



Citizen Science

(& Public Engagement @ STScI)

C. Christian

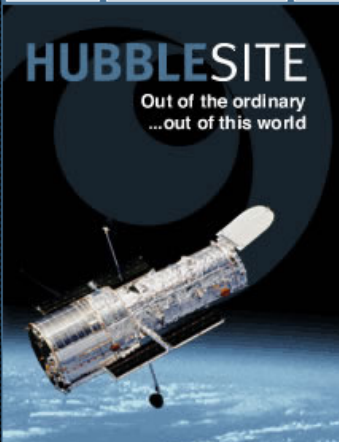
HST Outreach Project Scientist

Public Engagement Portal


[HOME](#) [NEWSCENTER](#) [GALLERY](#) [HUBBLE DISCOVERIES](#) [HUBBLE TELESCOPE](#) [EXPLORE ASTRONOMY](#) [EDUCATION & MUSEUMS](#) [REFERENCE DESK](#) [THE FUTURE: WEBB TELESCOPE](#)

HUBBLESITE

Out of the ordinary
...out of this world



Get Involved




Volunteer • Participate • Interact

**VOLUNTEER YOUR TIME. PARTICIPATE IN CONTESTS.
INTERACT WITH THE ASTRONOMICAL COMMUNITY.**


Love our celestial images and the science behind em? Get involved! Explore these opportunities to collaborate with experts, contribute your time and talents, or just have fun.

Have a new project idea? [Share it with us.](#)




Hubble Hangouts

Live talks each month! Present your questions or comments, or just watch.



Citizen Science

Join forces with professional astronomers to make new discoveries and better understand our universe. Through the projects



Hubble Image Processors

If you are a photography and/or science enthusiast, try uncovering your own gems in the Hubble archive! Here you'll find guides.

Activities



Hubble Hangouts: Live talks each month! Question, comment, watch



Creative Challenge: Monthly challenge to create an artistic interpretation of an HST image



MyStar: A game to create stars and systems throughout the universe.

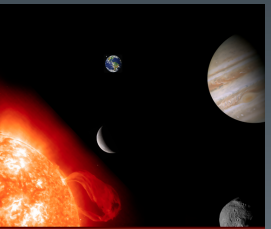
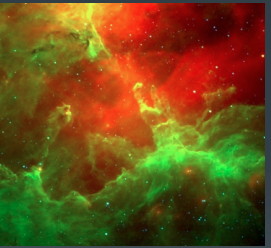


Hubble Heritage: HST observations treated to enhance the visual and artistic nature of the cosmos.



Hubble Image Processors: Enthusiasts try their hand at processing HST data for visual appeal.

....And Citizen Science



Citizen *Science*

- Volunteers perform tasks that contribute to research
- Research problems require large numbers of individuals to apply cognitive skills
- Studies cannot be performed through algorithms

Outcomes

- Refereed research papers
- Machine learning
- Creation of interested community
- Potential for education applications

What
is it?

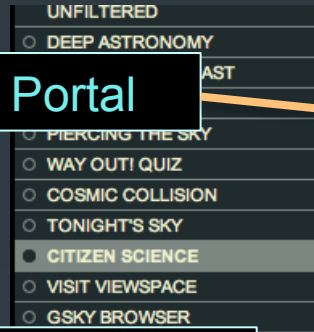
STScI Citizen Science

Umbrella Portal

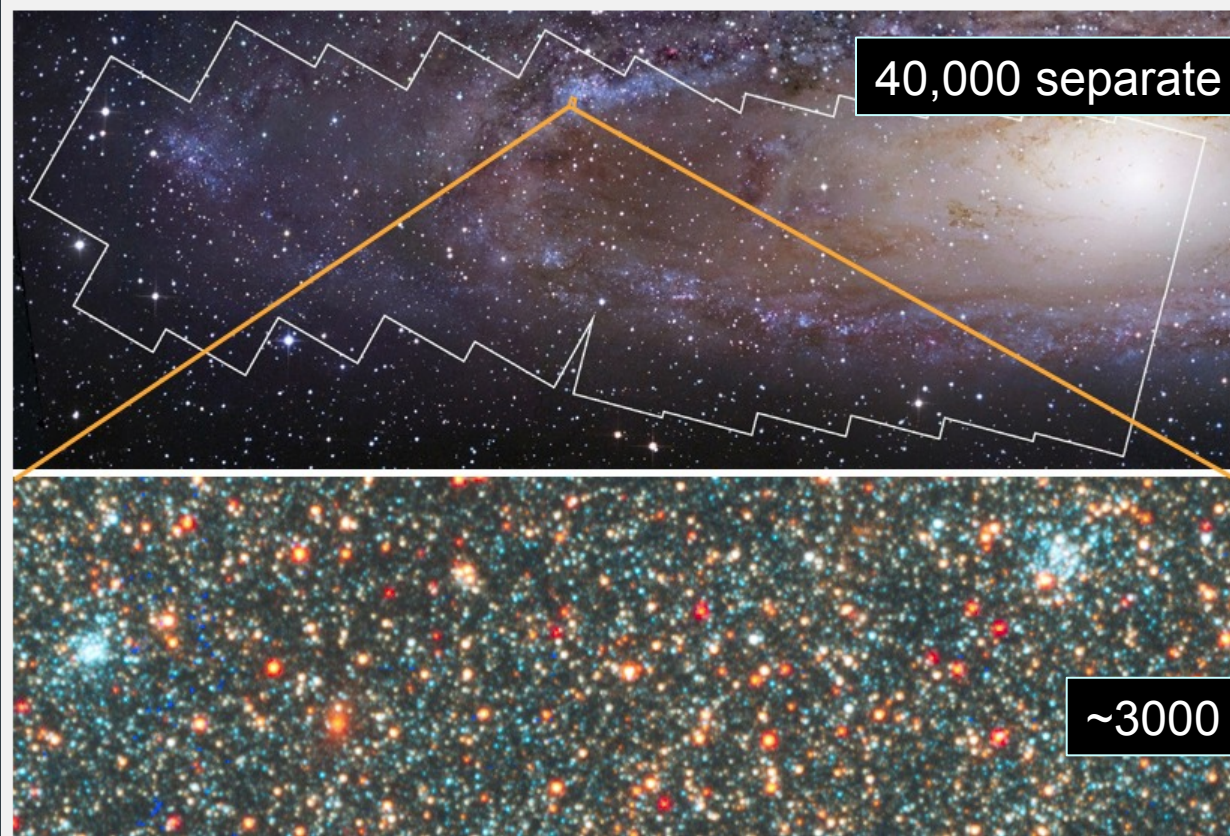
Short duration projects
(months)

Use existing infrastructure
(Zooniverse / Cosmo Quest)

Researchers design project,
mentor Citizen Scientists



The main content area of the citizen science website. At the top is the 'citizen science' logo with the tagline 'DISCOVER SOMETHING'. Below this is a section titled 'PARTICIPATE IN CURRENT SPACE-SCIENCE RESEARCH PROJECTS' with the text 'Join forces with professional astronomers to make new discoveries and better understand our universe.' and a link to the 'Mikulski Archive for Space Telescopes (MAST)'. To the right is a 'Planet Hunters' project card featuring a planet and the text 'planethunters.org'. Below this is a 'Galaxy Zoo: Hubble' project card showing a Hubble telescope and a galaxy, with the text 'How do galaxies form?'. To the right of that is 'The Andromeda Project' card with the text 'THE ANDROMEDA PROJECT'. Arrows from the callout boxes point to the 'Umbrella Portal' (the menu), 'Short duration projects' (the Planet Hunters card), 'Use existing infrastructure' (the Galaxy Zoo card), and 'Researchers design project' (the Andromeda Project card).

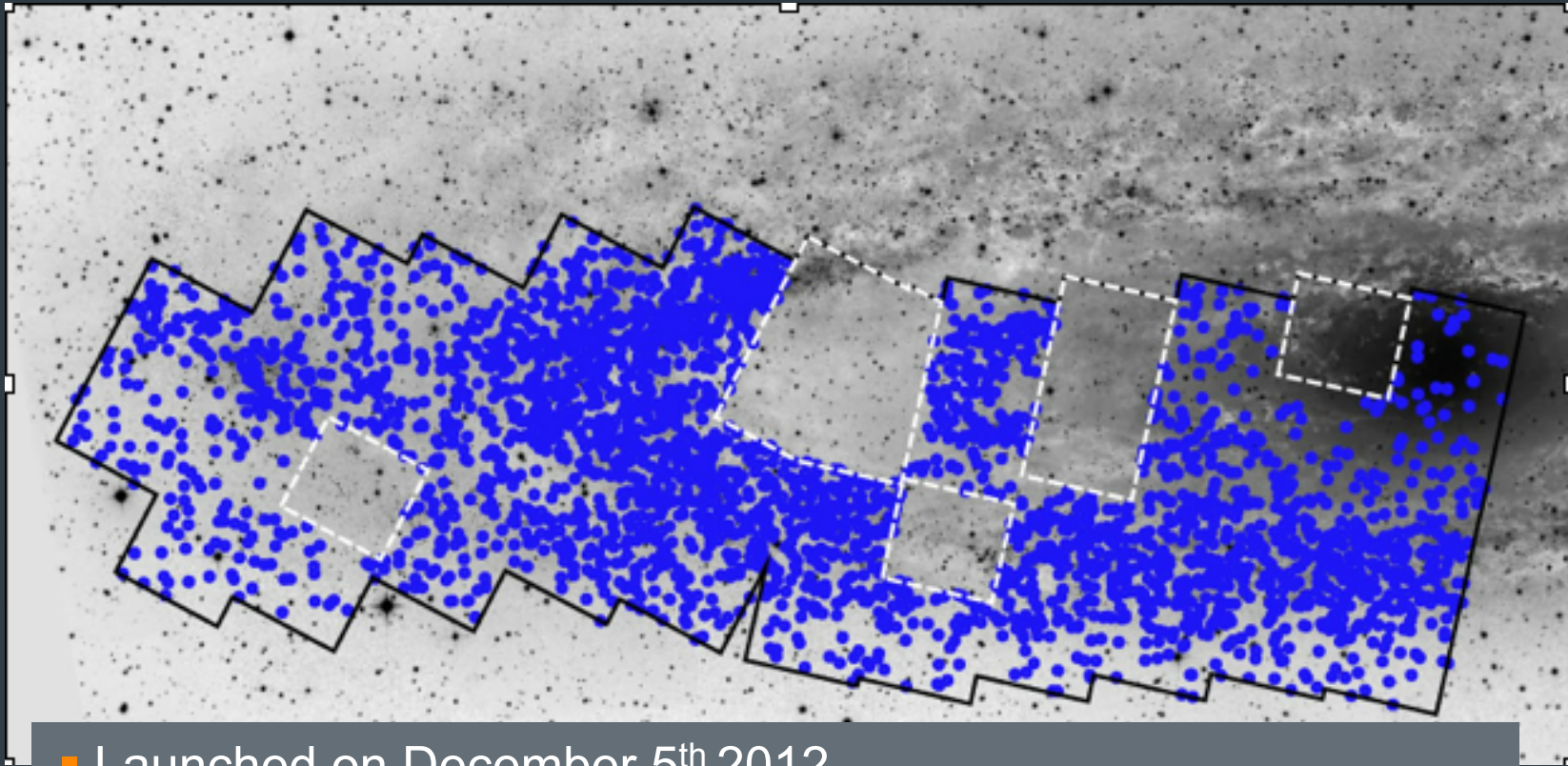


40,000 separate exposures of M31

Panchromatic Hubble
Andromeda Treasury
(PHAT) survey


~3000 star clusters

8 members science team
one month searching the first ~20% of the survey's imaging
~600 likely star clusters
4x number previously known in same region



- Launched on December 5th 2012
- Goal 50 users examine ~12,000 image cutouts
- ~7,000 unique visitors and more than 100,000 image classifications in the first day.
- Overall classification rate that is greater than **one per second!**
- After 16 days, concluded data collection after amassing over **1 million image classifications**, = 80 individual classifications per image

Training interface



Mark Background Galaxies

Mark the galaxy by clicking in the center then dragging out until the majority of the galaxy's light is enclosed (just like the star clusters).

Objects in this image

star cluster	2
galaxy	0

cross 0

linear 0

ghost 0

Finished

Andromeda Project is a **Zooniverse** project. | [Our Projects](#)



THE **ANDROMEDA** PROJECT

[Home](#)[About](#)[Classify](#)[Guide](#)[Profile](#)[Blog](#)[Talk](#)

January 14, 2013

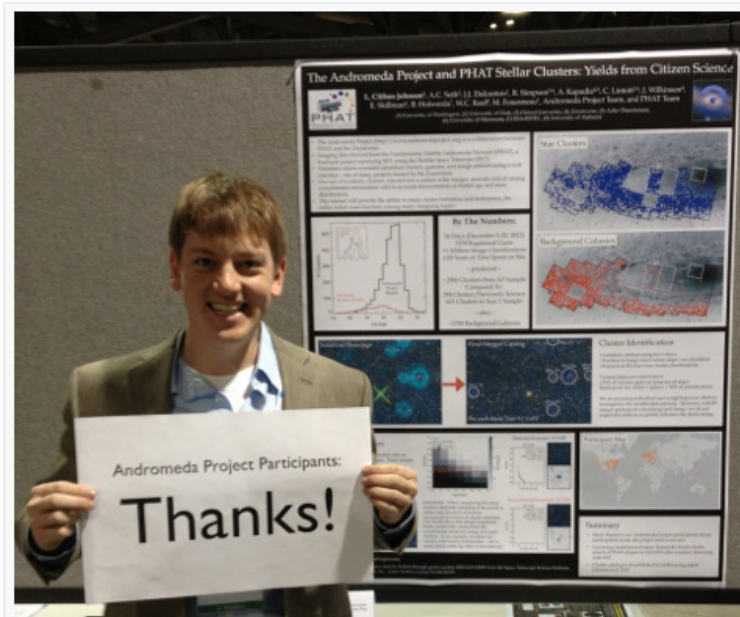
by lcjohnso

In Uncategorized

2 Comments

First Results at AAS

This week in Long Beach, CA at a meeting of the American Astronomical Society (AAS), I presented first results from the Andromeda Project. Thanks to the help of ~5100 registered participants and thousands of others who classified images, the science team was able to create an initial catalog a *little more than one month after the launch of the site*. This turn-around time amazed me, the science team, and nearly every astronomer I spoke to at the conference.



Cliff Johnson presenting Andromeda Project results at the 221st meeting of the American Astronomical Society in Long Beach, CA.

The full poster can be downloaded in PDF format at [this link](#), but here is a [summary of the main points from our presentation](#).

SEARCH

WELCOME

This is the blog of the **Andromeda Project** from the Zooniverse. We need your help finding star clusters and galaxies in M31.

RECENT POSTS

[First Results at AAS](#)

[Round #1 Complete!](#)

[Power of Many](#)

[Highlights So Far](#)

[Galaxies Behind A Galaxy](#)

CATEGORIES

[Highlights](#)

[Introductory](#)

[Uncategorized](#)

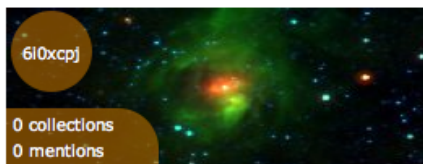
TWEETS

RT @the_zooniverse: Sign up to one of

Talk

Recent | Trending

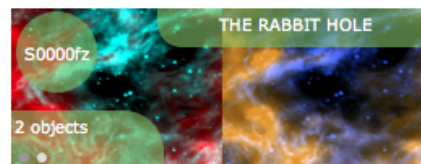
RECENT OBJECTS



Page 1 of 8,258



RECENT COLLECTIONS



Page 1 of 148



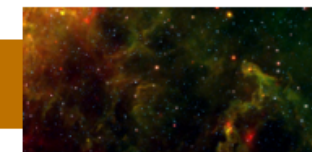
FEATURED

chat

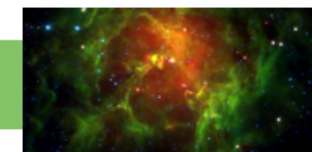
Hi everyone

help

Bugs / Annoyances



Chicken and a Turkey



CMWS00008n - Cool Shapes



RECENT DISCUSSIONS

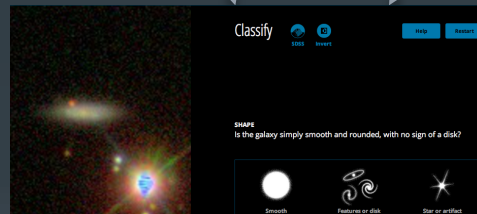
Updated In the last day

Citizen Scientists

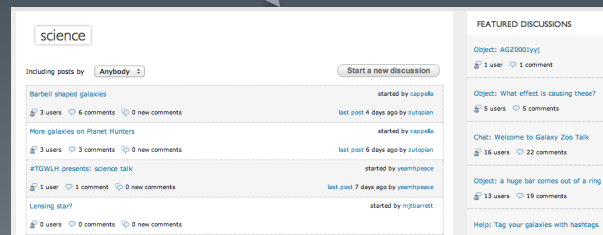
Portals



Tasks



Data collection, Community discussion



monitoring,
mentoring

task creation,
modification



Science Team

How does
it work?

Outcomes, Publications

- Galaxy Zoo (SDSS) - 33 publications

- The Galaxy Zoo survey for giant AGN-ionized clouds: past and present black hole accretion events 2012 W Keel *etal* MNRAS **420** 878
- Galaxy Zoo: reproducing galaxy morphologies via machine learning 2010 M Banerji *etal* MNRAS **408** 342

- Kepler - 5 publications

- Planet Hunters: A Transiting Circumbinary Planet in a Quadruple Star System 2012 M. Schwamb *etal* eprint arXiv:1210.3612
- Planet Hunters: Assessing the Kepler Inventory of Short-period Planets 2012 M Schwamb *etal* ApJ **754** 129S

- Moon Zoo – 11 publications

- Moon Zoo: First Science Results 2010 C. Lintott European Planetary Science Congress

➔ Challenge is to motivate science teams to consider Citizen Scientist tasks as a critical aspect of data processing pipelines.

Worth the investment!

Does it
work?

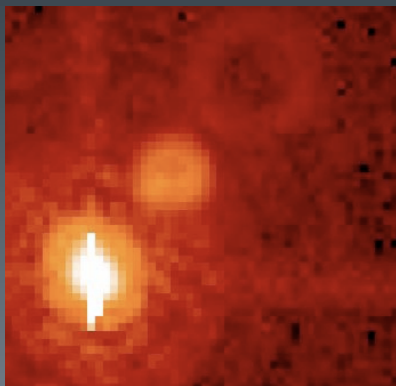
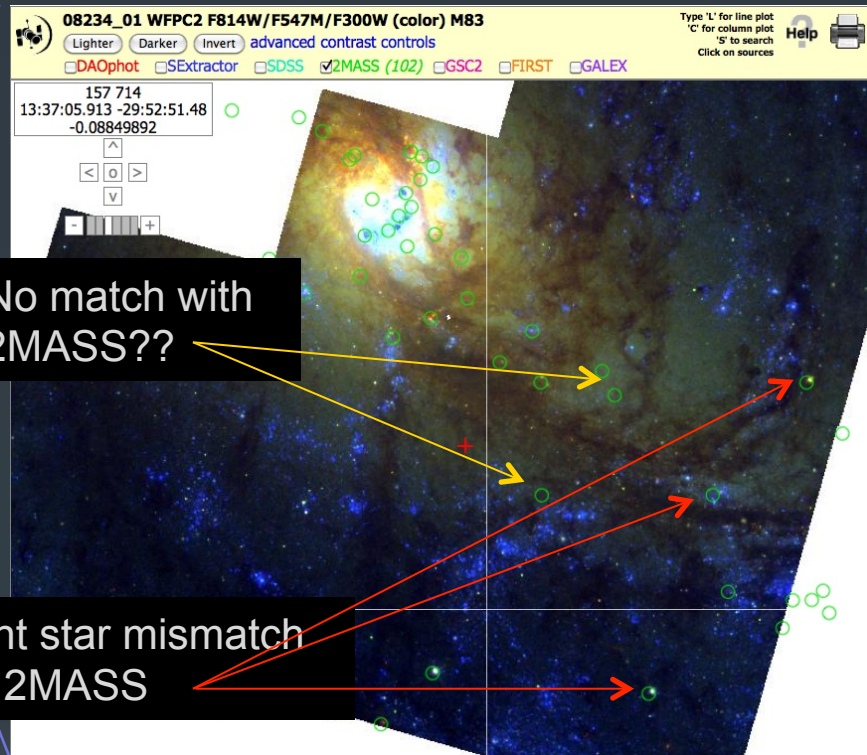
CiSci Research Projects at STScI



- Galaxy Zoo Hubble [done, HST data, part of Zooniverse, Galaxy Zoo 2]
- Galaxy Zoo 3 [done, CANDELS HST data, part of Zooniverse]
- Andromeda Project [paused, PHAT HST data, part of Zooniverse]
- Planet Investigators [in progress, HST data, part of CosmoQuest]
- M83 [in progress, HST data]
- Galex Transients [in planning, Galex]
- PlanetHunters [running, external (Yale), Kepler data from MAST, Zooniverse]
- Light Echoes [idea, HST data]
- Frontier Fields [idea, HST data]
- PanSTARRS [idea, future, PanSTARRS data in MAST]

CiSci Technical Projects at STScI

■ Catalog correction



- Ghost images
- Cosmic ray rejection
- Anomaly identification

