



UNIVERSITY OF MINNESOTA
Driven to Discover®

ADLER PLANETARIUM




ZOONIVERSE

A brief Tour of the Zooniverse: How Crowdsourcing Science is Solving Big Data Problems in Research

Dr. Lucy Fortson
University of Minnesota

Solar Physics Webinar
Monthly Speaker Series
December 17, 2021

 zooniverse.org

 [@the_zooniverse](https://twitter.com/the_zooniverse)

 [@therealzooniverse](https://www.facebook.com/therealzooniverse)

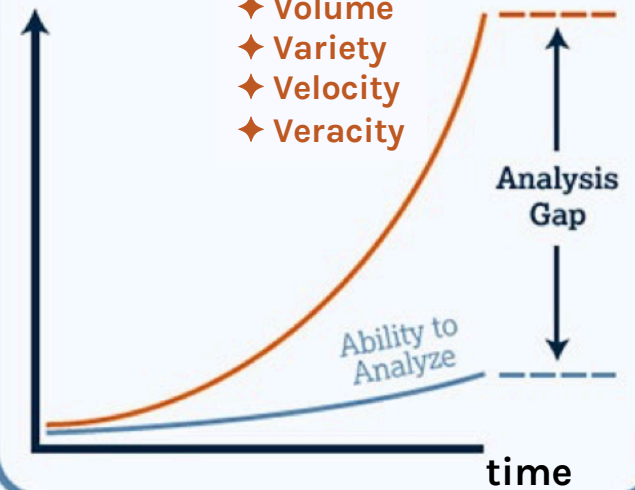




The Data Deluge

Information Explosion

- ◆ Volume
- ◆ Variety
- ◆ Velocity
- ◆ Veracity



Artificial Intelligence only
as good as its training.



VS



Which is better at spotting the tiger?



Human Brain
better at
analyzing
complex
images



Which is better at spotting the tiger?



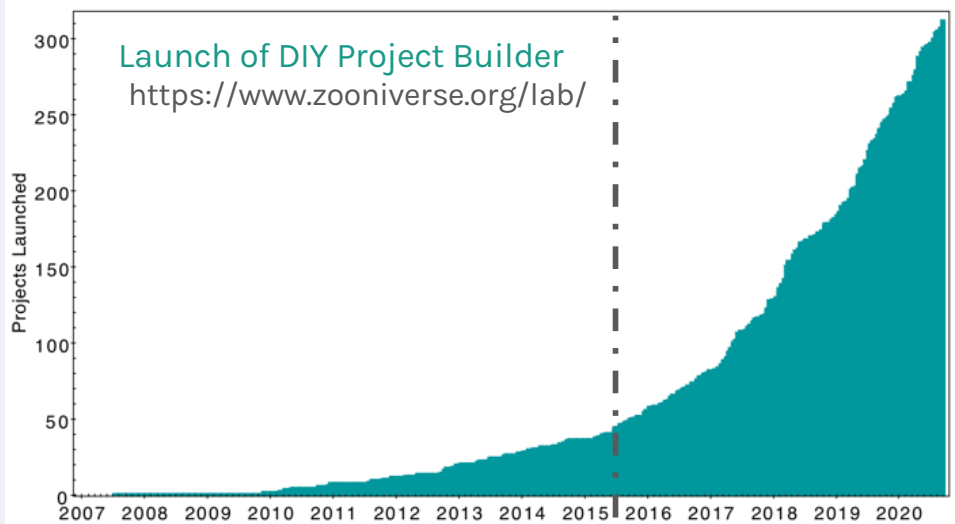
Cognitive Surplus?

**128 years
every hour!!**



Zooniverse.org

- Started with Galaxy Zoo in 2007
- ~2.5 million volunteers worldwide
- 641,078,369 classifications (as of last night)
- 300+ projects
- 300+ peer reviewed papers



Active Paused Finished

ALL DISCIPLINES ARTS BIOLOGY CLIMATE HISTORY LANGUAGE LITERATURE MEDICINE NAT

Most Recently Launched x

Showing 1-20 of 85 projects found. Name: x

1 2 3 4 5

UNEARTHING MICHIGAN ECOLOGICAL DATA

ASTRO-ECOLOGY

SCIENCE SCRIBBLER: VIRUS FACTORY

SNAPSHOT MOUNTAIN ZEBRA

HAWK TALK

ZWICKY'S QUIRKY TRANSIENTS

LAKESIDE DARK DATA

COSMIC

LOCAL GROUP CLUSTER SEARCH

CEDAR CREEK: EYES ON THE WILD

EARTHQUAKE DETECTIVE

DECODING PUNCH CARDS

THE HUNT FOR GALAXY CLUSTERS

SOUTHERN WEATHER DISCOVERY

MONKEY HEALTH EXPLORER

PELICANS

SUPERWASP VARIABLE STARS

VARIABLE STAR ZOO

SOUNDS OF NEW YORK CITY (SONYC)

WHERE ARE MY BODY ORGANS?


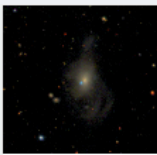

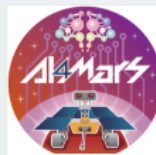

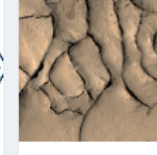
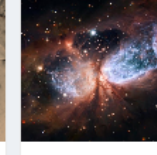
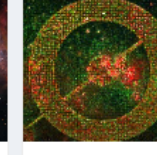
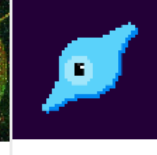
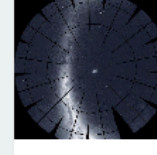

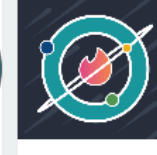

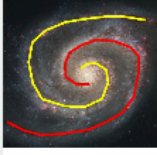





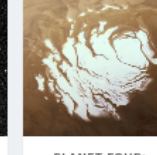
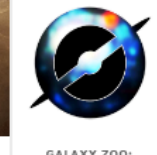

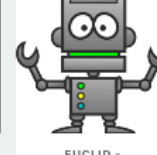



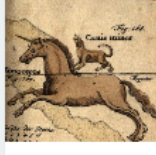



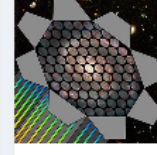



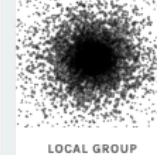
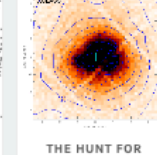


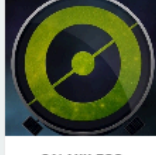

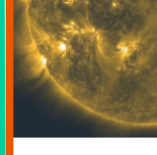
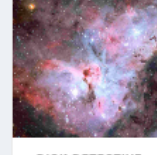

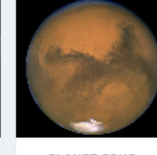

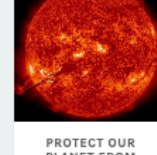
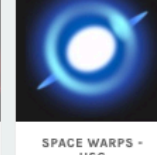
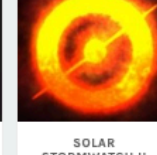
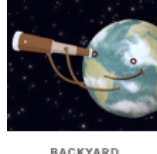
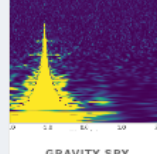


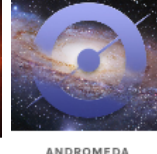
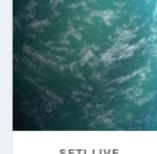
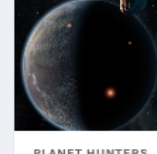
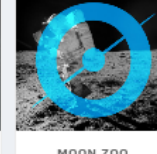

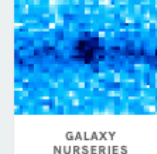
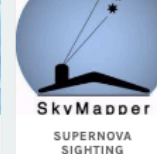

Space Science Projects

- active

- finished

- paused

ZOOIVERSE

 CITIZEN ASAS-SN	 ZWICKY CHEMICAL FACTORY	 BURSTS FROM SPACE	 AI4MARS	 MUON HUNTER CLASSIC	 PLANET FOUR: RIDGES	 HUBBLE'S HOT STARS	 MILKY WAY PROJECT	 SPACE FLUFF	 PLANET PATROL	 CATALINA OUTER SOLAR SYSTEM	 PLANET HUNTERS TESS MOBILE
 DISK DETECTIVE	 SPIRAL GRAPH	 AURORA ZOO	 PLANET FOUR	 SUPERNOVA HUNTERS	 POPPIN' GALAXY	 COMET HUNTERS	 PLANET FOUR: TERRAINS	 GALAXY ZOO: CLUMP SCOUT	 HUBBLE ASTEROID HUNTER	 EUCLID - CHALLENGE THE	 MUON HUNTERS 2.0
 RADIO GALAXY ZOO: LOFAR	 STAR NOTES	 MAPPING HISTORIC SKIES	 GALAXY ZOO MOBILE	 GALAXY BUILDER	 EXOPLANET EXPLORERS	 GALAXY ZOO: 3D	 ASTEROID ZOO	 ZWICKY'S QUIRKY TRANSIENTS	 COSMIC	 LOCAL GROUP CLUSTER SEARCH	 THE HUNT FOR GALAXY CLUSTERS
 PLANET HUNTERS TESS	 SUPERWASP VARIABLE STARS	 GALAXY ZOO	 ASTRONOMY REWIND	 SUNSPOTTER	 DISK DETECTIVE 1.0	 RADIO GALAXY ZOO	 PLANET FOUR OUROBOROS	 VARIABLE STAR ZOO	 PROTECT OUR PLANET FROM	 SPACE WARPS - HSC	 SOLAR STORMWATCH II
 BACKYARD WORLDS: PLANET 9	 GRAVITY SPY	 RADIO METEOR ZOO	 SOLAR STORMWATCH	 ANDROMEDA PROJECT	 SETI LIVE	 PLANET HUNTERS	 MOON ZOO	 AGENT NEO	 GALAXY NURSERIES	 SUPERNOVA SIGHTING	 PLANET 9

Task Types

ZOOIVERSE

Decision trees

Zwicky's Quirky Transients

ABOUT CLASSIFY TALK COLLECT RECENTS

TASK

is the object seen in the center of the difference image real or bogus?

Real
Bugus
Skip

NEED SOME HELP WITH THIS TASK?

Done & Talk Done

TUTORIAL

FIELD GUIDE

SCIENCE REFERENCE DIFFERENCE

MagDiff

Days Prior to Event

x 9

Multiple marking & drawing tools

Galaxy Builder

ABOUT CLASSIFY TALK COLLECT RECENTS

TASK

Draw an ellipse around the outer edge of the galaxy

Galactic Disk (of 1 maximum drawn)

NEED SOME HELP WITH THIS TASK?

Adjust the size of this component (you won't see the shape you drew change, you will see the 1st and 3rd images change)

Adjust the brightness of the disc

Score: 6.50

Next →

TUTORIAL

FIELD GUIDE

“Survey” or “filter” tool

GRAVITY SPY

ABOUT CLASSIFY TALK COLLECT FEEDBACK BLOG

Mike Zevis

Hanford

Frequency (Hz)

Time (s)

Normalized energy

Duration Frequency Edding

Air Compressor (50 Hz) No Glitch

Blip Paired Doves

Chirp Power Line (60 Hz)

Extremely Loud Repeating Blips

Helix Scattered Light

Ice Fish Scratchy

Light Modulation Tjorne

Low Frequency Burst Wulin Mode Harmonic (500 Hz)

Low Frequency Line Wandering Line

None of the Above Whistle

Showing 20 of 20. Clear filters

Done & Talk Done

Show the project tutorial

Restart the project mini-course

FIELD GUIDE

Transcription and annotation tools

Astronomy Rewind

ABOUT CLASSIFY TALK COLLECT RECENTS

Welcome to workflow 2 of Astronomy Rewind
<https://www.zooniverse.org/projects/astrometry/astrometry-rewind-2>

TASK

Transcribe the numbers. Do not transcribe any symbols or letters.

08 93 01

TUTORIAL

FIELD GUIDE

NGC 3044

Transcribe the numbers. Do not transcribe any symbols or letters.

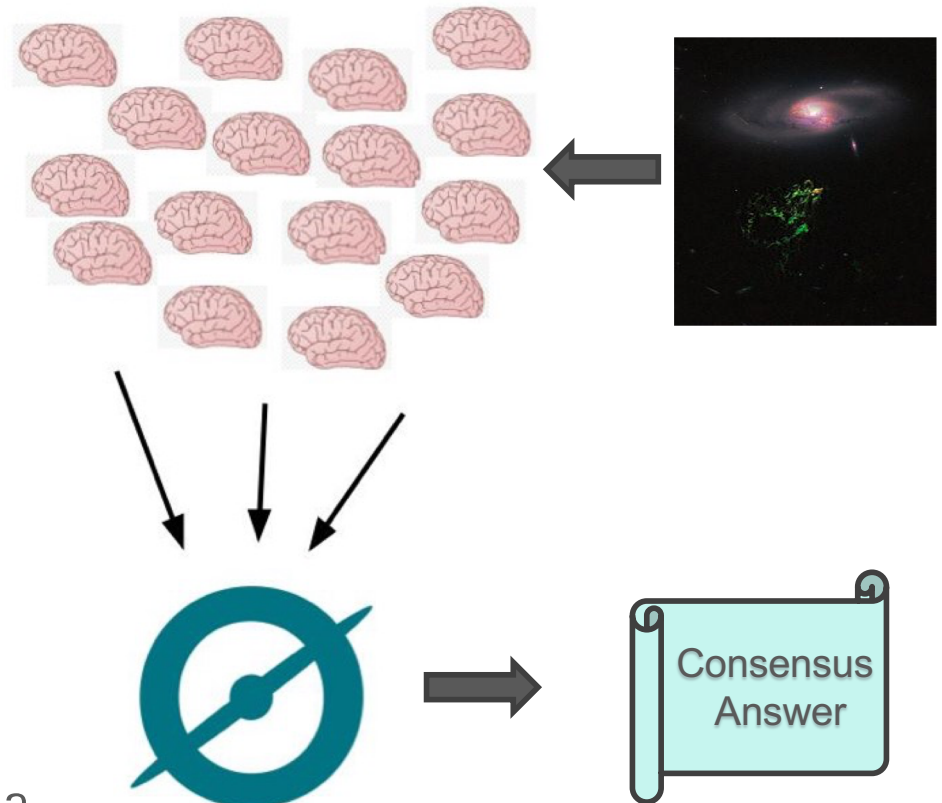
Note: In the example above, the left-hand value on the x-axis is transcribed as 23 22 40 and the right-hand value on the x-axis is transcribed as 23 25 0. Do include the inferred initial values (in this case 23 23), even if they're not labeled on the figure.

Use the Zoom as needed.

How does Zooniverse work?

ZOONIVERSE

- Volunteers **classify** (assess data) independently
- Brute force retirement*: between 3 and 80 classifications per image/video file (aka **subject**)
- Responses are aggregated for **consensus**
- Raw and consensus **data are made available to researchers** (and, eventually, open to the public)
- **Volunteers interact with researchers** on Talk boards, blog posts, social media



*Can use volunteer skill for more sophisticated retirement

The Galaxy Zoo Era

ZOONIVERSE

- Launched 2007 with 1 million SDSS galaxies
- ~40 million classifications by nearly 150,000 users
- Roughly 3.3 continuous person-years!

Galaxy Zoo solved the intermediate big data issue of not enough “experts” to produce morphological catalogs from surveys on the scale of SDSS.



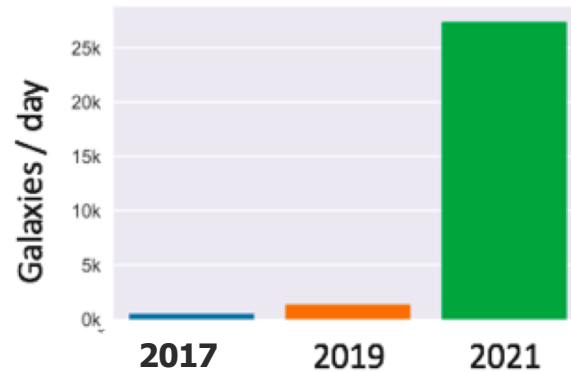
Used brute force retirement of subjects ~40 classifications per galaxy

Increasing Overall System Efficiency

2.0 meter Sloan Digital Sky Survey Telescope



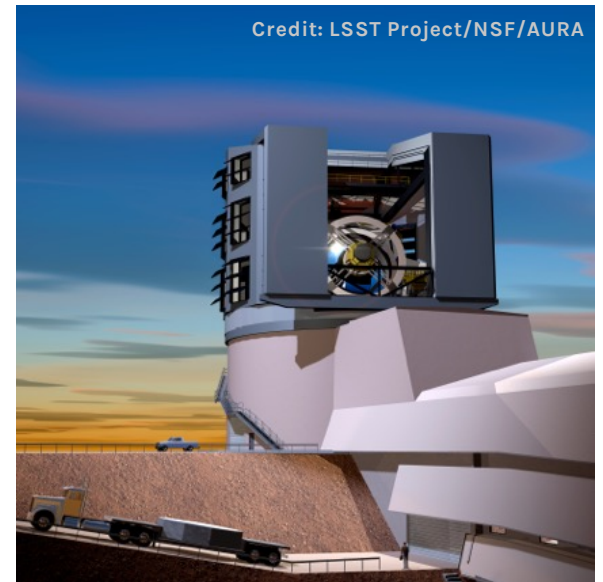
- About 20 Tbytes total data in 10 years
- About 1 million galaxies imaged



But what about the next generation surveys?

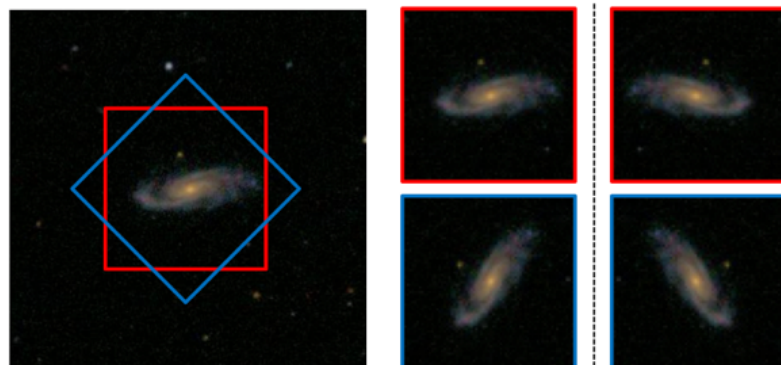
➔
Need to
deploy
artificial
intelligence!

8.4 meter Large Synoptic Survey Telescope



- About 15 Tbytes total data PER NIGHT
- About 50 Petabytes data in 10 years
- About 20 billion galaxies imaged

Training the Machines

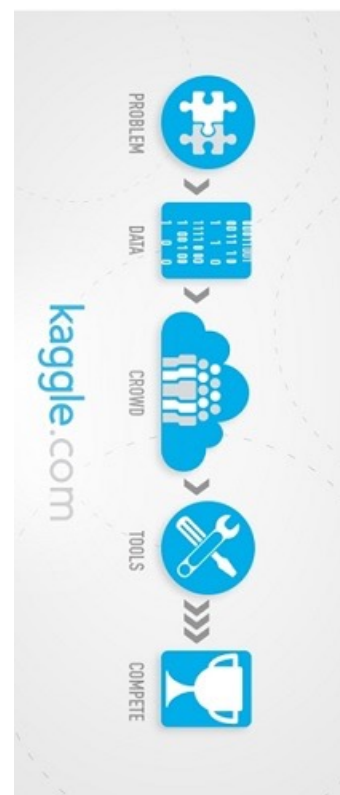


(a) 4 crops from an image



(b) 4 viewpoints from each crop

Increasing Overall System Efficiency

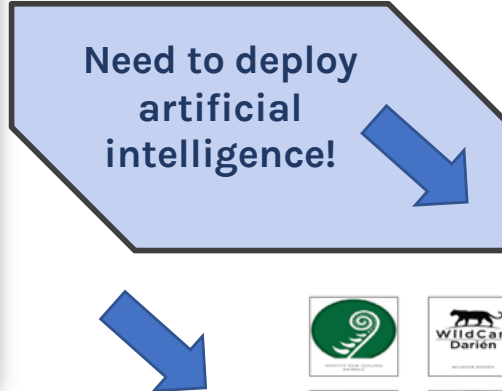


Dieleman et al.
arXiv: 1503.07077

Machines require large sets of images to train them correctly ...

Camera Trap Projects

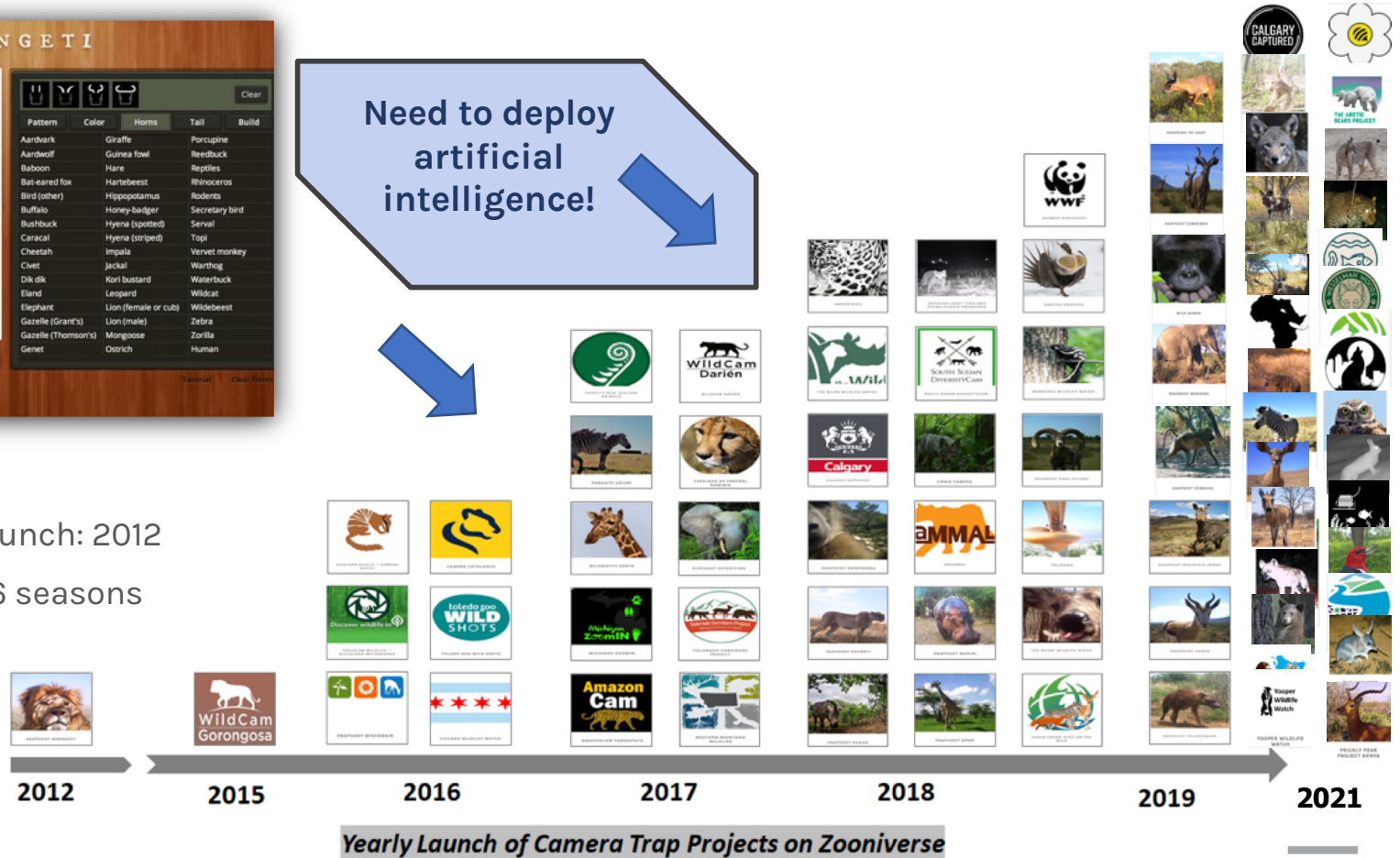
Deploying Artificial Intelligence



Swanson et al. (2015)

Snapshot Serengeti Launch: 2012

7 million images over 6 seasons



All machines need is just large training sets... ????

Training the Machines

Deploying Artificial Intelligence

Are we really ready for this?



The Zorilla Problem

Deploying Artificial Intelligence

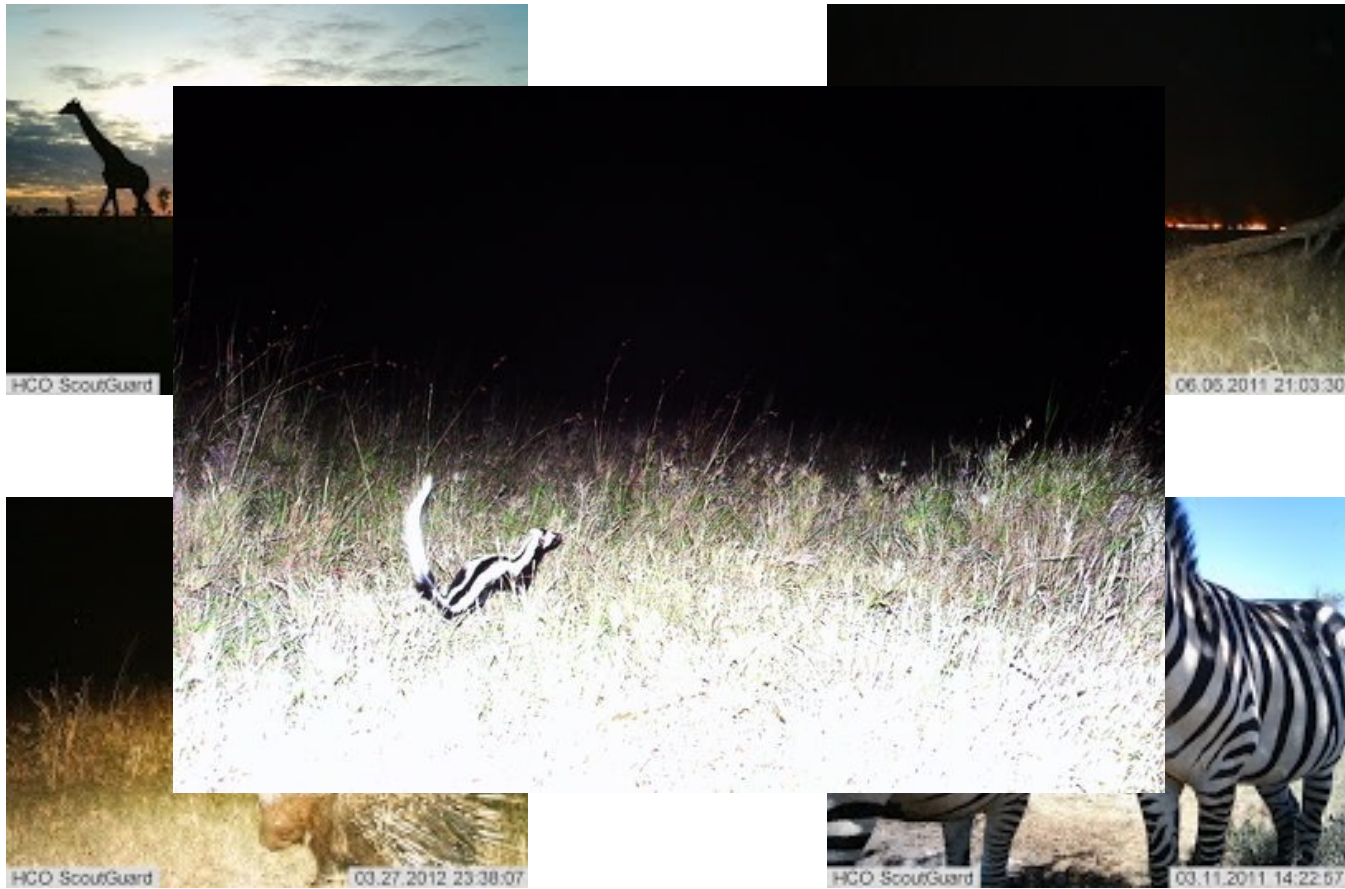
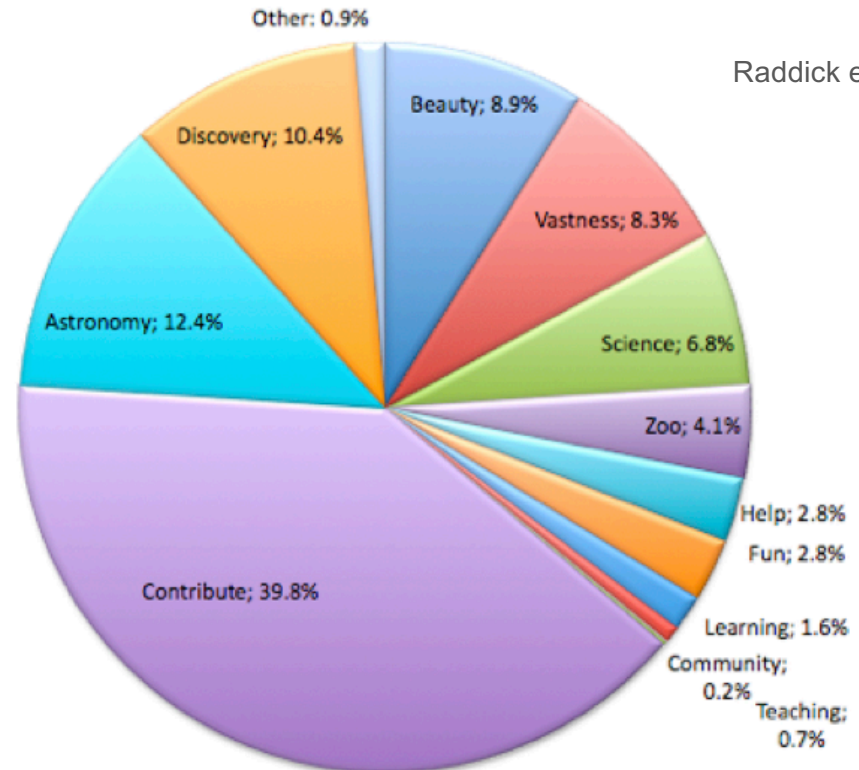


Image source: http://www.ezwebrus.com/funny_pictures/polar_bears/polar_bears_002.jpg

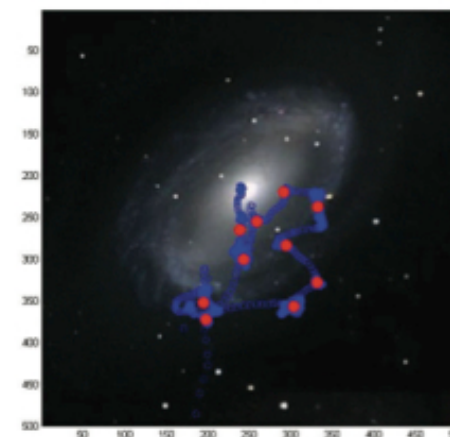
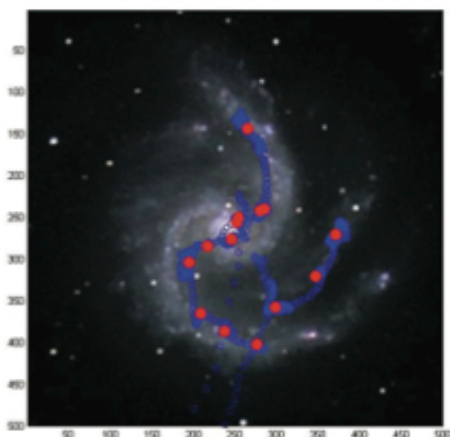
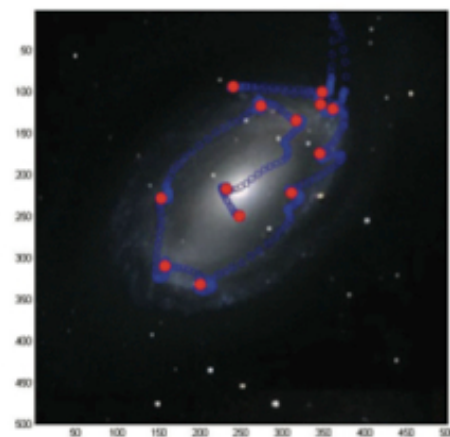
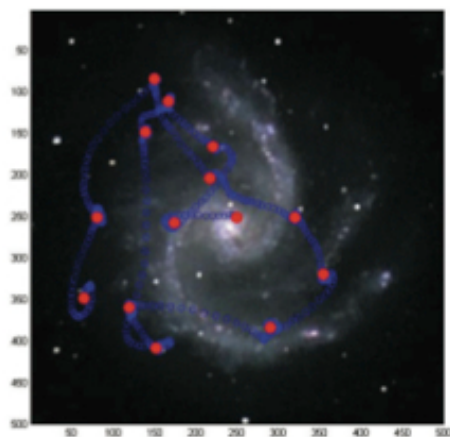


Do you think the machines will find me?

**“Contribute to Research”
most common
motivation to participate
in Galaxy Zoo. Wow!**



Expert vs Non-expert classifier



The screenshot shows the Galaxy Zoo website interface. At the top, the logo "GALAXY ZOO.org" is displayed with a glowing orange galaxy icon. Below the logo is a navigation menu with links: Welcome, Home, The Science, How to Take Part, Galaxy Analysis, Forum, Press & News, FAQ, Links, Contact Us, Login, and Register. On the left side, there are two menu items: Galaxy Tutorial and Galaxy Analysis. The main content area features a large image of a galaxy. To the right of the image, the text reads "Galaxy Ref: 588010880371851294" and "Choose the Galaxy Profile by clicking the buttons below". Below this text are five buttons: "CLOCK" (with a clockwise spiral icon), "ANTI" (with a counter-clockwise spiral icon), "SDFE ON/UNCLEAR" (with a star icon), "SPIRAL GALAXY" (with a combined spiral and star icon), "ELLIPTICAL GALAXY" (with an orange oval icon), "STAR / DON'T KNOW" (with a star icon), and "HERGERS" (with a curved arrow icon). At the bottom of the image area, there is a checkbox labeled "Show Grid Overlay on the next Image".

GALAXY ZOO.org

Welcome | Home | The Science | How to Take Part | Galaxy Analysis | Forum | Press & News | FAQ | Links | Contact Us | Login | Register

Galaxy Tutorial
Galaxy Analysis

Galaxy Analysis

Welcome to Galaxy Zoo's view of the Universe. If you're here you should already have seen the **Tutorial**, but feel free to go and remind yourself. There's no need to agonise for too long over any one image, just make your best guess in each case.

Galaxy Ref:
588010880371851294

Choose the Galaxy Profile by clicking the buttons below

CLOCK ANTI SDFE ON/UNCLEAR
SPIRAL GALAXY

ELLIPTICAL GALAXY

STAR / DON'T KNOW HERGERS

Show Grid Overlay on the next Image

Posting “strange things” to a discussion board

The screenshot shows a forum post on the Galaxy Zoo Forum. The post is titled "Give peas a chance!" and is by user Hanny, a Global Moderator and Hero Member. The post includes a link to a SDSS chart: <http://cas.sdss.org/astro/en/tools/chart/chart.asp?ra=10.65386865&dec=16.03407835>. Below the link is a small image of a star field, which is the "strange thing" mentioned in the title. The image is labeled "gCA4MM91B.jpg (20.57 kB, 512x512 - viewed 576 times.)". The forum interface includes a search bar, login/register options, and navigation links.

Understanding Human Classifiers

Machine Learning Needs Citizen Science

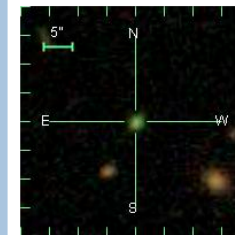
Searching for explanations...

SDSS J140740.08+021748.1

GALAXY ra=211.91700644, dec=2.29671082, ObjId = 587726032799400204

Column names link to glossary entries. Move mouse over a column name to get its units.

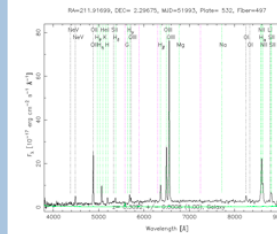
mode	PRIMARY
status	TARGET PRIMARY OK_STRIPE OK_SCANLINE PSEGMENT RESOLVED OK_RUN GOOD SET
flags	BINNED1
PrimTarget	TARGET_SERENDIP_FIRST
SecTarget	



u	g	r	i	z		
21.66	20.69	19.32	19.46	18.81		
err_u	err_g	err_r	err_i	err_z		
0.20	0.03	0.02	0.02	0.06		
run	rerun	camcol	field	obj	rowc	colc
1462	40	4	578	268	287.5	672.1
fiberMag_r	petroMag_r	devMag_r	expMag_r	psfMag_r	modelMag_r	
19.72	19.35	19.32	19.35	19.48	19.32	
extinction_r	petroRad_r	parentId	nChild			
0.09	1.591	0	0			

SpecObjID = 149967997929259008

plate	mid	fiberid	z	zErr	zConf	specClass	ra	dec	fiberMag_r	objId
532	51993	497	0.309	0.00082	0.996203	GALAXY	211.91699	2.29675	19.55	587726032799400204



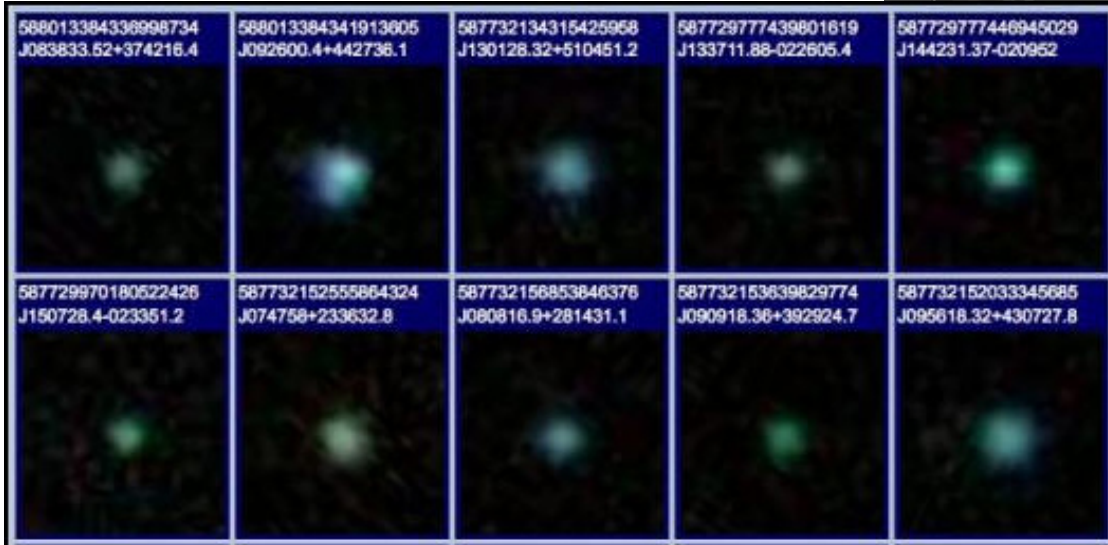
zStatus	XCORR_HIC
zWarning	AB_INC
PrimTarget	TARGET_SERENDIP_FIRST
SecTarget	
eClass	0.632703
emZ	0.000
emConf	
xcZ	0.309
xcConf	0.996203

Cross-identifications

catalog	delta	propermotion	angle	blue	red
---------	-------	--------------	-------	------	-----

Galaxy Zoo Green Peas

Entirely new class of galaxy discovered by volunteers!



GALAXY ZOO FORUM

Please login or register.
earthstars [password] Forever Login
Login with username, password and session length

Search [input] News: If you are having trouble logging in then please use [this page](#) to reset

Home Help Login Register

Galaxy Zoo » Galaxy Zoo Forum » The objects » Weird and wonderful » Give peas a chance!


Pages: [1] 2 3 ... 188 PRINT

AuthorTopic: Give peas a chance! (Read 113529 times)

Hanny
Global Moderator
Hero Member
[avatar]

Give peas a chance!
on: August 12, 2007, 08:13:57 AM

<http://cas.sdss.org/astro/en/tools/chart/chart.asp?ra=10.65386865&dec=16.03407835>


gCA4MM91B.jpg (20.57 kB, 512x512 - viewed 576 times.)

Logged

www.hannysvoorwerp.com

Machine Learning Needs Citizen Science

Since 2007, ~330 papers and growing on the topic of Green Peas

[Show highlights](#) [Show abstracts](#) [Hide Sidebars](#) [Go To Bottom](#)

2021NewA...8301492E 2021/02
NGC 2366 : An optical search for possible supernova remnants
Ercan, E. N.; Aktekin, E.

2021arXiv210108328W 2021/01
The H α Dots Survey. IV. A Fourth List of Faint Emission-Line Objects
Watkins, Joseph D.; Salzer, John J.; Van Sistine, Angela *and 3 more*

2021MNRAS.500..558M 2021/01 *cited: 1*
Double-peaked Lyman α emission at $z = 6.803$: a reionization-era galaxy self-ionizing its local H II bubble
Meyer, Romain A.; Laporte, Nicolas; Ellis, Richard S. *and 2 more*

2021ApJ...906..104C 2021/01
The Effects of Biconical Outflows on Ly α Escape from Green Peas
Carr, Cody; Scarlata, Claudia; Henry, Alaina *and 1 more*

2021AAS...23722806B 2021/01
A Multifaceted Approach to Studying Extreme, Star-Forming Green Pea Galaxies
Brunker, S. W.

2021AAS...23722804D 2021/01
Emission Lines from Superwinds of Super Star Clusters
Danehkar, A.; Oey, M. S.; Gray, W. J.

2021AAS...23714401C 2021/01
Lyman-alpha Escape From Green Peas with RASCAS
Carr, C. A.; Scarlata, C.; Blaizot, J. *and 1 more*

2021AAS...23712603H 2021/01
Searching for AGN in Green Pea galaxies
Harish, S.; Malhotra, S.; Rhoads, J. *and 2 more*

2020arXiv201212378O 2020/12
Starburst galaxies
Orlitova, Ivana

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Years Citations Reads

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2012	6	0	6
2013	7	0	7
2014	8	0	8
2015	9	0	9
2016	10	0	10
2017	11	0	11
2018	12	0	12
2019	13	0	13
2020	14	0	14
2021	15	0	15

Limit results to papers from to [Apply](#)

Humans Make Serendipitous Discoveries

Machine Learning Needs Citizen Science

Hanny's Voorwerp



GALAXY ZOO FORUM

Please login or register.
earthstars [password] forever [dropdown] Login
Login with username, password and session length


News: If you are having trouble logging in then please use [this page to reset](#)

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Galaxy Zoo » Galaxy Zoo Forum » The objects » Weird and wonderful » The Hanny's Voorwerp.


Pages: [1] 2 3 ... 33 [PRINT](#)

AuthorTopic: The Hanny's Voorwerp. (Read 57073 times)

Hanny
Global Moderator
Hero Member

Posts: 16264
"Voorwerp kid"

The Hanny's Voorwerp.
« on: August 13, 2007, 11:16:40 AM »

What's the blue stuff below?
Anyone?
<http://cas.sdss.org/astro/en/tools/chart/chart.asp?ra=145.2671505&dec=34.73290502>


gCAW18XSF.jpg (22.43 kB, 512x512 - viewed 5398 times.)

« Last Edit: February 08, 2008, 01:57:07 PM by Hanny » [Logged](#)

www.hannysvoorwerp.com

Selected articles from
Zooniverse astronomy projects
with citizen scientists as co-authors:

Solar Stormwatch:

Davis, ... Baeten (2012)

Barnard, ... Wilkinson, Baeten, Poeffel, Harder (2017)

Space Warps:

Küng, ... Baeten, ... Cornen, Macmillan, ... Wilcox (2015)

Geach, ... Baeten, ... Cornen, ... Macmillan, ... Wilcox et al. (2015)

Marshall, ... Wilcox, Baeten, Macmillan, Cornen et al. (2016)

More, ... Baeten, Wilcox, Macmillan, Cornen et al. (2016)

PlanetHunters:

Boyajian, LaCourse, et al. (2016)

Schwamb, ... Gagliano, Jek, et al. (2013)

Fischer, ... DeFouw, Hajduk, Neal, Nemeč, Schuepbach, Zimmermann et al. (2011)

Disk Detective:

Kuchner, ... Biggs, Bosch, Cernohaus, Luca, Hyogo, Wa, Piipuu, Pineiro. (2016)

Radio Galaxy Zoo:

Banfield, ... Matorny, Terentev, et al. (2016)

Galaxy Zoo:

Simmons, ... Jek, et al. (2016)

Lintott, ... van Arkel, et al. (2011)

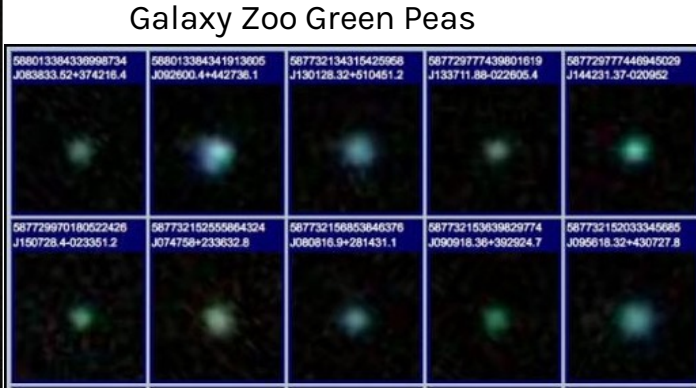
Schawinski, ... van Arkel et al. (2014)

Keel, ... van Arkel et al. (2014)

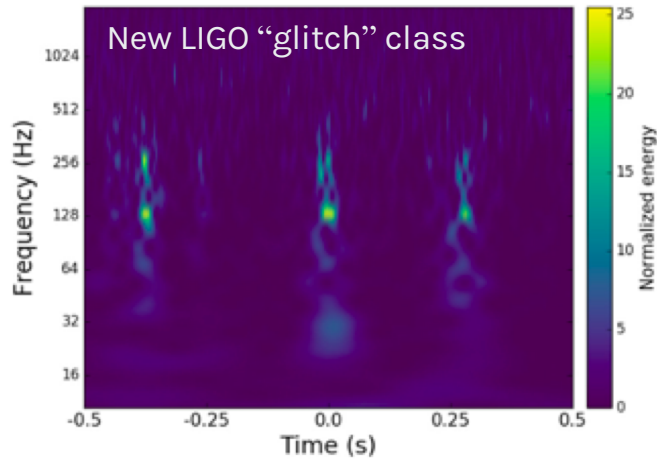
Rare and unknown objects

Machine Learning Needs Citizen Science

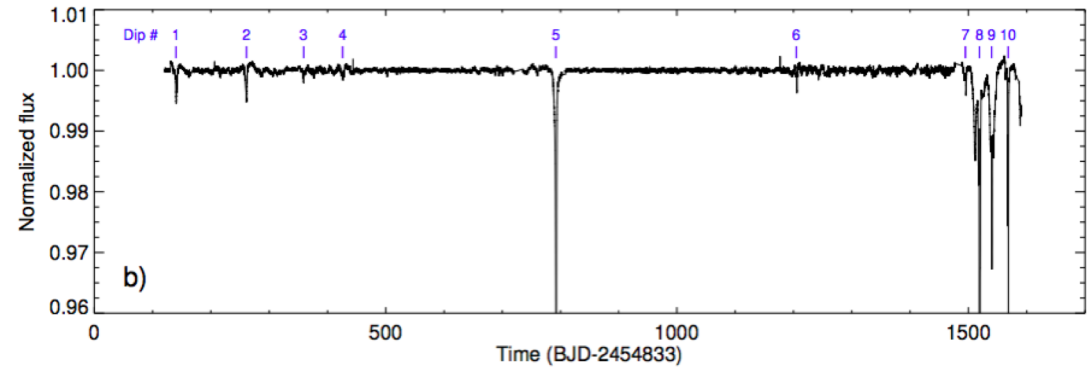
Hanny's Voorwerp - light echo of a quasar



A rare "zorilla" in Snapshot Serengeti




Planet Hunters KIC 8462852 or "WTF" star



From primary task (known knowns) to finding "known unknowns" to serendipitous discovery (unknown unknowns) by volunteers.

Combining Humans + Machines

ZOONIVERSE



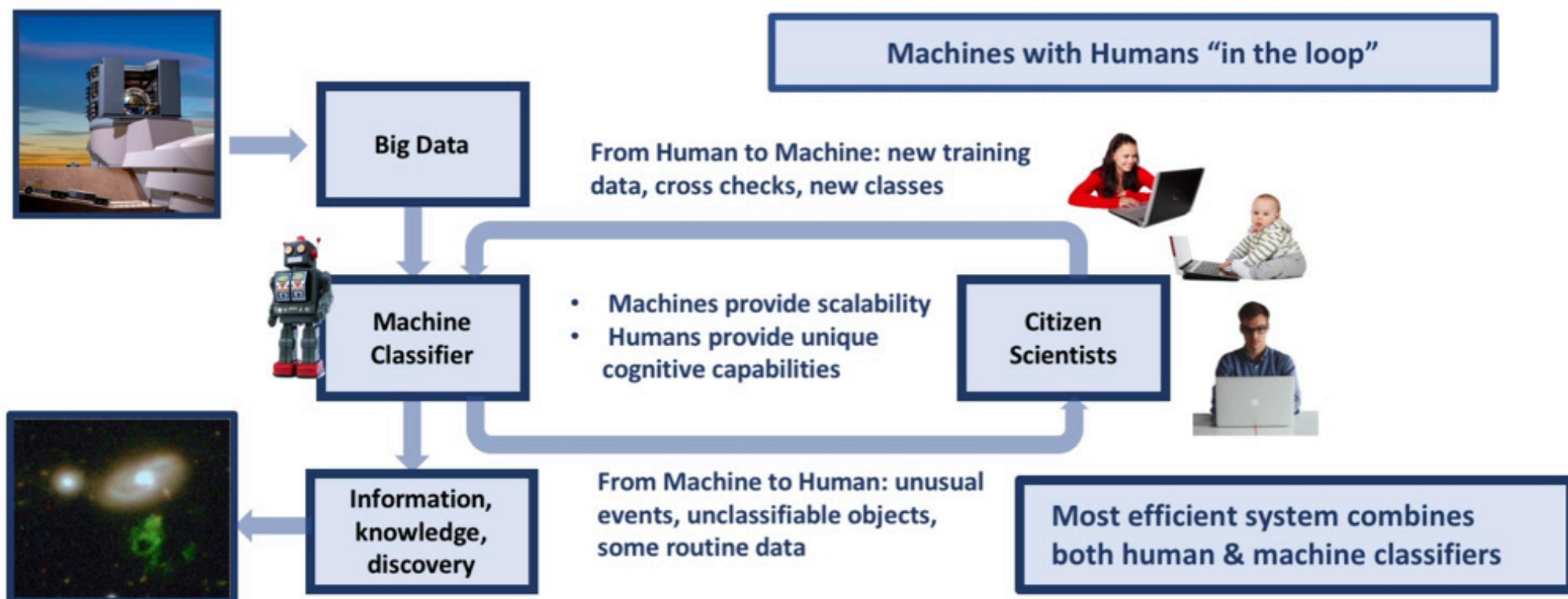
I can make serendipitous discoveries because I'm good at finding strange and rare things in the data!

My processors are so powerful I am super fast at finding things I am trained to find!

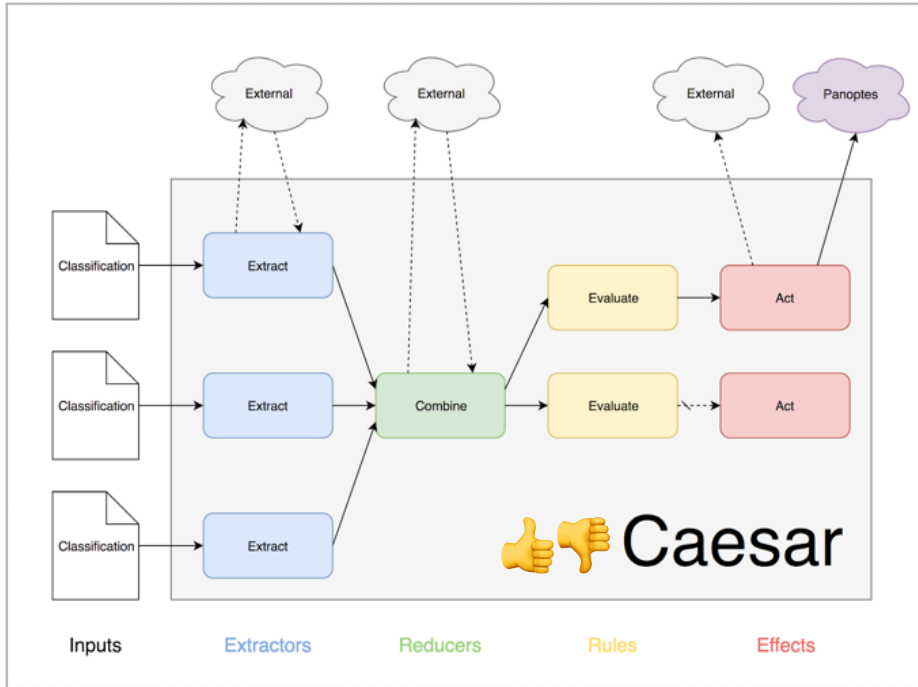
Combining Humans + Machines

ZOONIVERSE

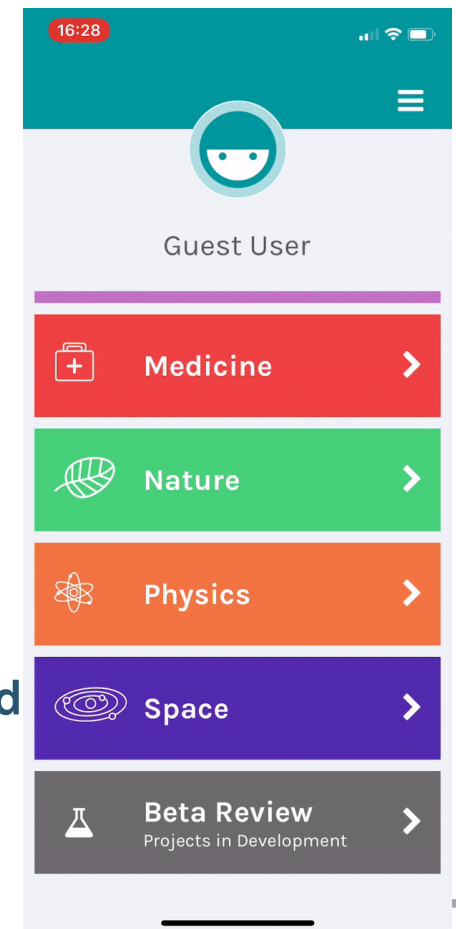
Zooniverse can tackle Big Data by optimally combining machines and humans to quickly get through Big Data while not missing serendipitous discoveries.



Decision engine functionality + Mobile



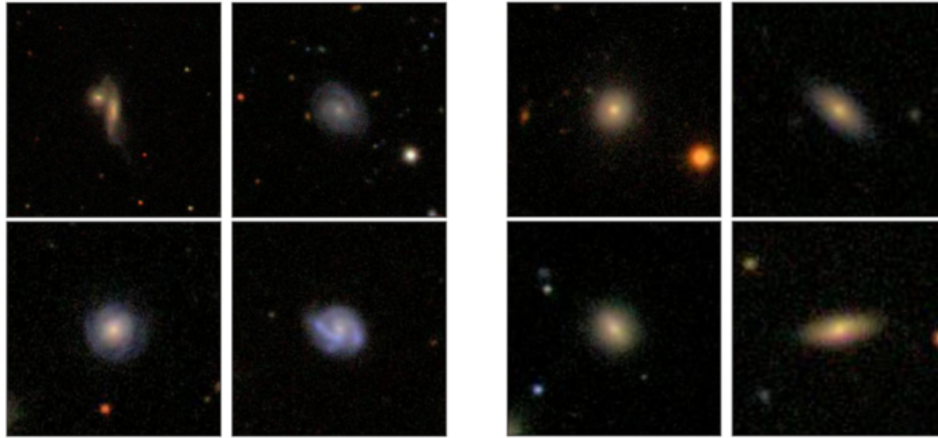
Cascade filtering on mobile: 43% fewer classifications needed



- Early Consensus vs “brute” force retirement
- Dynamic Subject Generation
- User Promotion

Active Learning

Machine predicts which image, when classified, will give it the most new information



More of these

Less of these

- Model retrains and requests new classifications daily
- New surveys get classified on a timescale of weeks, not years
- Every galaxy seen by at least 3 volunteers

Now live on Galaxy Zoo !

Increasing Overall System Efficiency

Work by Mike Walmsley; Oxford arXiv:1905.07424

Active Learning + Leveling Up Humans

Optimizing for serendipity

The screenshot shows the Gravity Spy website. At the top left is the Gravity Spy logo. The top right navigation menu includes: ABOUT, CLASSIFY, TALK, COLLECT, RECENTS. A blue banner below the navigation contains the text: "We are excited to bring you Virgo glitches, a new workflow structure and a cool new tool! Check out [this blog post](#) for more information on Virgo and how the new workflow structure is designed and how it may affect you. Check out [this blog post](#), for more information on our new webapp [gravityspytools](#)." The main content area features a large image of the LIGO detector with the text: "Help scientists at LIGO search for gravitational waves, the elusive ripples of spacetime." Below this text is a "Learn more" button. At the bottom of the page is a "Get started" section with a dropdown arrow. It contains a series of buttons representing different levels of achievement: "You've unlocked level 1: Neutron Star Mountain", "You've unlocked level 2: Galactic Supernova", "level 3: Binary Neutron Star Merger", "level 4: Neutron Star-Black Hole Merger", "level 5: Binary Black Hole Merger", "level 6: Virgo", and "level 7: Inflationary Gravitational Waves". On the far right of this section is a button labeled "level 8: Virgo".

Provide volunteers opportunities to “level up” – helps in detecting new types of glitches for LIGO

A Haystack of Needles

Optimizing for serendipity

Volunteers use discussion boards to create collections to help identify new glitch classes

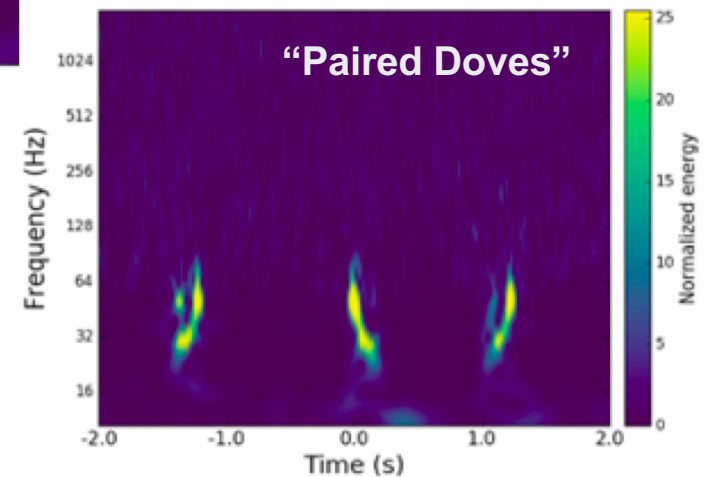
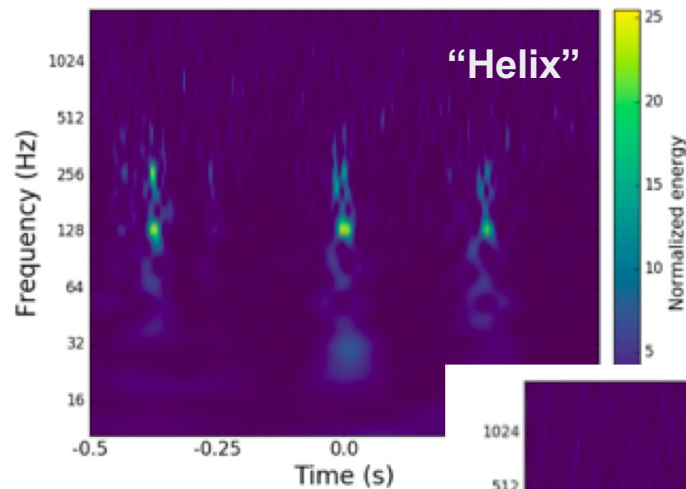


EcceruElme
@EcceruElme
MODERATOR

January 11th 2017, 9:06 pm

This post is going to be updated many times, first it's a clickable check list (sorry that it's not completely alphabetical). If you know hashtags which are not on the list, please make a comment. If you notice a hashtag what is on the list, and you would like to modify it (because of incorrect spelling, redundancy, permutation of names or for other reason) please feel free to do it in your notes, comments. Thank you for participating in the efforts on making the hashtag system as useful as possible. To be continued!

1. [#aeroline](#) morphology, new. example: [Subject 3825220](#)
2. [#aircompressor](#) official class
3. [#airplane](#) same as andes
4. [#also](#)
5. [#andes](#) same as airplane
6. [#angel](#) same as mushroom and lfbtree (LF burst variation)
7. [#anomaly](#)
8. [#antichirp](#)
9. [#amplifiedfb](#)
10. [#apples](#) morphology example: [Subject 2216664](#)
11. [#arcs](#) morphology, old. scattered light
12. [#artefact](#)
13. [#arrow](#)
14. [#arrowhead](#)



Solar Stormwatch was one of the very first projects on the Zooniverse platform!

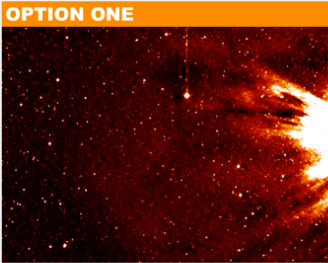
Launched Dec 21, 2009

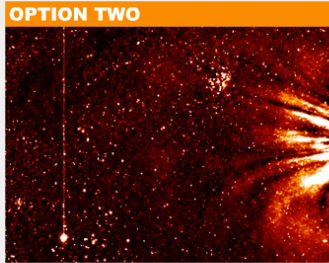
SOLAR STORMWATCH BETA

WHY SCIENTISTS NEED YOU

- MISSION BRIEFING
- SPOT & TRACK STORMS**
- TALK ABOUT IT

DEVELOP YOUR SPOTTING SKILLS
Spot solar storms in the STEREO spacecraft's picture archive

OPTION ONE


OPTION TWO


Select the image that you think features a solar storm.

1/4

ZOONIVERSE

REAL SCIENCE ONLINE

HOME PROJECTS ABOUT EDUCATION BLOGS RESEARCHERS CONTACT

GALAXY ZOO HUBBLE

Galaxy Zoo
The original Zooniverse project. Help astronomers figure out how galaxies form and evolve by classifying their shape. Over 50 million classifications so far but we need more!

JOIN IN

The Zooniverse Community

254,072 people just like you...

Name: Alice
Age: 27
Occupation: Forum moderator; organizer of various Zoo events
Joined Zooniverse: July 2007 - from the beginning
Alice' Zooniverse: "The most interesting thing I've ever done. It brings the Universe to the people! Hope to see you on the forum; ask me anything."


Alice
I'd like to be featured here too!

Live Projects

- GALAXY ZOO HUBBLE
- SOLAR STORMWATCH
- GALAXY ZOO UNDERSTANDING COSMIC MERGERS
- GALAXY ZOO THE HUNT FOR SUPERNOVAE

Zooniverse Activity

Total Volunteers: 254,072
Total Zoo 2 Classifications: 53,203,634

Zooniverse Heatmap

Solar Stormwatch was one of the very first projects on the Zooniverse platform!

Led to 7 papers...

Solar Stormwatch (7)



Testing the current paradigm for space weather prediction with heliospheric imagers, Barnard+, 2017



Tracking CMEs using data from the Solar Stormwatch project; observing deflections and other properties, Jones+, 2017



Validation of a priori CME arrival predictions made using real-time heliospheric imager observations, Tucker-Hood+, 2015



Observational Tracking of the 2D Structure of Coronal Mass Ejections Between the Sun and 1 AU, Savani+, 2015



Differences between the CME fronts tracked by an expert, an automated algorithm, and the Solar Stormwatch project, Barnard+, 2015



The Solar Stormwatch CME catalogue: Results from the first space weather citizen science project, Barnard+, 2014



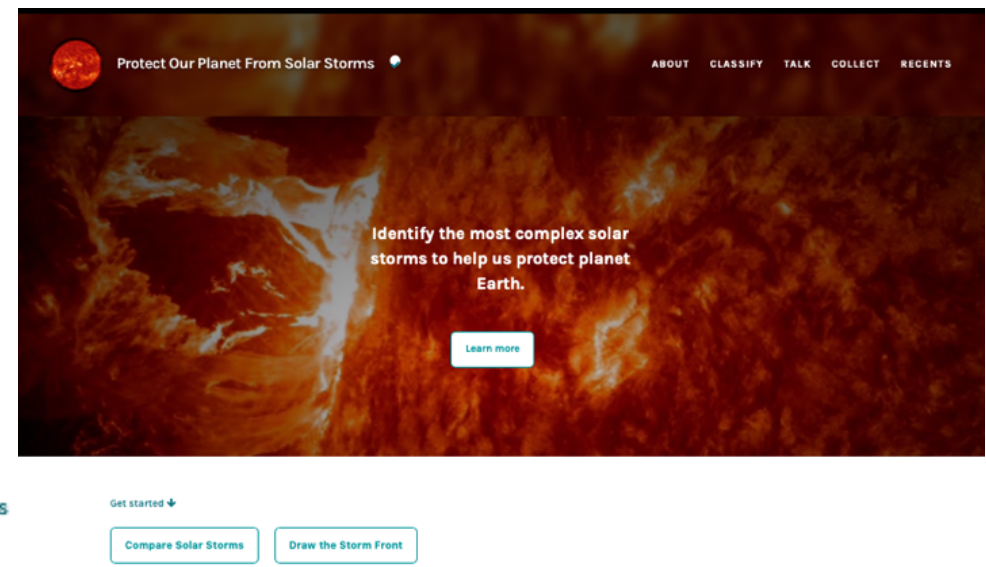
The distribution of interplanetary dust between 0.96 and 1.04 au as inferred from impacts on the STEREO spacecraft observed by the heliospheric imagers, Davis+, 2012

Protect Our Planet From Solar Storms (1)



The Visual Complexity of Coronal Mass Ejections Follows the Solar Cycle, Jones+, 2020

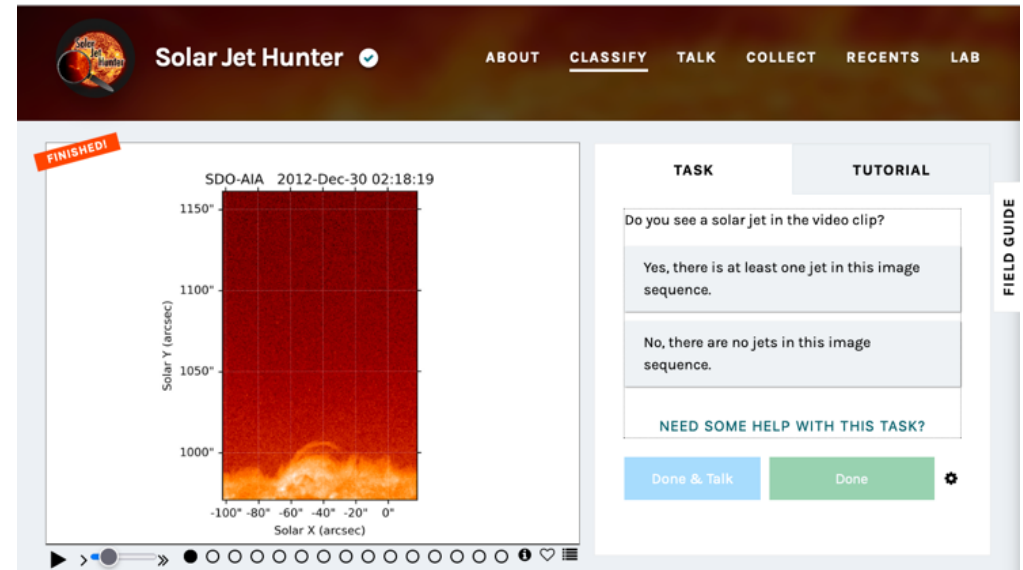
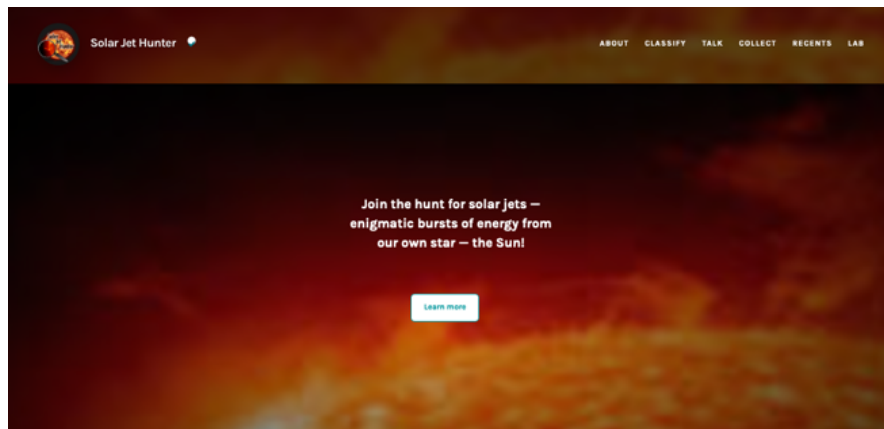
...and a follow-on project from May 2018 to Nov 2020.



See <https://zooniverse.org/publications>

Newly launched! Solar Jet Hunters with SDO data.

Launched Dec 7, 2021



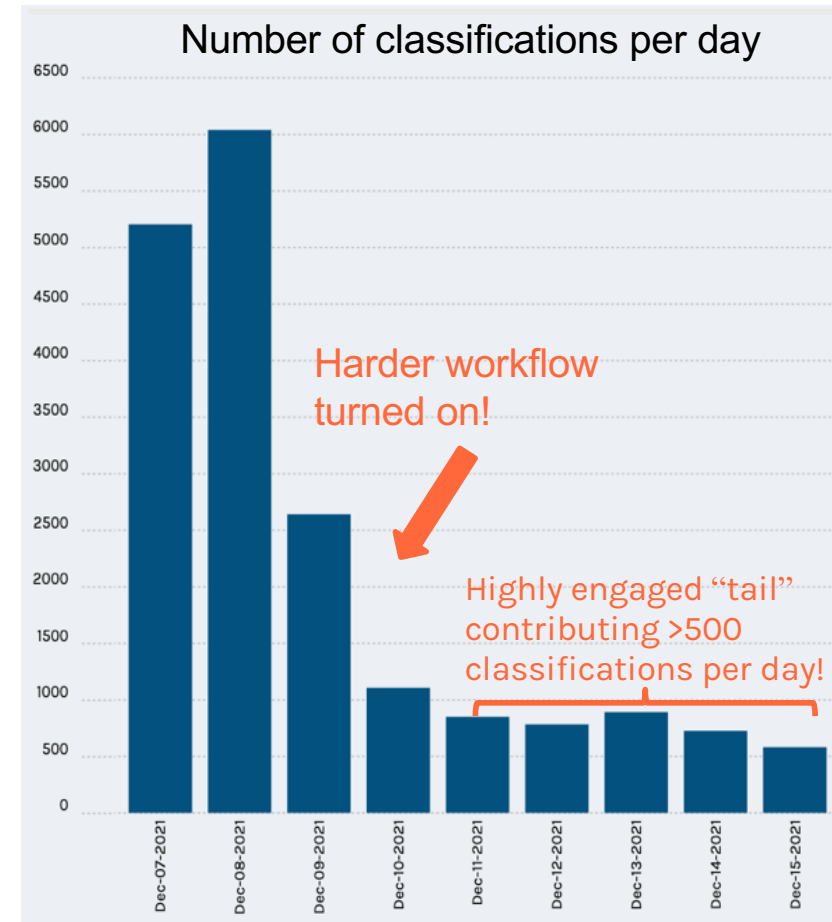
- Took only 2 days for 700 volunteers to classify 4000 clips in data from 2011-2013
- 1200 clips contained at least one solar jet confirmed by at least two people

- First workflow to identify if solar jets are in a 15 frame clip

Led by Sophie Musset, Lindsay Glesener, Gregory Fleishman, Navdeep Panesar, et al.

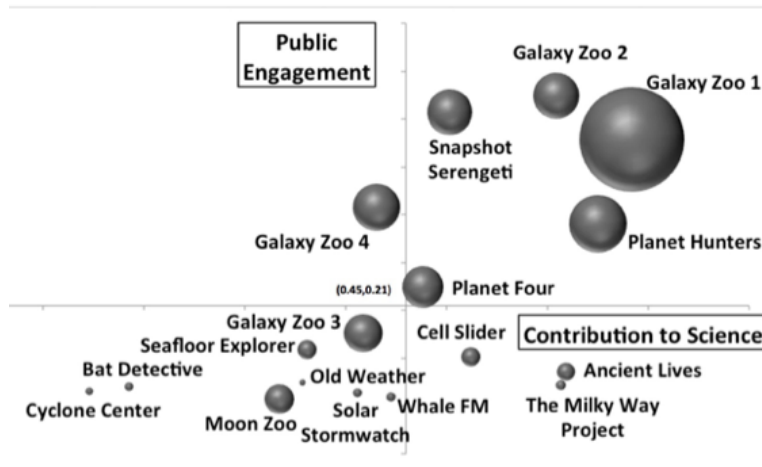
Newly launched! Solar Jet Hunters with SDO data.

The screenshot shows the Solar Jet Hunters interface. On the left is a video frame of the Sun from SDO-AIA, dated 2014-Jan-05 15:58:43. The image is overlaid with a grid. The Y-axis is labeled 'Solar Y (arcsec)' and ranges from -150 to -300. The X-axis is labeled 'Solar X (arcsec)' and ranges from -1150 to -900. On the right is a 'TASK' panel with a 'TUTORIAL' tab. The tutorial text reads: 'Go to the frame in the movie strip in which a jet first appears. If there are two jets in the movie strip just pick either to start with. In that frame, use the Start Jet 1 tool to mark the position on the Sun where the base of this first jet is launching from. Next, go to the frame in the movie strip in which this first jet is last visible. In that frame, use the End Jet 1 tool to mark the position on the Sun where the base of this first jet was launched from. Finally, go to the frame where this first jet has the maximum jet length. In that frame, use the Box Jet 1 tool and draw a box from the base of the jet to the tip of the jet. Then rotate and size the box to best fit the jet even if its curved.' Below the text are three buttons: 'Start Jet 1' (0 of 1 required, 1 maximum drawn), 'End Jet 1' (0 of 1 required, 1 maximum drawn), and 'Box Jet 1' (0 of 1 required, 1 maximum drawn). At the bottom of the task panel are options for 'NEED SOME HELP WITH THIS TASK?' and 'Hide previous marks', along with 'Back' and 'Next' buttons.



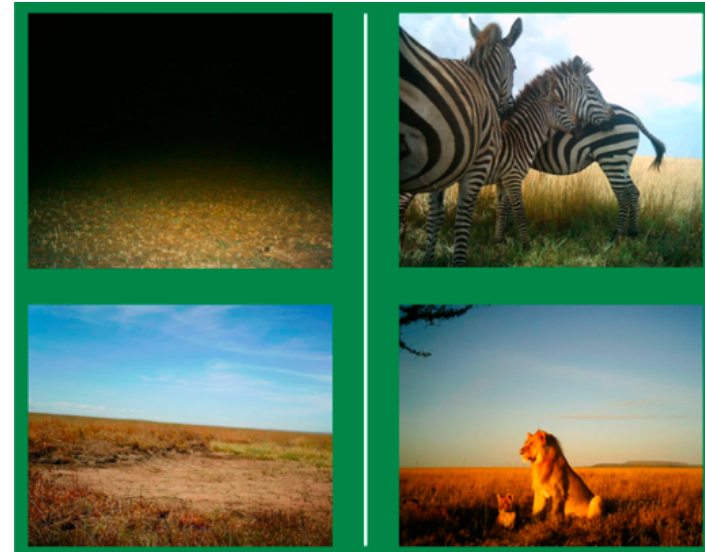
- Second work flow - provide location of jet base at start/end of jet and length/width at maximum extent.
- Ultimate goal: develop machine learning algorithm to identify and locate solar jets.

Human Engagement critical to science outcomes



Cox et al 2015

BUT...



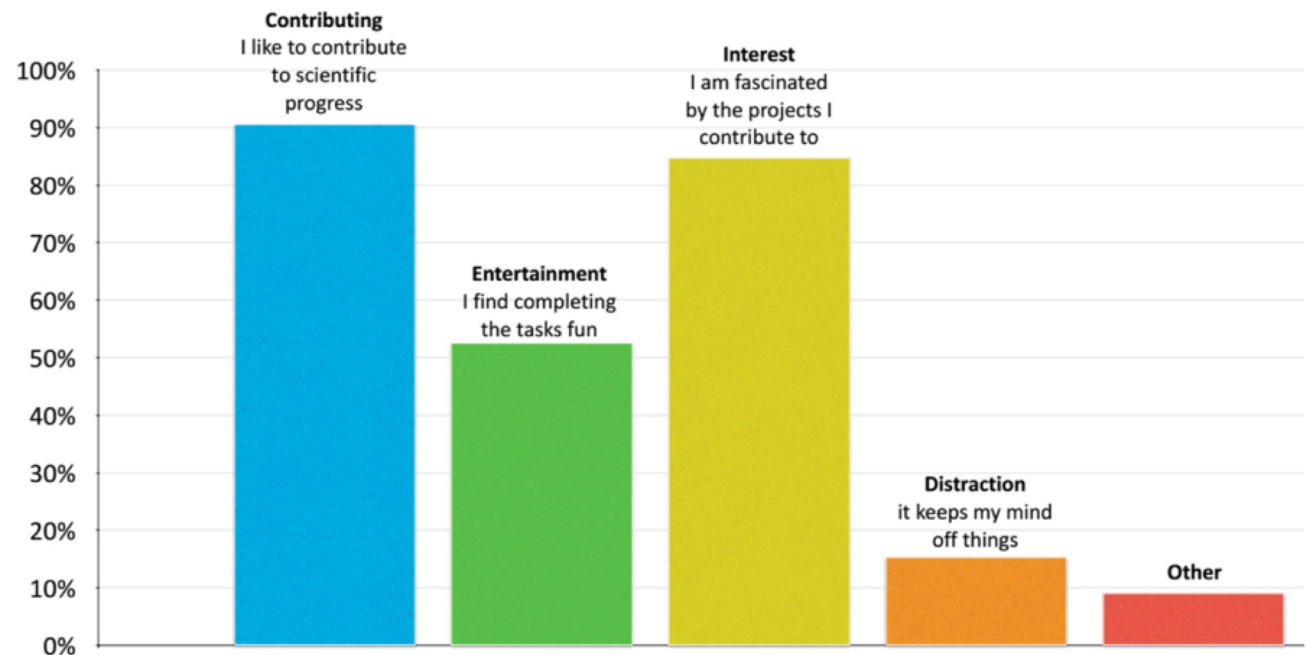
Bowyer et al 2015 HCOMP

When tasks are hard or machines are in the loop, need to be mindful that people are complicated...

When tasks are hard or machines are in the loop, need to be mindful that people are complicated...

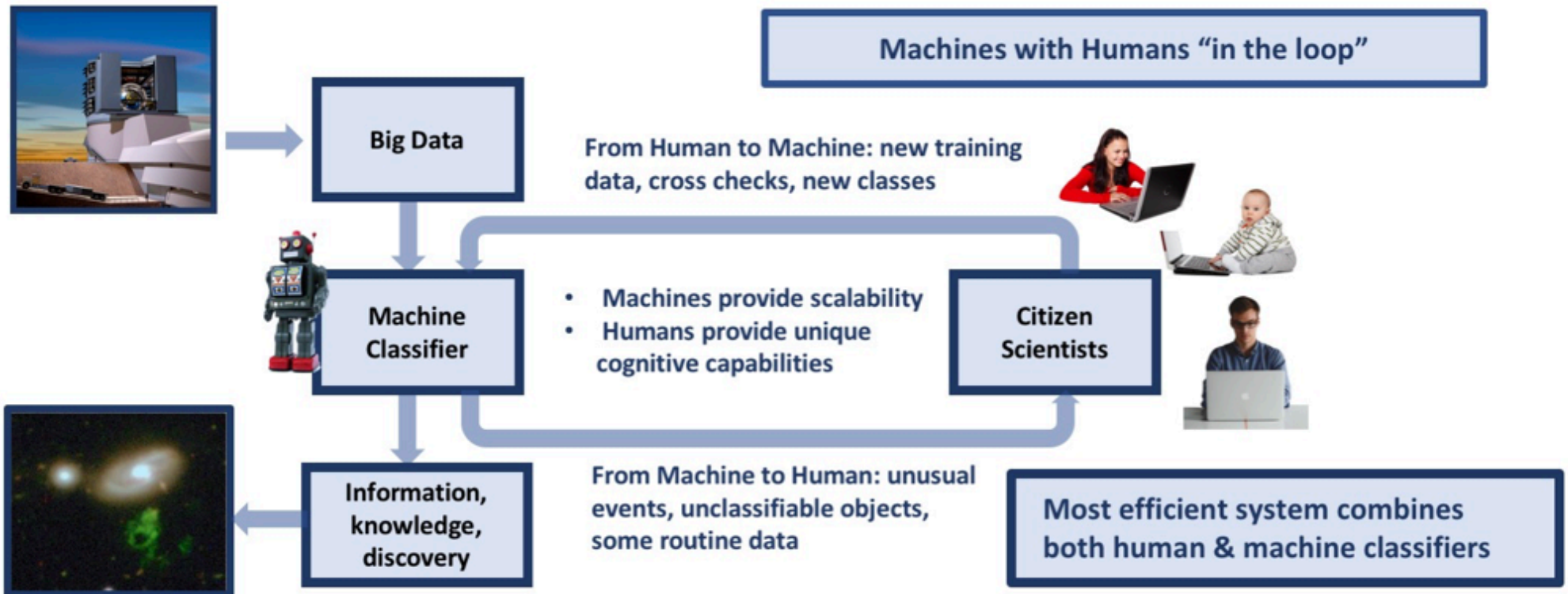
Recall volunteer incentive: contribute to research

- Many will stay through hard projects if you keep them engaged.
- Make sure very clear messaging to volunteers if machines are deployed at all!



Hardick et al. (2013); Crowson et al. (unpublished)

Zooniverse is ready to help close the analysis gap in astrophysics, solar science and more!



ZOONIVERSE



Zooniverse Announces NASA Partnership Leveraging World Leading Scientific Expertise

Press Release From: [Adler Planetarium](#)

Posted: Wednesday, July 22, 2020

Chicago's Adler Planetarium, along with its Zooniverse team and the team from the University of Minnesota, and NASA are pleased to announce a new partnership leveraging world-leading expertise across organizations to advance citizen science capabilities and achievements. Zooniverse is the largest platform for people-powered research in the world. To date, more than two million Zooniverse volunteers have come together to assist professional researchers in over 240 projects, enabling research that would not be possible, or practical, otherwise. Volunteers don't need any specialized background, training, or expertise to participate in any Zooniverse projects, and can contribute to real academic research, on their own computers, at their own convenience.

If you have an idea for a NASA-funded citizen science project apply to the Citizen Science Seed Funding Program:

<https://science.nasa.gov/science-news/citizenscience/nasa-funding-available-for-scientists>

And thanks to all of our volunteers!!!

Thank you!

lucy@zooniverse.org

🐦 @lucyfortson

LEVERHULME
TRUST _____

