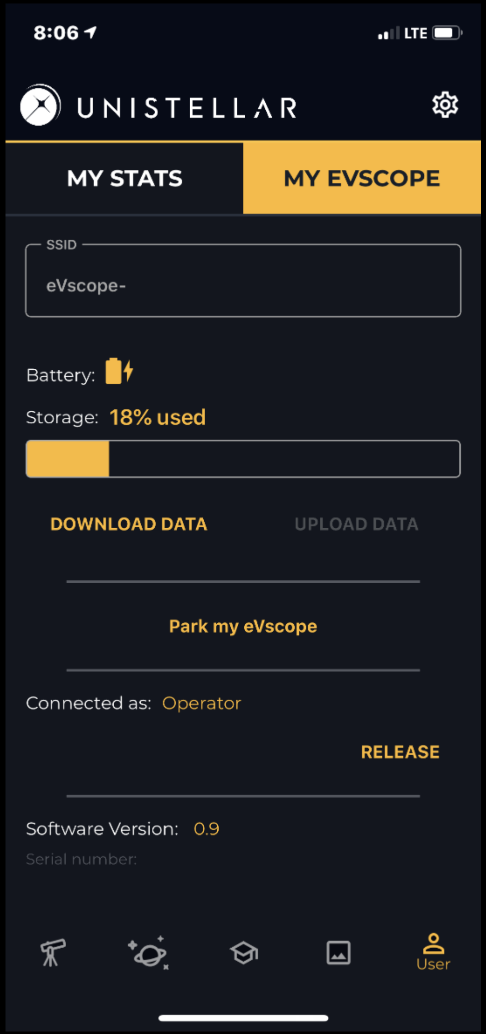

Recommandé par Un...
Galaxies
Amas
Explorer

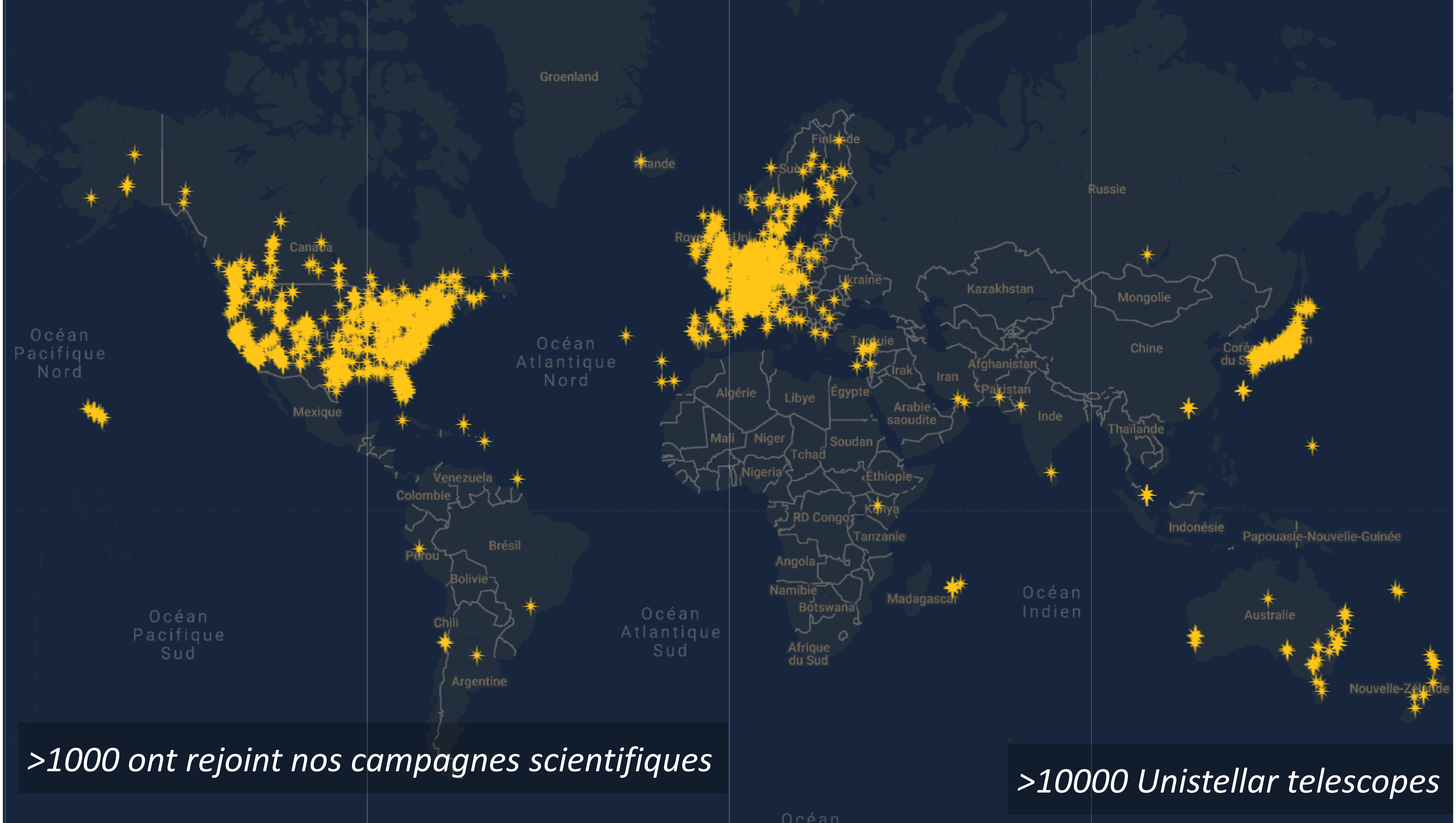

9:18
4G
Status: Operator
Live-View On & Sky Tracking Off
eVscope

Application








Groenland
Canada
Mexique
Océan Pacifique Nord
Océan Atlantique Nord
Océan Pacifique Sud
Océan Atlantique Sud
Océan Indien
Venezuela
Colombie
Brésil
Bolivie
Chili
Argentine
Algérie
Libye
Égypte
Mali
Niger
Tchad
Soudan
Nigeria
Éthiopie
RD Congo
Tanzanie
Angola
Namibie
Botswana
Afrique du Sud
Madagascar
Ukraine
Irak
Iran
Arabie saoudite
Afghanistan
Kazakhstan
Russie
Mongolie
Chine
Inde
Thaïlande
Indonésie
Papouasie-Nouvelle-Guinée
Australie
>1000 ont rejoint nos campagnes scientifiques
>10000 Unistellar telescopes

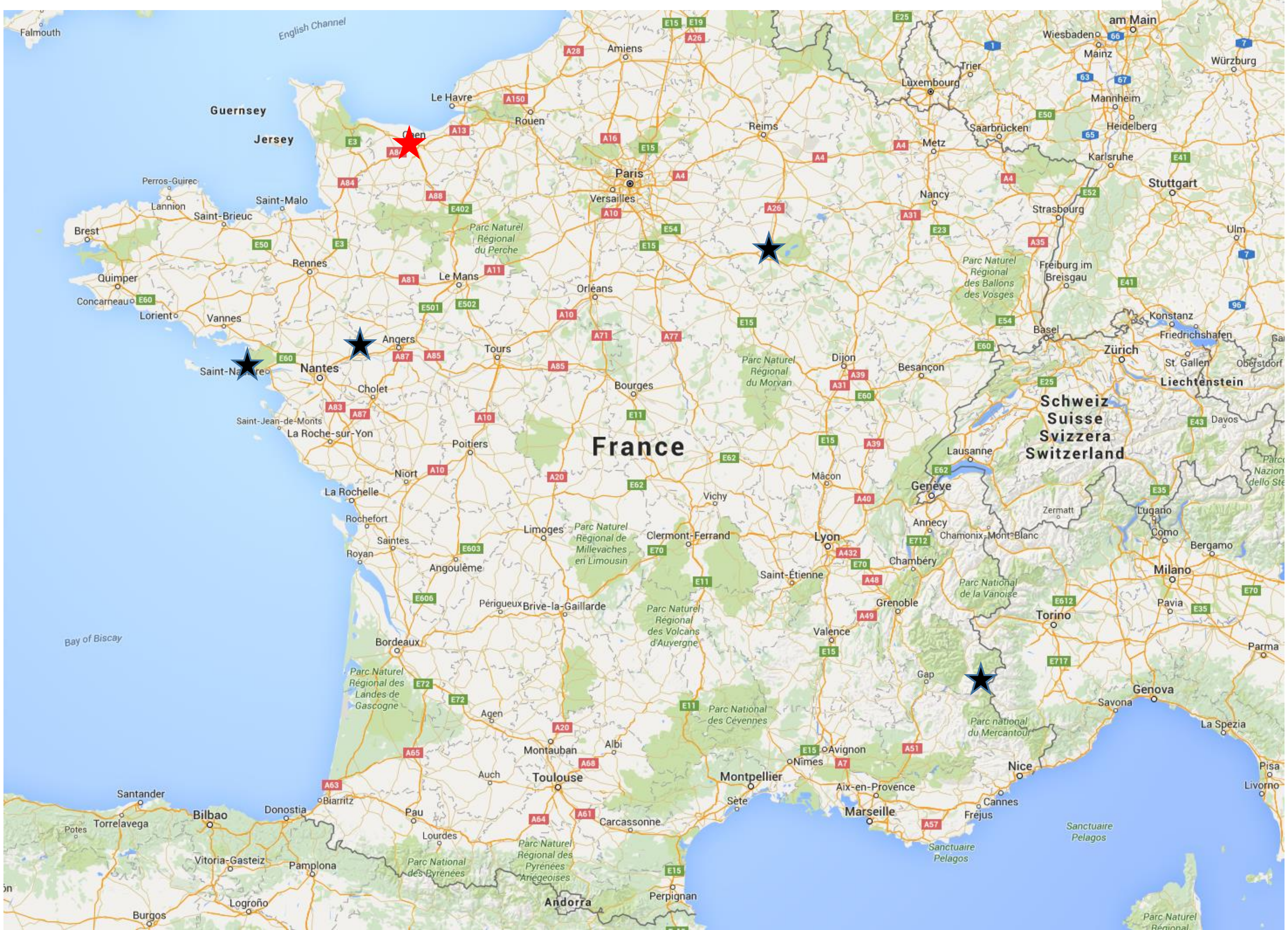
Est. Sky Quality: **18.69** Magnitude. **Class 7** Bortle. **3.61** mcd/m² Brightness. **3437.28** μcd/m² Artificial Brightness.

Evscope 1 (07/2020)
Evscope 2 (10/2021)

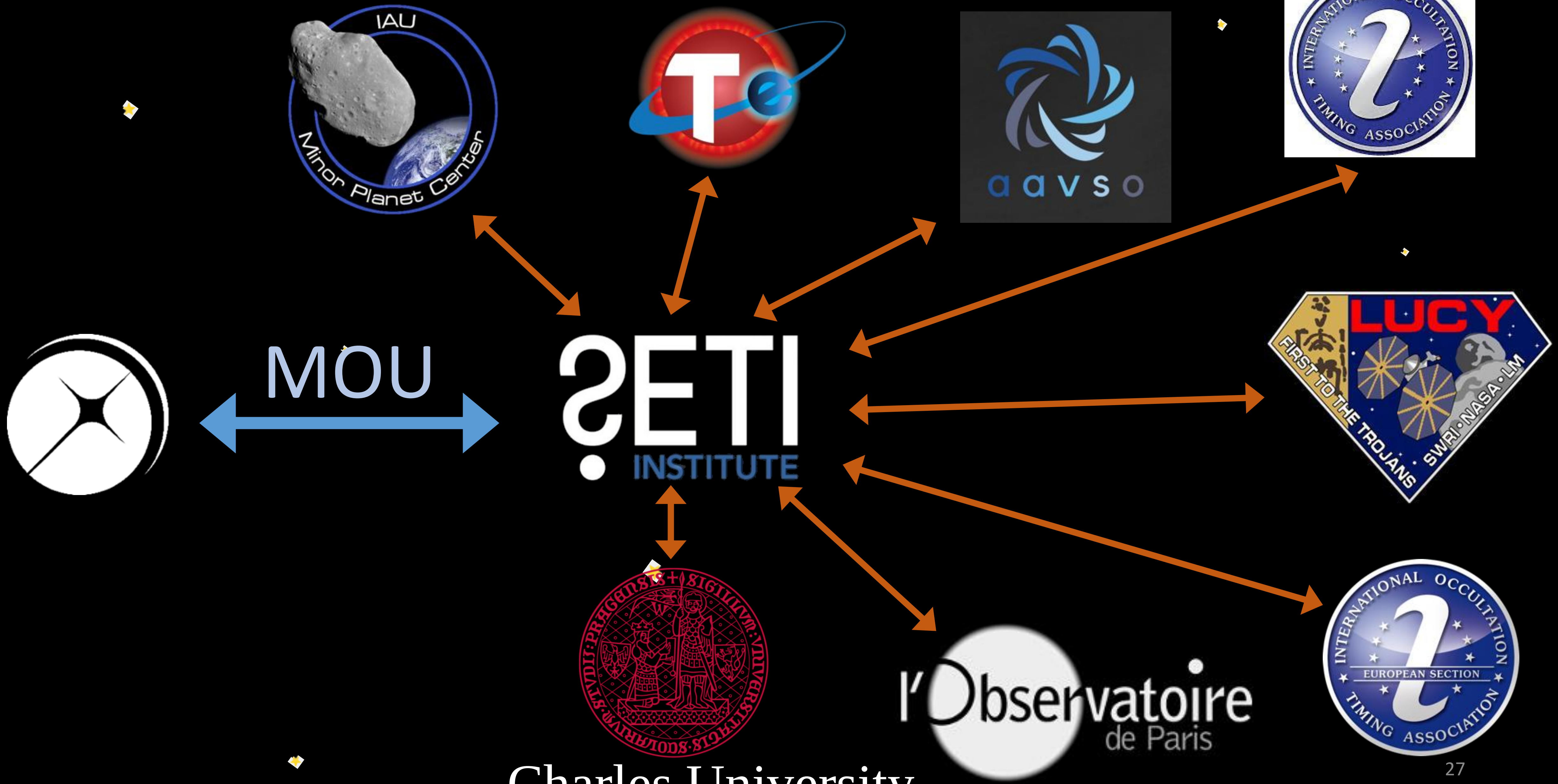
Observations « fréquentes »

Observateur assez actif

« Ambassadeur »



SCIENTIFIC PARTNERSHIPS

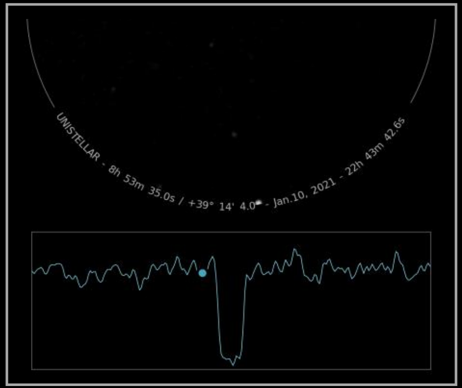


Charles University

Five main scientific campaigns for citizen scientists

Asteroid Occultations

Shapes of Asteroids



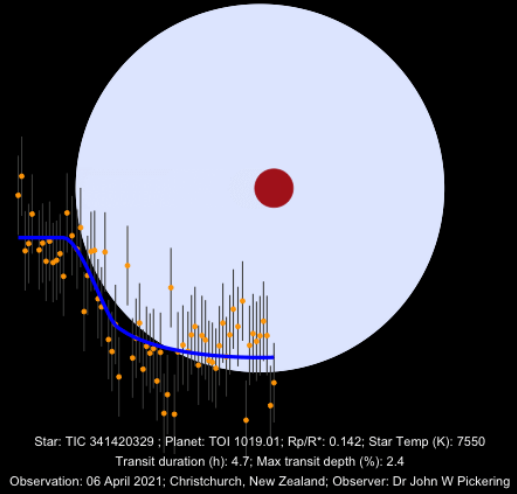
Planetary Defense

Orbits & Shapes of
Near-Earth Asteroids

Asteroid "1999AP10"

Exoplanet Transits

Planet Timing &
Confirmation

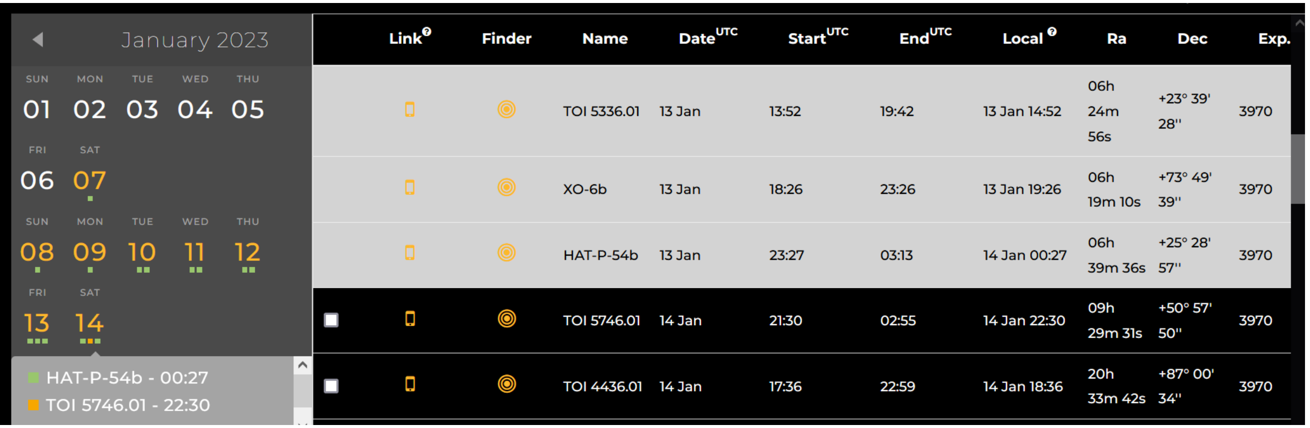


Created by
citizen astronomer
John W. Pickering

Cometary Activity

Brightness & Evolution
of Comets

Cosmic Cataclysm
(nova, supernova and more)



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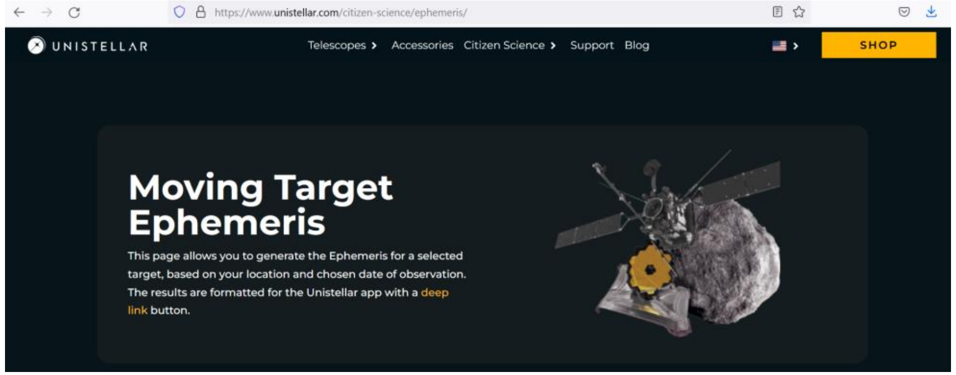
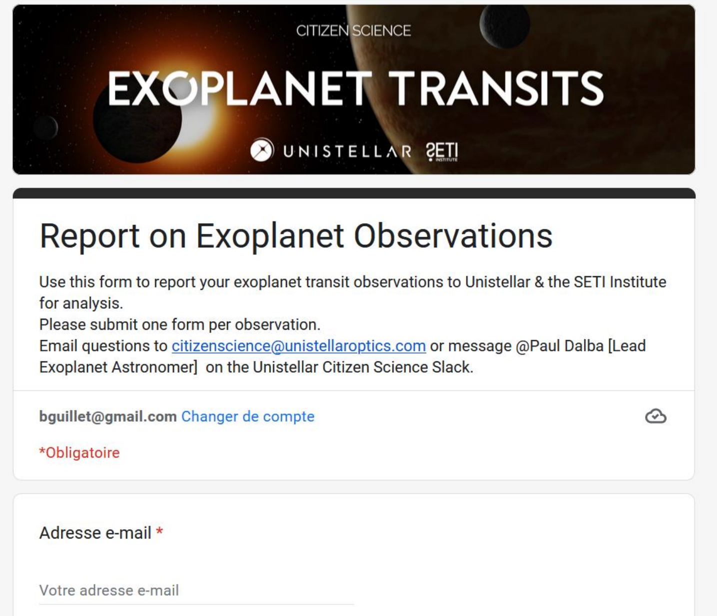
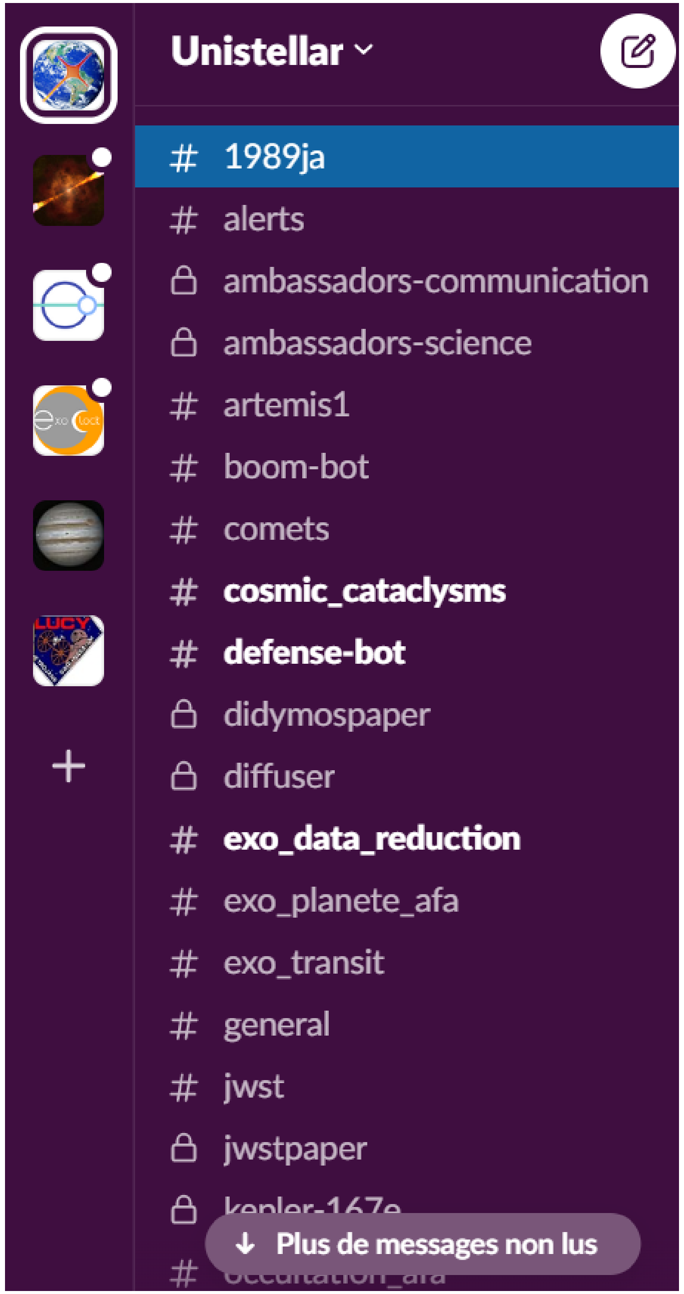
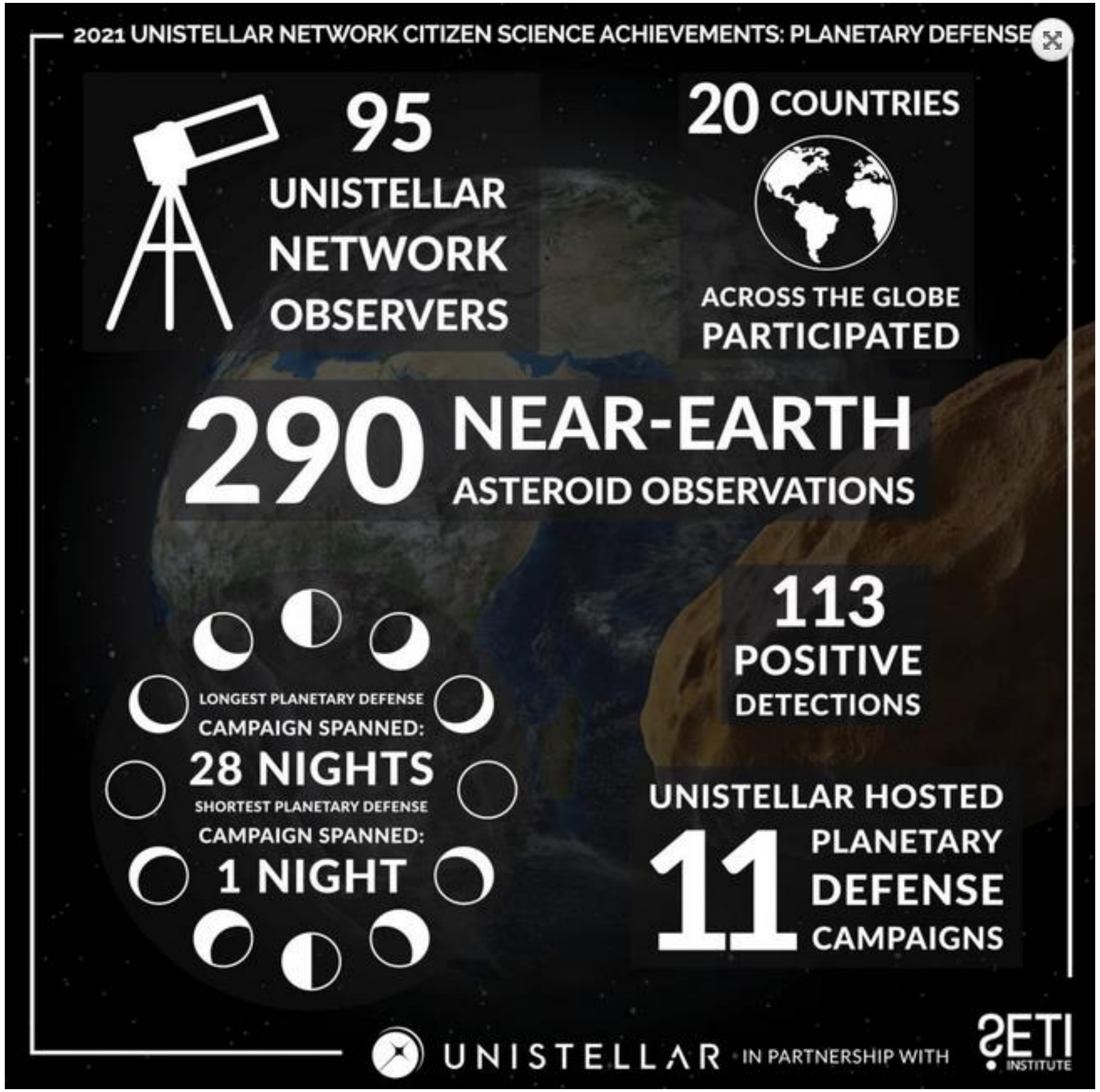
			TOI 5336.01	13 Jan	13:52	19:42	13 Jan 14:52	06h 24m 56s	+23° 39' 28''	3970
			XO-6b	13 Jan	18:26	23:26	13 Jan 19:26	06h 19m 10s	+73° 49' 39''	3970
			HAT-P-54b	13 Jan	23:27	03:13	14 Jan 00:27	06h 39m 36s	+25° 28' 57''	3970
			TOI 5746.01	14 Jan	21:30	02:55	14 Jan 22:30	09h 29m 31s	+50° 57' 50''	3970
			TOI 4436.01	14 Jan	17:36	22:59	14 Jan 18:36	20h 33m 42s	+87° 00' 34''	3970

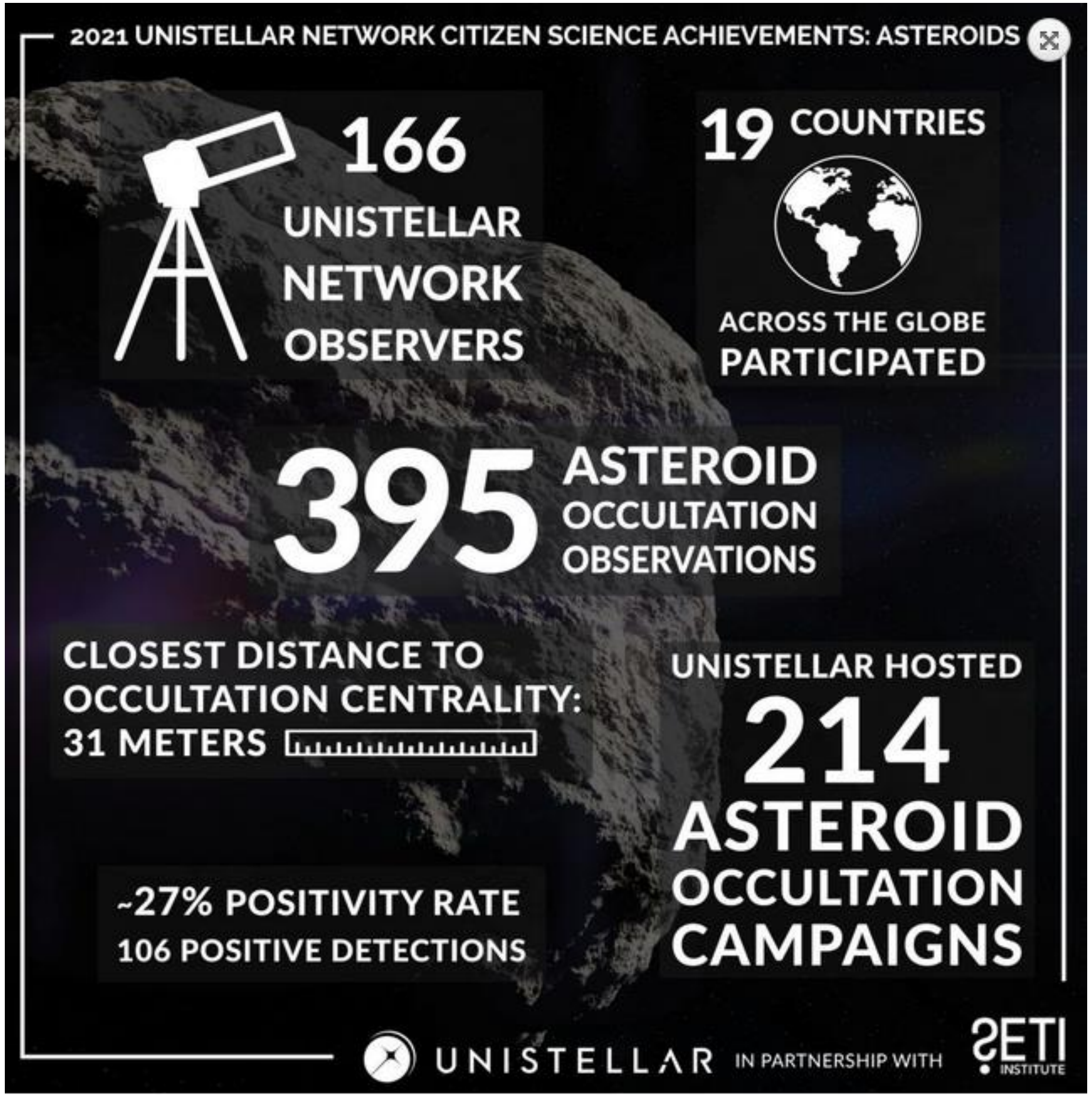




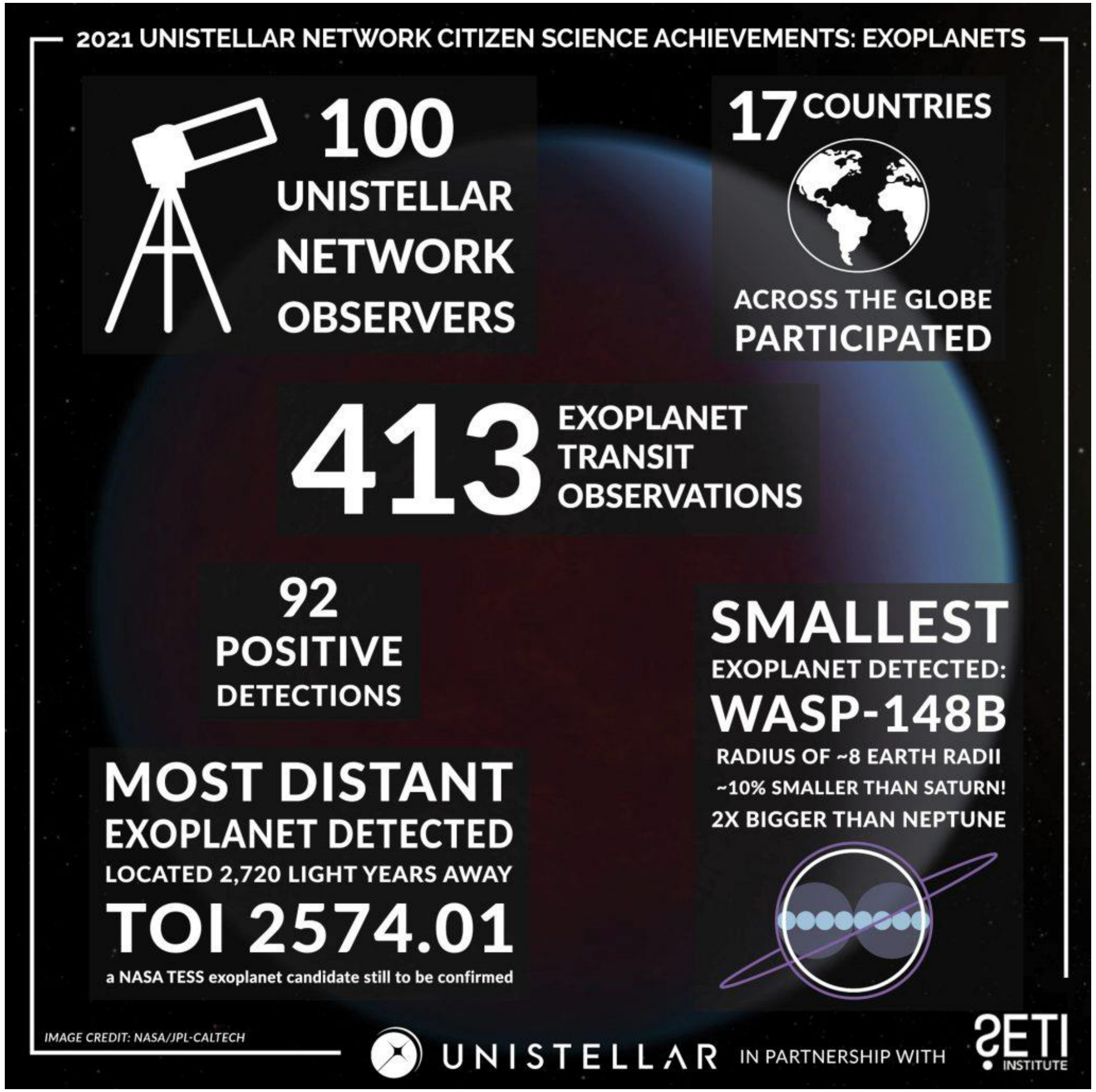


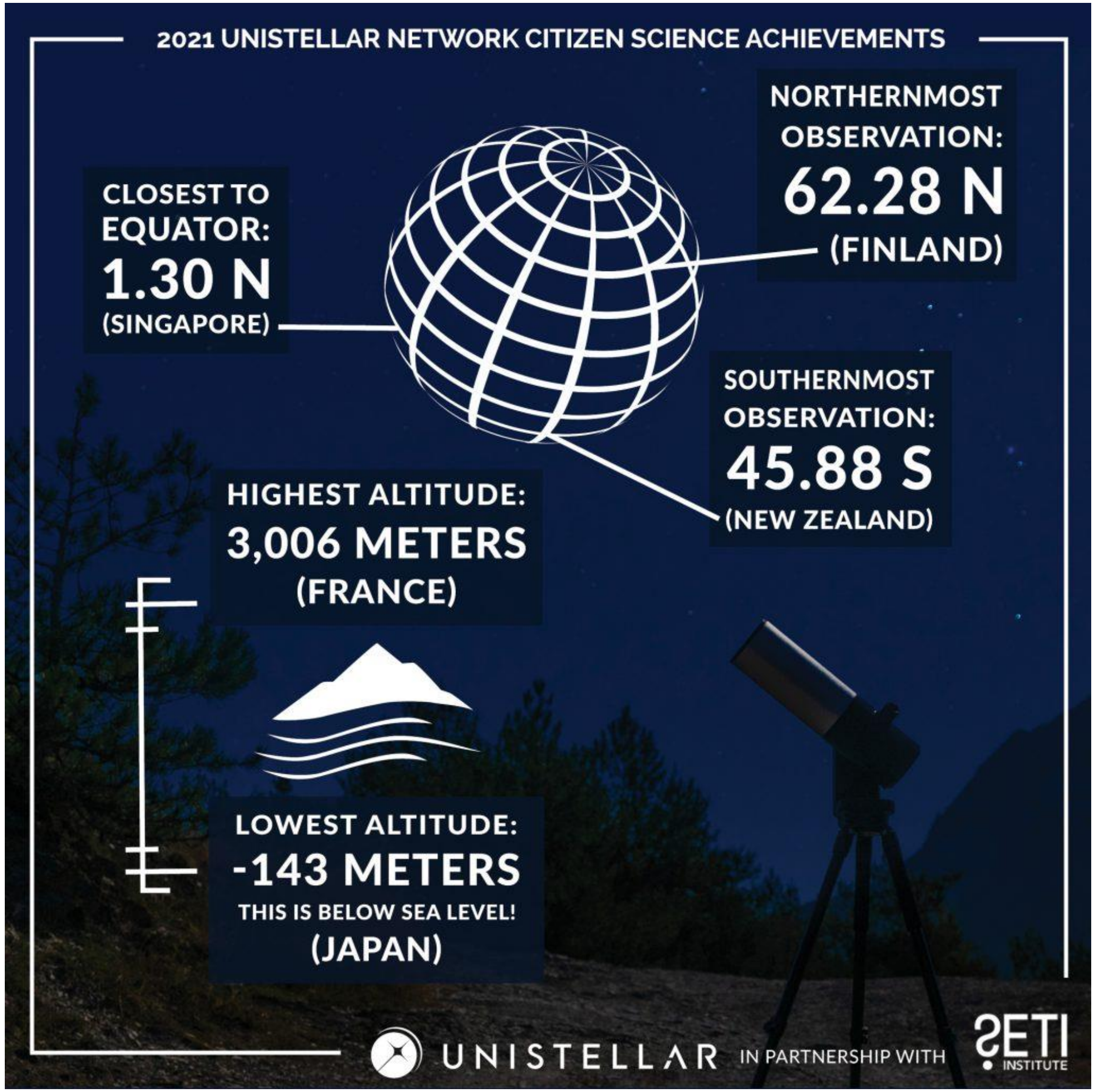
Faits marquants du réseau Unistellar en 2021





Faits marquants du réseau Unistellar en 2021





Five main scientific campaigns for citizen scientists

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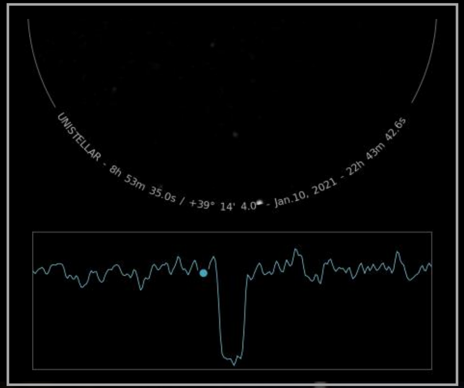
Shapes of Asteroids



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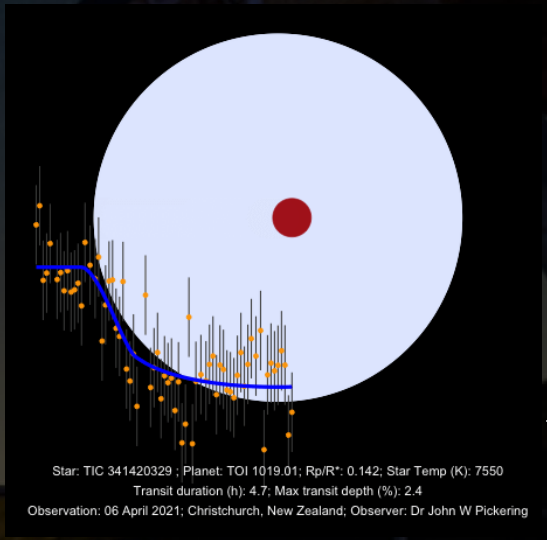

Created by
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Cosmic Cataclysm
(nova, supernova and more)

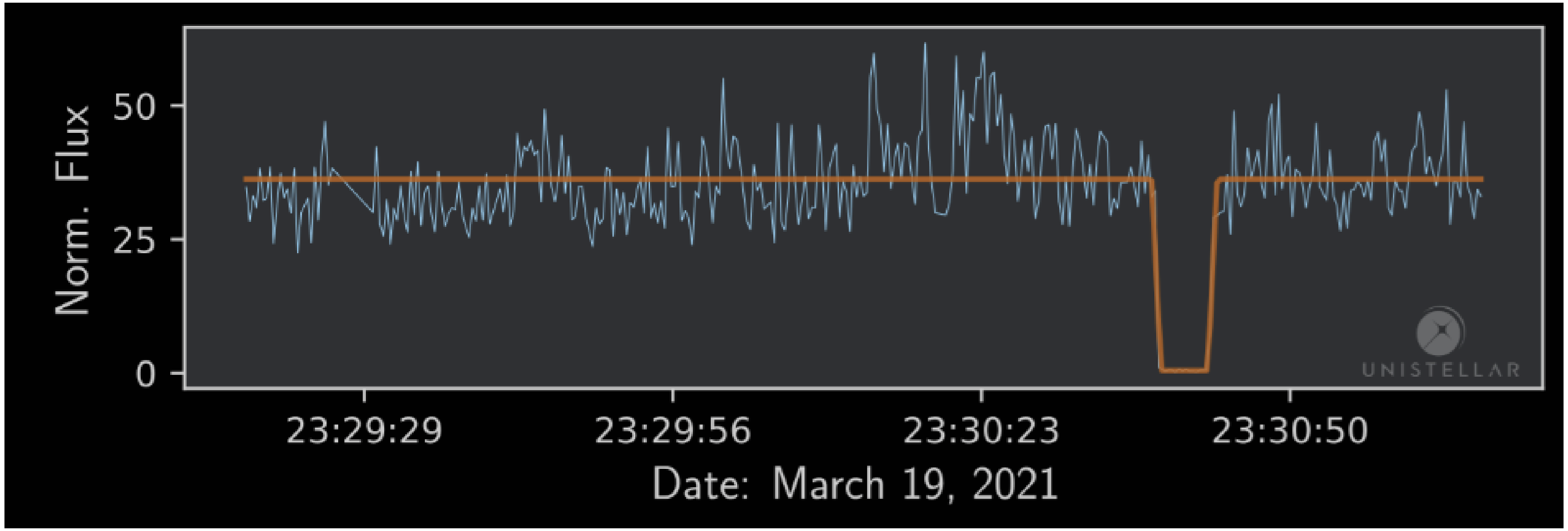
UNISTELLAR SETI INSTITUTE

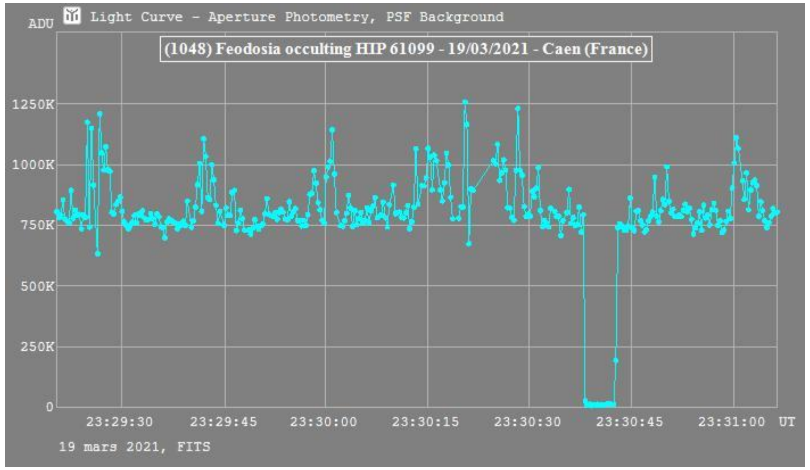
occultation de l’étoile HIP 61099 par l’astéroïde (1048) Feodosia le 20 mars 2021

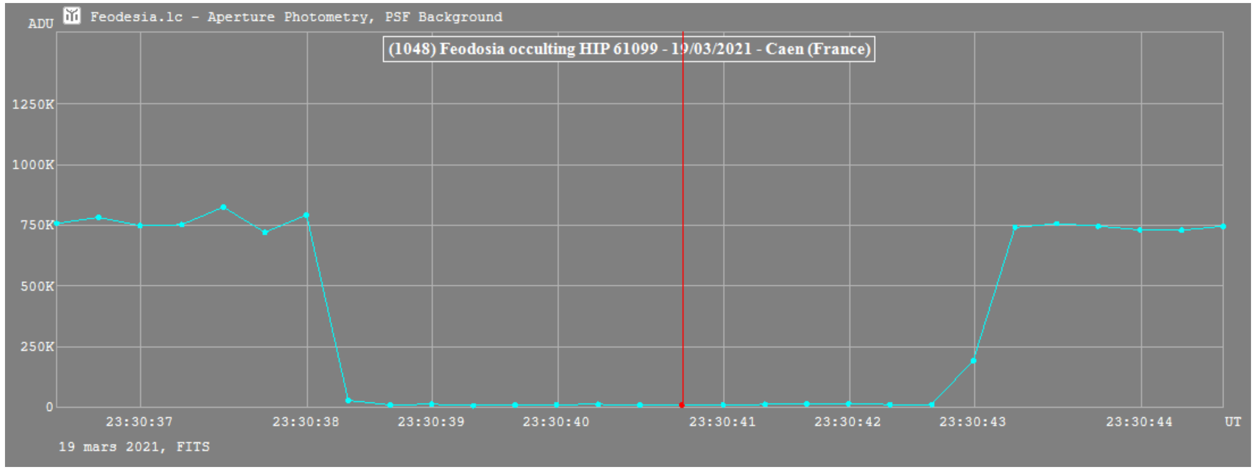
Astéroide de la ceinture principale
(orbite entre les planètes Mars et Jupiter)
1ère observation 29/11/1924 par Karl Reinmuth
distance moyenne au Soleil ~ 408 millions de km
excentricité : 0,181, période 4,5 ans
(périhélie 335 millions de km,
aphélie, est à 483 millions de km).
taille estimée à 70 km de diamètre
rotation sur lui-même en environ 10 h 30.

HIP 61099 (SAO 82349),
étoile rouge de classe spectrale K0
située à 84 années-lumière du Soleil
Magnitude V = 7,7

occultation de l’étoile HIP 61099 par l’astéroïde (1048) Feodosia le 19 mars 2021

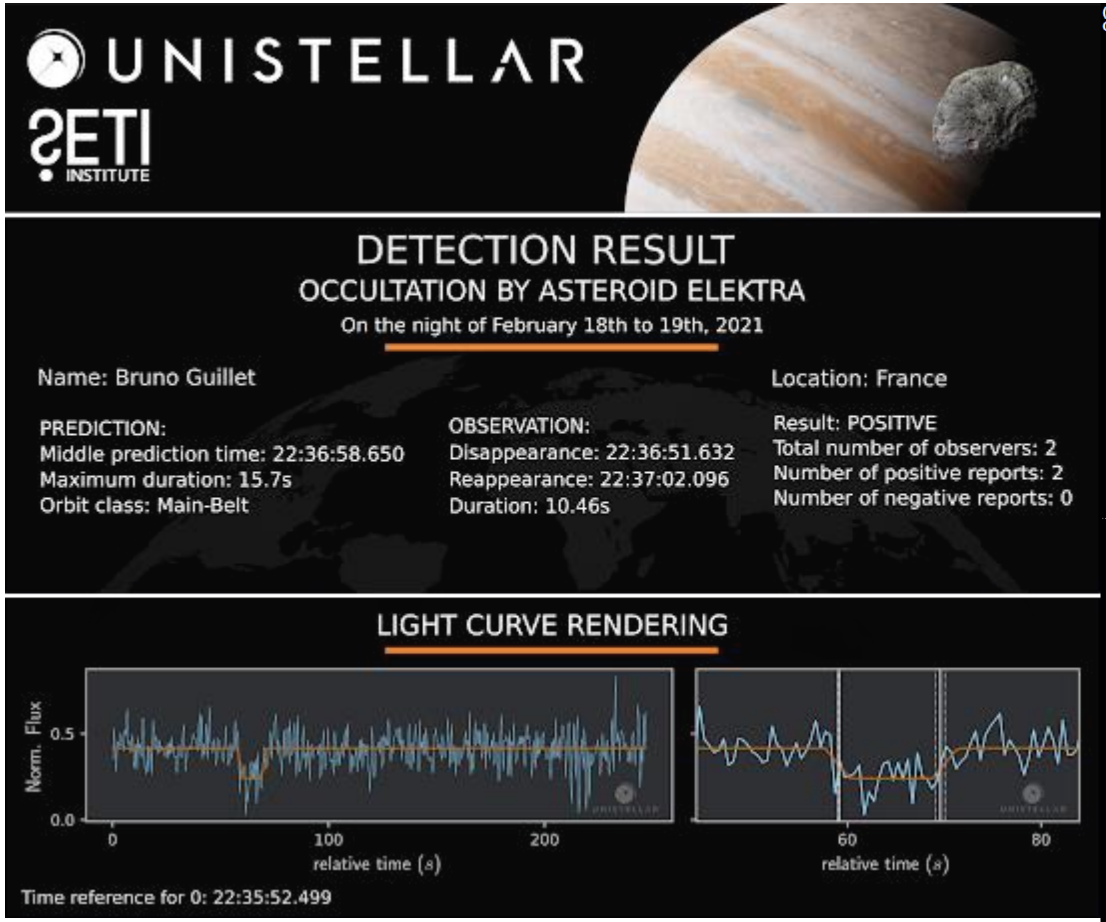


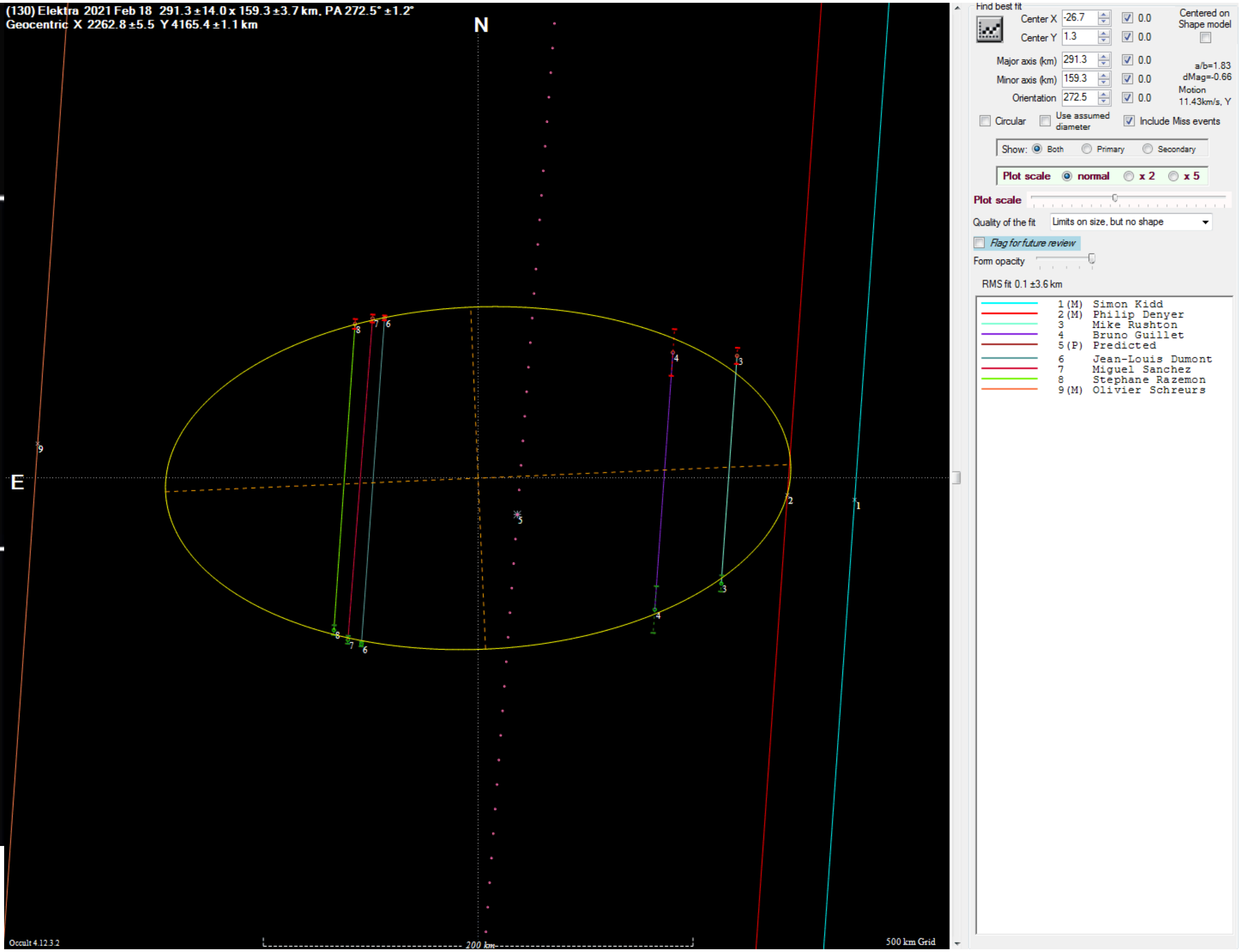




Tangra

occultation par l’astéroïde (130) Elektra le 18 février 2021

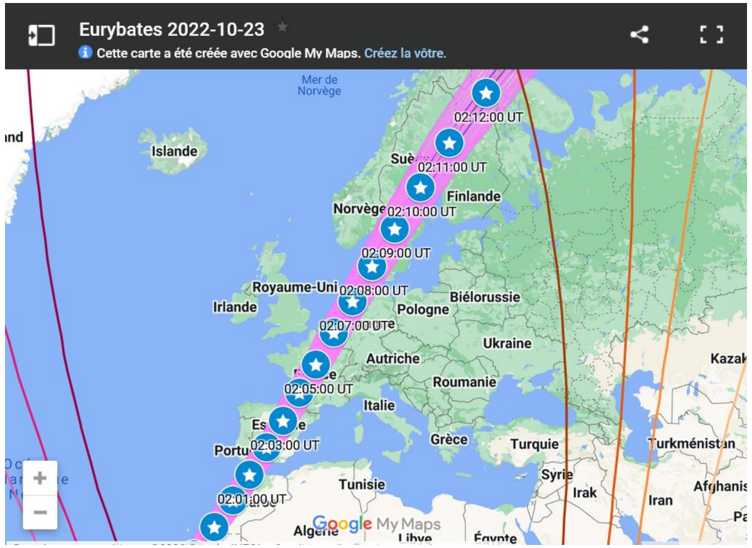


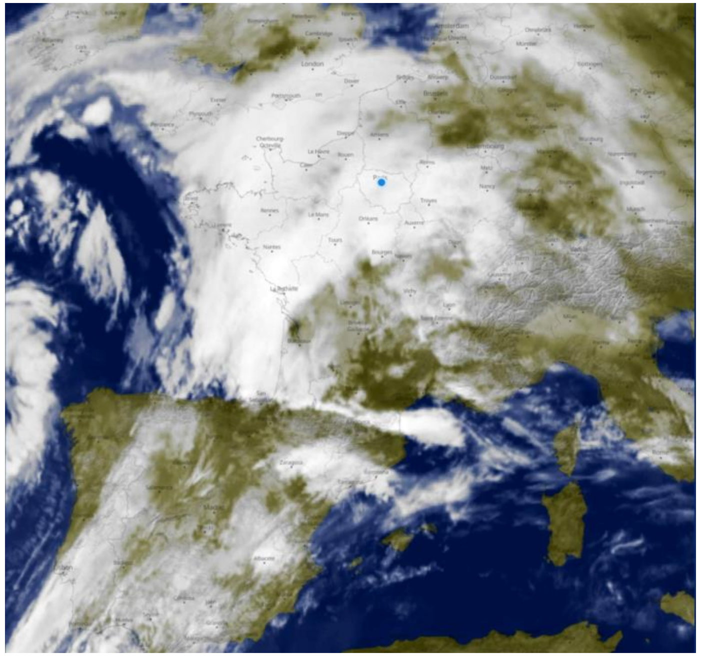


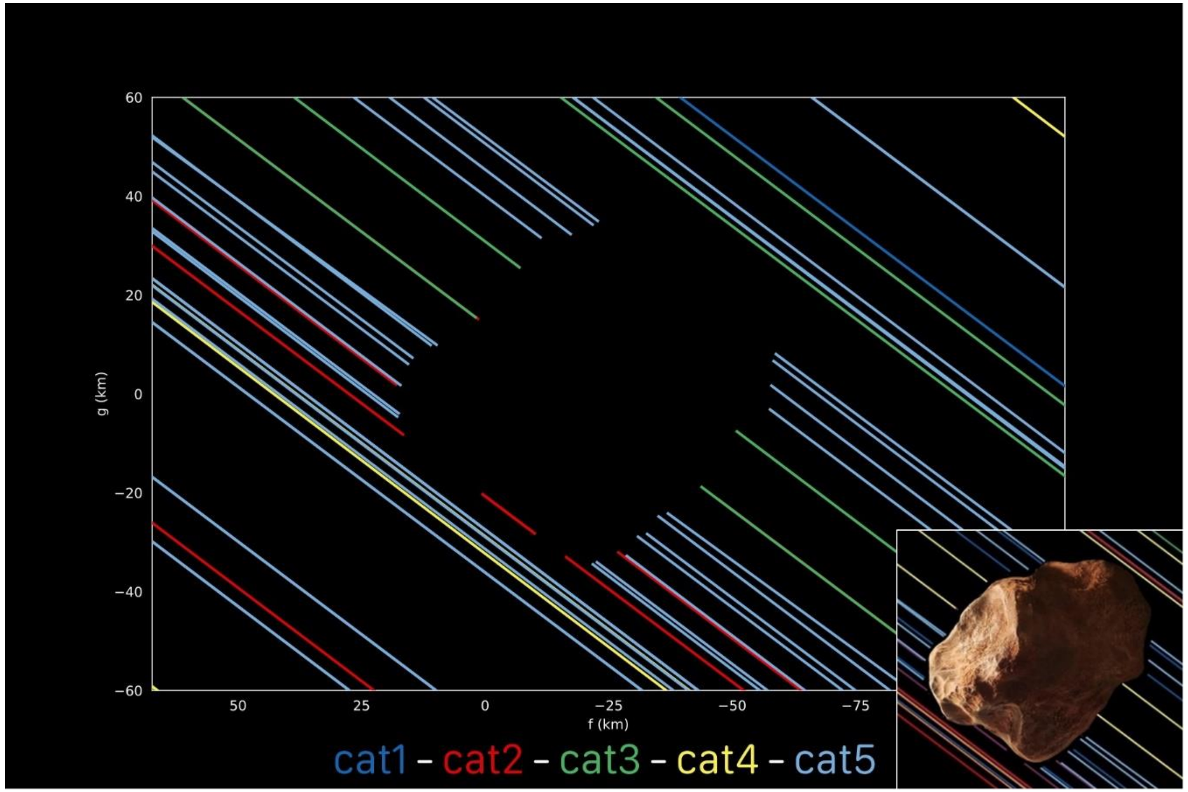
Étoile : UCAC4 484-021613
V = 11.9

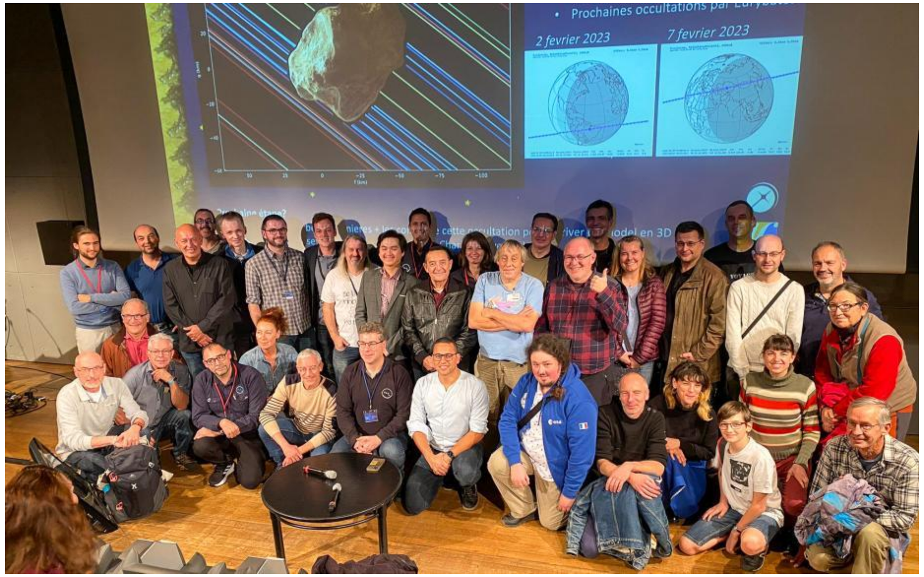
euraster.net

Campagne Eurybate – AFA & Unistellar









RCE2022

Five main scientific campaigns for citizen scientists

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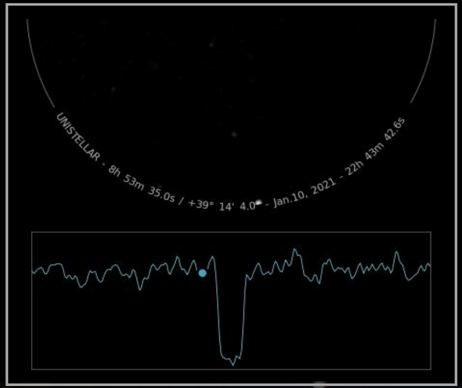
Shapes of Asteroids



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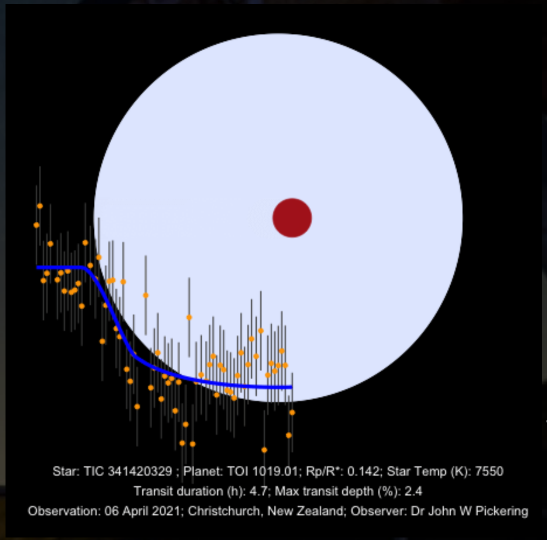

Created by
citizen astronomer
John W. Pickering

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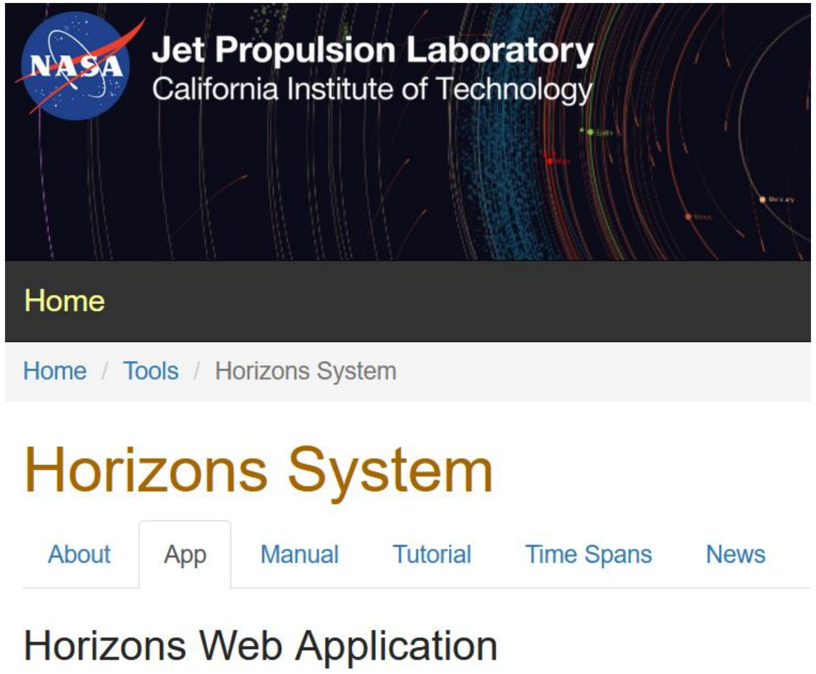
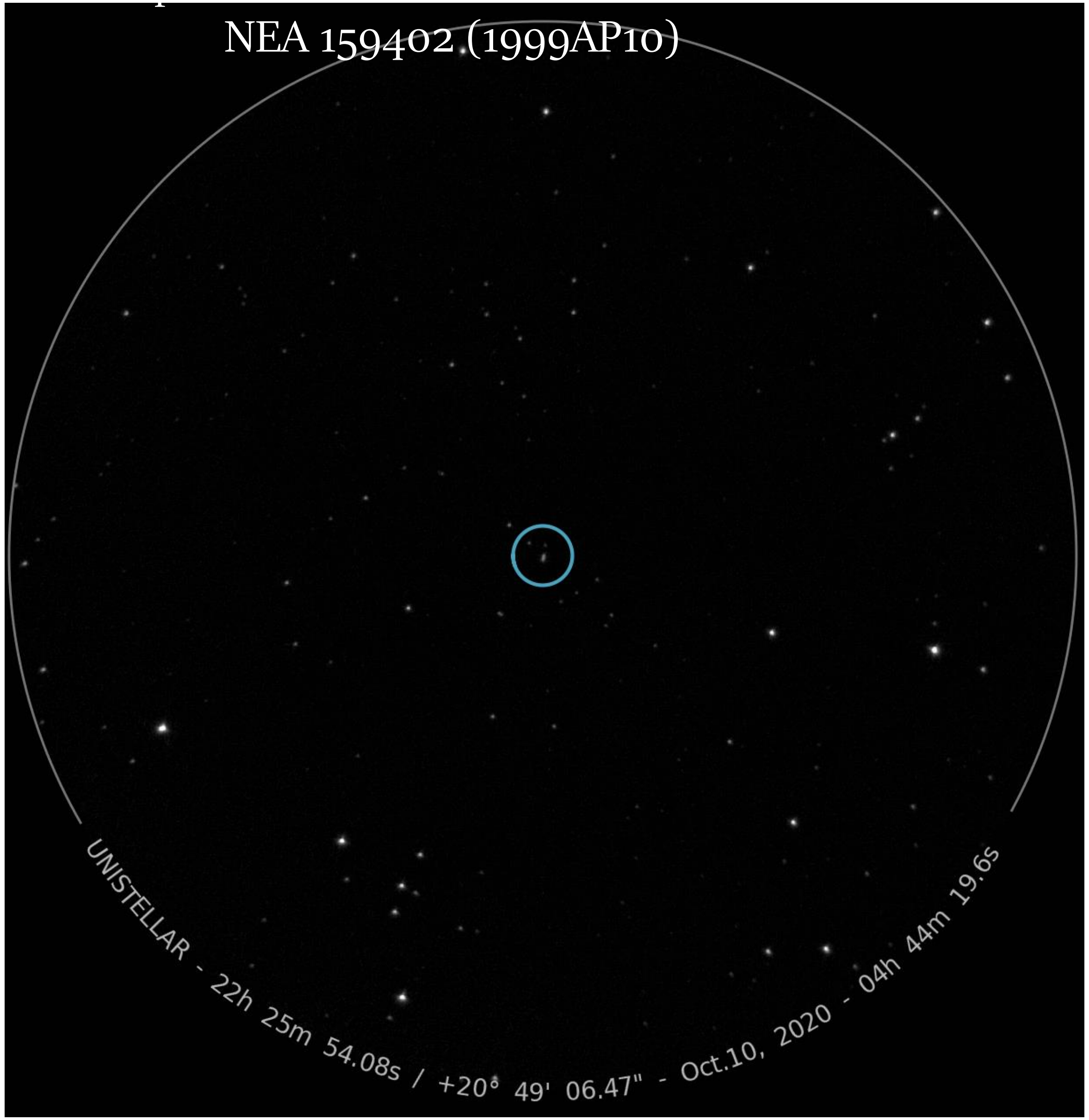
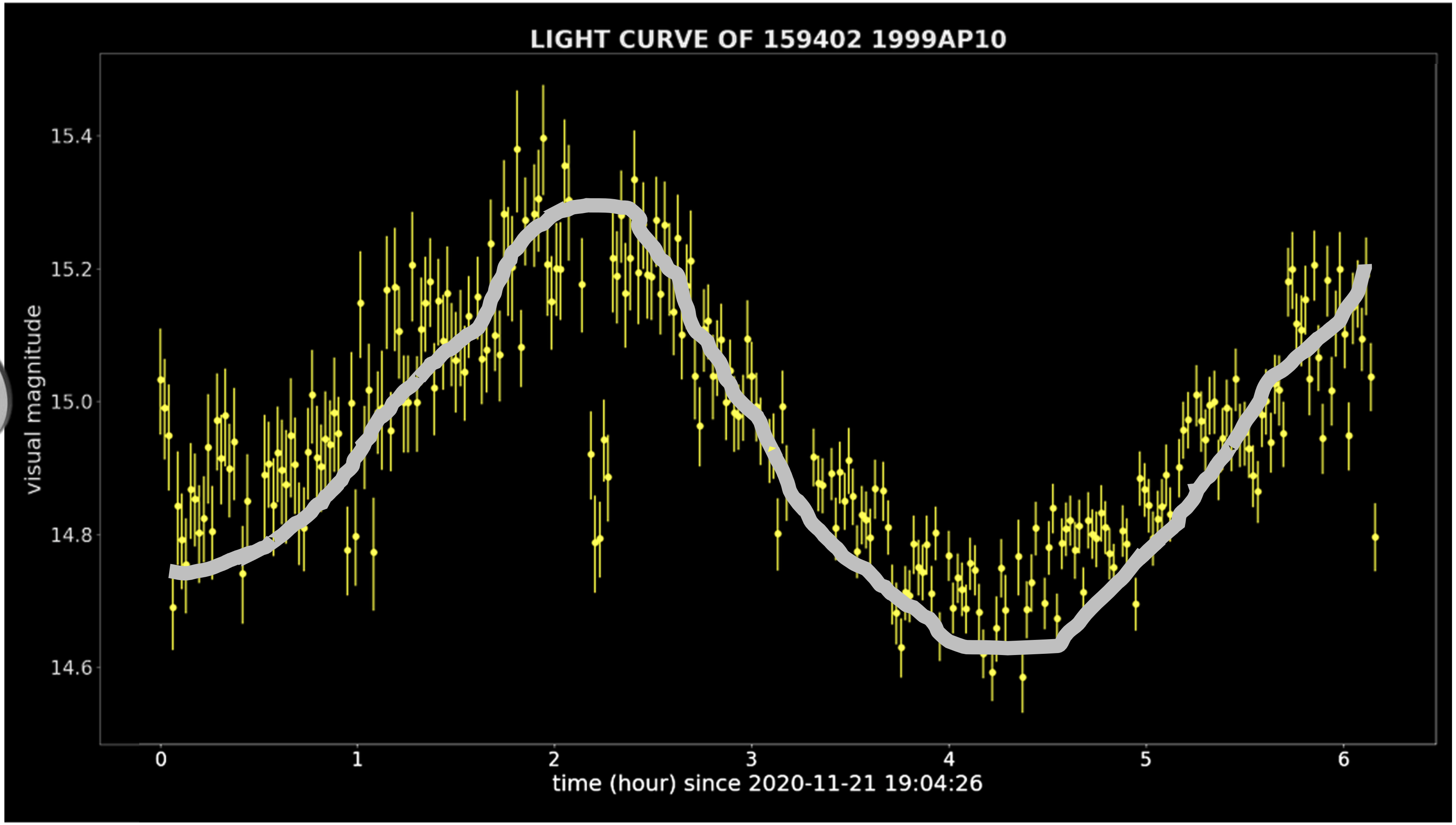
Observation de NEA 2021 CO (diamètre 50 m) – 5 février 2021
Distance inférieure à la Lune

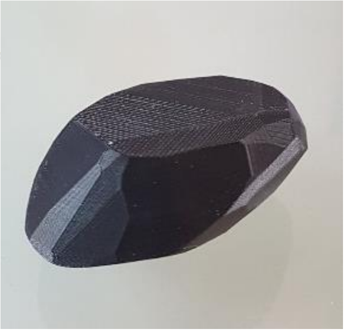


NEA 159402 (1999AP10)

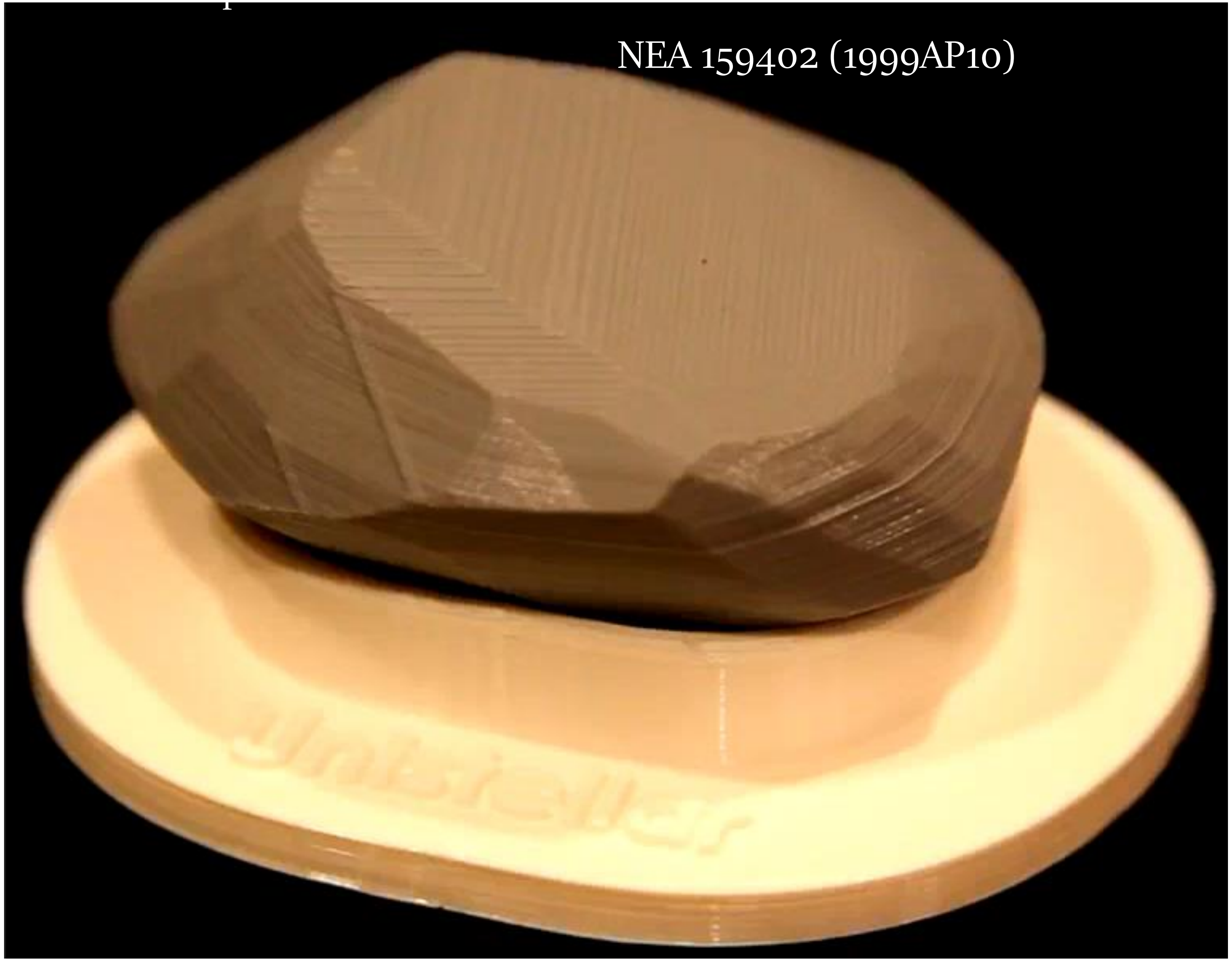



UNISTELLAR


LIGHT CURVE OF 159402 1999AP10
visual magnitude
15.4
15.2
15.0
14.8
14.6
0
1
2
3
4
5
6
time (hour) since 2020-11-21 19:04:26




UNISTELLAR


NEA 159402 (1999AP10)

ROTATION PERIOD DETERMINATION FOR (7335) 1989 JA

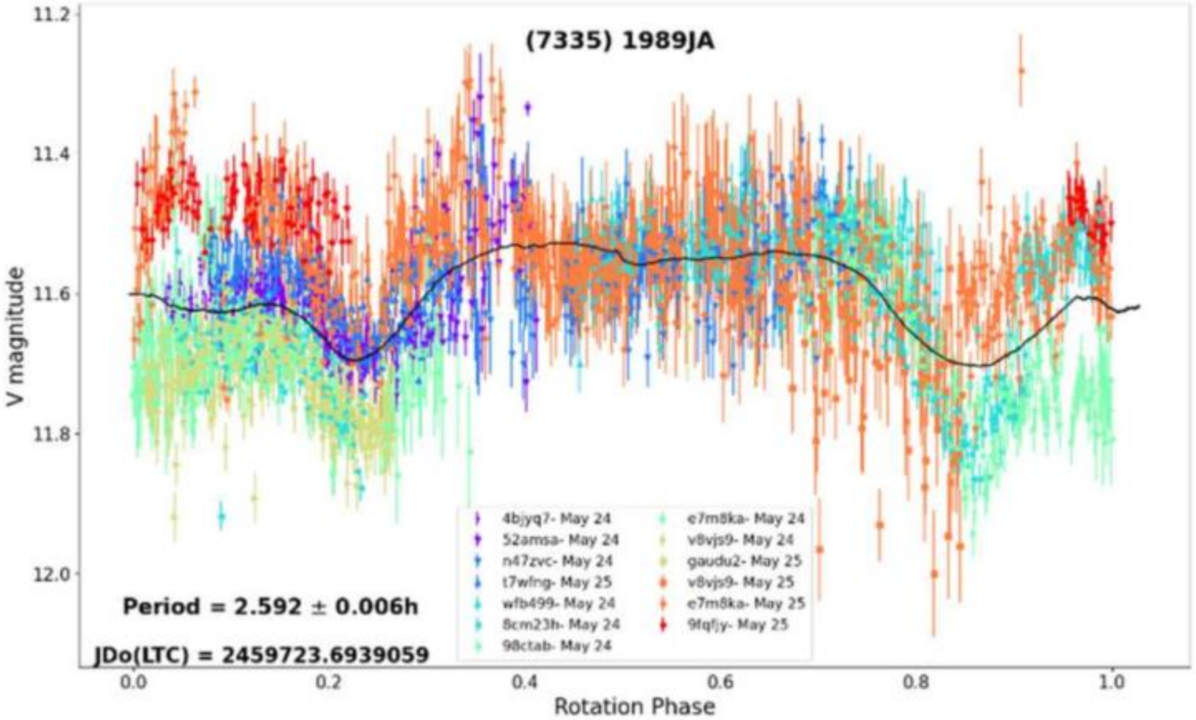
Ryan Lambert, Franck Marchis
SETI Institute, Carl Sagan Center, 189 Bernardo Avenue, Suite 200, Mountain View CA, 94043, USA
rlambert@seti.org

Josef Hanuš
Charles University, Faculty of Mathematics and Physics, Institute of Astronomy, V Holešovickách 2
18000 Prague 8, CZECH REPUBLIC

John Archer, Mario Billiani, John K. Bradley, Phil Breeze-Lamb, Michael Camilleri, Martin Davy, John Deitz, Stephen Donnelly, Mark Fairfax, Keiichi Fukui, Ryan Gamurot, Tateki Goto, Bruno Guillet, Scott Kardel, Rachel Knight, William Hedegaard Langvad, Margaret A. Loose, Nicola Meneghelli, Mike Mitchell, Pavel Nikiforov, Bruce Parker, John W. Pickering, Michael Primm, Justus Randolph, Felipe Braga Ribas, Fabien Richardot, Darren A. Rivett, Masao Shimizu, Georges Simard, Martin Smallen, Ethan Teng, Marcos A. van Dam, Aad Verveen, Joe Widi
Unistellar Citizen Astronomers

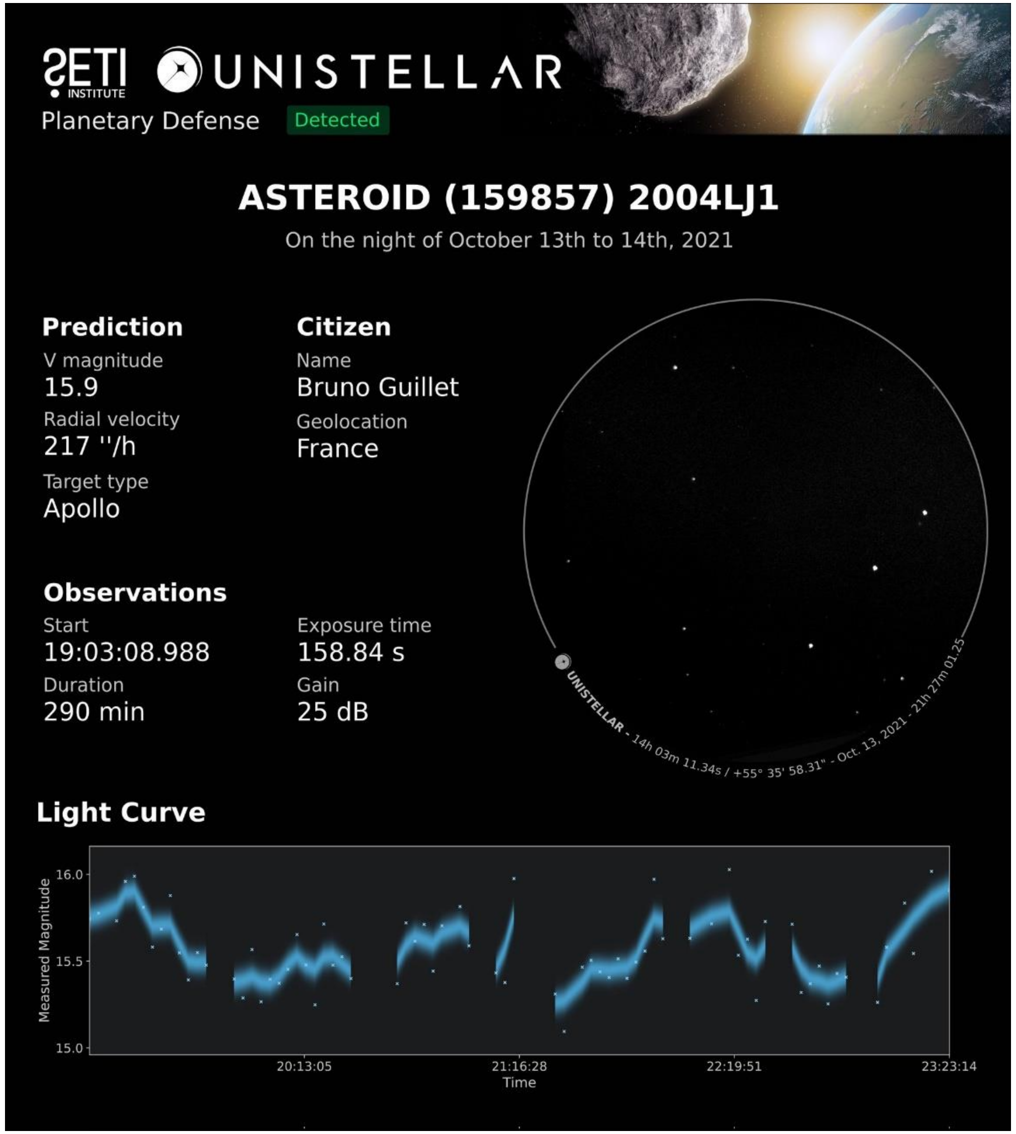
(Received: 2022 September 30)

We present the results of an observational study of the near-Earth asteroid (7335) 1989 JA conducted during its recent close approach. Using data collected from participating Unistellar citizen astronomers network, we report a best-fitting synodic rotation period of 2.592 ± 0.006 hours with a corresponding amplitude of 0.09 ± 0.01 magnitudes for (7335) 1989 JA.

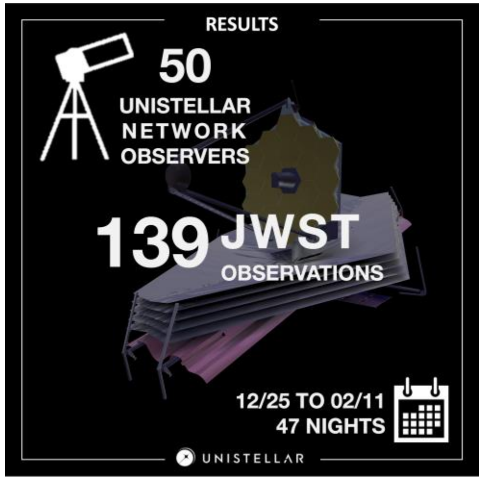


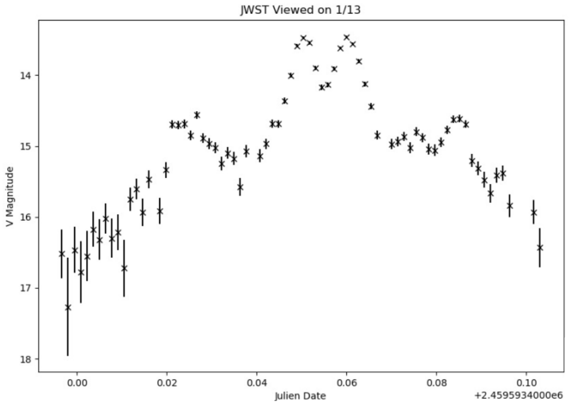
Publié dans The Minor Planet Bulletin 2023

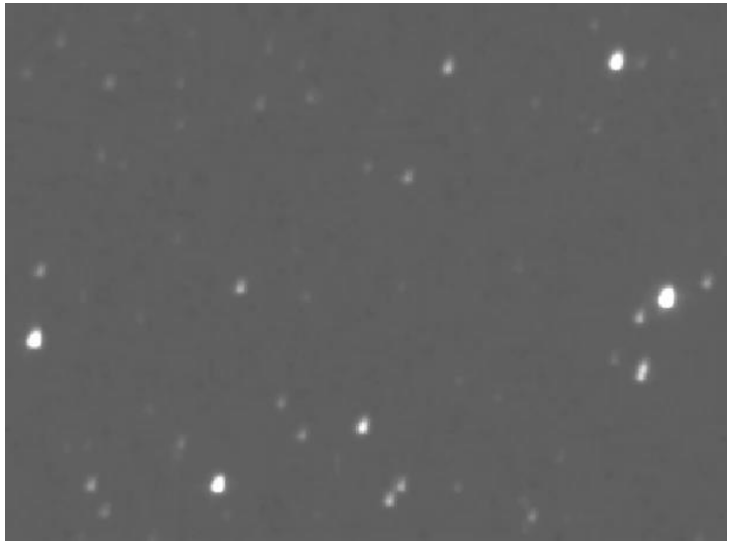
This #NEA belongs to the Apollo asteroid: it will cross the path of Earth's orbit at some point. Its estimated size is around 3km across
Astrometric positions and photometry are useful to refine its orbit, its shape and its spin.



Observations d'engins spatiaux







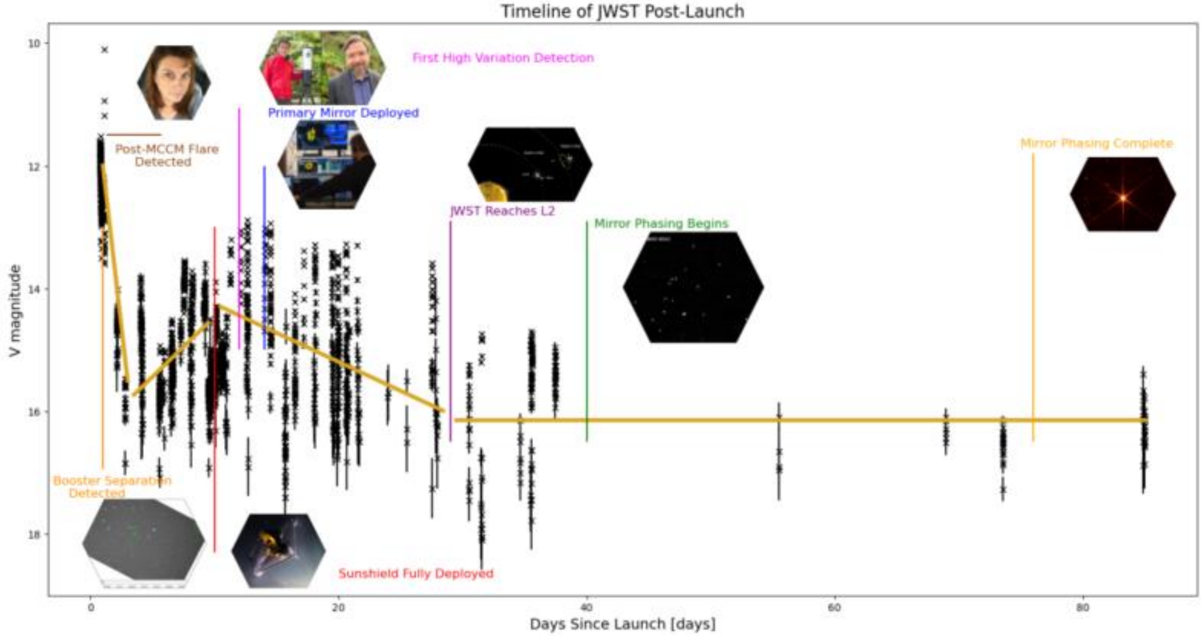


Figure 7. Global light curve variation showing the changes in brightness. Yellow lines indicate the overall trend in the brightness of JWST at various stages of its deployment.

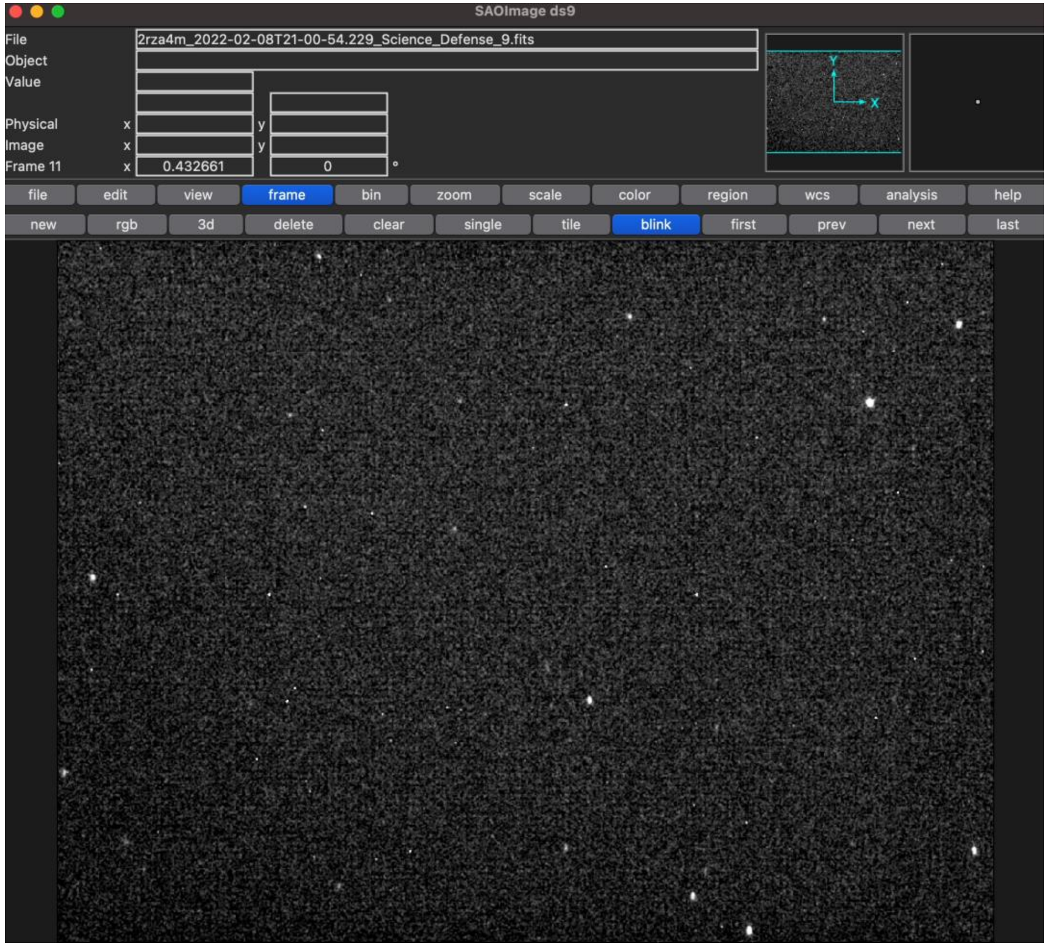
Citizen Science Astronomy with a Network of Small Telescopes: The Launch and Deployment of JWST

Lambert R. A.[a], Marchis, F.[a,b,*], Asencio, J.[b], Blaclard, G.[b], Sgro, L.A.[a], Giorgini, J.D.[c], Plavchan, P.[d], White, T.[e], Verveen, A.[e], Goto, T.[e], Kuossari, P.[e], Sethu, N.[e], Loose, M.A.[e], Will, S.[e], ...ibbernsen, K.[e], Pickering, J.W[e], Randolph, J.[e], Fukui, K.[e], Huet, P.[e], Guillet, B.[e], Clerget, O.[e], Stahl, S.[e], Yoblonsky, N.[e], Lauvernier, M.[e], Matsumura, T.[e], Yamato, M.[e], Laugier, J.M.[e], Brodt-Vilain, O.[e], Espudo, A.[e], Kukita, R.[e], Iida, S.[e], Kardel, S.[e], Green, D.[e], Tikkanen, P.[e], Douvas, A.[e], Billiani, M.[e], Knight, G.[e], Ryno, M.[e], Simard, G.[e], Knight, R.[e], Primm, M.[e], Wildhagen, B.[e], Poncet, J.[e], Frachon, T.[e], Shimizu, M.[e], Jackson, A.[e], Parker, B.[e], Redfern, G.[e], Nikiforov, P.[e], Friday, E.[e], Lincoln, K.[e], Sweitzer, J.[e], Mitsuoka, R.[e], Cabral, K.[e], Katterfeld, A.[e], Fairfax, M.[e]

SETI Institute, 339 Bernardo Ave, Suite 200, Mountain View, CA, USA 94043; [b]Unistellar, 5 allée Marcel Leclerc,. bâtiment B,. 13008 Marseille, France; [c]Solar System Dynamics Group, Jet Propulsion Laboratory, California Institute of Technology, 4800 Oak Grove Drive, Pasadena, CA 91109, USA; [d]George Mason University, 4400 University Drive Fairfax, VA, 22030, USA; [e]Unistellar Citizen Scientist, Earth.

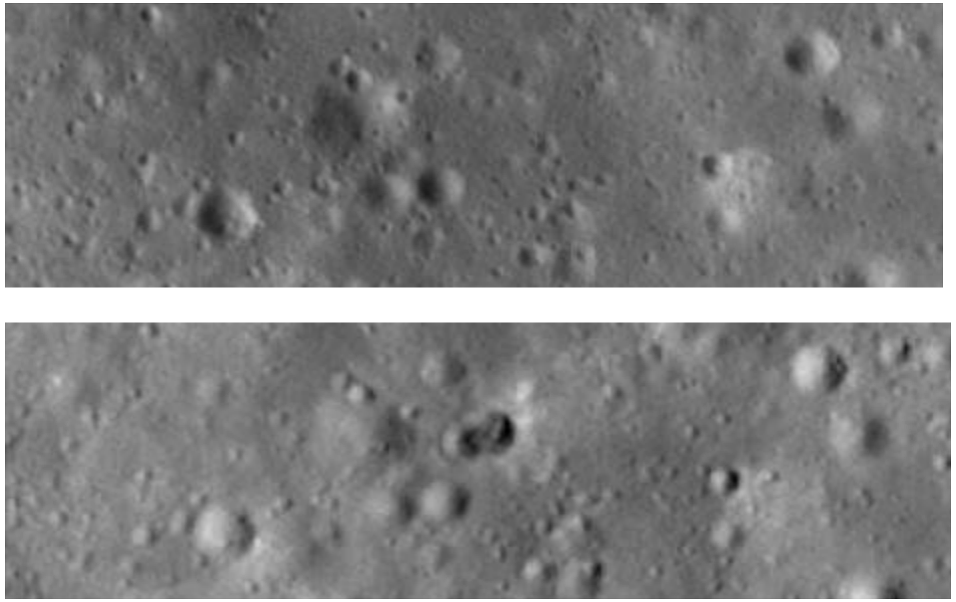
SPIE. Event: SPIE Astronomical Telescopes + Instrumentation, 2022, Montréal, Québec, Canada

DSCOVR booster (SpaceX) but the booster for the Chang'e 5-T1 lunar mission



Impact 4 mars 2022 face cachée

The before image is LRO's view from Feb. 28, 2022 (M1400727806L). The after image is from May 21, 2022 (M1407760984R). The width of the frame is 367 meters, about 401 yards. ***Credit:*** *NASA/Goddard/Arizona State University*



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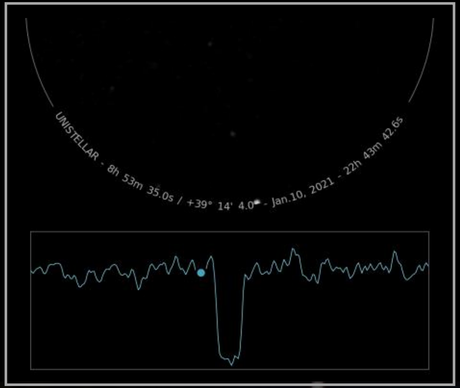
Asteroid Occultations

Shapes of Asteroids



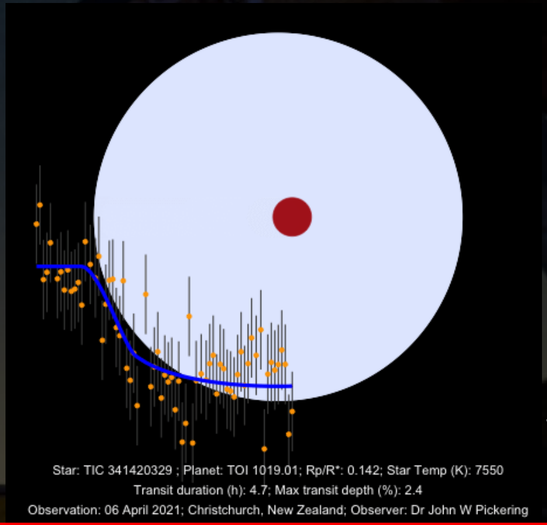
Planetary Defense

Orbits & Shapes of
Near-Earth Asteroids

Asteroid "1999AP10"

Exoplanet Transits

Planet Timing &
Confirmation

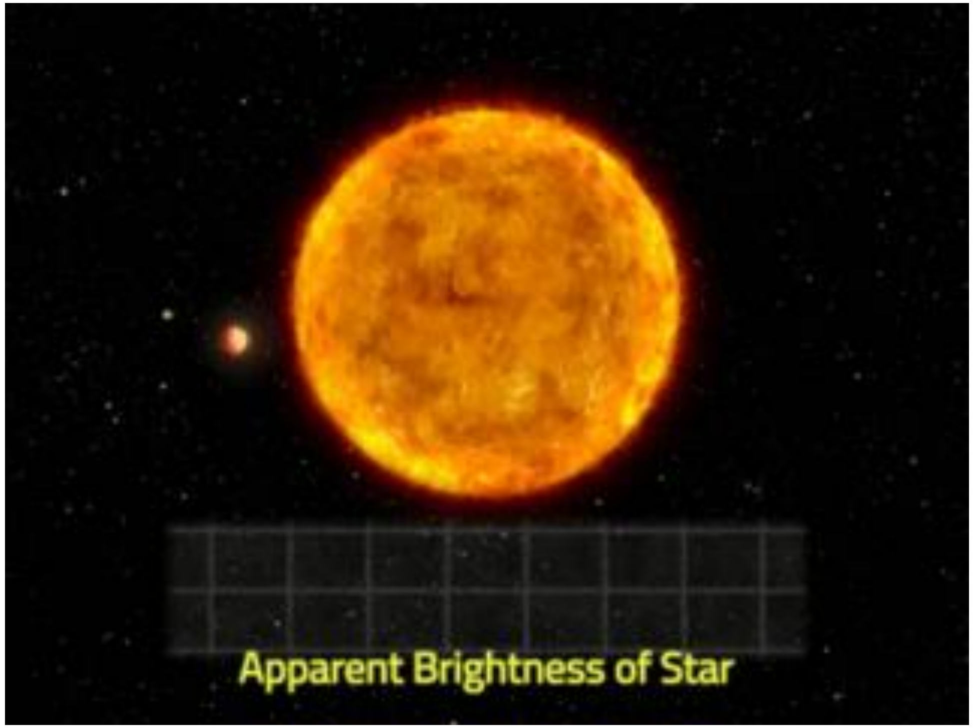


Created by
citizen astronomer
John W. Pickering

Cometary Activity

Brightness & Evolution
of Comets

Cosmic Cataclysm
(nova, supernova and more)



Les objectifs

- Mesurer les temps de transit moyen des nouveaux TOI (TESS *Objects of Interest*) candidats à être une exoplanète afin d'affiner les éphémérides pour le suivi JWST/Ariel/LUVOIR.
- Aider à confirmer les candidats exoplanètes en éliminant les faux positifs (par exemple, les étoiles binaires à éclipses proches).
- Contribuer aux archives publiques telles que la base de données des exoplanètes de l'AAVSO (code obs. "UNIS").
- Mesurer les variations temporelles des transits (TTV) en collaboration avec TFOP et NASA Exoplanet Watch.
- Détecter les transits de longue durée et de longue période nécessitant une large couverture géographique et continue du ciel.

The Unistellar Exoplanet Campaign: Citizen Science Results and Inherent Education Opportunities

[1,2]Daniel O'Conner Peluso, [2,3,4]Tom Esposito, [1,2,4]Franck Marchis, [2,5,6]Paul Dalba, [2]Lauren Sgro [1,7]Colleen Megowan-Romanowicz, [1,8]Carl Pennypacker, [1]Brad Carter, [1]Duncan Wright, [3,9]Arin Avsar, [2]Amaury Perrocheau, [10]Unistellar Citizen Scientists (163)*

*See Appendix I for full list of citizen scientist names

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[2]SETI Institute, Carl Sagan Center, 339 N. Bernardo Avenue Suite 200, Mountain View, CA, USA
[3]Astronomy Department, University of California, Berkeley, CA 94720, USA
[4]Unistellar, 2121 Harrison St Suite C, San Francisco, CA 94110, USA
[5]Heising-Simons 51 Pegasi b Postdoctoral Fellow
[6]Department of Astronomy and Astrophysics, University of California Santa Cruz, 1156 High Street, Santa Cruz, CA, USA
[7]American Modeling Teachers Association, Sacramento, CA, USA
[8]UC Berkeley and Lawrence Berkeley National Laboratory, Berkeley, CA, USA
[9]Lunar and Planetary Laboratory, University of Arizona, Tucson, AZ 85721, USA
[10]Various Nations

ABSTRACT

This paper presents early results from and prospects for exoplanet science using a citizen science private/public partnership observer network managed by the SETI Institute in collaboration with Unistellar. The network launched in January of 2020 and includes 163 citizen scientist observers across 21 countries. These observers can access a citizen science mentoring service developed by the SETI Institute and are also equipped with Unistellar Enhanced Vision Telescopes (eVscopes). Unistellar technology and the campaign's associated photometric reduction pipeline enables each telescope to readily obtain and communicate light curves to observers with signal to noise ratio (SNR) suitable for publication in research journals. Citizen astronomers of the Unistellar Exoplanet Campaign (UE) routinely measure transit depths of ≳1% and contribute their results to the exoplanet research community. The match of the detection system, the targets, and the scientific and educational goals is robust. Results to date include 281 transit detections out of 651 processed observations. In addition to this campaign's capability to contribute to the professional field of exoplanet research, UE endeavors to drive improved STEM (science, technology, engineering, and mathematics) education outcomes by engaging students and teachers as participants in science investigations. That is, *learning science by doing science*.

Key words: exoplanets, citizen science astronomy, astronomy education, STEM education, exoplanet network

Figure 4 is an example of a raw, processed, and stacked image collected from a UE citizen scientist eVscope during a routine observation of Qatar-1b in April 2022 (V = 12.7).

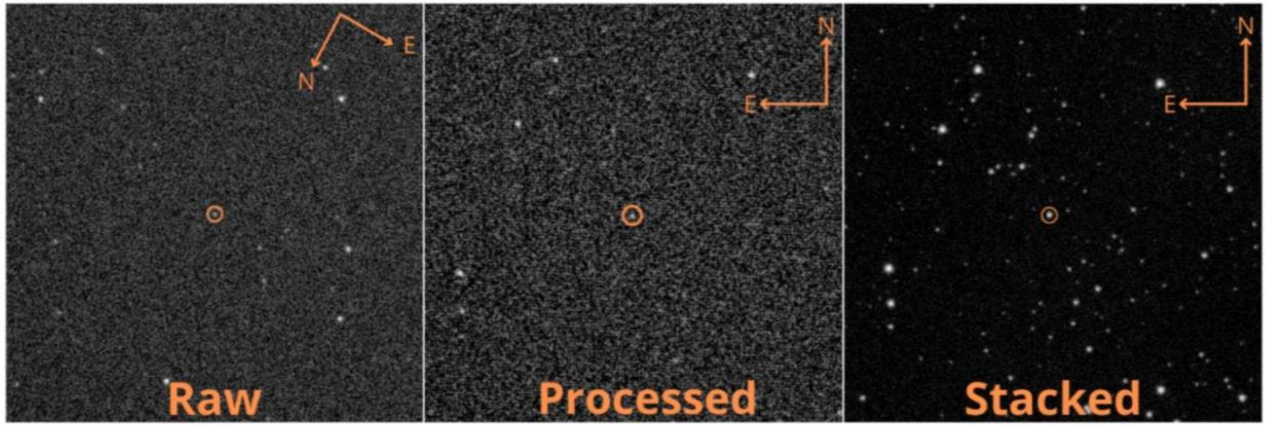


Figure 4. The observation was done in a Bortle 7 sky in a small city near Caen, France with a relatively high air mass between 2.4 and 1.9. The raw FITS file had an exposure of 3.970 s and gain of 31 dB. The processed image was dark subtracted and the stacked image is of 30 frames with 119.1 s integration time. The raw and single processed frames correspond to the first image in the stack. Each image is on a log brightness scale with minimum set to mean background level.

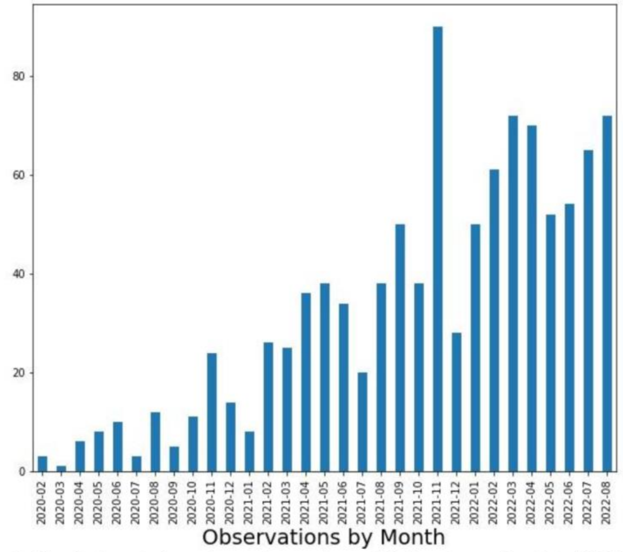


Figure 5. Distribution of all exoplanet observations of UE by observation date (YYYY-MM).

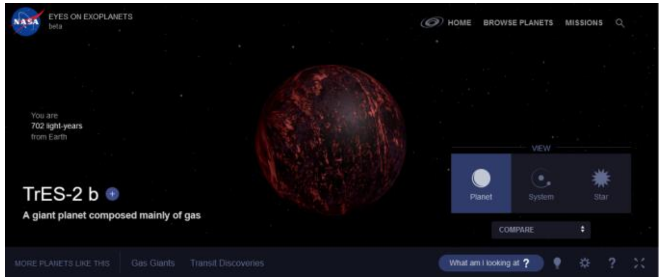
Accepté pour Publications of the Astronomical Society of the Pacific (PASP) 2023

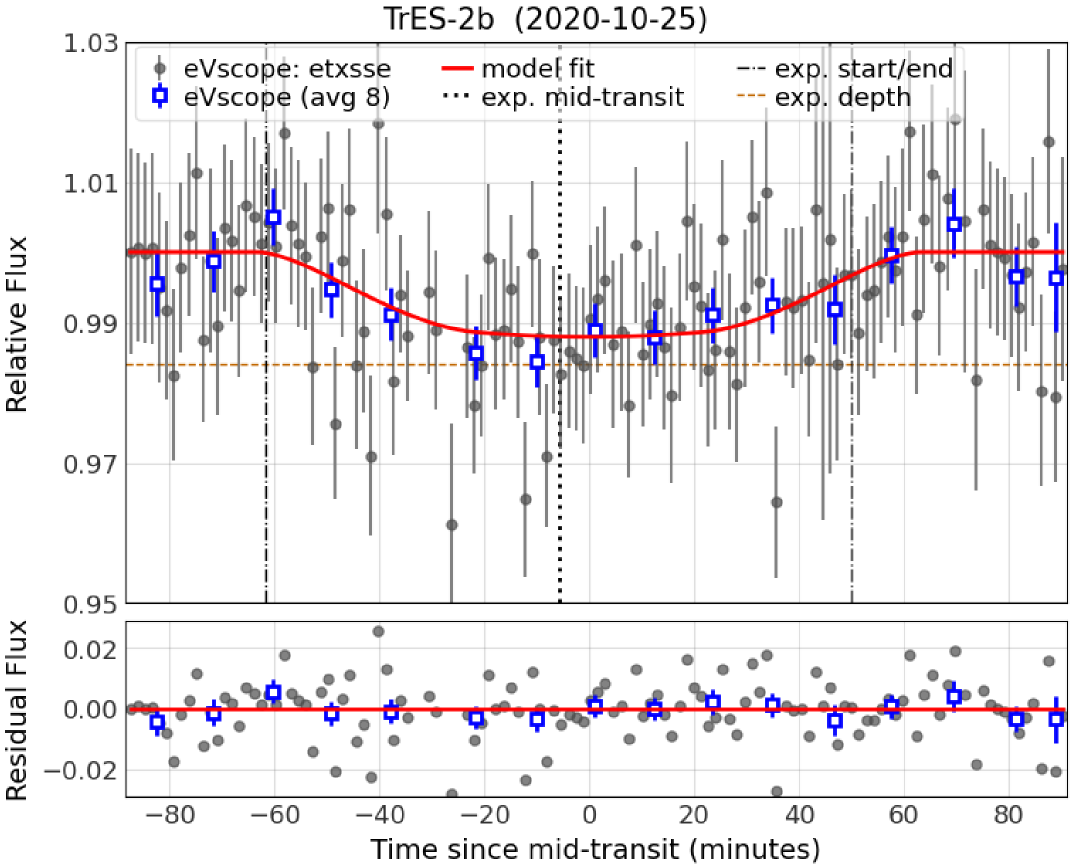
TrES-2b (ou connu aussi sous le nom Kepler-1b) est une planète de taille comparable à Jupiter qui orbite autour de GSC 03549-02811, une étoile de type solaire située à 700 années-lumière de nous.

Cette planète appartient à la classe des jupiters chauds, car elle se déplace sur une orbite très rapprochée de son étoile, à environ 5,3 millions de kilomètres, une distance 10 fois moindre que celle qui sépare Mercure du Soleil.

TrEs-2b est très sombre, plus noir qu'un bloc de charbon!

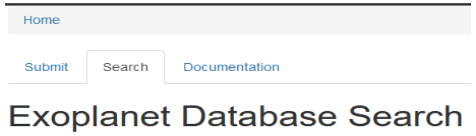
Etoile
TrES-2
22:04:28 +81:33:57 (J2000)
V magnitude: 11.25
Type spectral ~G0V



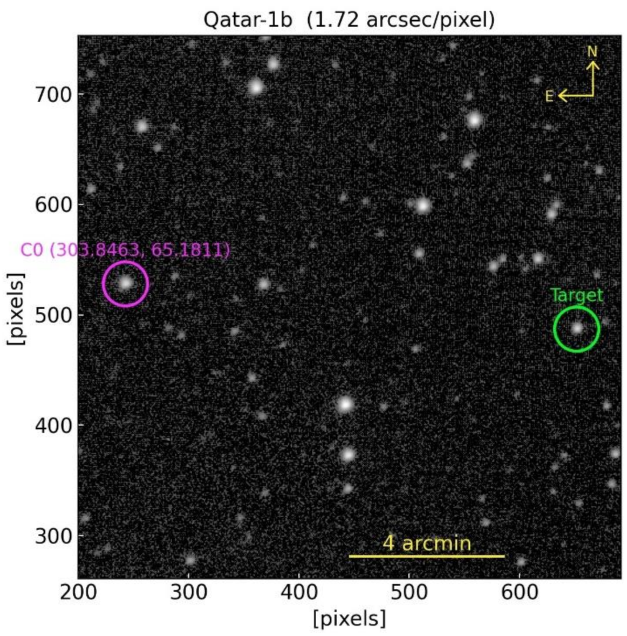


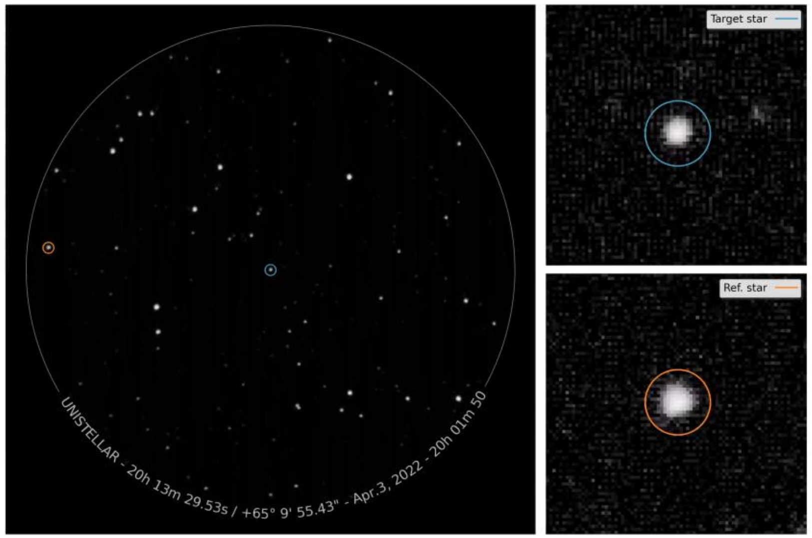
Mid-transit time: 5.8 ± 4.4 minutes later than predicted
Depth: 1.33% ± 0.24% compared to 1.60% predicted
Rp/Rs (ratio of planet radius to host star radius): 0.115 ± 0.011, compared to 0.125 predicted

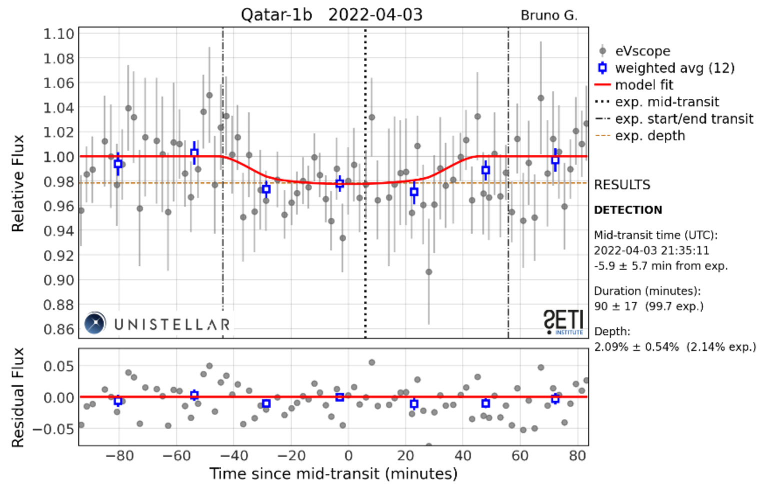
aavso



Obs. code “GBRC”
“UNIS”







→Enseignant aux USA

Utilisation des éphémerides publiques :

- Unistellar
- NASA exoplanet archive
- Swarthmore transit fider
- ExoClock

exo Clock

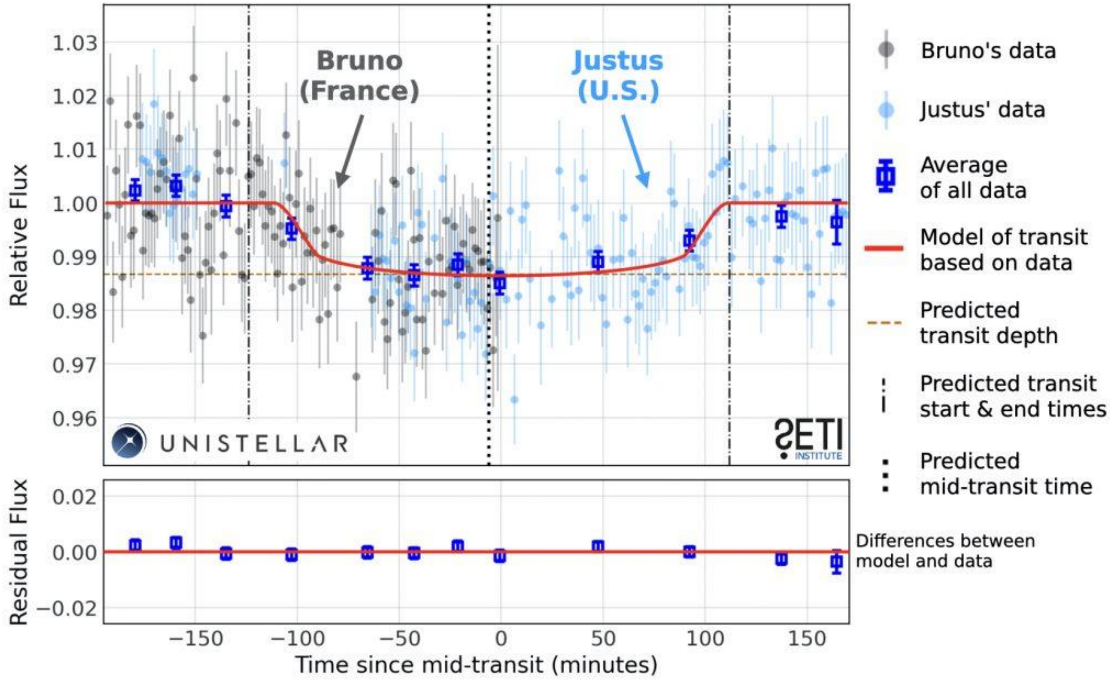
ETD ... complete ... worldwide ... continuously growing ... Exoplanet Transit Database http://var.astro.cz/ETD

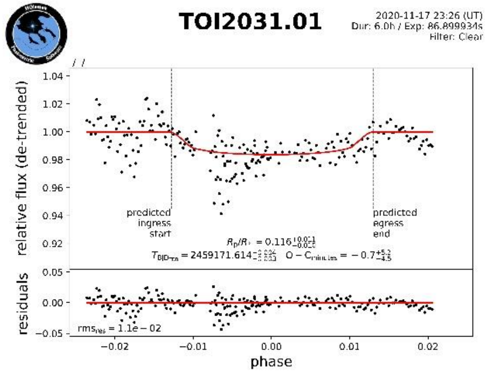
EXOPLANET WATCH

TESS

SG1: Seeing-limited Photometry

TOI 2031.01 (observations conjointes US-Europe) – Nov. 2020





Guillet *et al.* AAVSO meeting 2021

Etoile

TOI 2031.01

22:04:28 +81:33:57 (J2000)

V magnitude: 11.25

Type spectral ~F4V

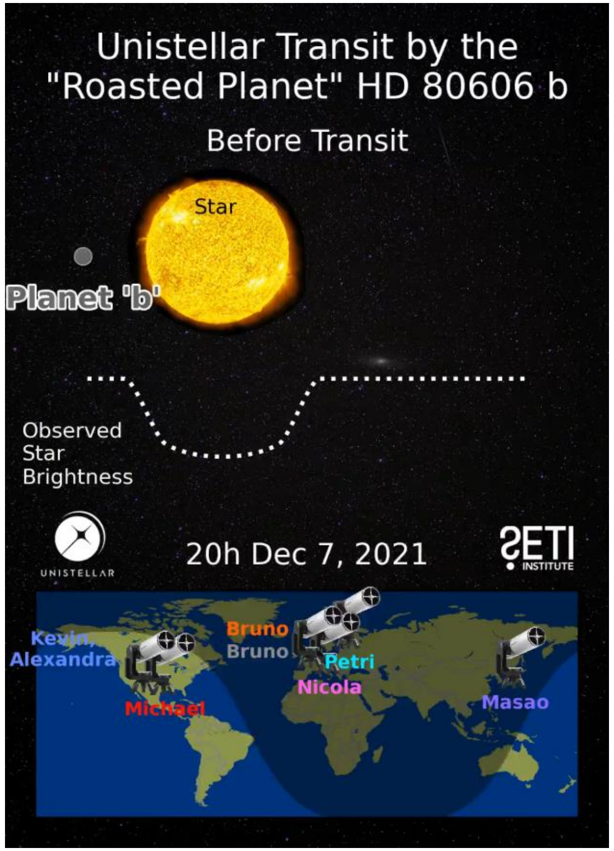
Planète (Jupiter chaude)

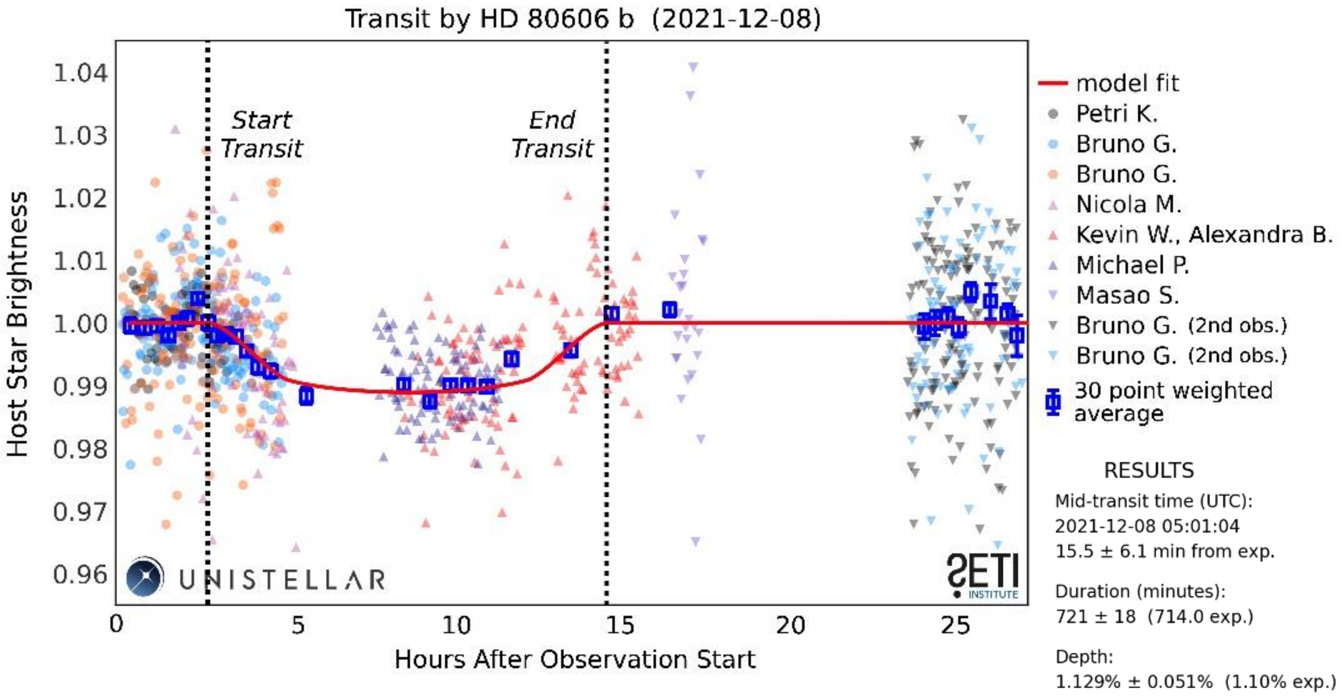
Période: 5.71547 ± 0.00001 jours

Rayon: 1.23 ± 0.05 $R_{Jupiter}$

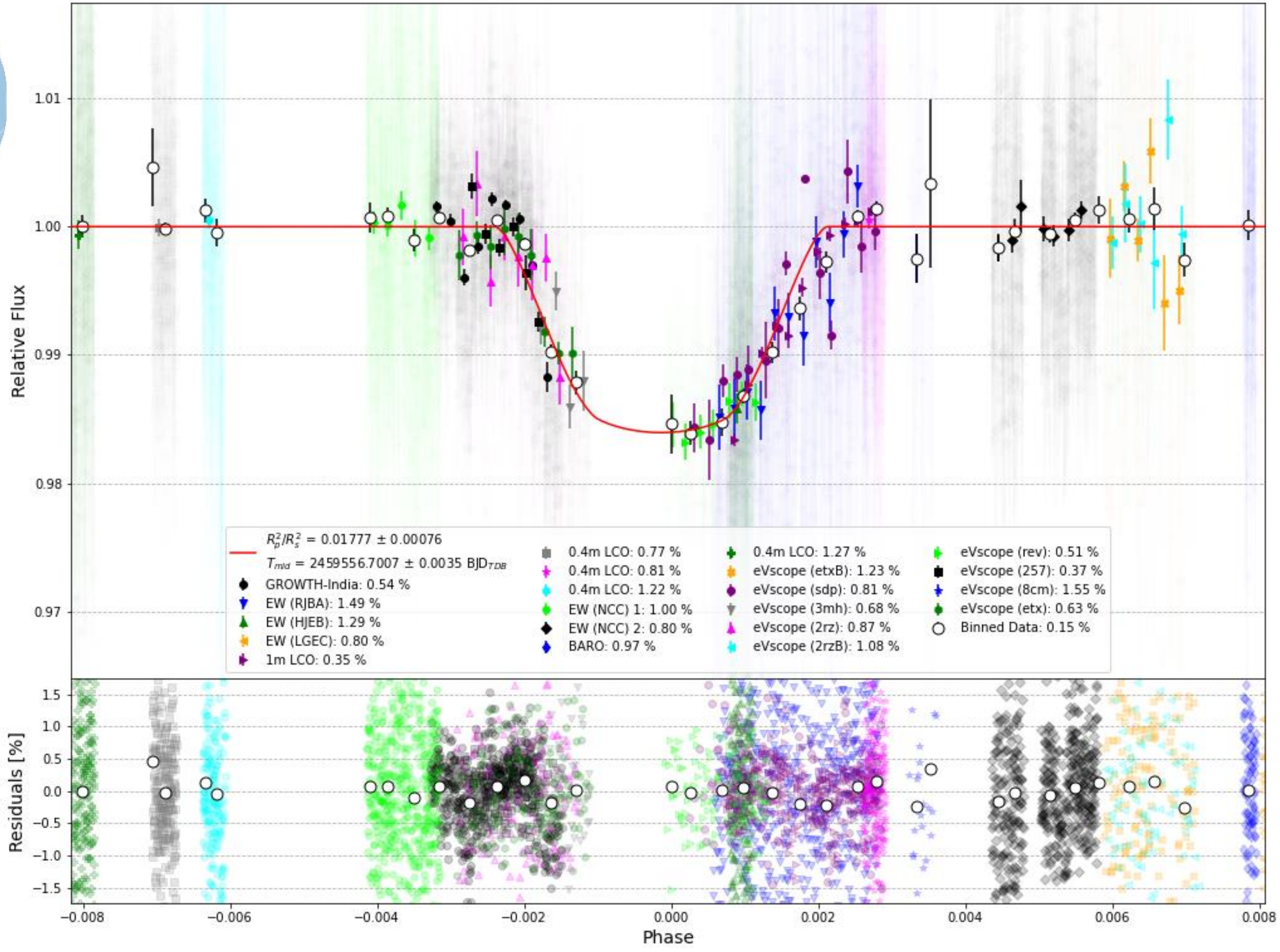
HD 80606b (préparation pour JWST) – Déc. 2021

L'observation du transit de HD 80606b, d'une durée de 12 heures, a permis d'améliorer l'horodatage du transit (à ± 15 minutes) en utilisant la photométrie recueillie pendant une période de 27 heures par des observateurs répartis sur sept fuseaux horaires.





Facility	Location (N,E)	Size (m)
Transiting Exoplanet Survey Satellite (TESS)	Space	0.1
Exoplanet Watch [HJEB]	(30.7, -104.2)	0.4
Las Cumbres (LCO)	(30.7, -104.2)	0.4
Las Cumbres (LCO)	(30.7, -104.2)	0.4
Las Cumbres (LCO)	(30.7, -104.2)	0.4
Exoplanet Watch [NCC]	(23.5, 120.9)	0.4
Unistellar eVscope 2 (2rz)	(49.2, -0.4)	0.11
Unistellar eVscope (etx)	(49.2, -0.4)	0.11
Unistellar eVscope (257)	(60.8, 24.4)	0.11
Unistellar eVscope (3mh)	(45.3, 11.1)	0.11
Exoplanet Watch [GDAI]	(39.0, -108.2)	0.4
Unistellar eVscope (rev)	(30.4, 97.8)	0.11
Unistellar eVscope (sdp)	(32.2, -111)	0.11
GROWTH-India	(32.8, 79.0)	0.7
Exoplanet Watch [RJBA]	(34.1, -118.1)	0.15
Las Cumbres (LCO)	(30.7, -104.2)	1
Exoplanet Watch [HJEB]	(30.7, -104.2)	0.4
Las Cumbres (LCO)	(30.7, -104.2)	0.4
Unistellar eVscope (8cm)	(35.1, 134.4)	0.11
Exoplanet Watch [NCC]	(23.5, 120.9)	0.4
Unistellar eVscope 2 (2rzB)	(49.2, -0.4)	0.11
Unistellar eVscope (etxB)	(49.2, -0.4)	0.11
Boyce-Astro Research Observatory (BARO)	(32.6, -116.3)	0.43
Exoplanet Watch [LGEC]	(28.3, -16.6)	0.4
Exoplanet Watch [FMAA]	(31.7, -111.1)	0.15



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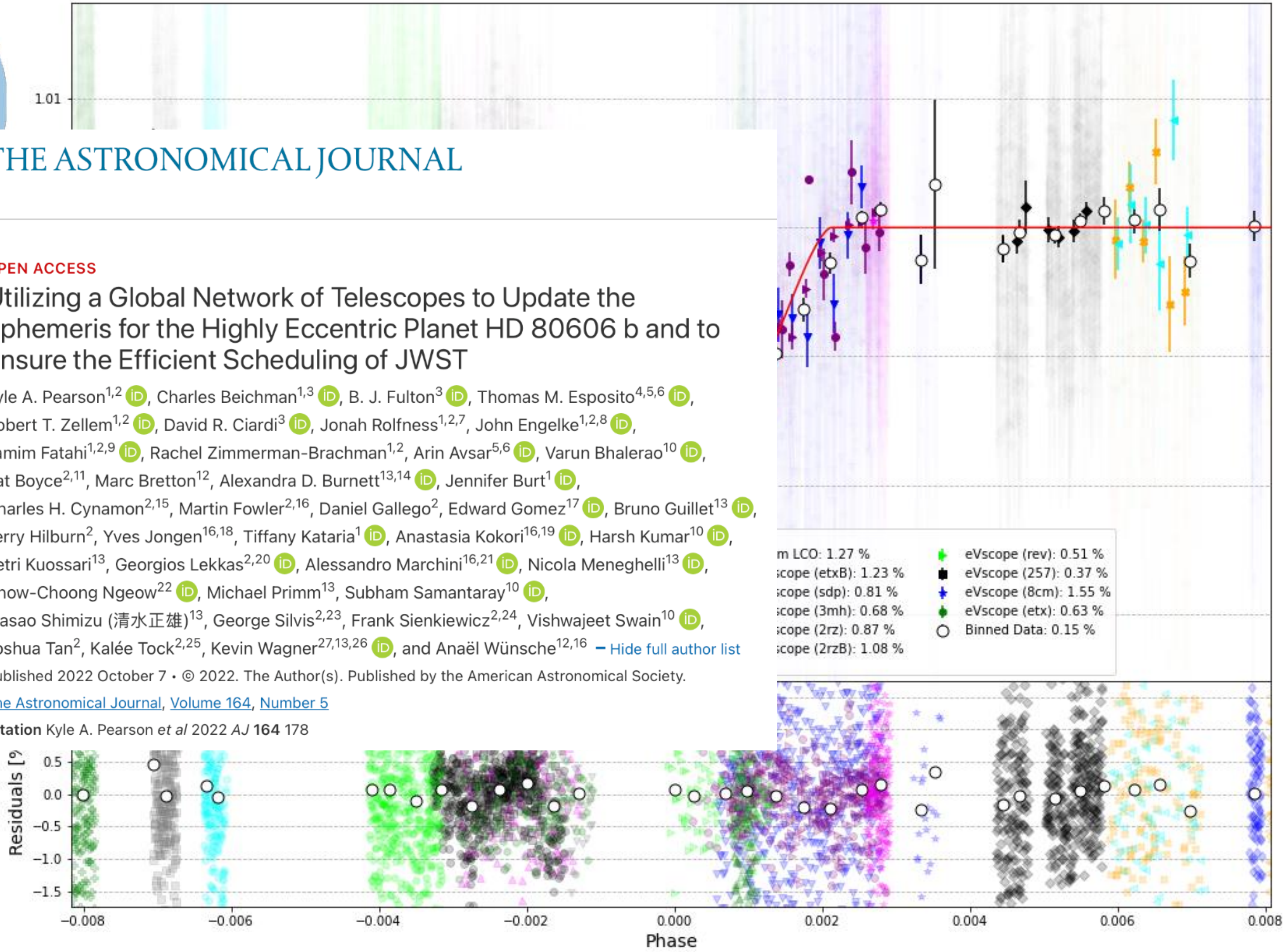
THE ASTRONOMICAL JOURNAL

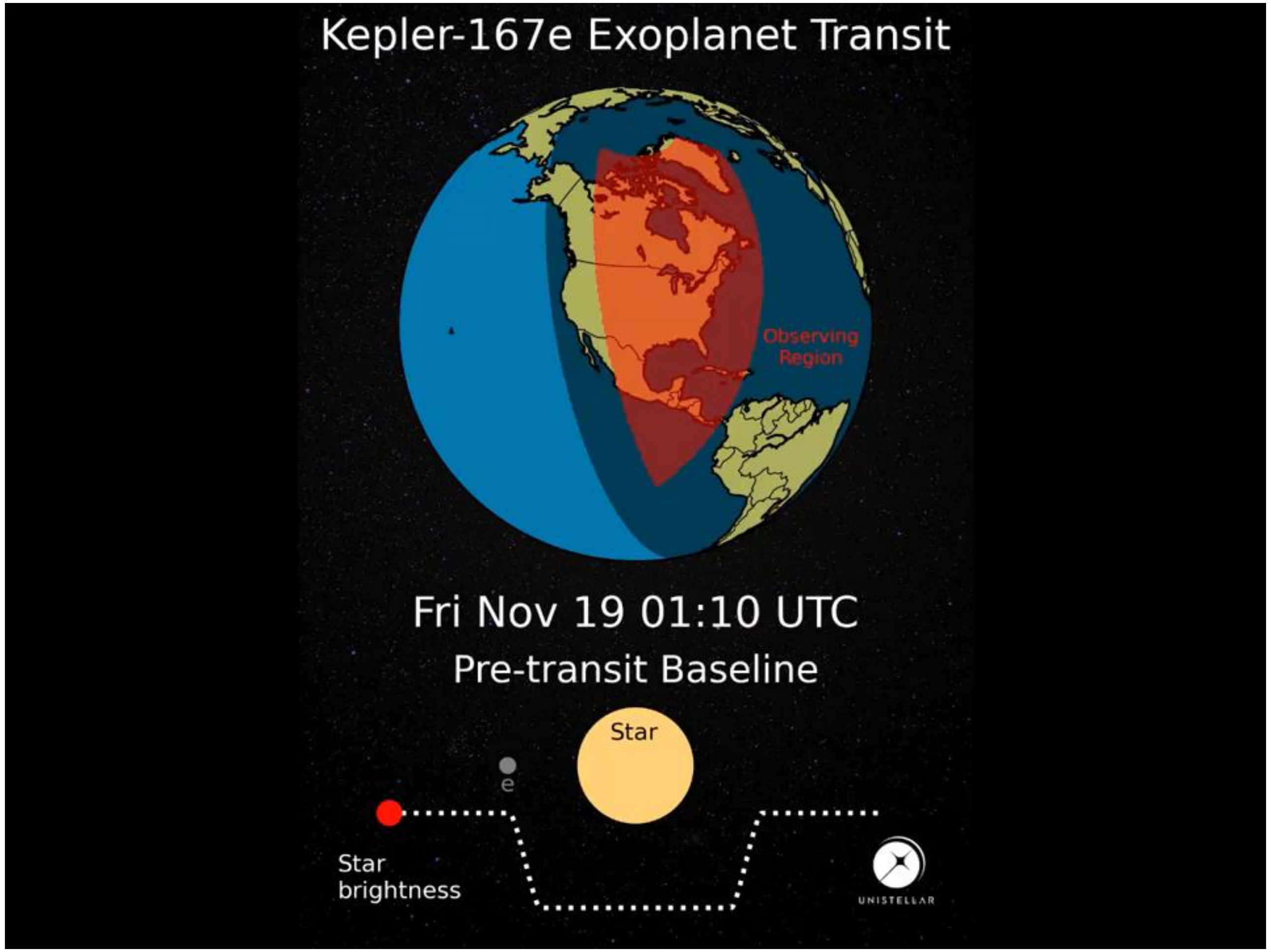
OPEN ACCESS

Utilizing a Global Network of Telescopes to Update the Ephemeris for the Highly Eccentric Planet HD 80606 b and to Ensure the Efficient Scheduling of JWST

Kyle A. Pearson[1,2], Charles Beichman[1,3], B. J. Fulton[3], Thomas M. Esposito[4,5,6], Robert T. Zellem[1,2], David R. Ciardi[3], Jonah Rolfness[1,2,7], John Engelke[1,2,8], Tamim Fatahi[1,2,9], Rachel Zimmerman-Brachman[1,2], Arin Avsar[5,6], Varun Bhalerao[10], Pat Boyce[2,11], Marc Bretton[12], Alexandra D. Burnett[13,14], Jennifer Burt[1], Charles H. Cynamon[2,15], Martin Fowler[2,16], Daniel Gallego[2], Edward Gomez[17], Bruno Guillet[13], Jerry Hilburn[2], Yves Jongen[16,18], Tiffany Kataria[1], Anastasia Kokori[16,19], Harsh Kumar[10], Petri Kuossari[13], Georgios Lekkas[2,20], Alessandro Marchini[16,21], Nicola Meneghelli[13], Chow-Choong Ngeow[22], Michael Primm[13], Subham Samantaray[10], Masao Shimizu (清水正雄)[13], George Silvis[2,23], Frank Sienkiewicz[2,24], Vishwajeet Swain[10], Joshua Tan[2], Kalée Tock[2,25], Kevin Wagner[27,13,26], and Anaël Wünsche[12,16] – Hide full author list

Published 2022 October 7 • © 2022. The Author(s). Published by the American Astronomical Society.
The Astronomical Journal, Volume 164, Number 5
Citation Kyle A. Pearson *et al* 2022 *AJ* **164** 178





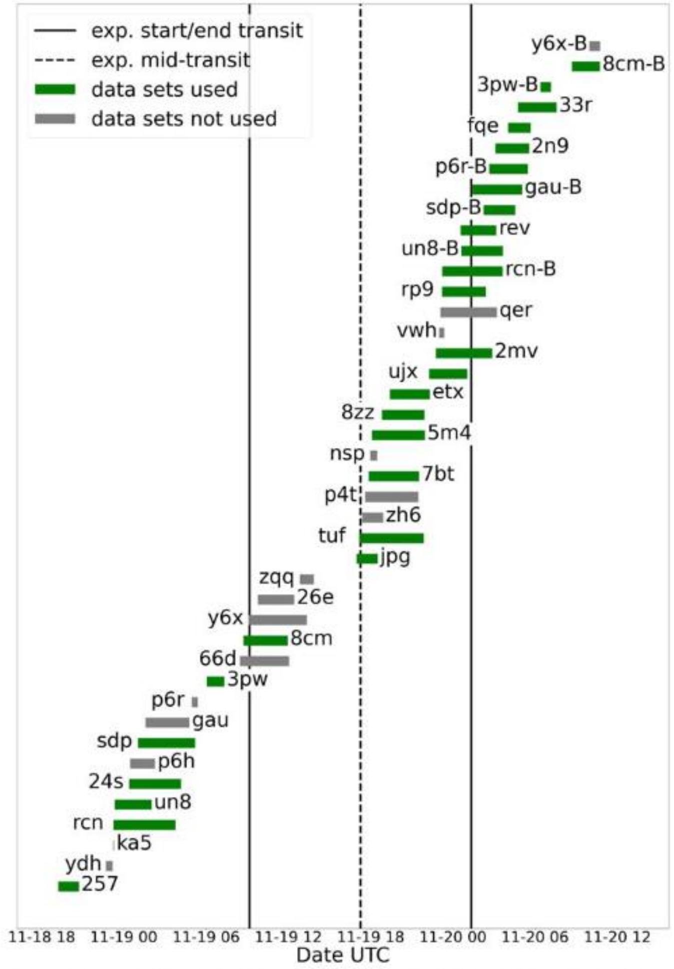


Figure 1. Time frames for eVscope observations of Kepler-167 e. 27 out of the 43 observations (green) were used to construct the final light curve. Vertical lines mark the predicted transit start, middle, and end times.

« Jupiter-like »
Periode : 1071 jours
Transit : 16 heures

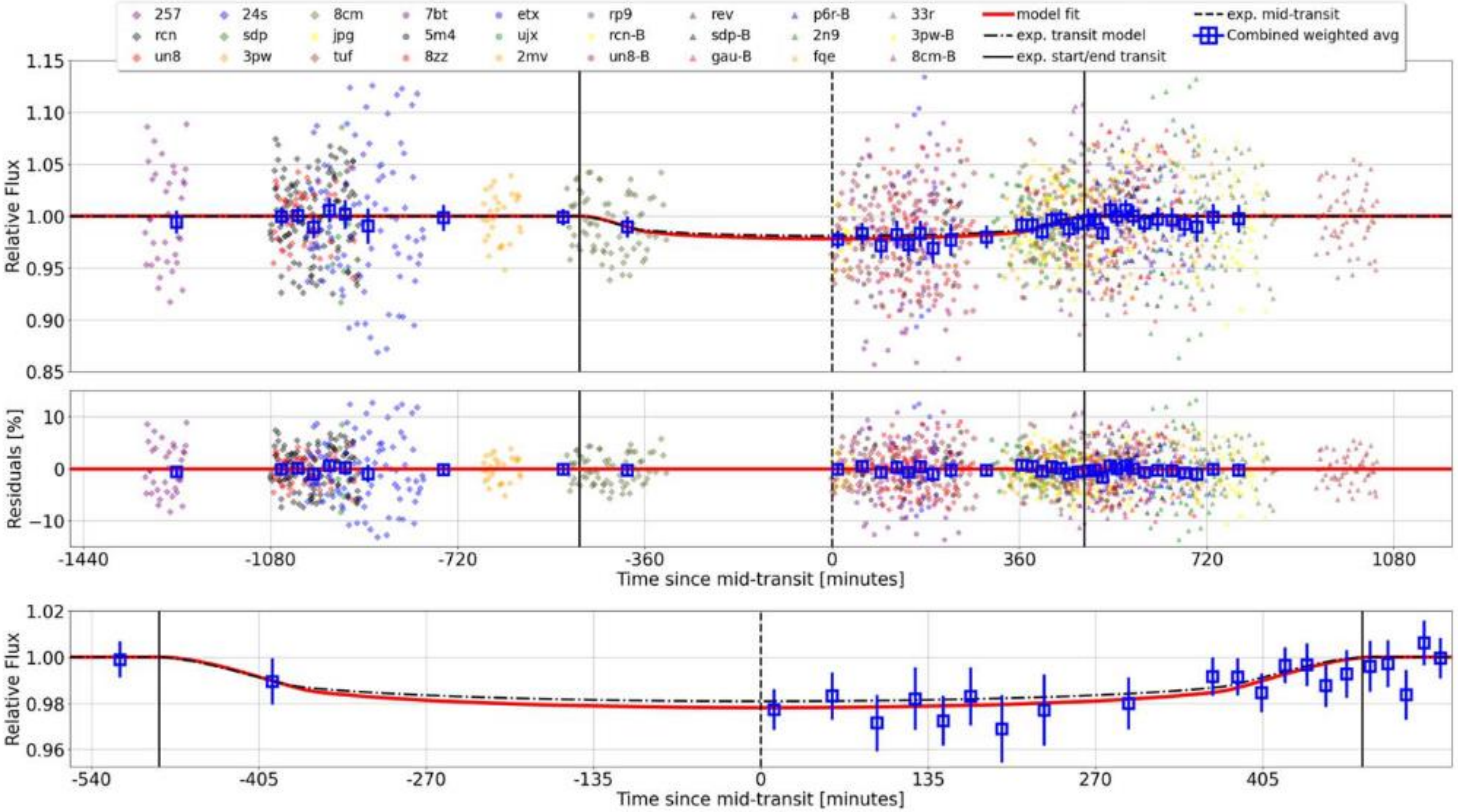


Figure 2. Transit light curve of Kepler-167 e (top) and residuals (middle) as observed by the Unistellar Network. Relative fluxes from individual data sets are plotted with different colors and symbols. The maximum likelihood model corresponding to the values in Table 1 is the red line and the time axis is defined as the time since that model's midtransit time. The blue squares are weighted average fluxes of the combined data. The expected transit model and its transit start, middle, and end times are plotted as black broken lines. The bottom panel is the same as the top panel but zooms in on the times the transit occurred and only shows the weighted average fluxes.

THE ASTROPHYSICAL JOURNAL LETTERS

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A 16 hr Transit of Kepler-167 e Observed by the Ground-based Unistellar Telescope Network

Amaury Perrocheau[1,2], Thomas M. Esposito[1,2,3], Paul A. Dalba[11,1,4], Franck Marchis[1,2], Arin M. Avsar[5], Ero Carrera[6], Michel Douezy[6], Keiichi Fukui[6], Ryan Gamurot[6], Tateki Goto[6], Bruno Guillet[6], Petri Kuossari[6], Jean-Marie Laugier[6], Pablo Lewin[7,8], Margaret A. Loose[6], Laurent Manganese[6], Benjamin Mirwald[6], Hubert Mountz[6], Marti Mountz[6], Cory Ostrem[6], Bruce Parker[6], Patrick Picard[6], Michael Primm[6], Justus Randolph[6], Jay Runge[6], Robert Savonnet[6], Chelsea E. Sharon[6,9], Jenny Shih[6], Masao Shimizu[6], George Silvis[8], Georges Simard[6], Alan Simpson[6], Thusheeta Sivayogan[6], Meyer Stein[6], Denis Trudel[6], Hiroaki Tsuchiyama[6], Kevin Wagner[12,6,10], and Stefan Will[6] – Hide full author list

Published 2022 November 28 • © 2022. The Author(s). Published by the American Astronomical Society.

The Astrophysical Journal Letters, Volume 940, Number 2

Citation Amaury Perrocheau *et al* 2022 *ApJL* **940** L39

DOI 10.3847/2041-8213/aca073

Article PDF Article ePub

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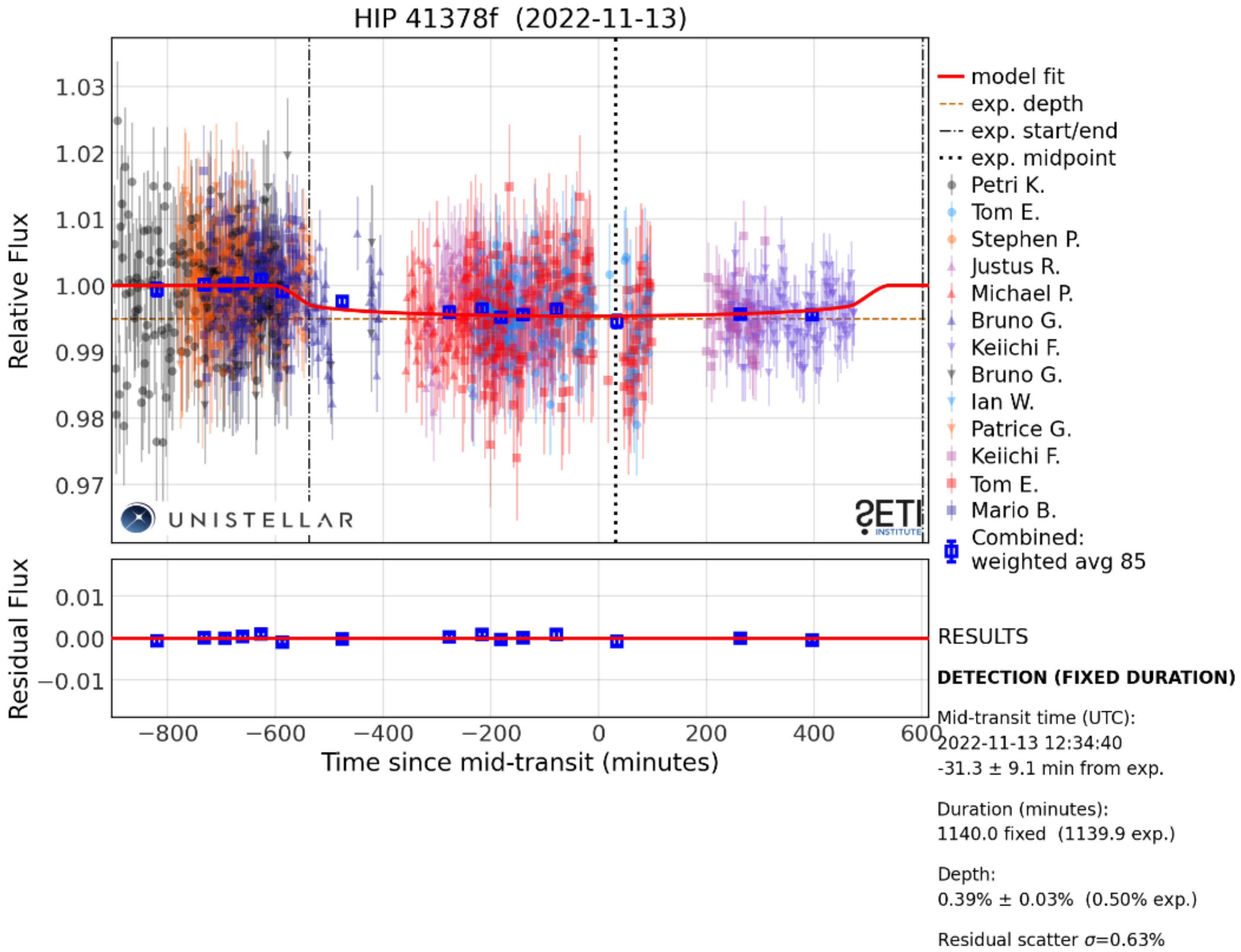
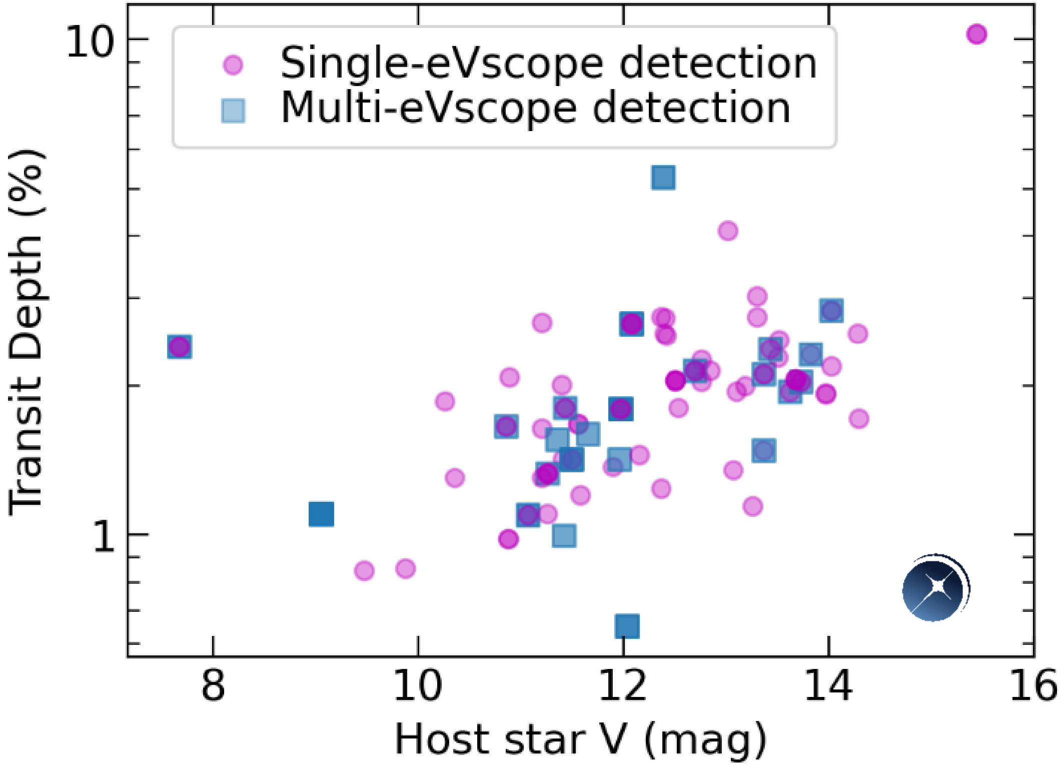
« Saturn-like »
Periode : 542 jours
Transit : 16 heures



Méthode de réductions de données et résultats

Les images (3,95 s chacune) sont corrigées des Dark, alignées et moyennées sur des temps d'intégration typique de 100 s. En utilisant le pipeline Python d'Unistellar/SETI ou des logiciels dédiés (HOPS, EXOTIC, AstroImageJ), les flux sont mesurés à partir de ces images par photométrie différentielle d'ouverture. Les flux relatifs sont alors ajustés avec des modèles de transit via des méthodes MCMC ou des méthodes des moindres carrés pour estimer les propriétés du transit et de l'exoplanète observée.

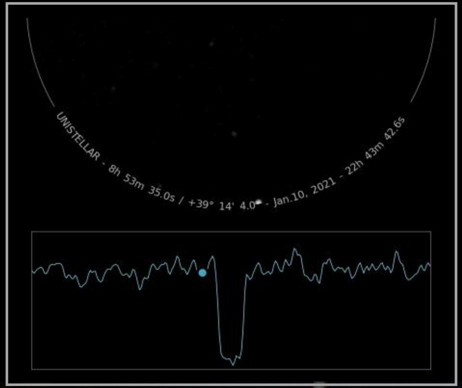


Les conditions d’observations (gain, temps d’exposition, heures de début et de fin d’observation) ainsi qu’une carte du ciel centrée sur la cible sont données.
Au final, 92 transits ont été détectés pour 413 observations issues de 17 pays de 4 continents différents. Plus de 50 détections de transit d'exoplanètes ont été soumises à la base de données des exoplanètes de l'AAVSO (*American Association of Variable Star Observers*) afin que les astronomes professionnels puissent mieux comprendre les planètes de notre galaxie. Des campagnes spécifiques d'observations avec les réseaux ExoClock et Exoplanet Watch ont été aussi menées.

Five main scientific campaigns for citizen scientists

Asteroid Occultations

Shapes of Asteroids



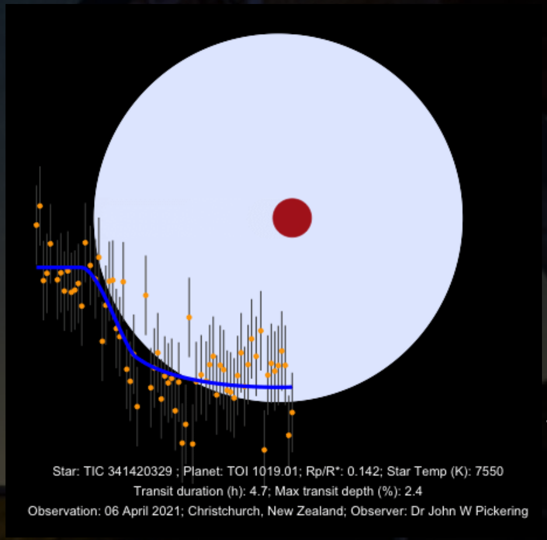
Planetary Defense

Orbits & Shapes of
Near-Earth Asteroids

Asteroid "1999AP10"

Exoplanet Transits

Planet Timing &
Confirmation



Created by
citizen astronomer
John W. Pickering

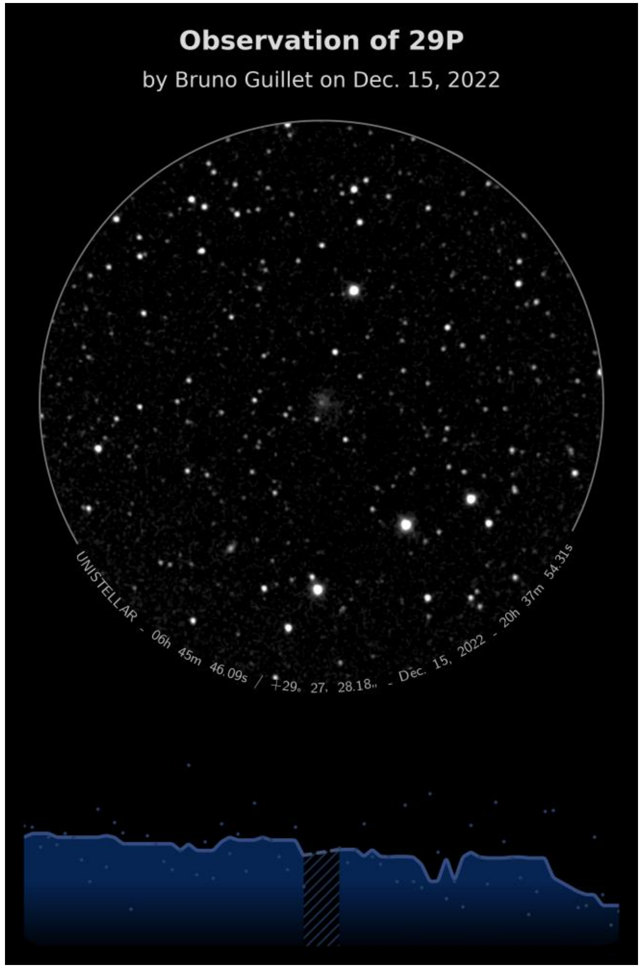
Cometary Activity

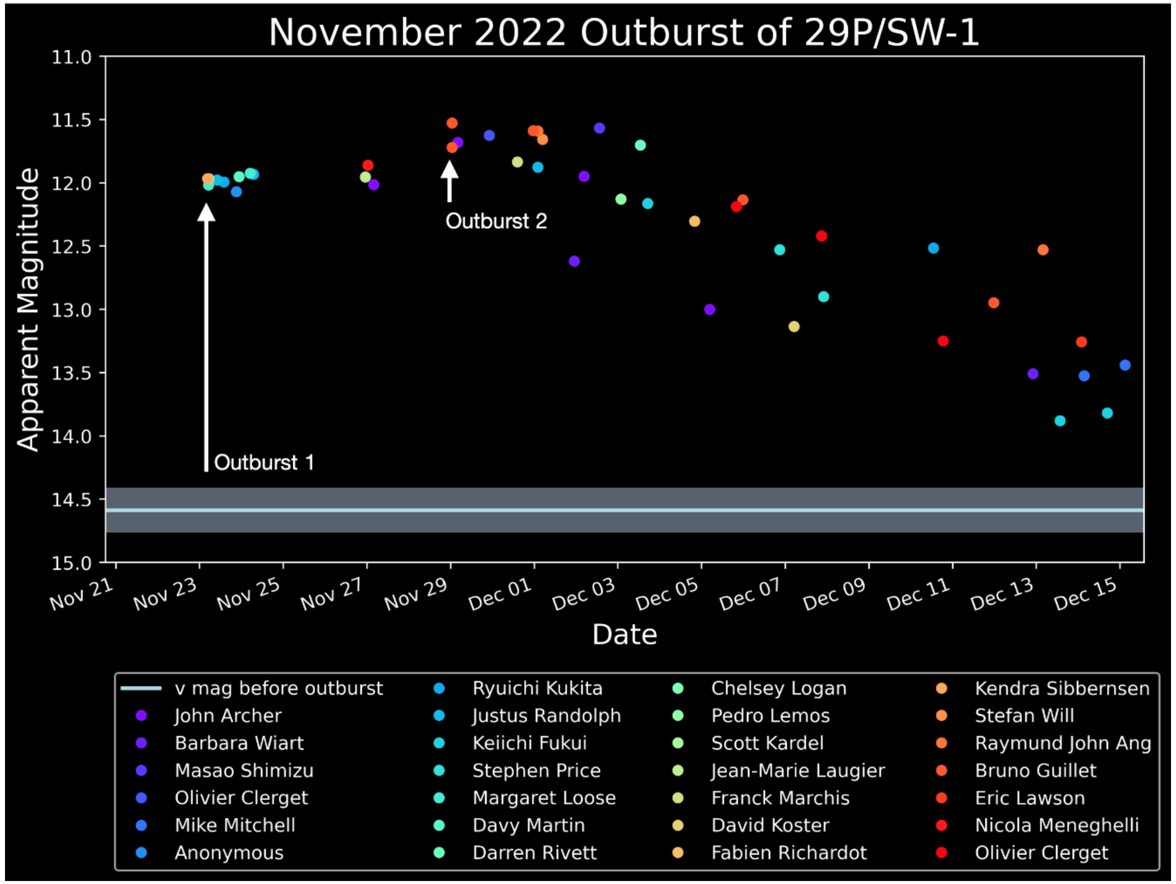
Brightness & Evolution
of Comets

Cosmic Cataclysm
(nova, supernova and more)

UNISTELLAR SETI INSTITUTE

29P/Schwassmann-Wachmann 1





DART mission: eVscope view of asteroid impact

Patrice Huet,
Réunion Island

Yes, we can crash into asteroids!

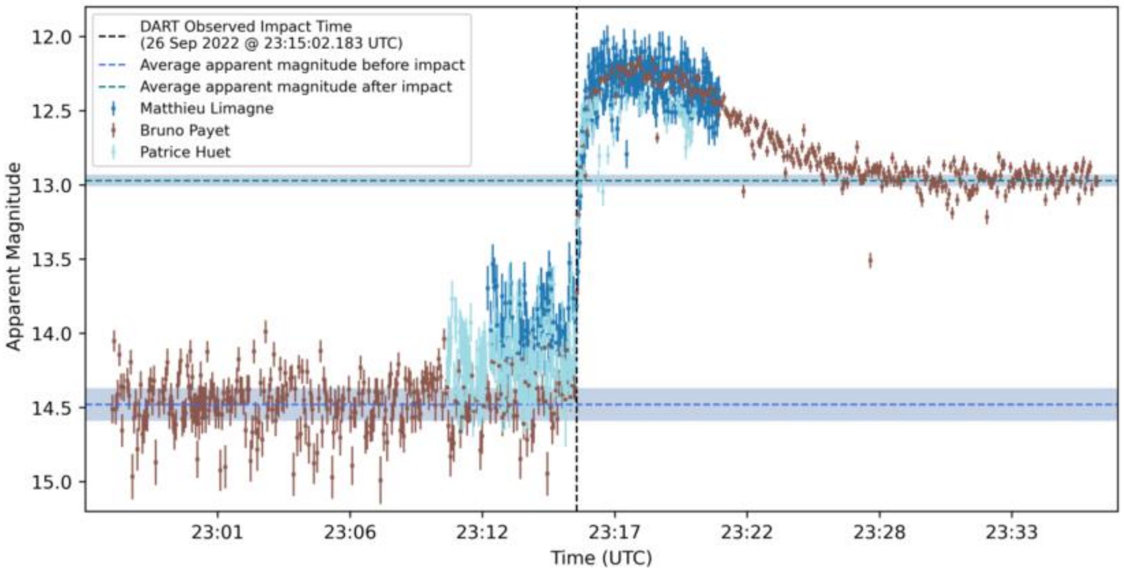
Mission DART

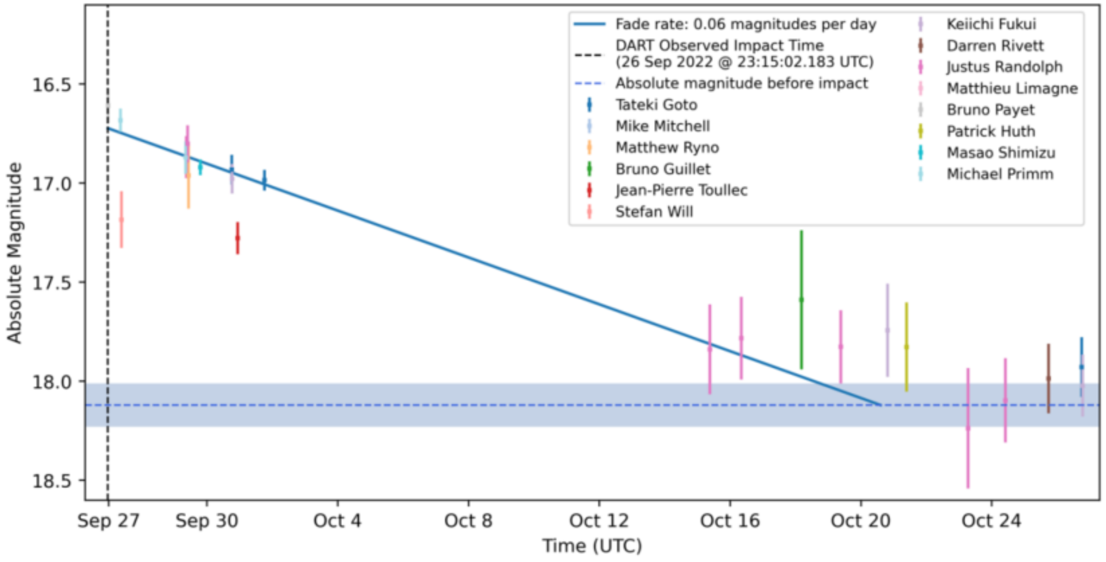
Ronald Wasilwa &
Susan Murabana,
Kenya
"The Traveling Telescope"

Yes, we can crash into asteroids!

Processed by Ariel Graykowski

UNISTELLAR SETI INSTITUTE





Characterizing the Effects of the DART Impact on Dimorphos with the Unistellar Network

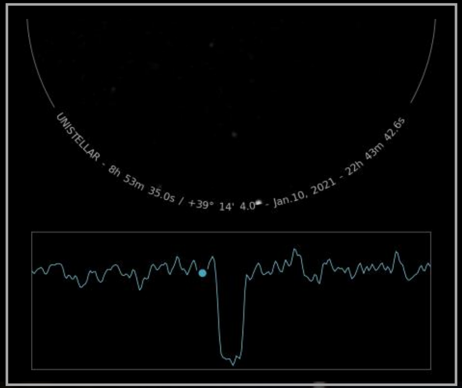
Ariel Graykowski[1], Ryan Lambert[1], Franck Marchis[1,2], Dorian Cazeneuve[1], Paul Dalba[1,3], Thomas M. Esposito[1,2,4], Daniel O'Conner Peluso[1,5], Lauren Sgro[1,2], Arnaud Malvache[2], Guillaume Blaclard[2], Tyler M. Powell[6], Patrice Huet[7], Matthieu Limagne[7], Bruno Payet[7], Colin Clarke[7,8], Susan Murabana[7,8], Daniel Chu Owen[7,8], Ronald Wasilwa[7,8], Mike Mitchell[7], Keiichi Fukui[7], Tateki Goto[7], Bruno Guillet[7], Patrick Huth[7], Satoshi Ishiyama[7], Ryuichi Kukita[7], Michael Primm[7], Justus Randolph[7], Darren Rivett[7], Matthew Ryno[7], Masao Shimizu[7], Jean-Pierre Toullec[7], Stefan Will[7], Wai-Chun Yue[7], Michael Camilleri[7], Kathy Graykowski[7], Ron Janetzke[7], Des Janke[7], Scott Kardel[7], Margaret Loose[7], John Pickering[7], Barton Smith[7], Ian Transom[7]

Soumis à publication

Five main scientific campaigns for citizen scientists

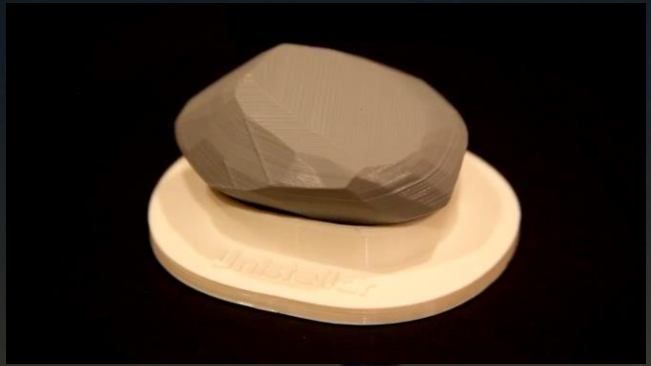
Asteroid Occultations

Shapes of Asteroids



Planetary Defense

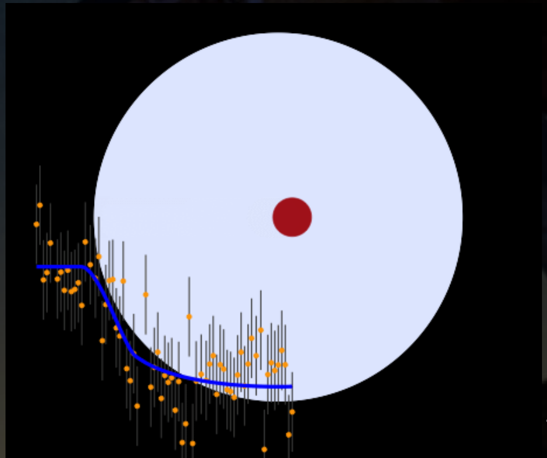
Orbits & Shapes of
Near-Earth Asteroids



Asteroid "1999AP10"

Exoplanet Transits

Planet Timing &
Confirmation

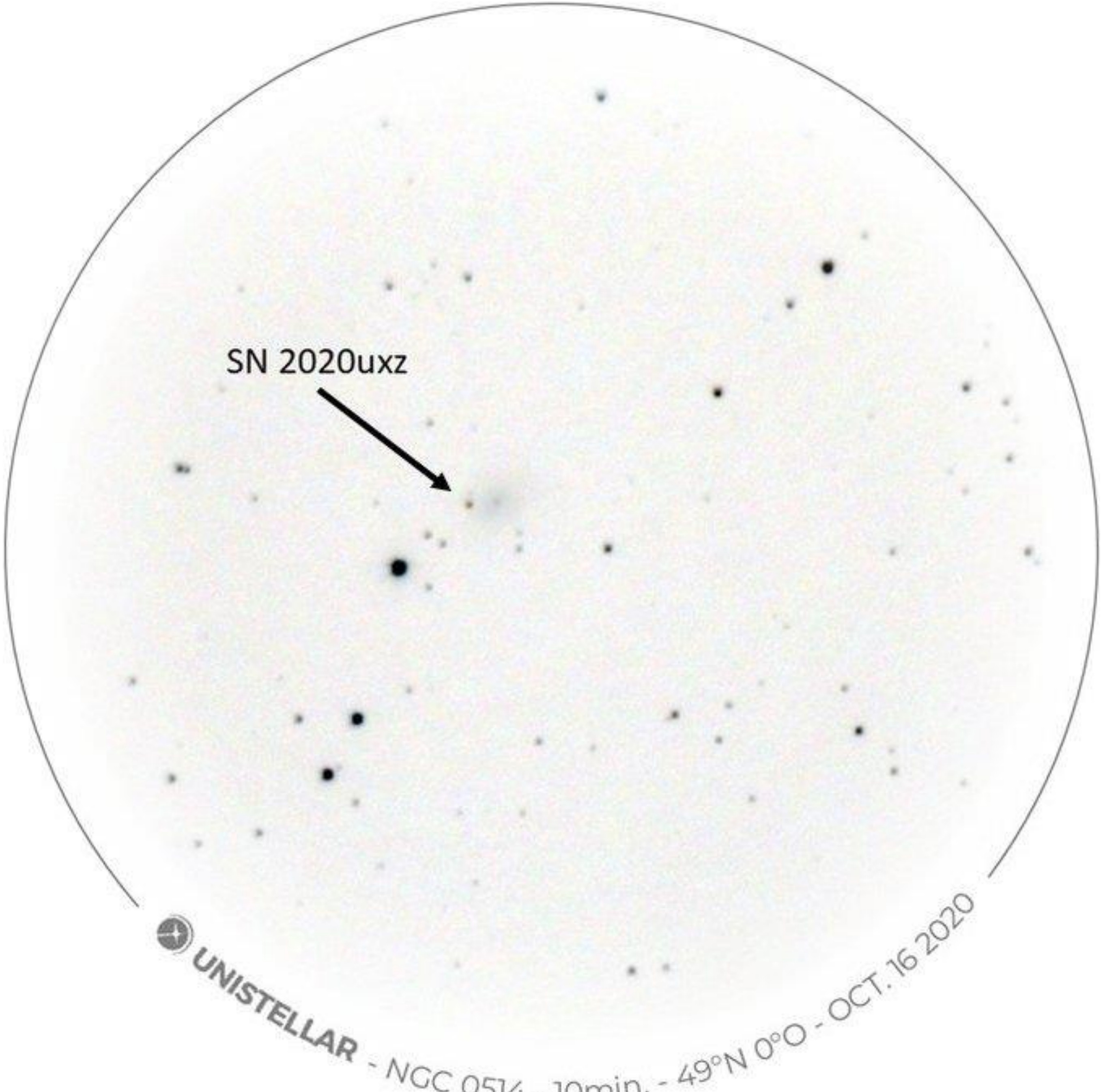


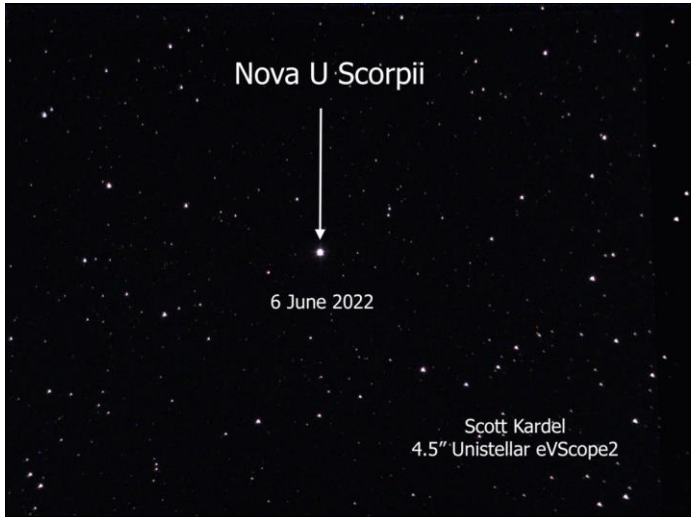
Created by
citizen astronomer
John W. Pickering

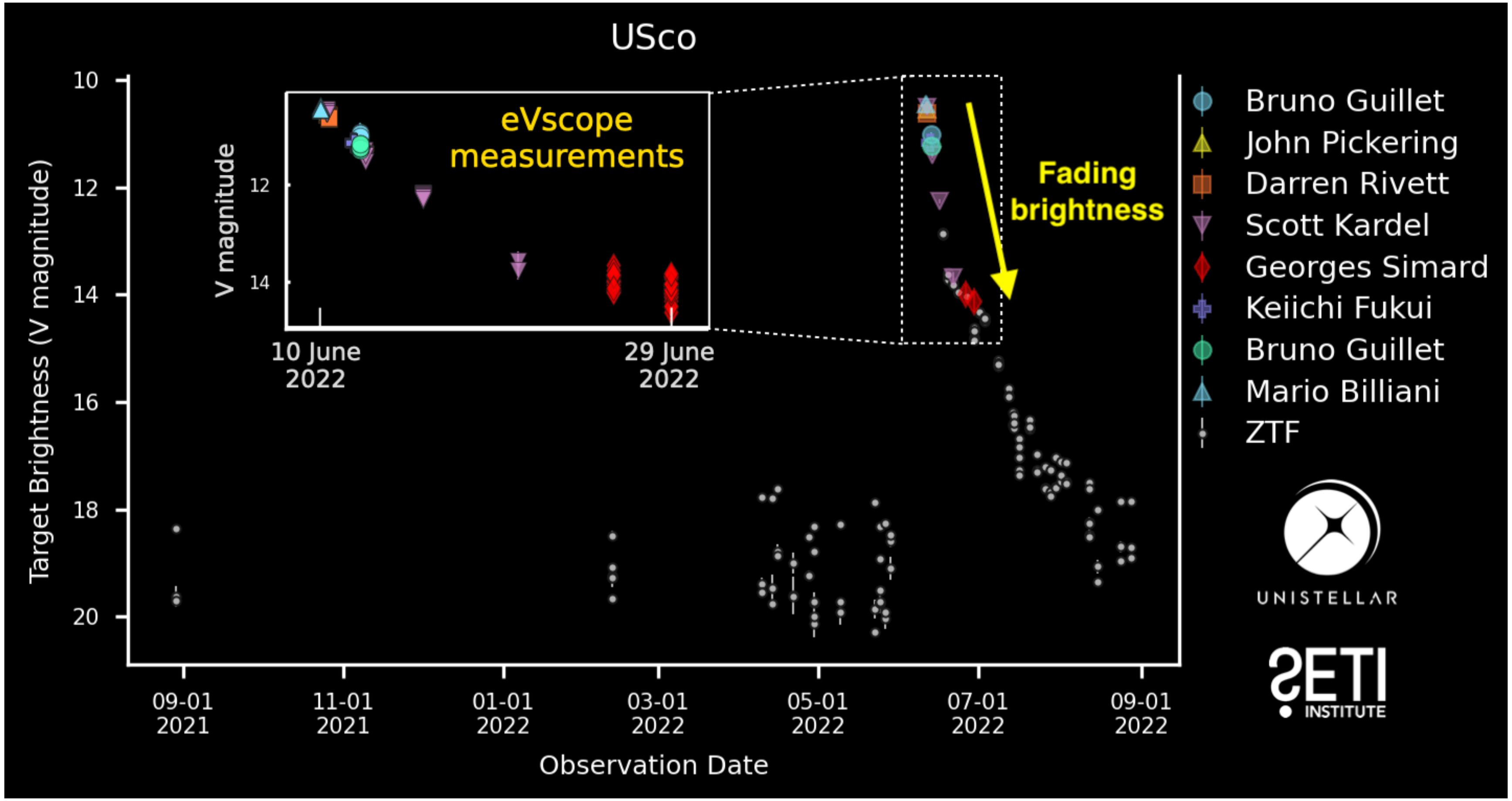
Cometary Activity

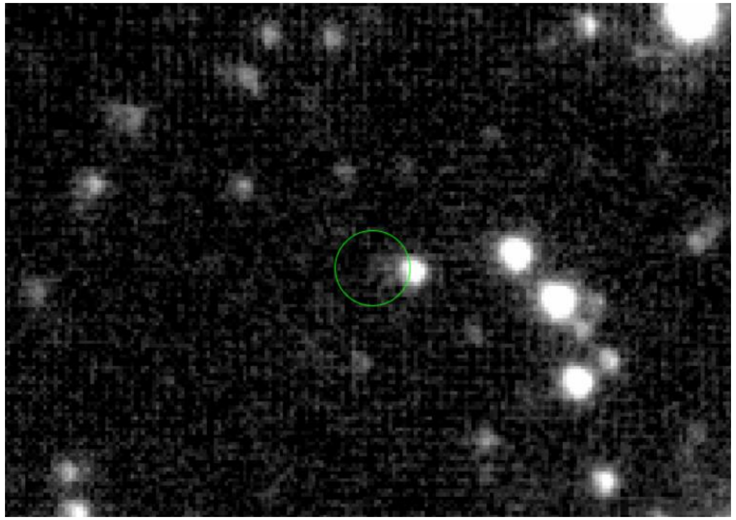
Brightness & Evolution
of Comets

Cosmic Cataclysm
(nova, supernova and more)


SN 2020uxz
UNISTELLAR - NGC 0514 - 10min. - 49°N 0°O - OCT. 16 2020

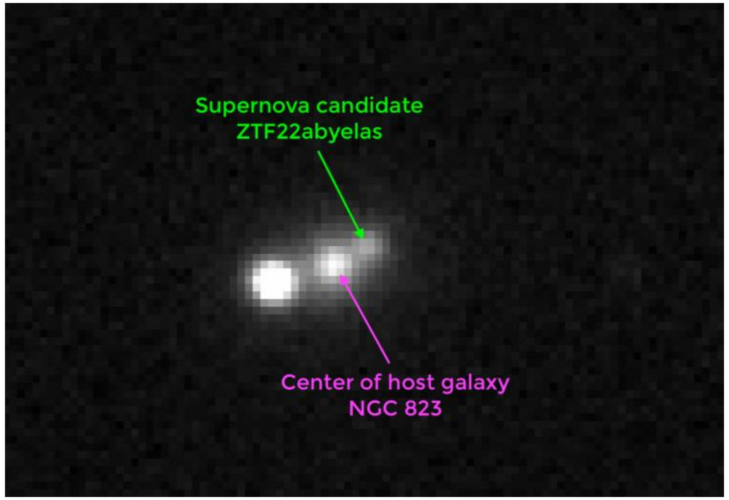

Nova U Scorpii
6 June 2022
Scott Kardel
4.5" Unistellar eVScope2


USco
Target Brightness (V magnitude)
10
12
14
16
18
20
09-01 2021
11-01 2021
01-01 2022
03-01 2022
05-01 2022
07-01 2022
09-01 2022
Observation Date
eVscope measurements
V magnitude
12
14
10 June 2022
29 June 2022
Fading brightness
Bruno Guillet
John Pickering
Darren Rivett
Scott Kardel
Georges Simard
Keiichi Fukui
Bruno Guillet
Mario Billiani
ZTF
UNISTELLAR
SETI INSTITUTE



A GRB Non-detection

In October of 2022, the gamma ray burst (GRB) GRB221009A briefly graced the night sky as one of brightest to ever be detected by gamma ray telescopes. The optical counterparts of these energetic events do not last long, but citizen astronomers were on target to see if they could catch it. Even though they did not detect the GRB, the campaign – started by the citizen astronomers themselves – proved to be a success. Seven observations showed a non-detection of the GRB, meaning astronomers could put a limit on its brightness.



Citizen Astronomers See a Dead Star Explode

On December 2nd, 2022 the Unistellar Alerts System received its first notification from professional telescopes that a new supernova-like object had been spotted. It then alerted Citizen Astronomers, who were on target only hours later. Rapid observations like these can help astronomers understand the conditions that caused the explosion. This target, ZTF22abyelas, was eventually classified by professionals as a Type Ia supernova, meaning that observers witnessed the light from an exploding white dwarf mere cosmic moments after its occurrence.

Faits marquants du réseau Unistellar en 2022

Occultation by Europa in Namibia - July 2022 <- not on our blog.

DART impact - Sep 2022

Artemis I return - dec 2022

Phaethon Occultation publshed in Nov 2022

Eurybate Oct 2022

Longest exoplanet transit - Oct 2022

First attempt to observe Didymos occultation - Oct 2022

Super image of Comet K2 - Oct 2022

Polymele new moon - Aug 2022

JWST followed by our network - June 2022

New grants from Moore and Lounsberry to support citizen science May 2022

1989JA - campaign and spin period - May 2022

First paper with a citizen scientist - feb 2022

HD80606b exoplanet orbit refined Apr 2022

TOI1812.01 orbit derived Jul 2022

NASA partnered of UNistellar/SETI for exoplanet confirmations