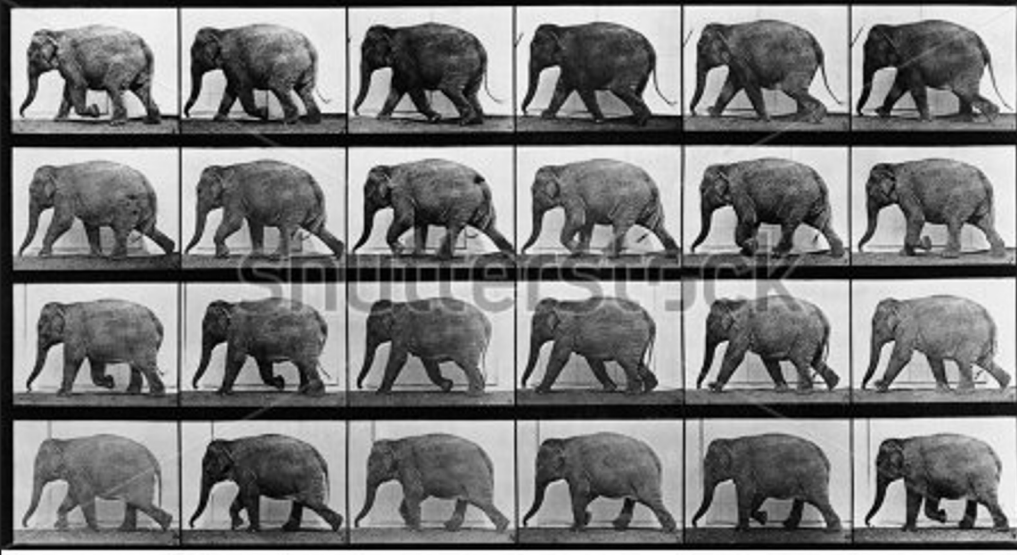




Eclipse
Megamovie
v 2.0.24

What is the Eclipse Megamovie?



The megamovie project is an effort to bring science quality imagery with the help of citizen scientists.

As a result, not only high cadence imagery can be obtained but also it demonstrates the importance of education in STEM programs irrespective of the citizen scientist background.

What is the Eclipse Megamovie

The Eclipse Megamovie has two main science objectives

- 1) The observation of transient phenomena evolution in the solar corona in different locations.
- 2) The registration of the total solar eclipse at high cadence for a ground observation.
- 3) Extra bonus: The observation of Baily's beads to determine the solar radius with high precision.

What is the Eclipse Megamovie



Druckmüller

What is the Eclipse Megamovie



Courtesy of Geoff Ingalls

Courtesy astrorx

What is the Eclipse Megamovie

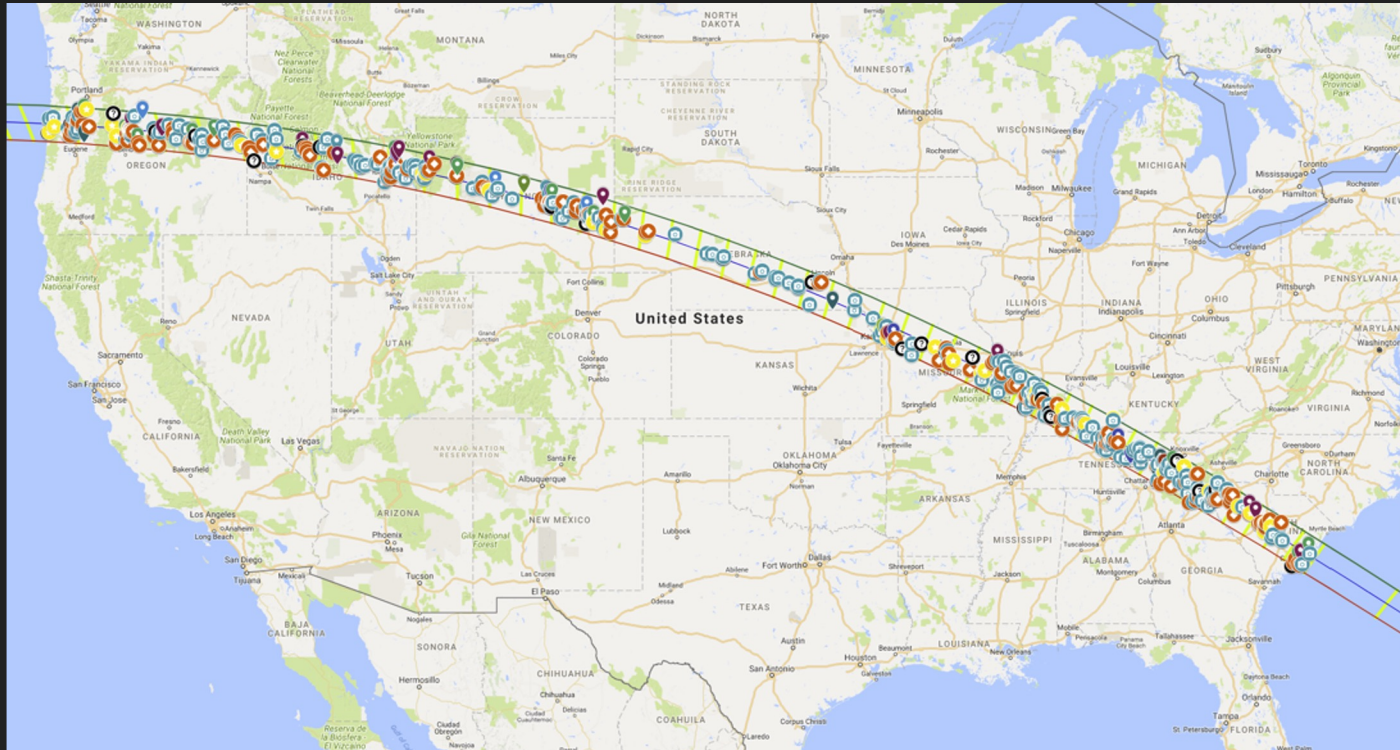


What is the Eclipse Megamovie

Did we succeed in 2017?

Yes, we did succeed!

- Good observing conditions
- 12,400 volunteers
- a free app for smartphone cameras
- almost 1 TB of imagery in the public domain



50,016 photographs contributed by 1,190 photographers

What is the Eclipse Megamovie

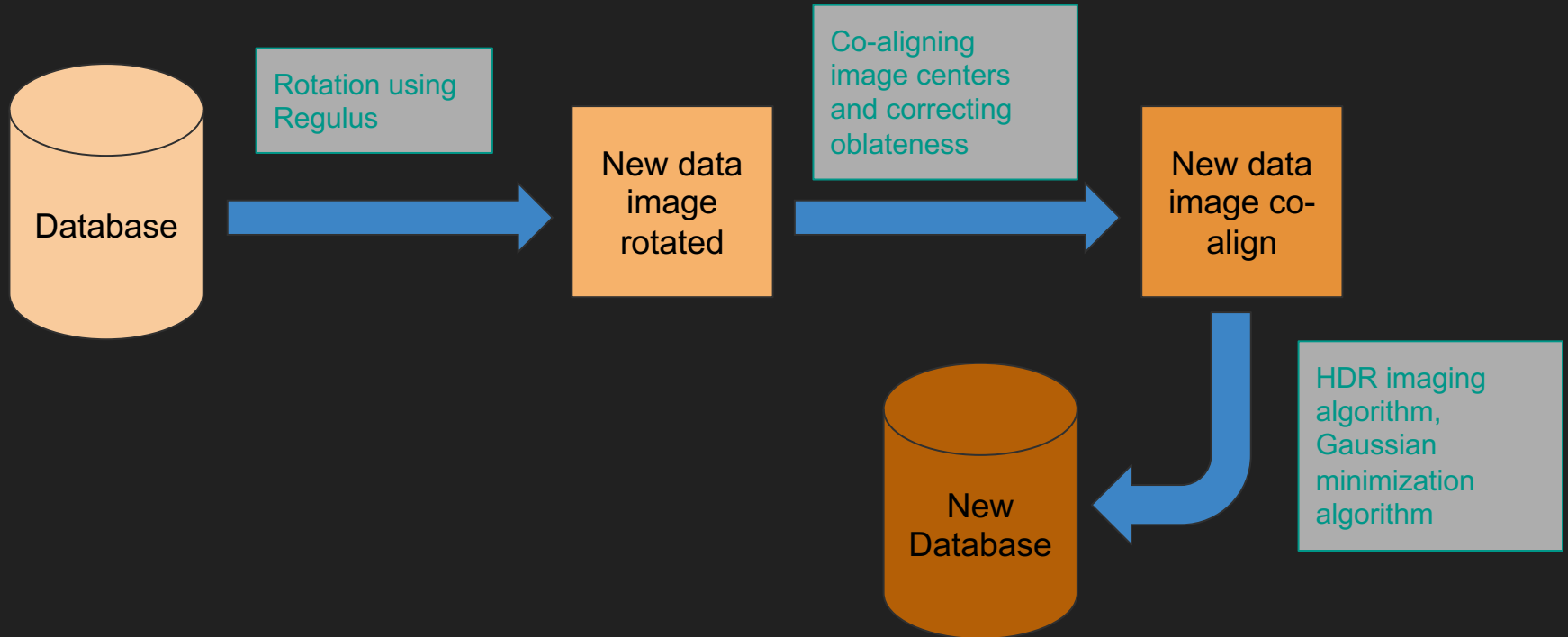
Did we succeed in 2017?

Yes, we did succeed!

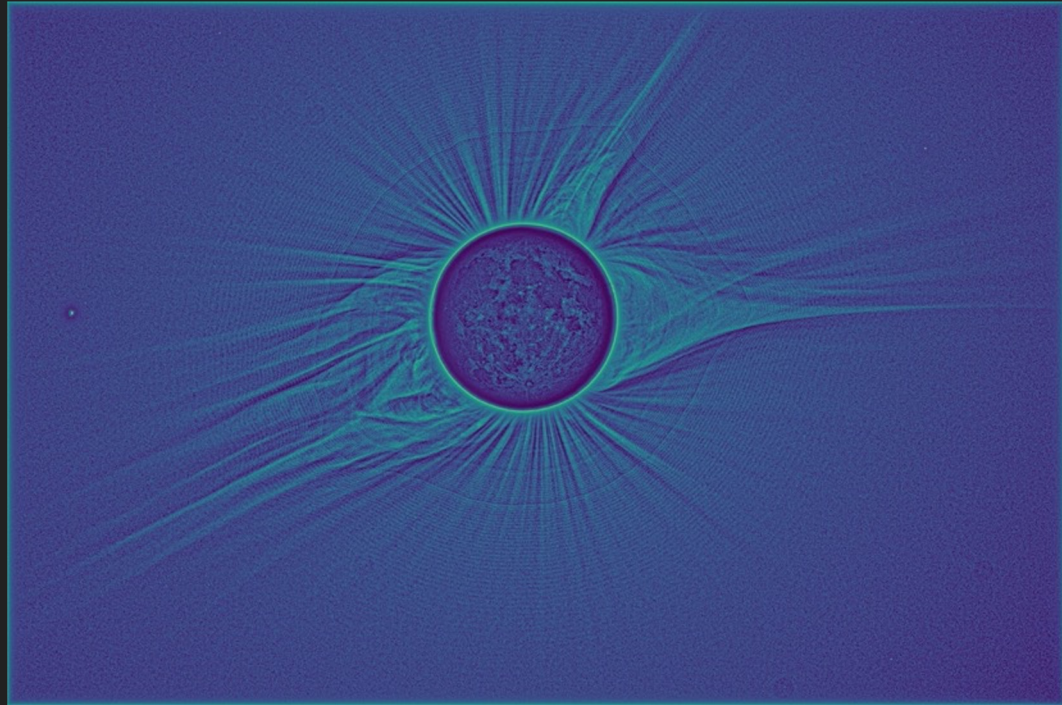
- Good observing conditions
- 12,400 volunteers
- a free app for smartphone cameras
- almost 1 TB of imagery in the public domain

Eclipse Megamovie: Results

An algorithm was developed to co-align all the catalog images and create HDR images.



Eclipse Megamovie: Results



HDR Gaussian normalized image (processed from our volunteers' photos)

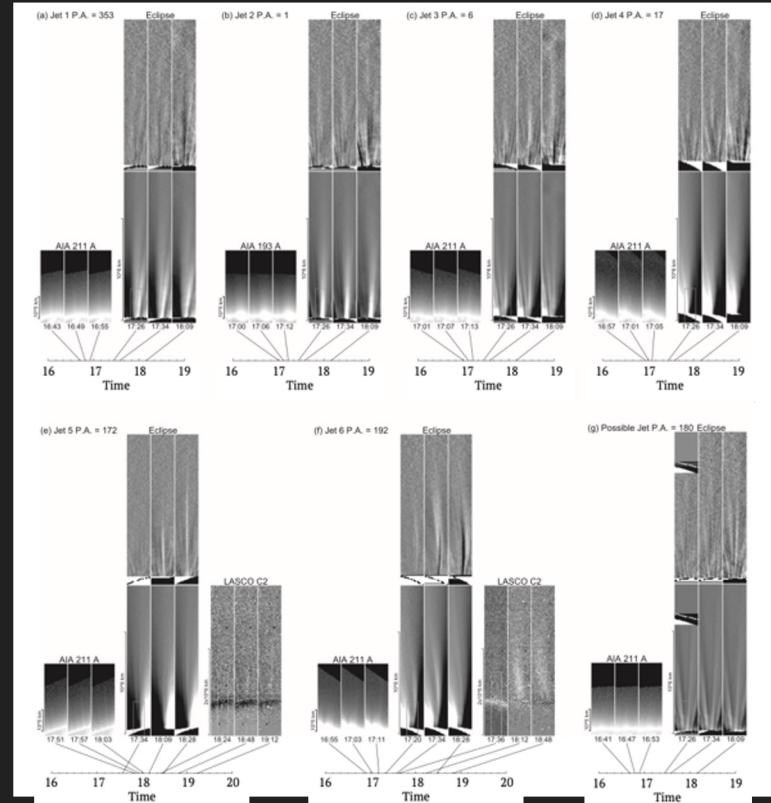
Eclipse Megamovie: Lessons Learned

- The instrument ecosystem became a problem complicated to tackle
 - The lack of flat field images and dark frames
 - Non standardized bracket timing and diaphragm apertures
- Lack of a core number of collaborators with similar if not identical instrumentation
- Although there was a great deal of training of the volunteers, more training and preparation was needed.



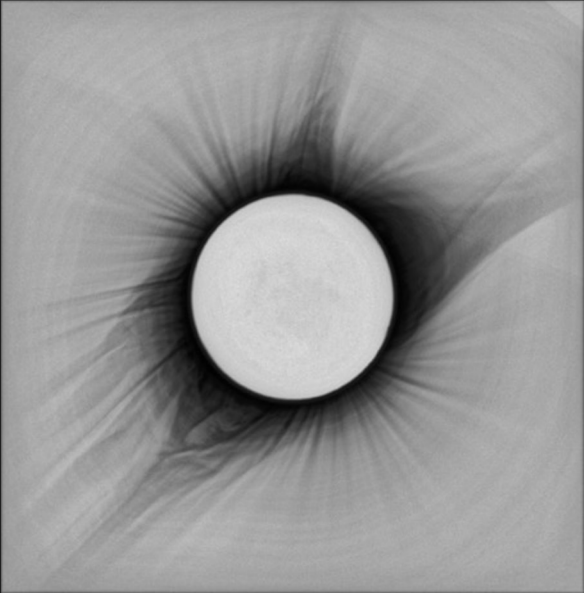
Eclipse Megamovie: Current status

Using difference images from a 70 minute time-series of images at seven sites from the 2017 solar eclipse and comparing with NASA data, a group of Japanese scientists found that it's common for ordinary polar jets to reach high altitudes and escape the Sun as part of the solar wind (Hanaoka et al 2018).

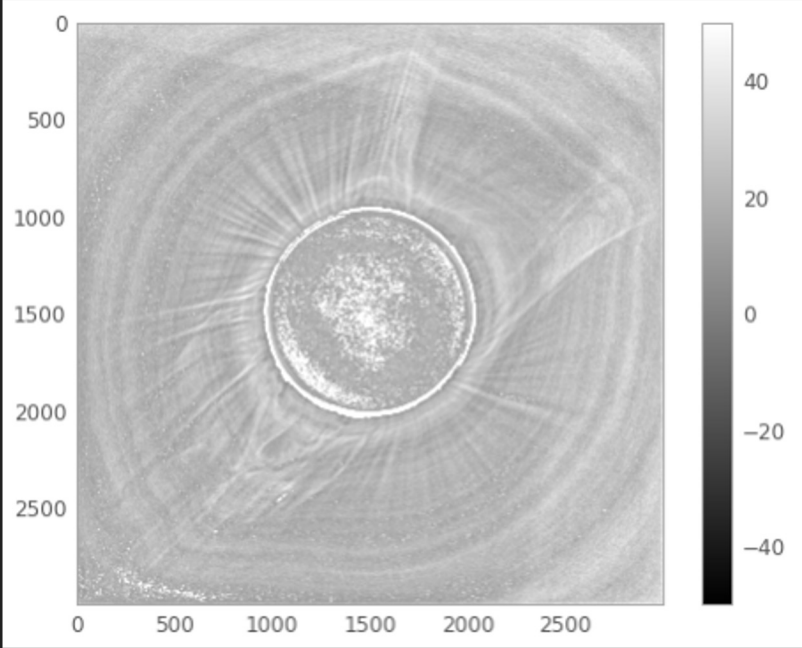


Eclipse Megamovie: Current status

HDR Image Example



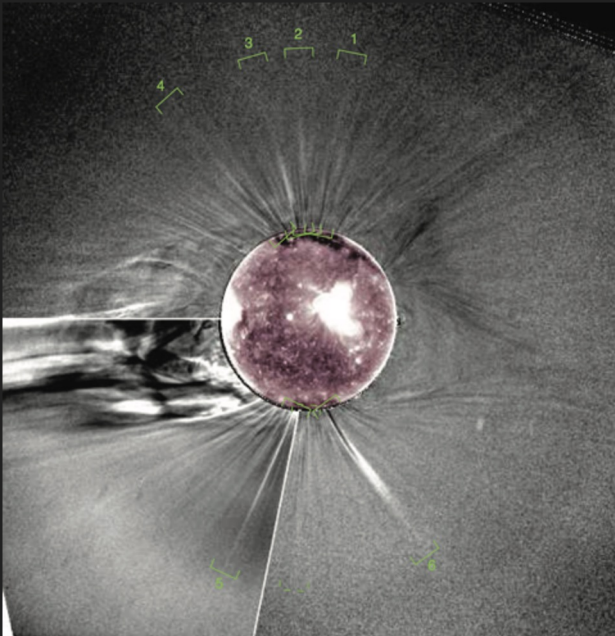
Difference Image Example



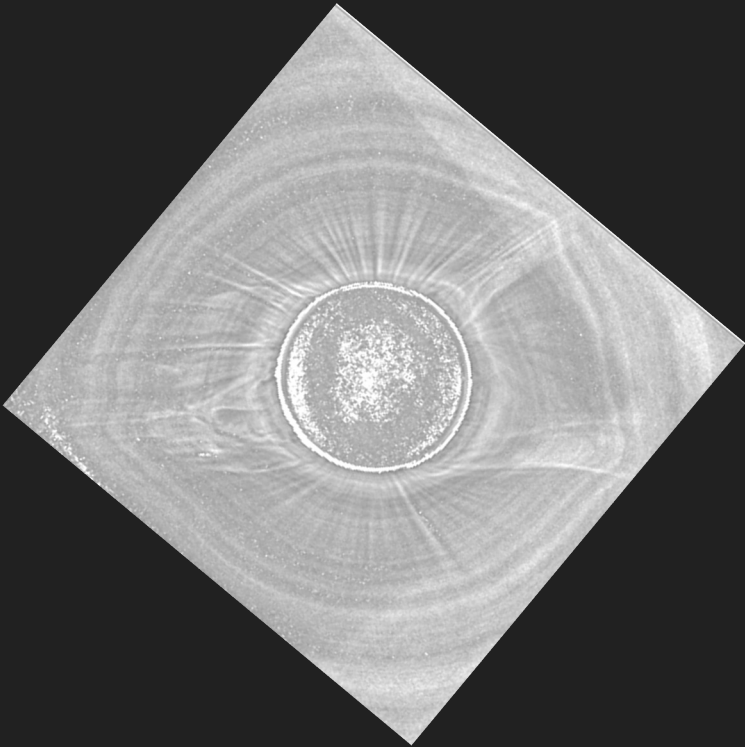
From Grace Kallman 2022 AGU presentation

Eclipse Megamovie: Current status

Hanaoka et al 2018
Difference Image



Eclipse Megamovie 2022
Difference Image



Eclipse Megamovie v2.0.24

What is new for 2024?

The objective of the Eclipse Megamovie is to create a scientifically valuable database of the solar corona during the 2024 solar eclipse. In particular, a database of transient events (flows, ejecta, CMEs).

For that we will be preparing a core volunteer group with identical equipment. The group will be trained not only to obtain the data with the instrumentation but also to actively analyse the data using the already existing python routines.

The general public will be encouraged to provide more information so that we could recreate the 2017 megamovie. However, their data will be filtered to the science database under the criteria that only data following established requirements will be accepted.

Eclipse Megamovie v2.0.24



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