Youth Astronomy and Space Science Congress (YASSC)

Organised by

Tamilnadu Astronomy and Science Society – TASS

In Association with

Indian Institute of Astrophysics - IIA Bengaluru

(An Autonomous Institution under the Dept. of Science & Technology, Govt. of India)

The Institute of Mathematical Sciences - IMSc Chennai

(A National Institute for Research in the Theoretical Sciences)

Tamil Nadu State Council for Science and Technology - TNSCST

(An Autonomous Body under the Dept. of Higher Education, Government of Tamil Nadu)

Raman Research Foundation - RRF

Research beyond Labs

The Citizens Role

Youth Astronomy and Space Science Congress (YASSC)

Muhilan B M
Citizen scientist

Agenda

- Who is citizen scientist
- Why citizen science in Astronomy is important
- Notable contributions of citizen scientist in astronomy
- Popular citizen science programs
- How to participate

Who is Citizen Scientist?

"A citizen scientist is anyone—**yes, anyone,** who contributes to scientific research, regardless of their background.
They could be ***students***, ***teachers***, ***office workers***, or even ***kids*** who are just curious about the world!"

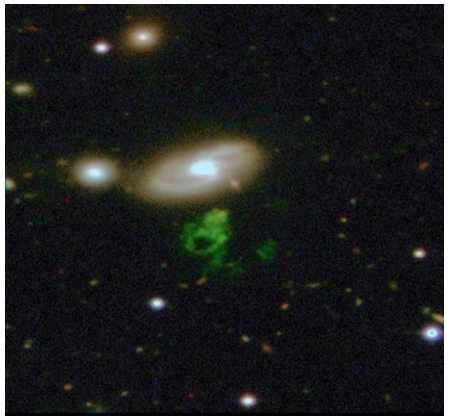
Why citizen science in Astronomy is important!

- Expands observational reach beyond professional astronomers.
- Allows large-scale data analysis through public participation.
- Encourages scientific literacy and engagement.
- Bringing more people into STEM careers.

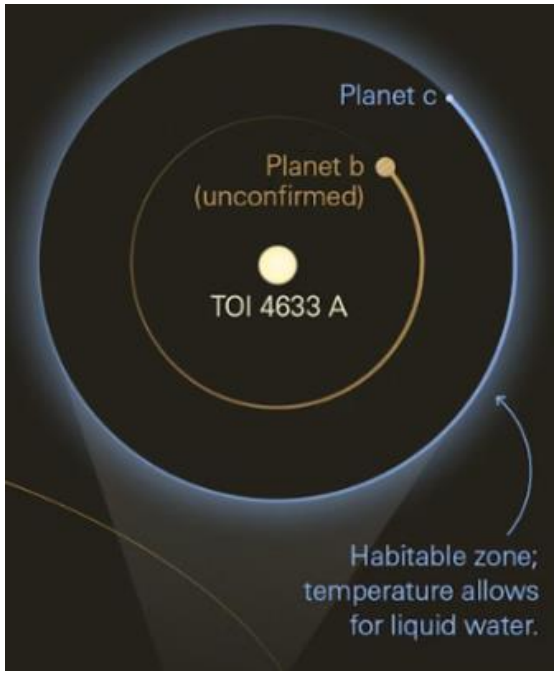
Notable contributions of citizen scientist in astronomy

Schoolteacher discovers ‘cosmic ghost’

A Dutch schoolteacher has discovered a mysterious and unique astronomical object through the Galaxy Zoo project.
Hanny van Arkel, a primary schoolteacher from the Netherlands, came across the image of a strange gaseous object with a hole in the center that has been described as a “cosmic ghost” while using the galaxyzoo.org web site to classify images of galaxies



“Hanny’s Voorwerp” is the green blob of gas (center) and is believed to be a “light echo” from the bright, stormy centerof a distant galaxy that has now gone dim.



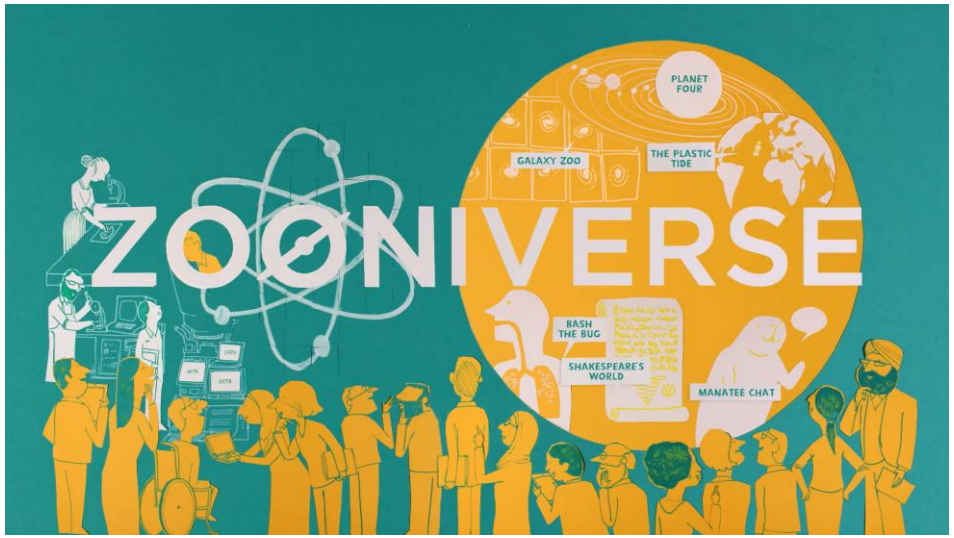
Citizen scientists have discovered a new exo-planet, searching through data collected by NASA's Transiting Exoplanet Survey Satellite (TESS)

New Supernova Is Discovered by Young Citizen Scientist

Caroline Moore, 14 year old

Noida boy, 14, picked by NASA to name asteroid he ‘discovered’

Citizen science programs in Astronomy



RAD@home India

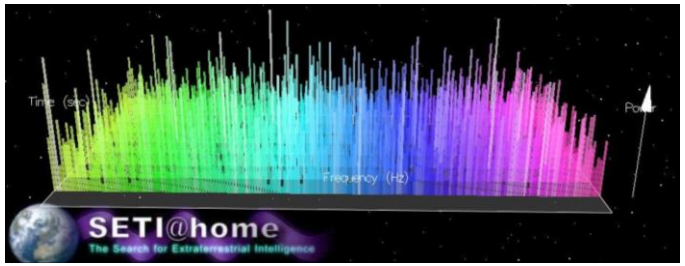
https://www.radathomeindia.org/

IASC

International Astronomical Search Collaboration

https://iasc.cosmosearch.org/

SKAO



https://setiathome.berkeley.edu/

Globe at Night

https://globeatnight.org/

aavso

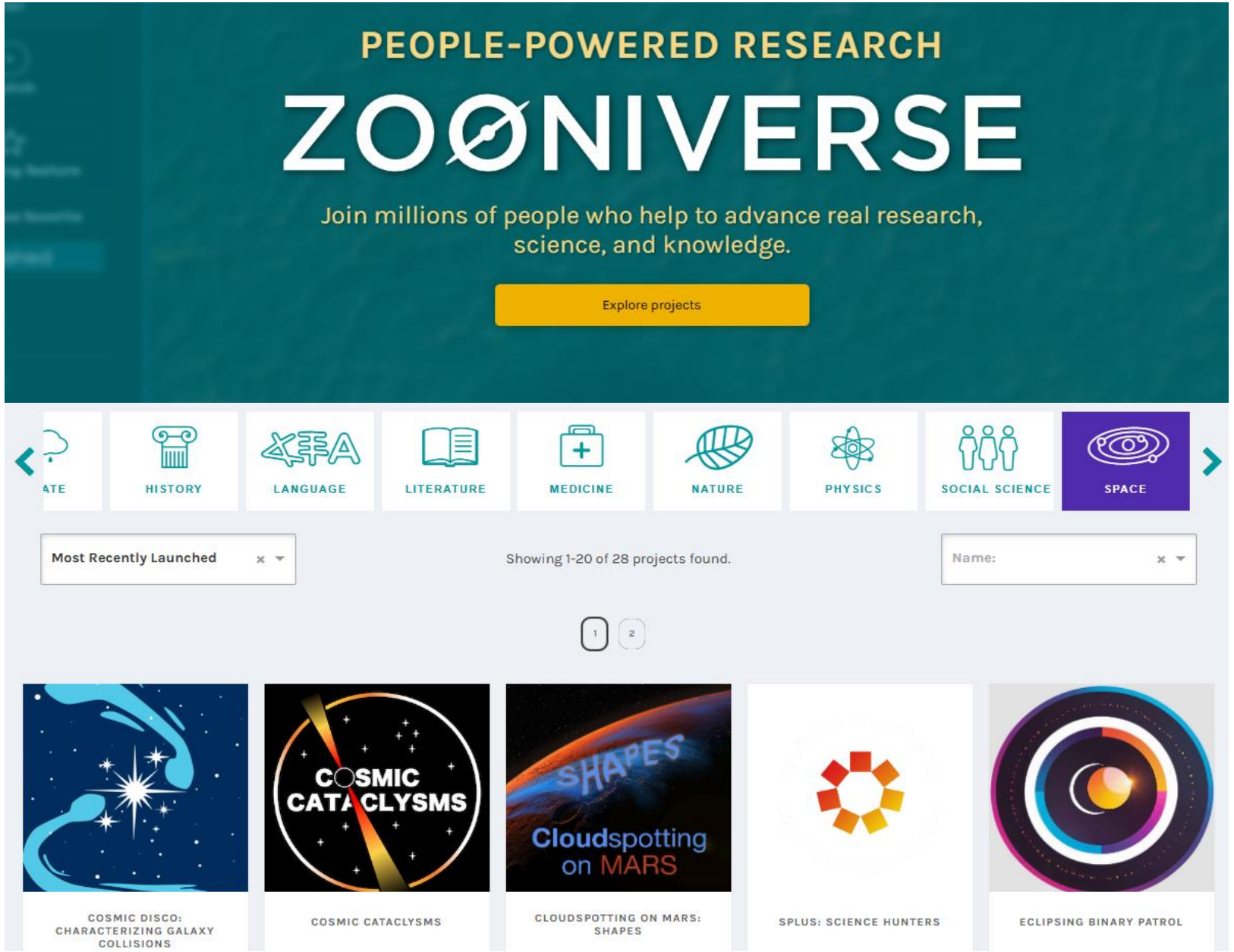
https://www.aavso.org/

scistarter

Science we can do together.

https://scistarter.org/

world's largest citizen science platform



Spot galaxies,

Help find planets!

No expertise needed –

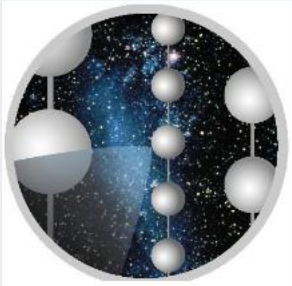
just curiosity!

Website:
https://www.zooniverse.org/

Various Citizen Science programs

THE DAILY MINOR PLANET

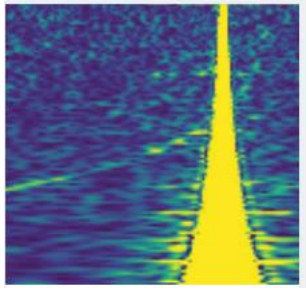
GAIA VARI



NAME THAT NEUTRINO!

CLOUDSPOTTING ON MARS

GWITCHHUNTERS



GRAVITY SPY

RADIO METEOR ZOO

COSMIC DISCO:
CHARACTERIZING GALAXY
COLLISIONS

BLACK HOLE HUNTERS

PLANET HUNTERS NGTS

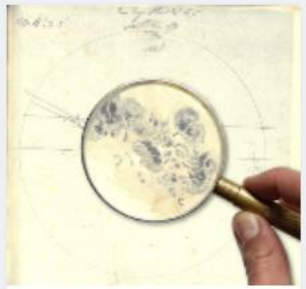
ACTIVE ASTEROIDS

DARK ENERGY EXPLORERS

CITIZEN ASAS-SN

SPLUS: SCIENCE HUNTERS

ECLIPSING BINARY PATROL



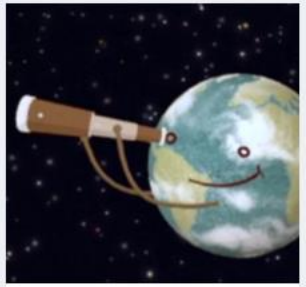
SUNSPOT DETECTIVES

DISK DETECTIVE

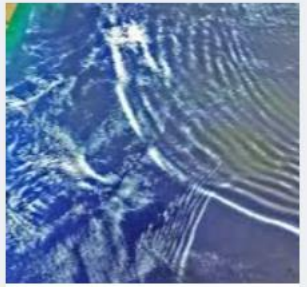
AURORA ZOO

SUPERWASP VARIABLE STARS

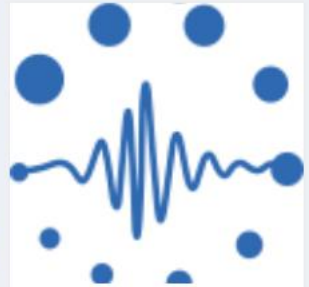
GALAXY ZOO



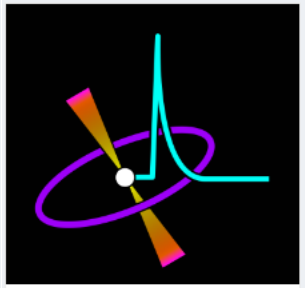
BACKYARD WORLDS: PLANET
9



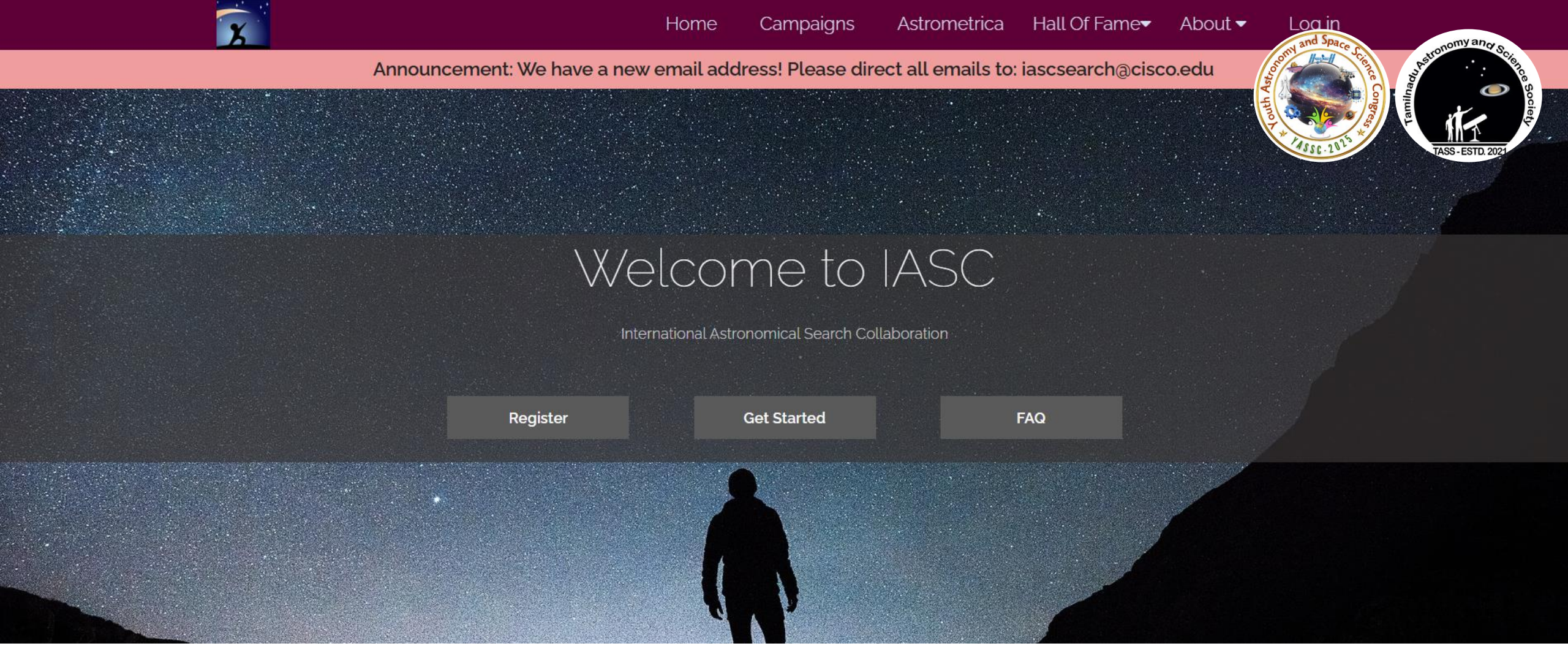
GRAVITY WAVE ZOO



KILONOVA SEEKERS



BURST CHASER



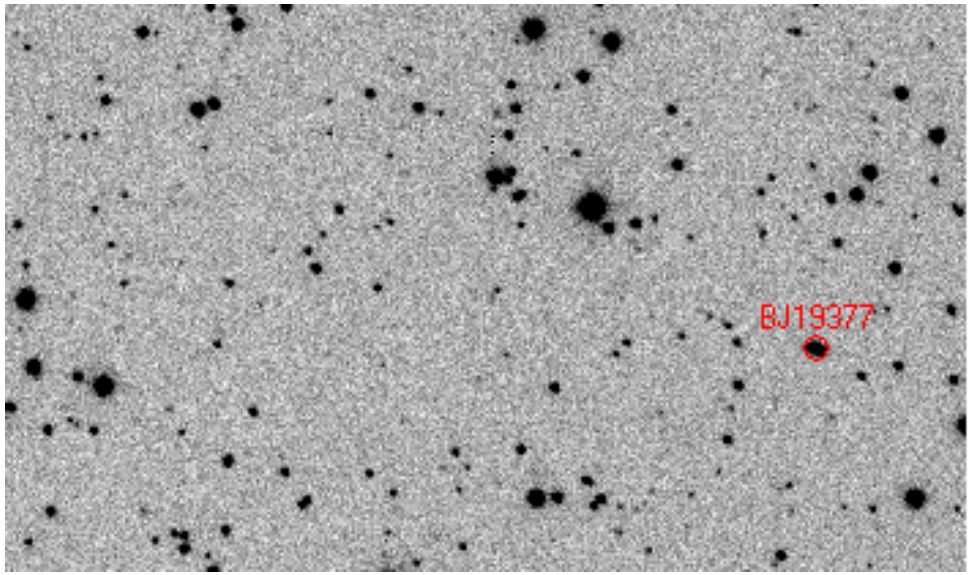
- Provides real astronomical data to citizen scientists for asteroid discovery.
- Open to students, teachers, and amateur astronomers.
- Some asteroids tracked by NASA for planetary defense!

Website : https://iasc.cosmosearch.org/

Pan-STARRS
CISCO COLLEGE
CATALINA SKY SURVEY
NASA Partner

Pan-STARRS, Hawaii

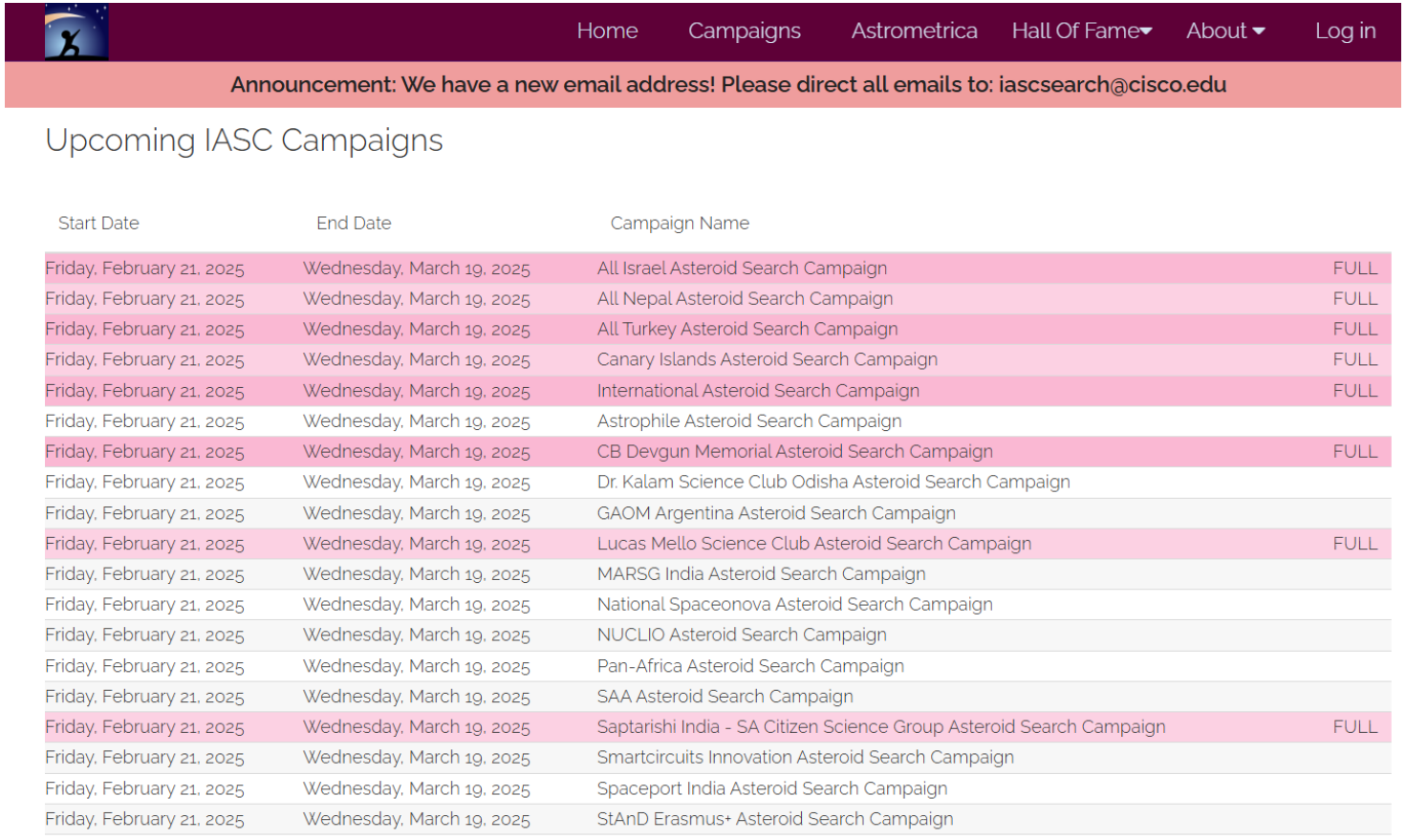
(Panoramic Survey Telescope & Rapid Response System) telescope
Located atop the dormant volcano Haleakala



How to participate ?

1) Register for an IASC Campaign

Schools, colleges, and astronomy clubs can register



Home Campaigns Astrometrica Hall Of Fame About Log in

Announcement: We have a new email address! Please direct all emails to: iascsearch@cisco.edu

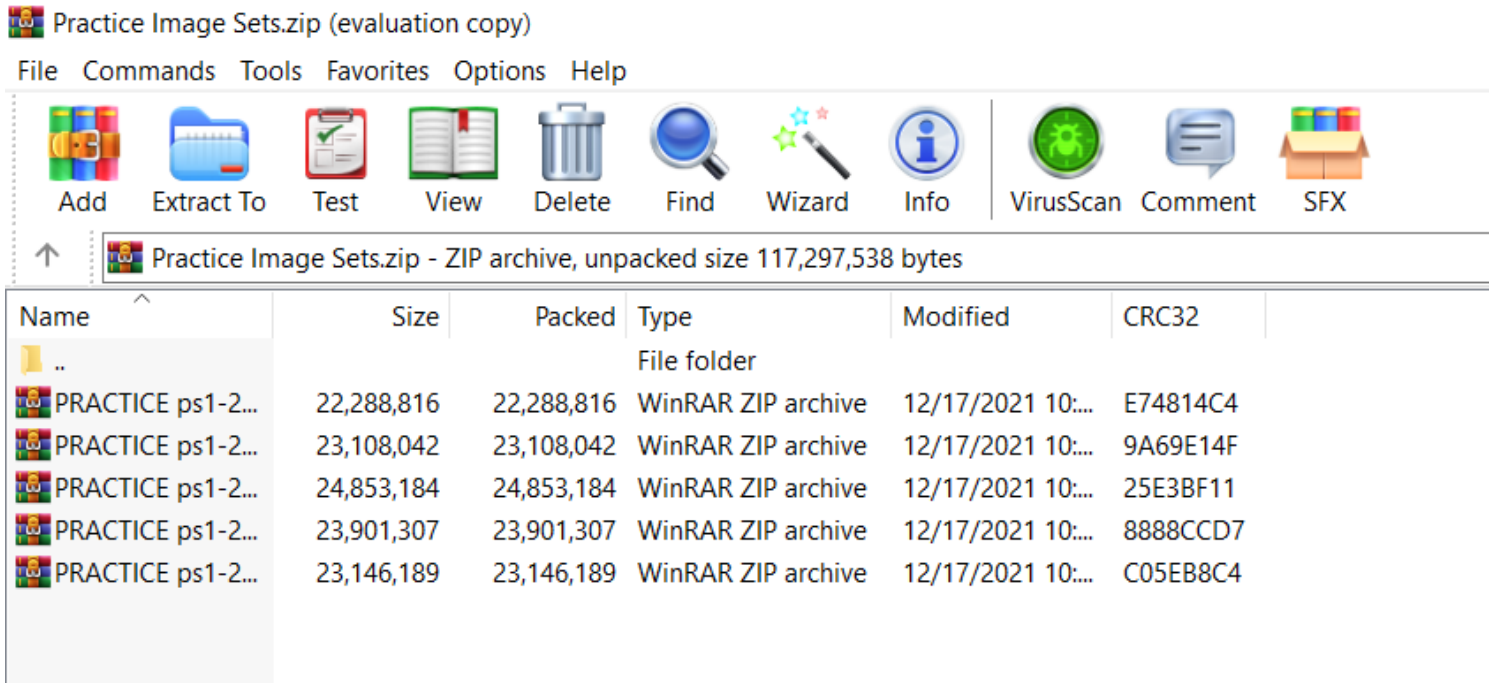
Upcoming IASC Campaigns

Start Date	End Date	Campaign Name	
Friday, February 21, 2025	Wednesday, March 19, 2025	All Israel Asteroid Search Campaign	FULL
Friday, February 21, 2025	Wednesday, March 19, 2025	All Nepal Asteroid Search Campaign	FULL
Friday, February 21, 2025	Wednesday, March 19, 2025	All Turkey Asteroid Search Campaign	FULL
Friday, February 21, 2025	Wednesday, March 19, 2025	Canary Islands Asteroid Search Campaign	FULL
Friday, February 21, 2025	Wednesday, March 19, 2025	International Asteroid Search Campaign	FULL
Friday, February 21, 2025	Wednesday, March 19, 2025	Astrophile Asteroid Search Campaign	
Friday, February 21, 2025	Wednesday, March 19, 2025	CB Devgun Memorial Asteroid Search Campaign	FULL
Friday, February 21, 2025	Wednesday, March 19, 2025	Dr. Kalam Science Club Odisha Asteroid Search Campaign	
Friday, February 21, 2025	Wednesday, March 19, 2025	GAOM Argentina Asteroid Search Campaign	
Friday, February 21, 2025	Wednesday, March 19, 2025	Lucas Mello Science Club Asteroid Search Campaign	FULL
Friday, February 21, 2025	Wednesday, March 19, 2025	MARSG India Asteroid Search Campaign	
Friday, February 21, 2025	Wednesday, March 19, 2025	National Spaceonova Asteroid Search Campaign	
Friday, February 21, 2025	Wednesday, March 19, 2025	NUCLIO Asteroid Search Campaign	
Friday, February 21, 2025	Wednesday, March 19, 2025	Pan-Africa Asteroid Search Campaign	
Friday, February 21, 2025	Wednesday, March 19, 2025	SAA Asteroid Search Campaign	
Friday, February 21, 2025	Wednesday, March 19, 2025	Saptarishi India - SA Citizen Science Group Asteroid Search Campaign	FULL
Friday, February 21, 2025	Wednesday, March 19, 2025	Smartcircuits Innovation Asteroid Search Campaign	
Friday, February 21, 2025	Wednesday, March 19, 2025	Spaceport India Asteroid Search Campaign	
Friday, February 21, 2025	Wednesday, March 19, 2025	StAnD Erasmus+ Asteroid Search Campaign	

How to participate ?

2) Receive Image Sets

Images are taken using professional observatories.

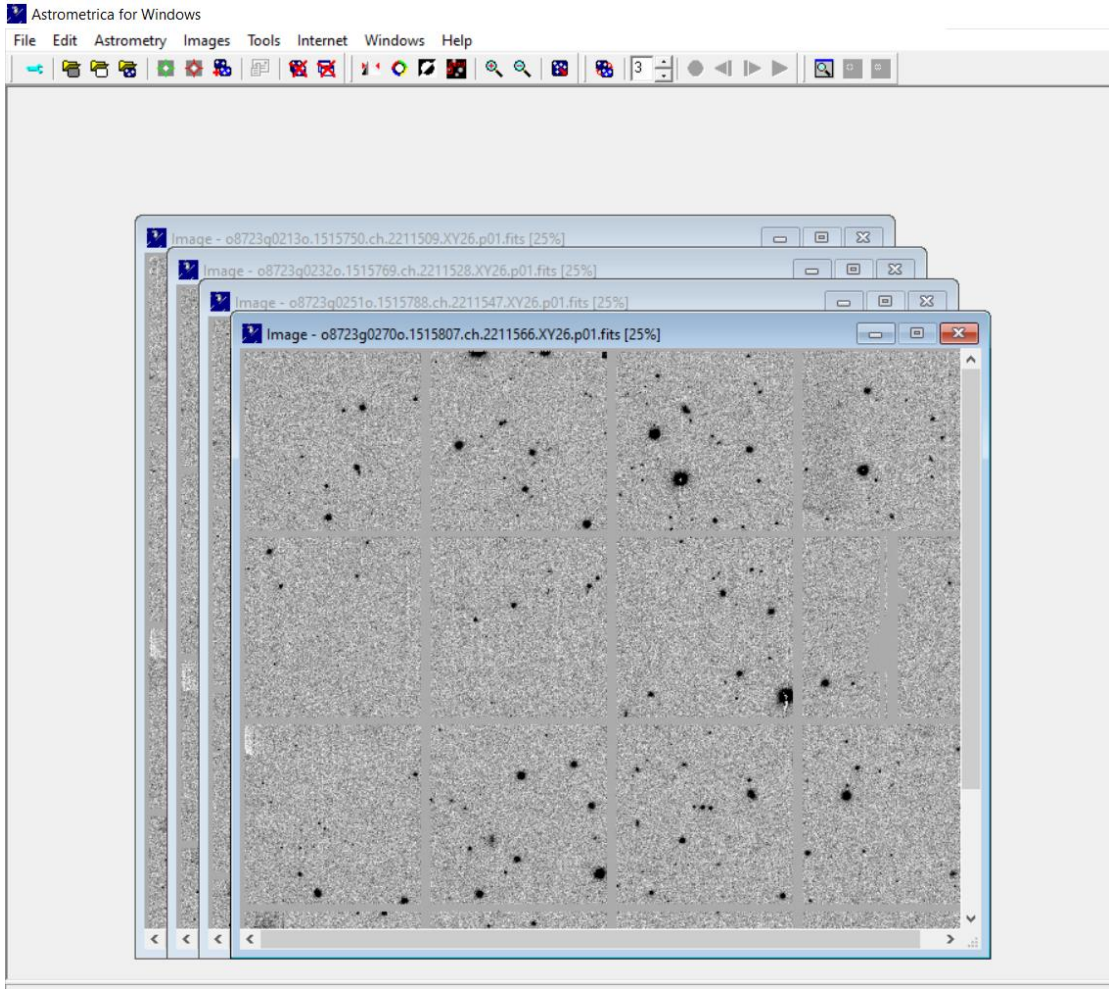


Extract the Zip files.

How to participate ?

3) Analyze Images Using Astrometrica

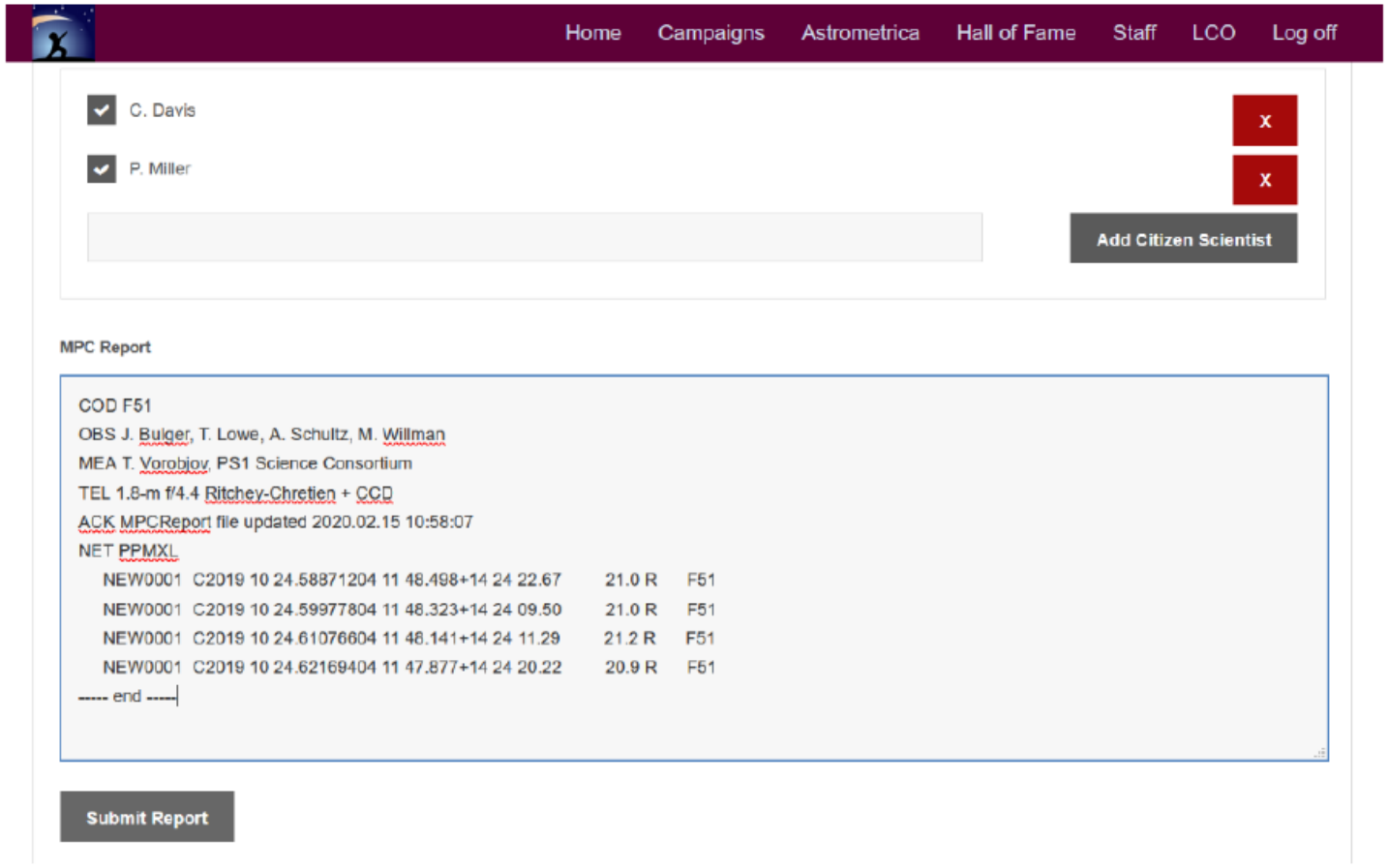
- Software used to detect and measure asteroid positions.
- Participants mark potential asteroid candidates.

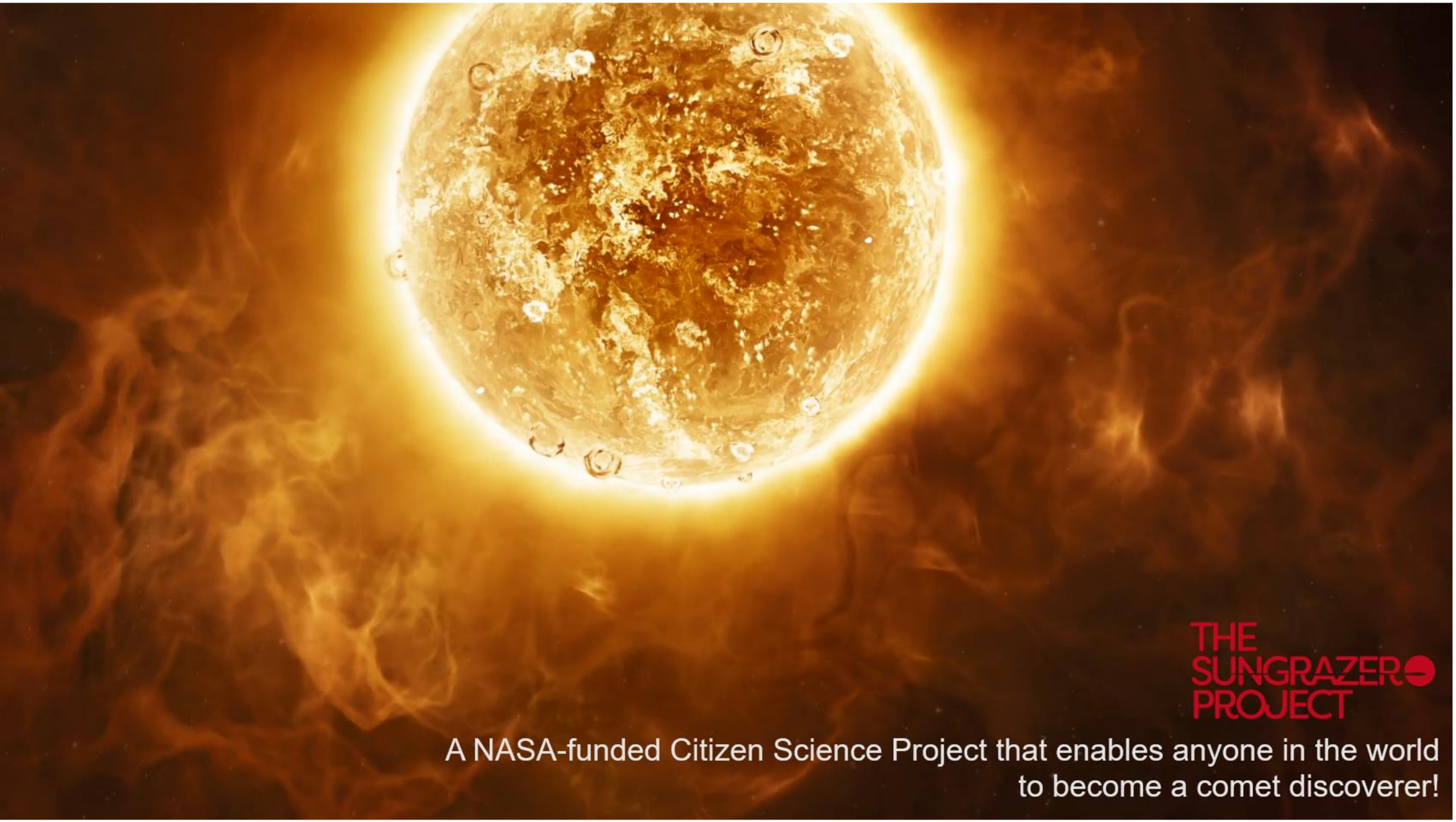


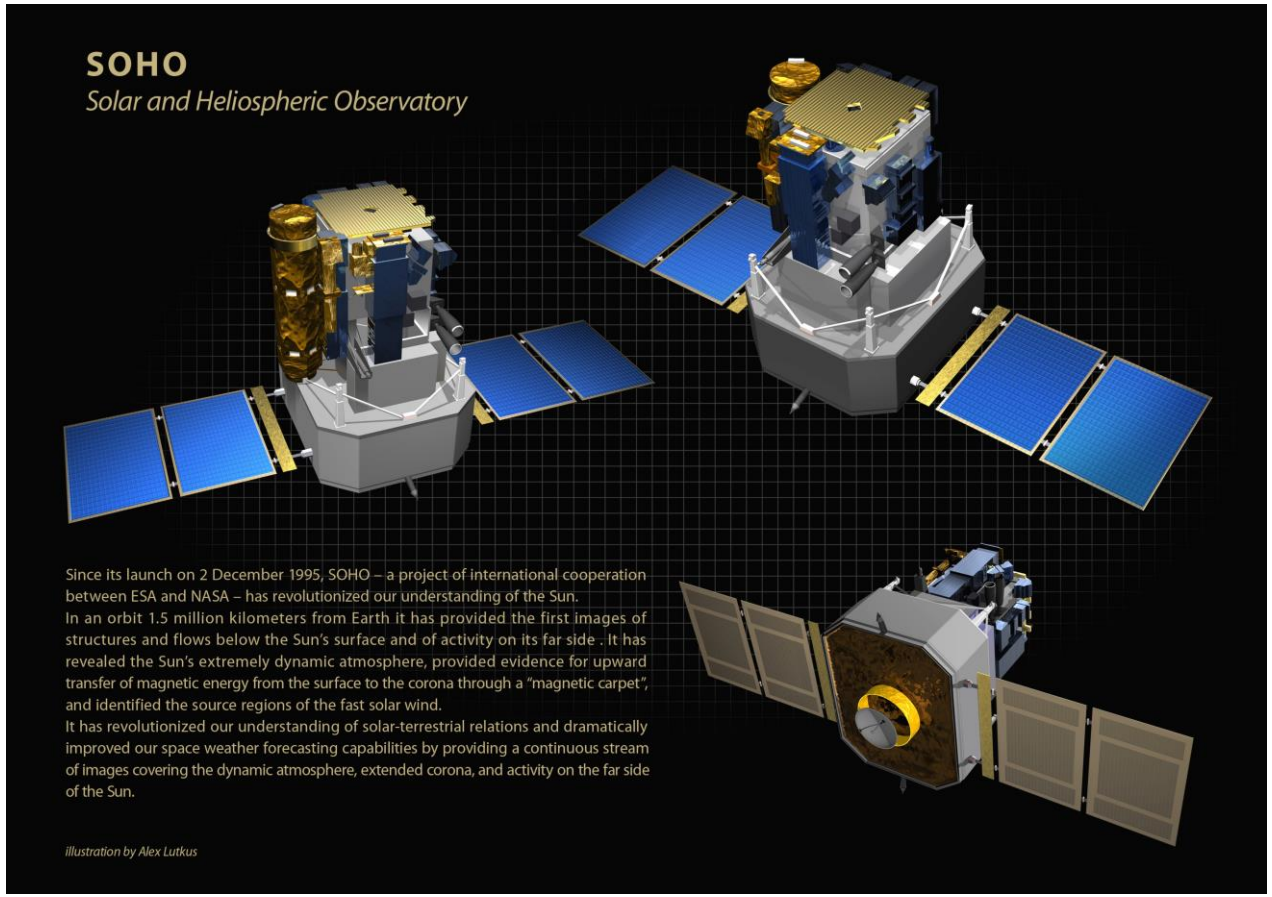
How to participate ?

4) Submit Reports

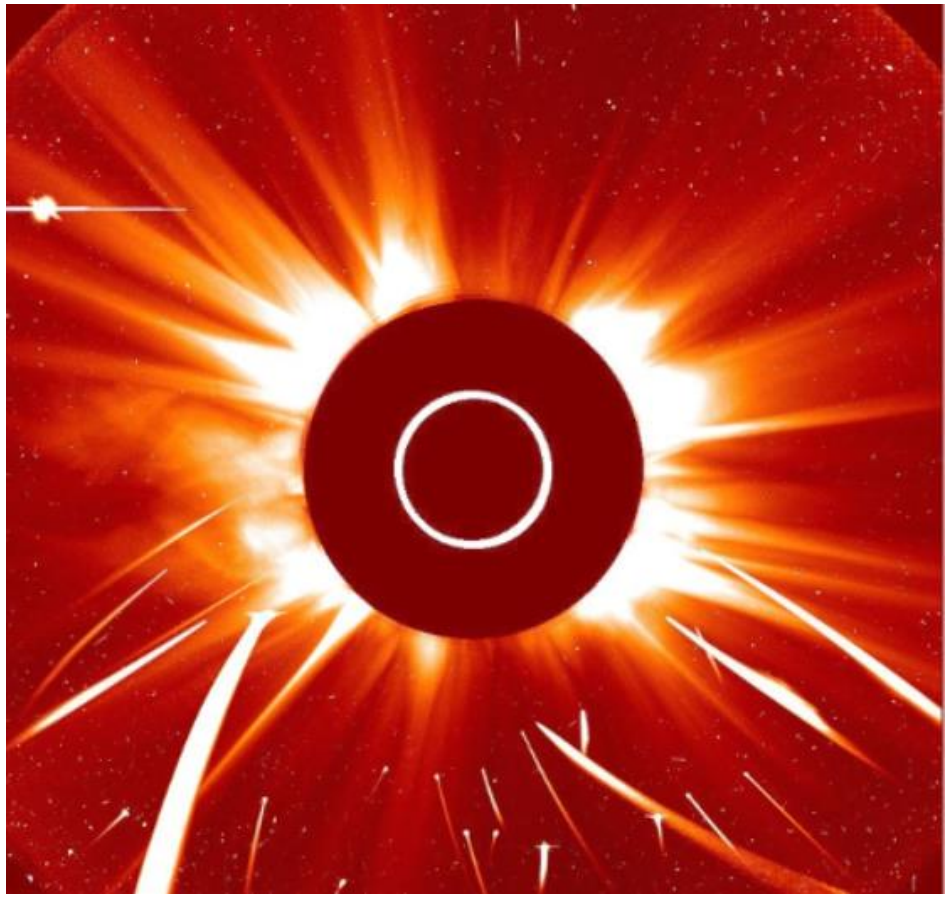
- Findings are submitted to IASC for verification.
- Verified objects may be submitted to the **Minor Planet Center (MPC)**.




THE
SUNGRAZER
PROJECT
A NASA-funded Citizen Science Project that enables anyone in the world
to become a comet discoverer!

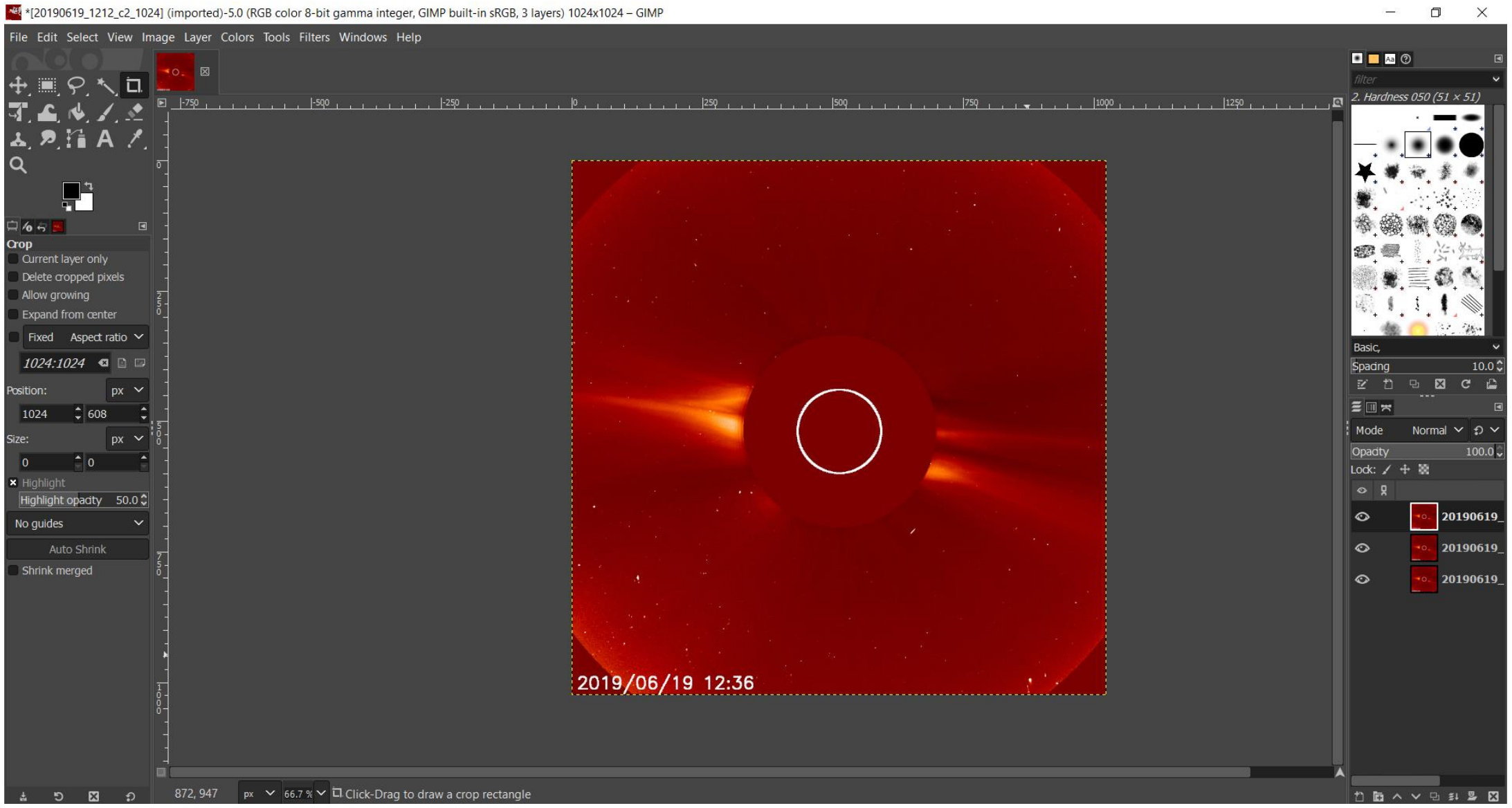


Found more than 4,100 new comets in over 25-years of operation

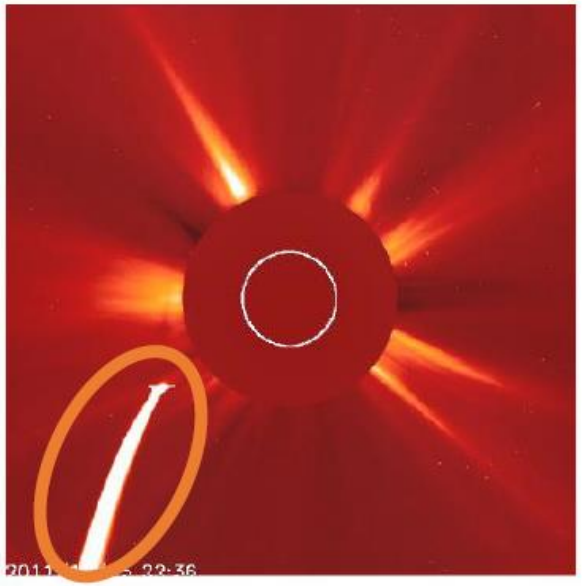


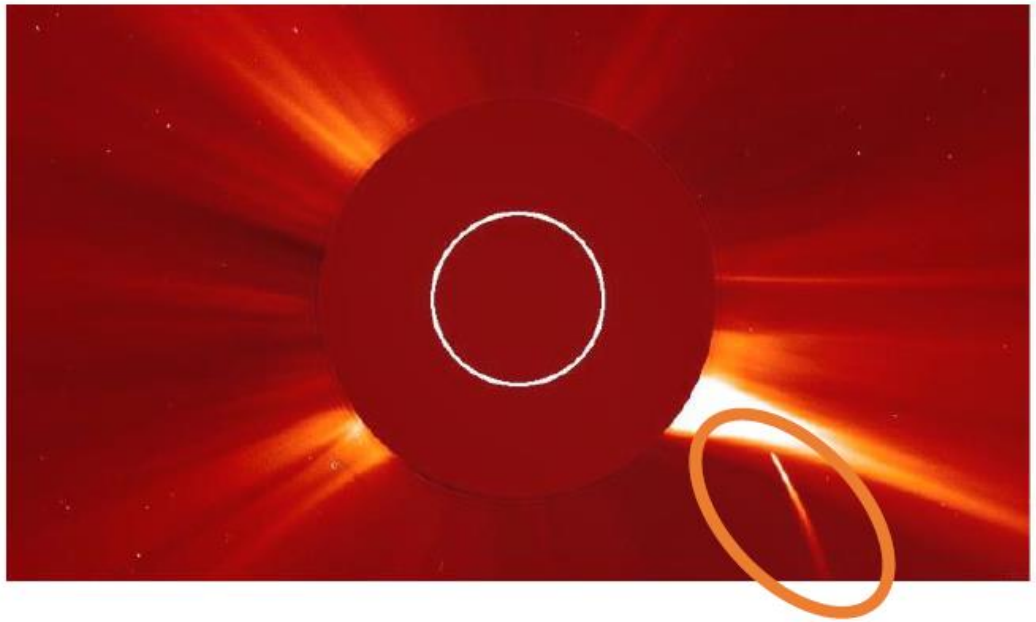
Uses LASCO (Large angle and spectrometric Coronograph) To block the Sun's bright disk

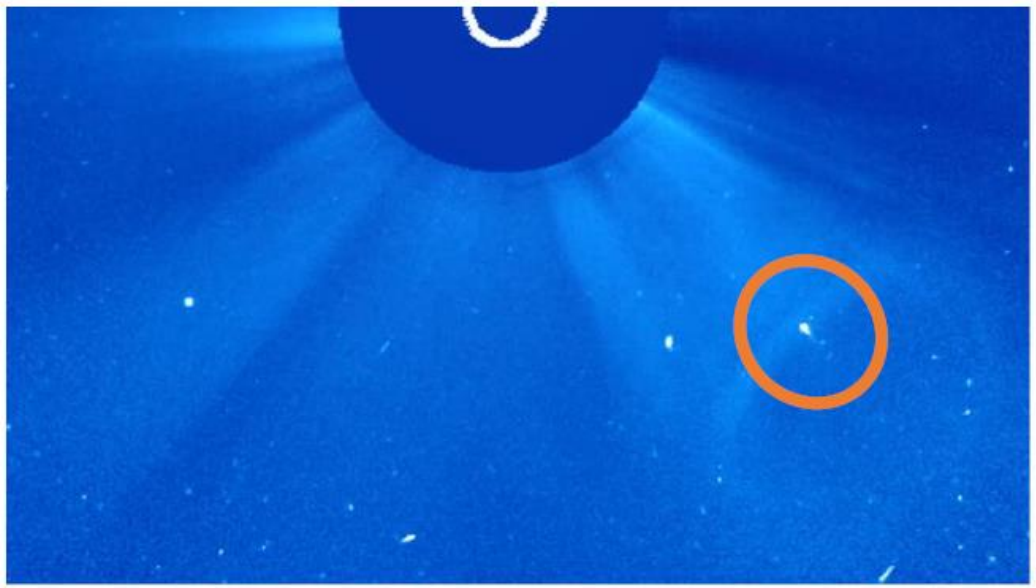
Tools to analyze the data : PIX SPY GIMP Photoshop



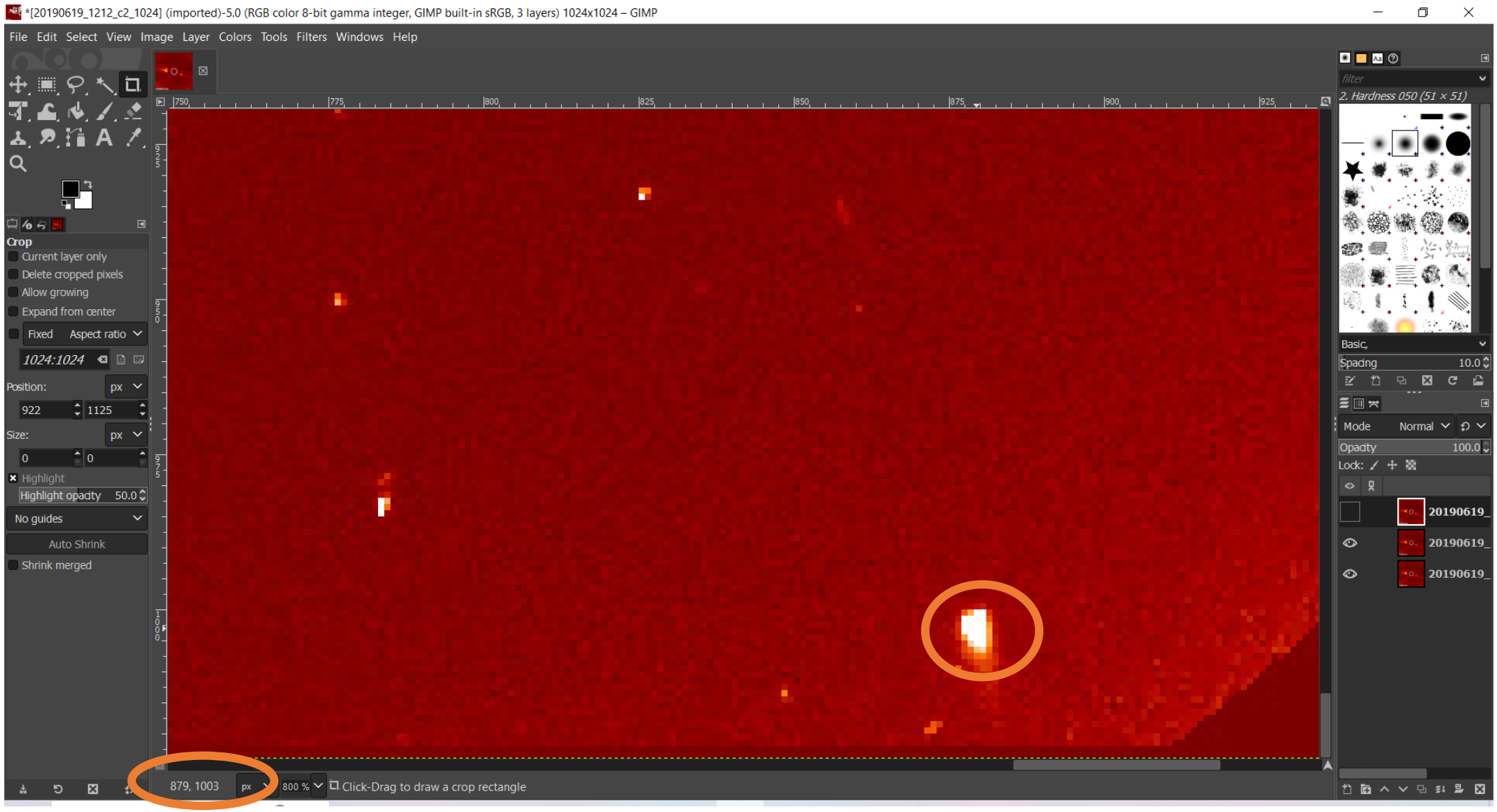
Track the moving comet







Track the Pixel coordinates



Report the Comet !

Contributor * NEW USER

Note to Admin
Firstname Lastname

Sighting Type * Potential Comet

Image or Report Date *
06/19/2019

Camera C2

Image Size 1024x1024

Your (0,0) position: * Lower Left

Comet Group Kreutz

FRAMES

Frame Time
12:12

X Pos
880

Y Pos
1009

Frame Time
12:24

X Pos
879

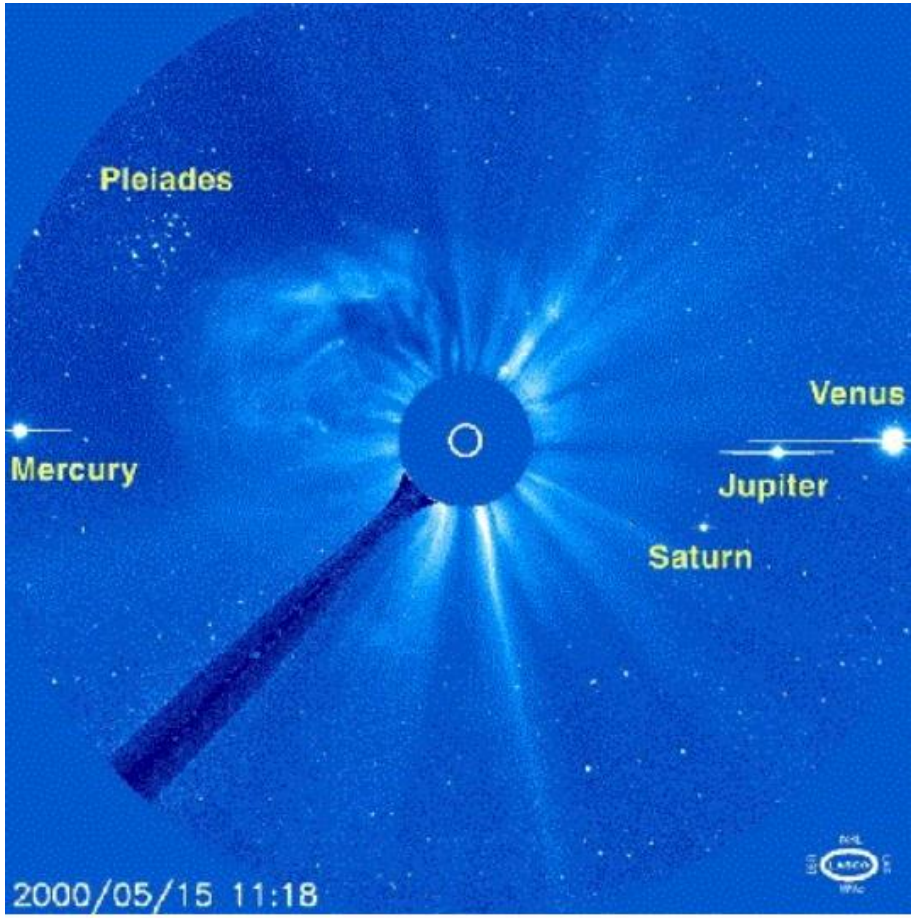
Y Pos
1003

Frame Time
12:36

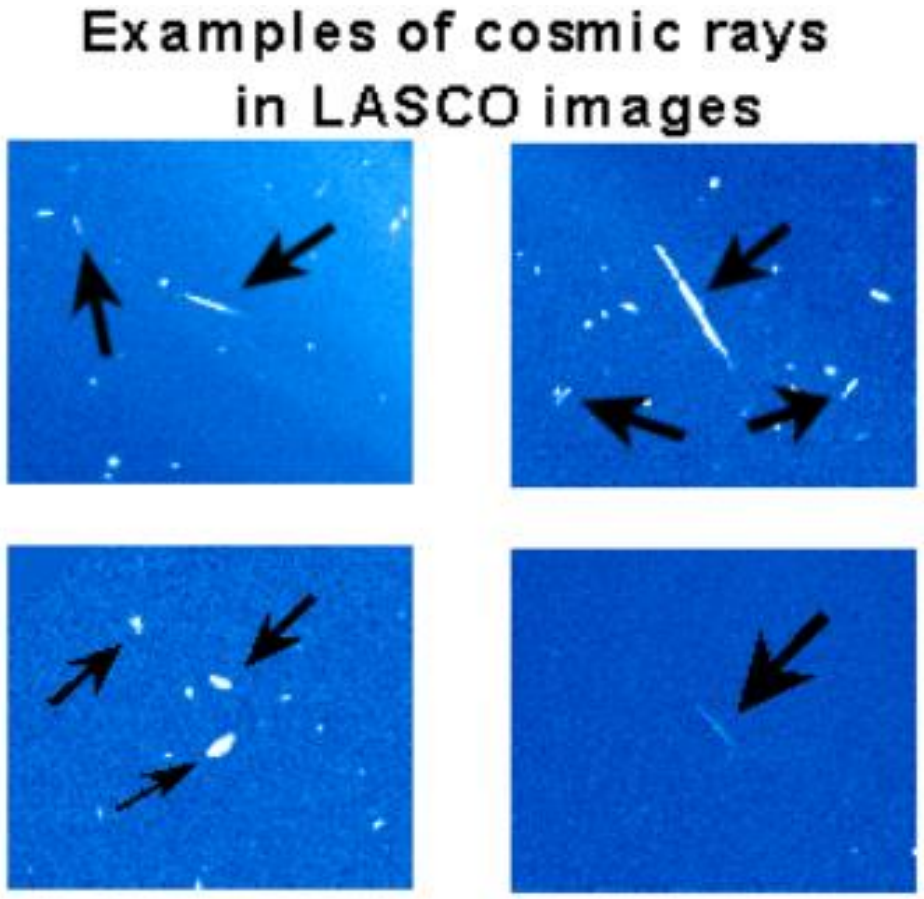
X Pos
878

Y Pos
995

Be careful for False Positive signals!



Planets (which move differently and have diffraction spikes)

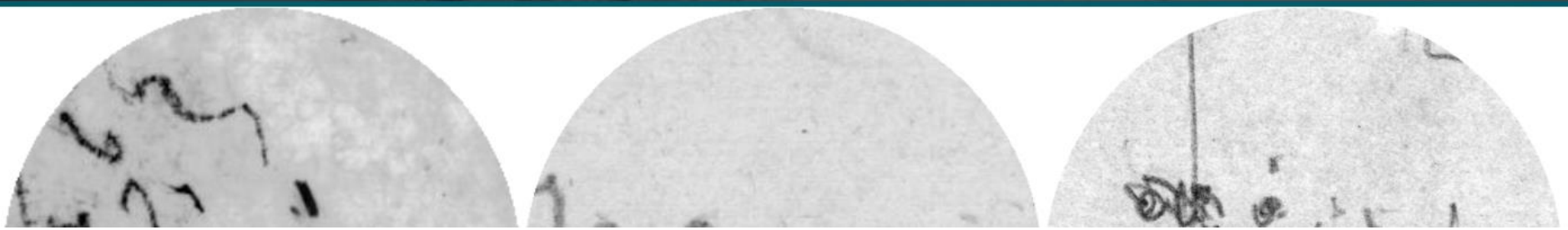


Cosmic rays (random bright spots)

Exploring Historical Solar Drawings to Understand Our Sun's Changes

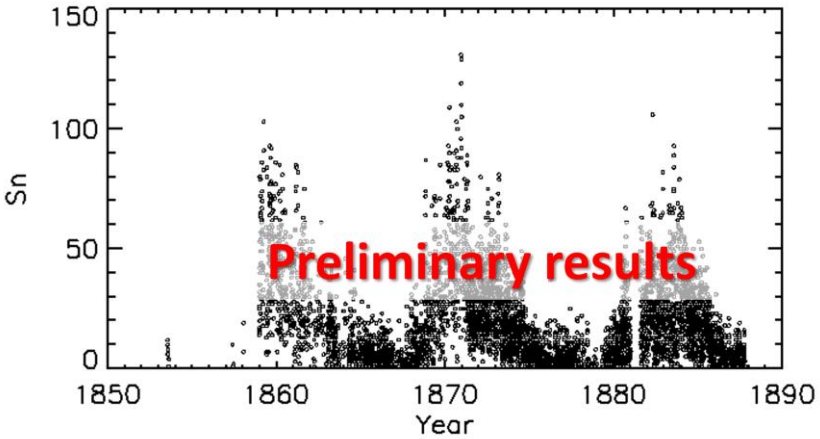
Learn more

Get started

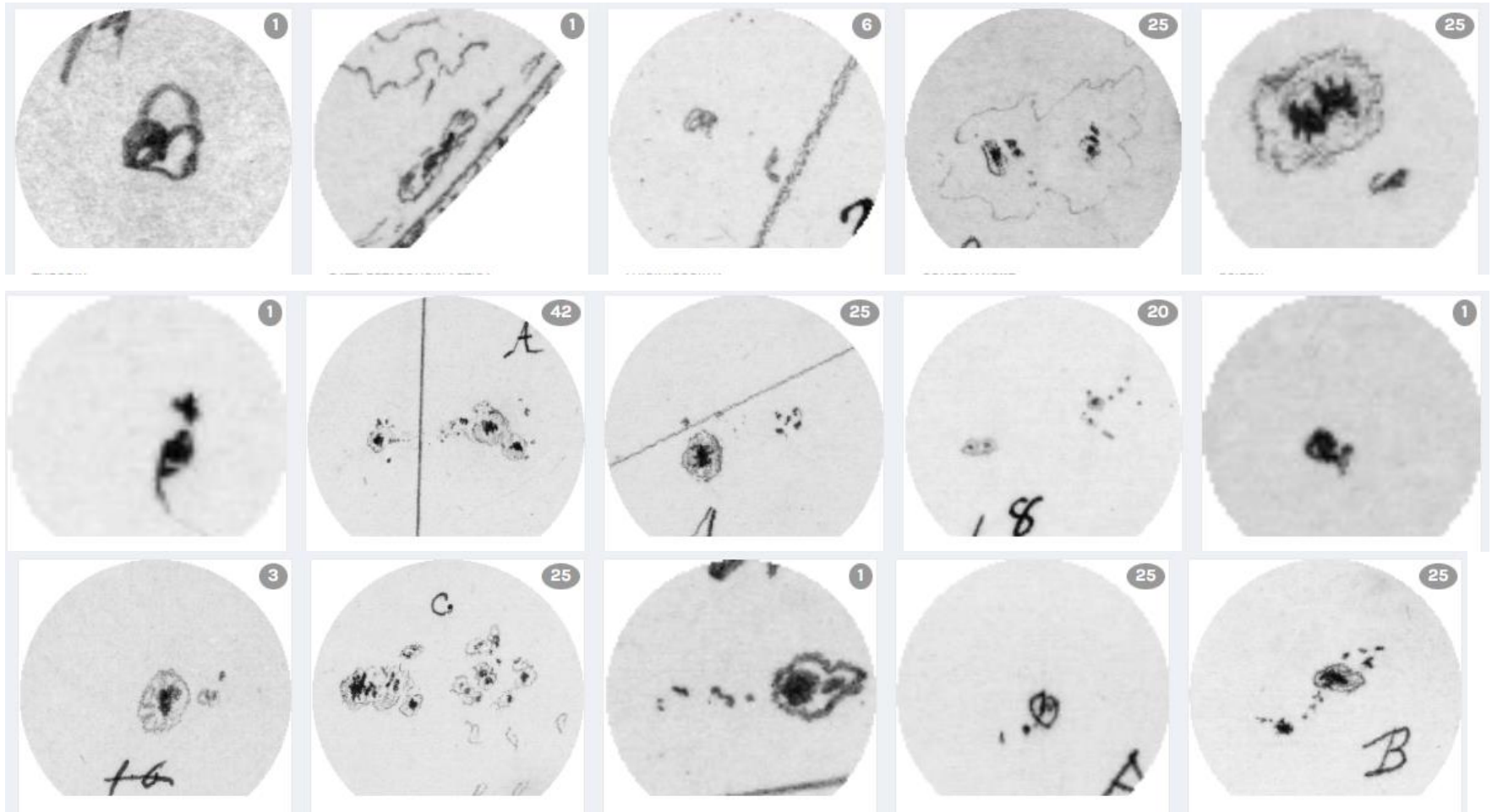


Angelo Secchi

An example drawing of sunspot by Secchi
(credit: INAF)



Sunspot Detectives



PROJECTS ABOUT GET INVOLVED TALK BUILD A PROJECT NEWS ER

Language English

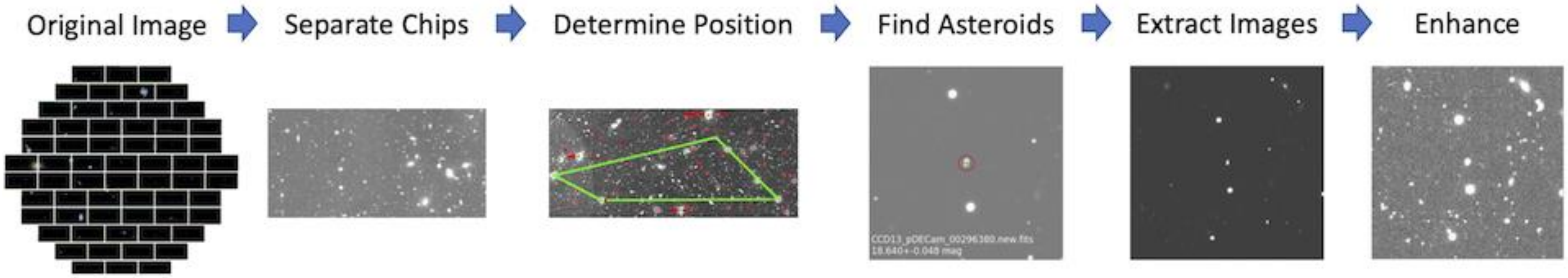
Active Asteroids

ABOUT CLASSIFY TALK COLLECT

Update 2025 January 12: (1) Thanks everyone for your hard work with that last batch, great results! We've got new curated data uploading right now! (2) New result published! Check out this publication about an active Near-Earth Object! (3) For those new to the project, check out this incredible and accurate AI-generated podcast about our super-paper!

Examine images to find comet-like tails... on asteroids! These strange objects hold clues about water on Earth, in the solar system, and beyond.

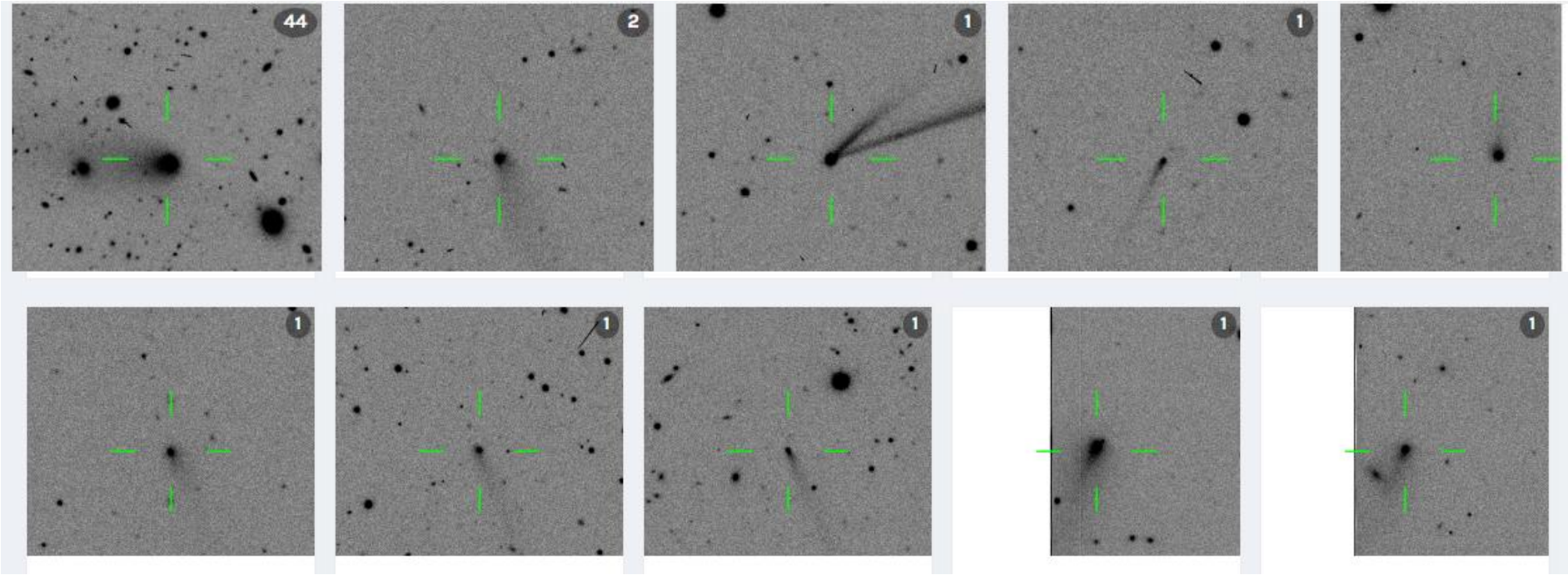
Learn more Get started



Individual pictures of asteroids from the publicly accessible archive of images taken with the Dark Energy Camera (DECam) mounted on the Blanco 4-meter telescope at the Cerro Tololo International Observatory in Chile

There are many (over 10 million) asteroids to classify!!

Active Asteroids

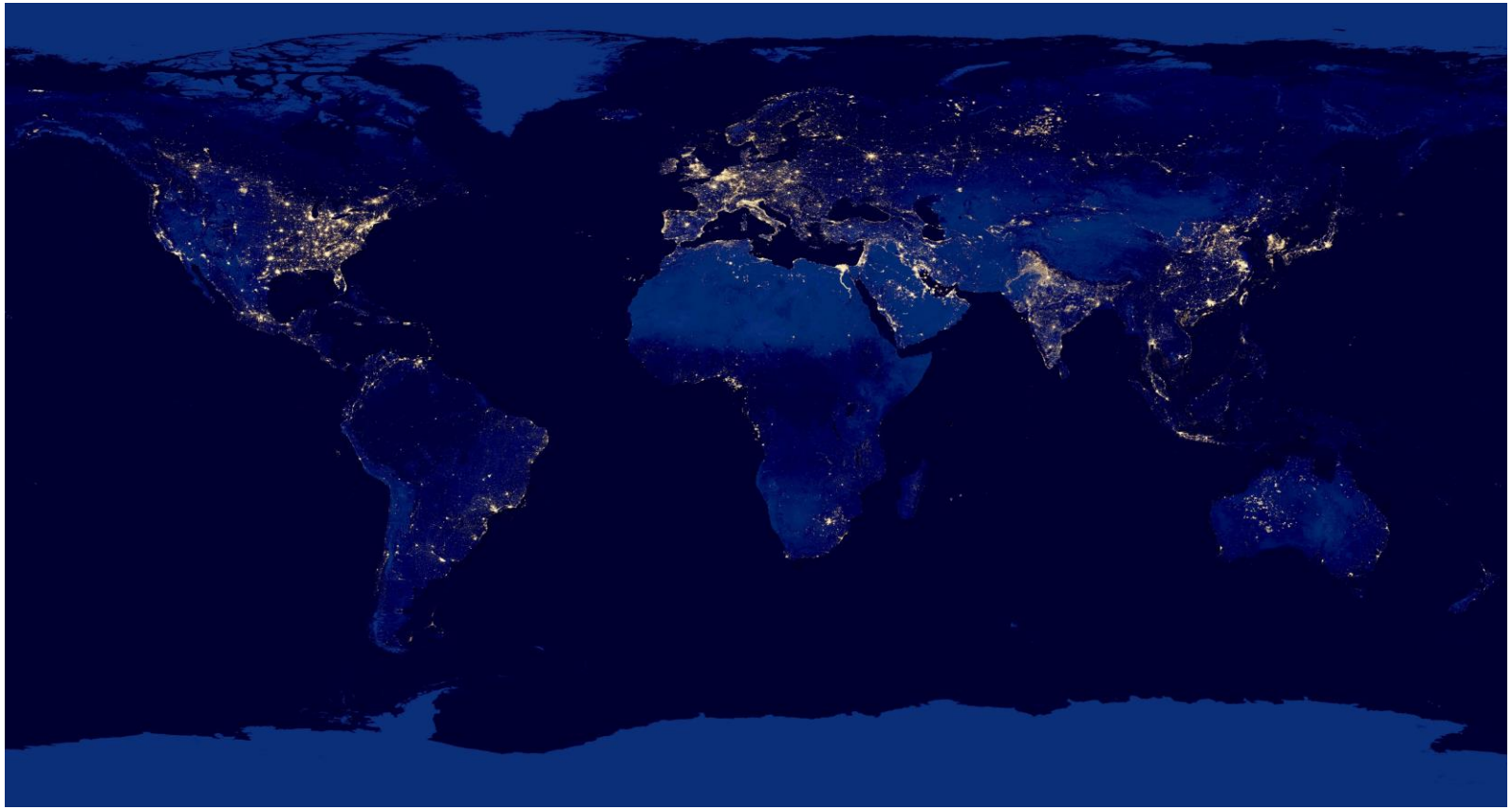


Why Search for Active Asteroids?

- Help answer key unsolved questions about how much water was delivered to Earth after it formed, and where that water originated.
- Advise searches for life about where water -- a prerequisite for life as we understand it -- is found, both in our own solar system and other star systems too.
- Inform spaceflight engineers seeking more practical, inexpensive, and environmentally responsible sources of fuel, air, and water.

Globe at Night

Globe at Night is an international citizen-science campaign to raise public awareness of the impact of light pollution by inviting citizen-scientists to measure & submit their night sky brightness observations.



Too much light pollution has consequences: it washes out starlight in the night sky, interferes with astronomical research, disrupts ecosystems, has adverse health effects and wastes energy.

February 19-28, 2025


Orion


Canis Major

March 21-30, 2025


Crux

April 19-28, 2025

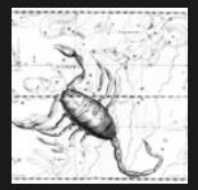

Canis Major


Crux

May 18-27, 2025


Crux

June 16-25, 2025


Scorpius

July 16-25, 2025


Sagittarius


Scorpius

August 15-24, 2025


Sagittarius

September 14-23, 2025


Grus

October 13-22, 2025


Grus

November 11-20, 2025


Grus

Six Easy Star Hunting Steps

1. During the campaign dates, go outside more than an hour after sunset (8-10 pm local time). The Moon should not be up. Let your eyes become used to the dark for 10 minutes before your first observation.
2. Use a night sky app on your phone outside to find the constellation from where you are.
3. Go to the Globe at Night Report page to start to enter Globe at Night measurements. Make sure you are in "Nighttime version"
4. With a smart phone, the app will put in the date, time, location (latitude/longitude) automatically. Otherwise please type them in. For your location, type the street address closest to your observation along with the city, state or province and country.
5. Choose the star chart that looks most closely to what you see toward your constellation. That is, what is the faintest star you can see in the sky and find in the chart?
6. Chose the amount of cloud cover at the time of observation and then click on the "SUBMIT DATA" button.

Report your observation

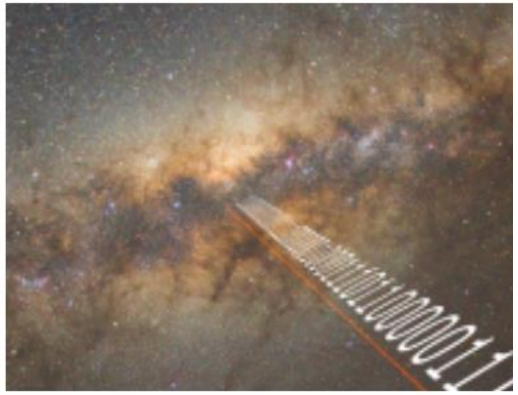
5 What were sky conditions like that night?

Clear | ¼ of the sky | ½ of the sky | More than ½ of the sky

Sky condition comments

E.g., Haze - direction? Clouds - type, direction? Sky glow/light dome - direction?

Some other interesting Citizen Science Programs - https://science.nasa.gov/citizen-science/



Are we alone in the universe?

Examine radio signals to help search for intelligent life beyond Earth. For anyone with a smartphone or laptop. **Read Project Summary**

Cloudspotting on Mars

Trace exotic clouds in the Martian atmosphere. For anyone with a smartphone or laptop. **Read Project Summary**

Exoplanet Watch

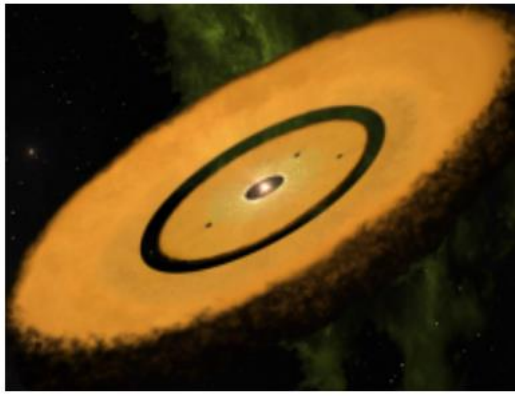
Track new planets beyond our solar system using backyard telescope data. For anyone with a smartphone or laptop. **Read Project Summary**

Backyard Worlds: Planet 9

Search the realm beyond Neptune for new planets, nearby stars and more. For anyone with a smartphone or laptop. **Read Project Summary**

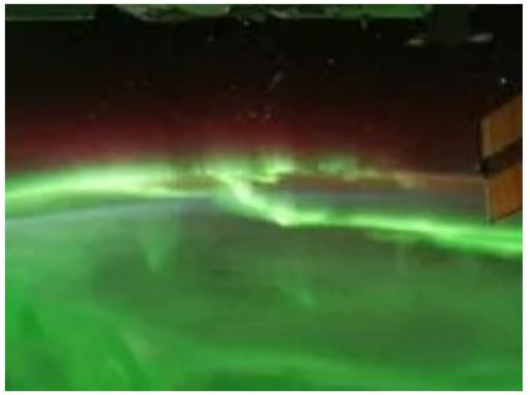
Backyard Worlds: Cool Neighbors

Discover Jupiter-like objects, balls of gas called brown dwarfs in our cosmic backyard. For anyone with a smartphone or laptop. **Read Project Summary**



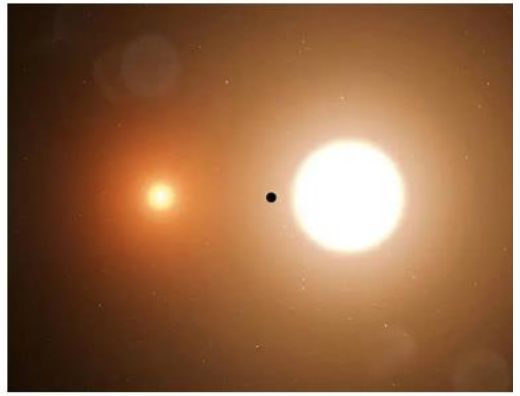
Disk Detective

Search for dusty disks around stars where distant worlds form and dwell. For anyone with a smartphone or laptop. **Read Project Summary**



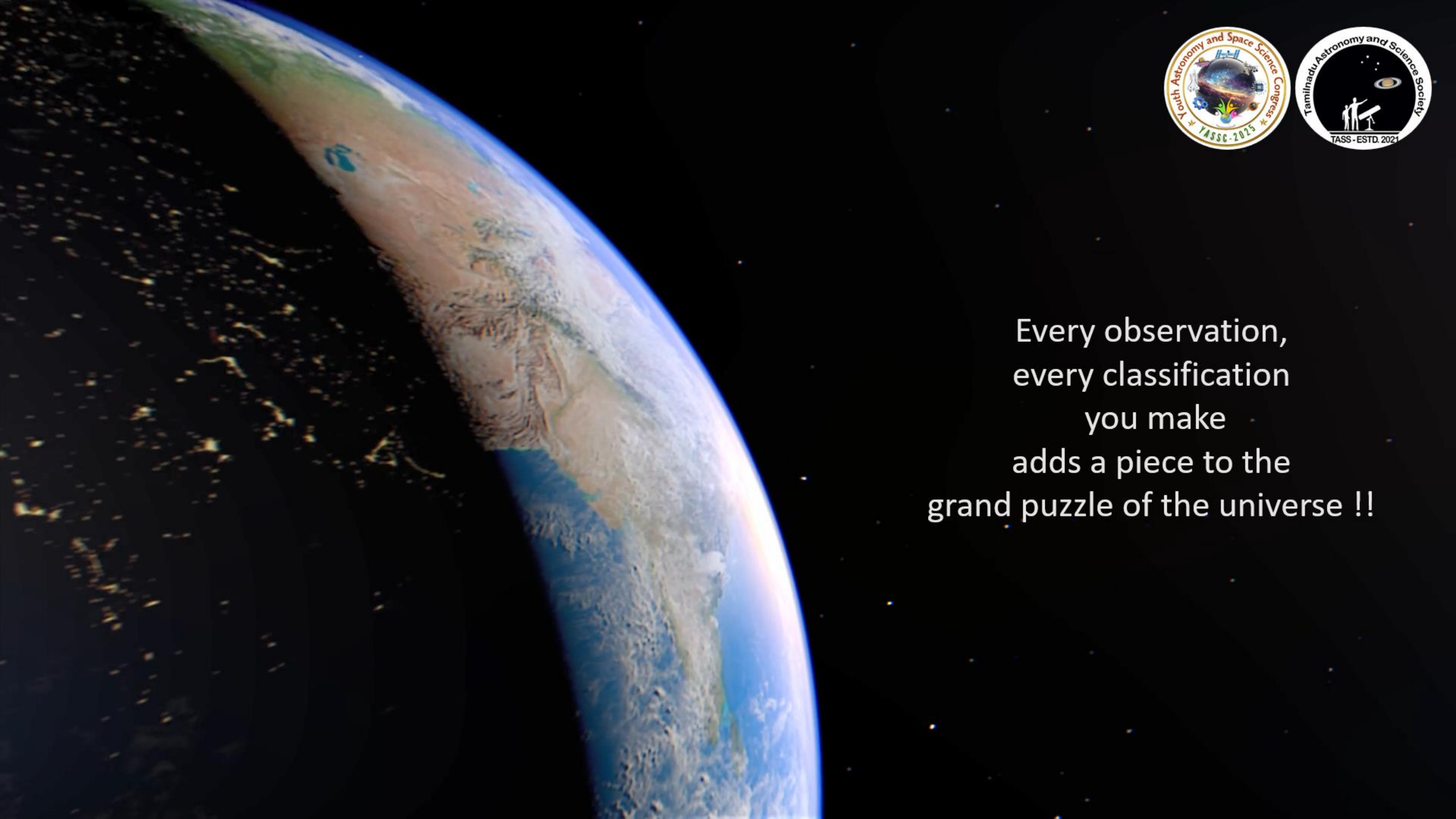
Aurorasaurus

Submit your observations of the Northern and Southern lights. **Read Project Summary**



Eclipsing Binary Patrol

Examine space telescope data to find special rare pairs of stars. For anyone with a smartphone or laptop. **Read Project Summary**


Youth Astronomy and Space Science Congress
YASSC-2025
Tamilnadu Astronomy and Science Society
TASS - ESTD. 2021
Every observation,
every classification
you make
adds a piece to the
grand puzzle of the universe !!

How to Engage students!

Bring space to classroom !

1) Integrate Citizen Science into Assignments & Projects

Encourage students to participate in real-world scientific research through citizen science platforms. Some ideas:

- ***Observational Projects*:** Assign students to record and report astronomical events like meteor showers, eclipses, or lunar phases.
- ***Data Analysis*:** Ask students to analyze data from projects like Galaxy Zoo (classifying galaxies) or Globe at Night (measuring light pollution).
- ***Contribute to Exoplanet Discovery*:** Engage students with NASA's Exoplanet Watch or Zooniverse projects

2) Organizing Student Seminars on Astronomy & Citizen Science

- Ask students to research and present on topics like:
  - How citizen science has contributed to astronomical discoveries.
  - The role of amateur astronomers in science.
- Encourage group discussions or debates on topics like space exploration, dark matter, and the search for extraterrestrial life.


Astronomy is for everyone !!