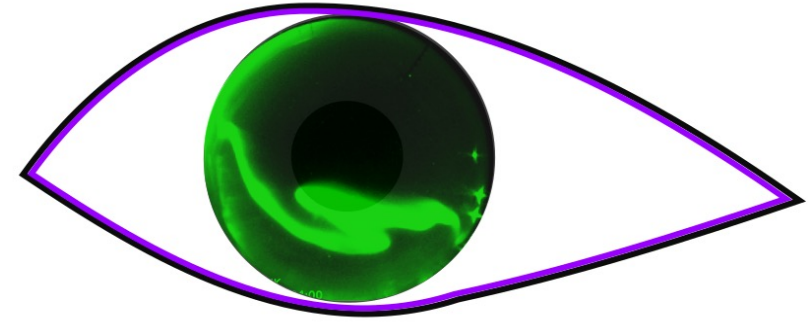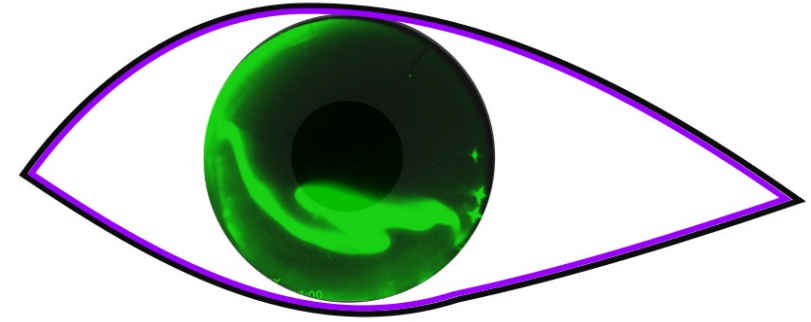# aurora-asi-lib
Aurora All-Sky Imager Library

Easily download, plot, animate, and analyze auroral all sky imager (ASI) data

Mykhaylo (Mike) Shumko, Bea Gallardo-Lacourt, Isaac Thompson, Alexa Halford, and Kyle Murphy

Follow along! Install with:

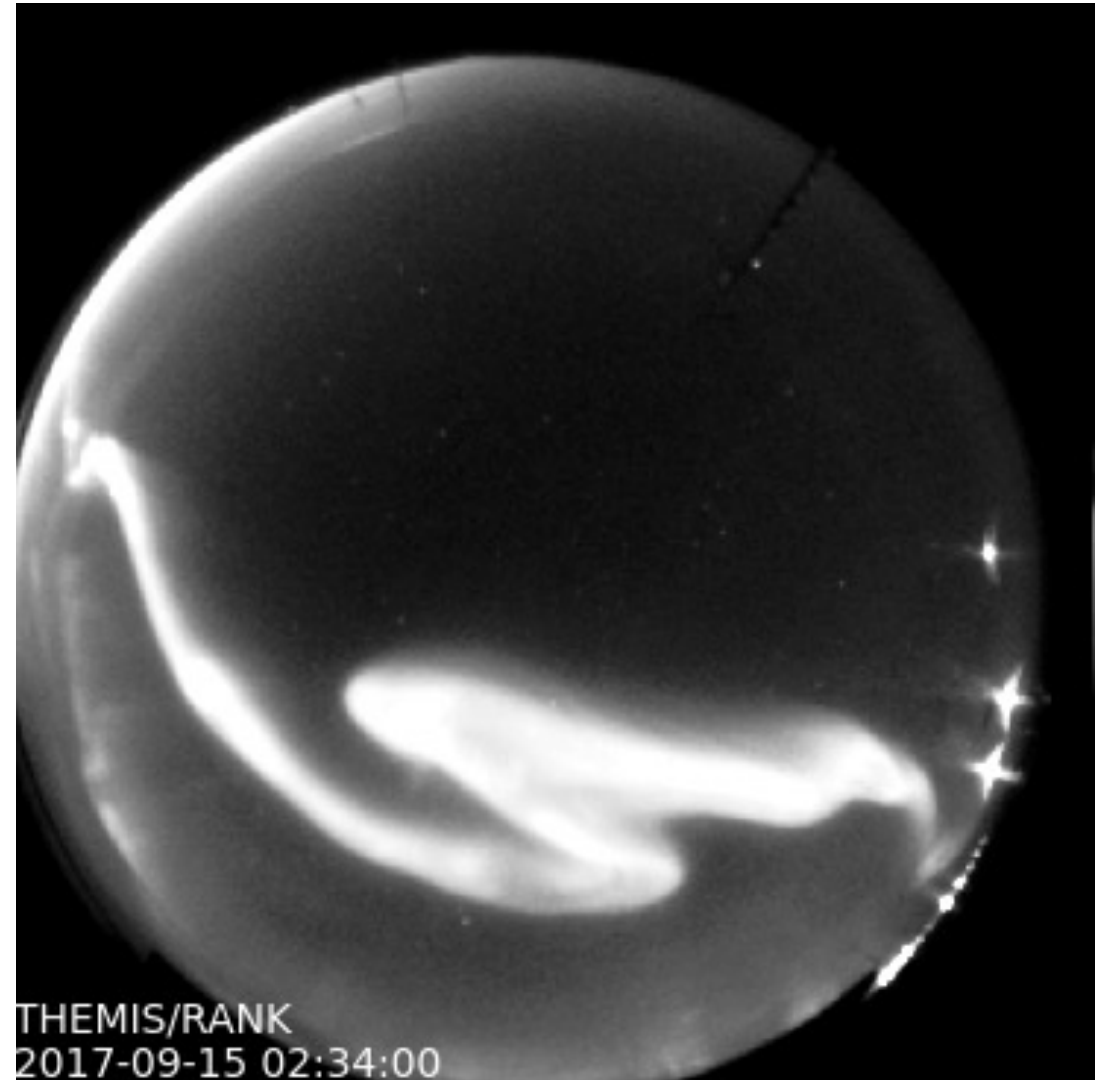   python3 –m pip install aurora-asi-lib

aurora-asi-lib overview

What?

A python package that enables seamless and painless handling and analysis of auroral images

Why?

Auroral researchers do similar analysis steps---our goal with asilib is to enable researchers to focus their time and energy on what matters: studying the aurora!
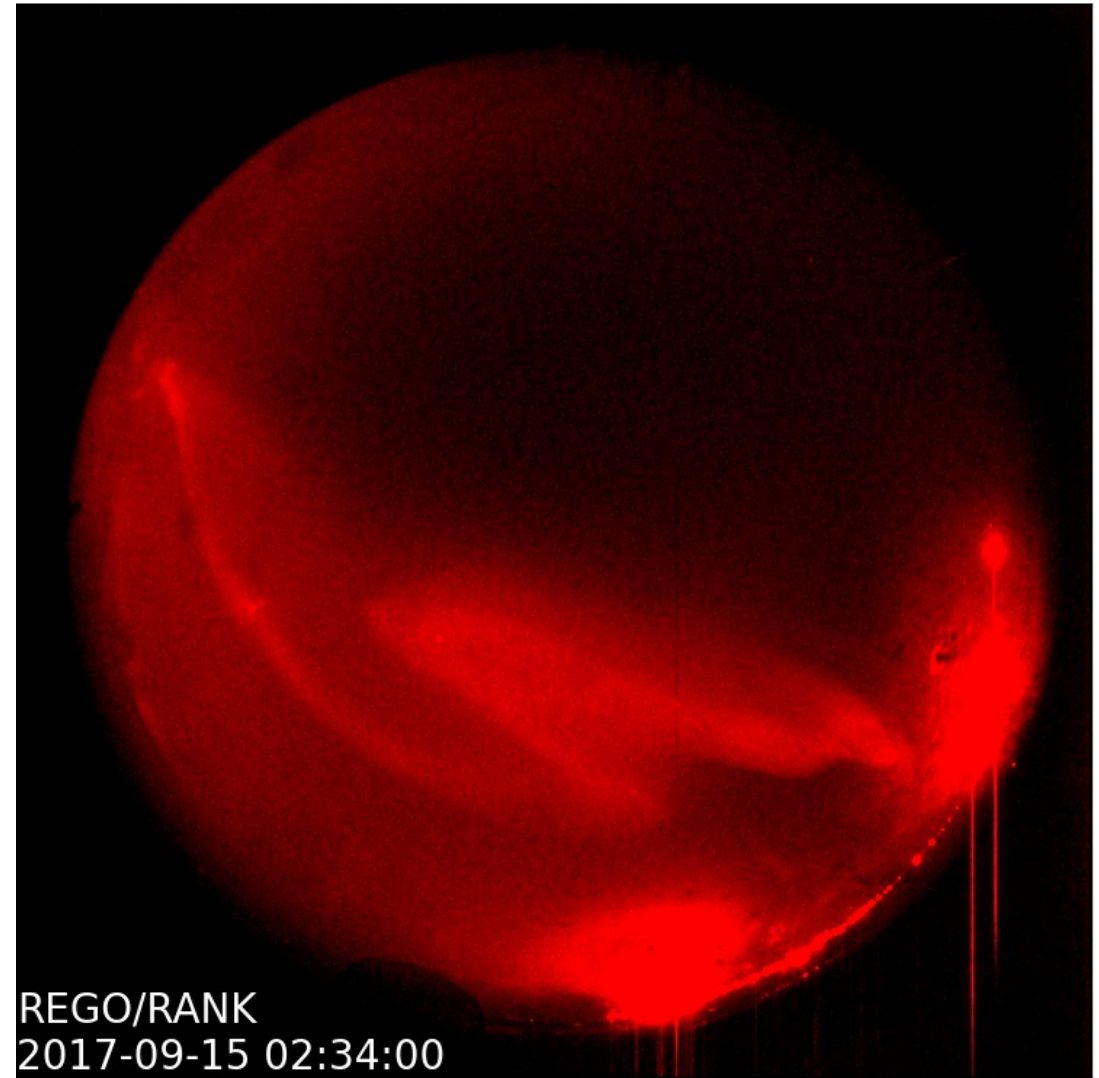

THEMIS/RANK
2017-09-15 02:34:00

aurora-asi-lib overview

Supported camera arrays:
- **THEMIS**
- **REGO**

Once these two arrays are fully supported, we plan to add other camera arrays to asilib.
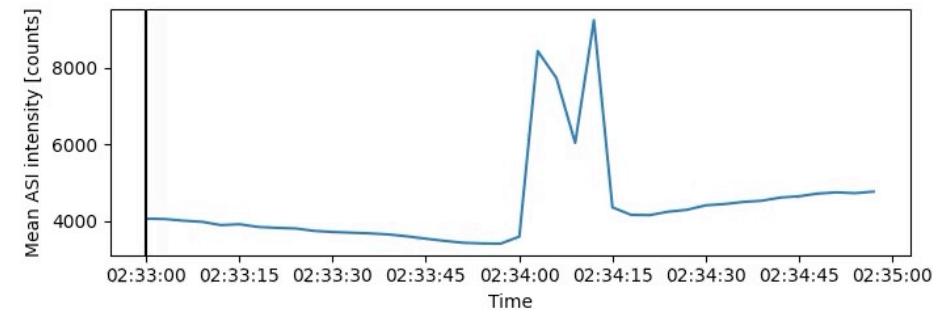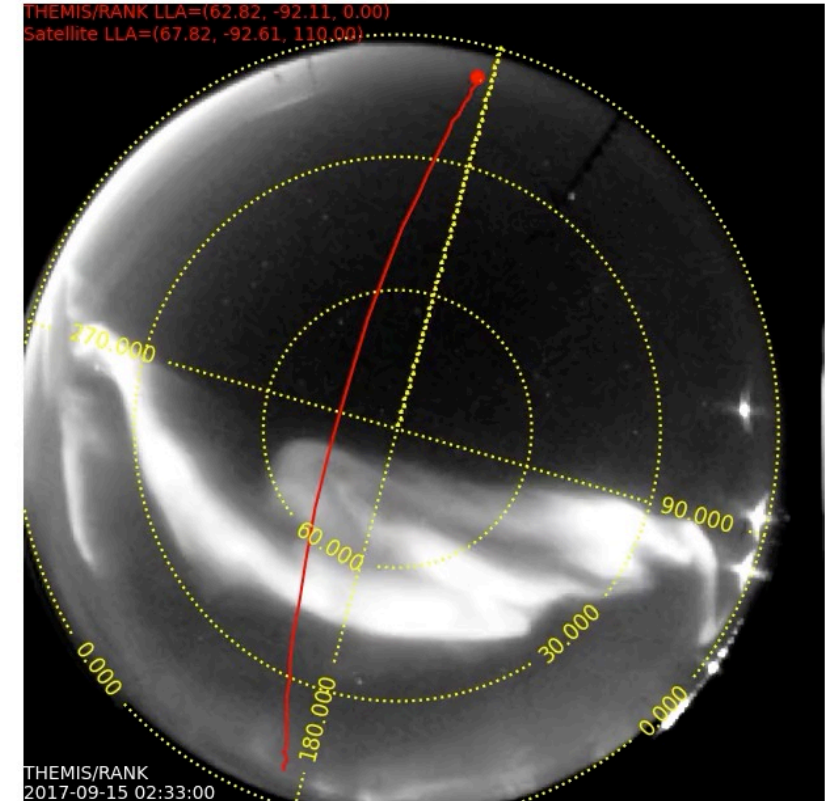- **TREX**
- **ASI-derived models**

REGO/RANK
2017-09-15 02:34:00

What can it do?

Plot one fisheye lens frame:
    asilib.plot_frame()

Make a movie:
    asilib.plot_movie()*
    asilib.plot_movie_generator()*

  * Requires ffmpeg

What can it do?

Map a satellite's location:
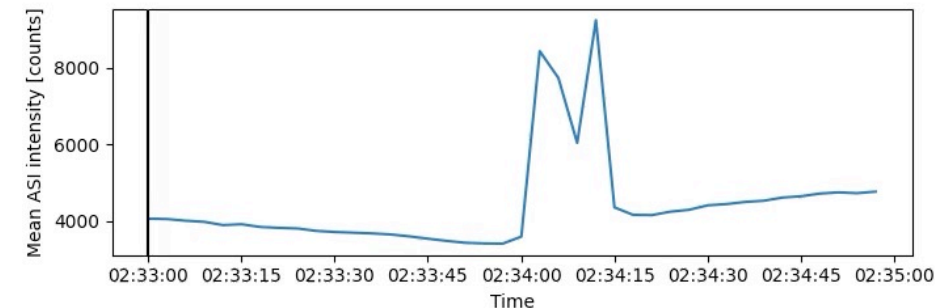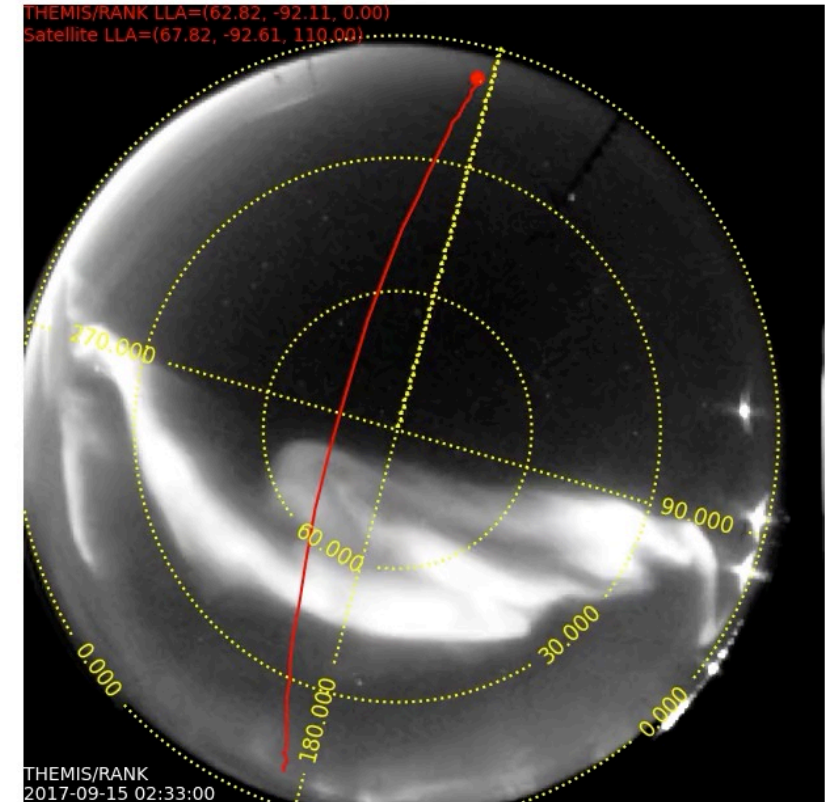 asilib.lla2azel()
  asilib.lla2footprint()*

Calculate equal areas in the image:
  asilib.equal_area()

* Requires IRBEM

What can it do?

Plot a keogram:
>   asilib.plot_keogram()

Load data
>   asilib.load_img()
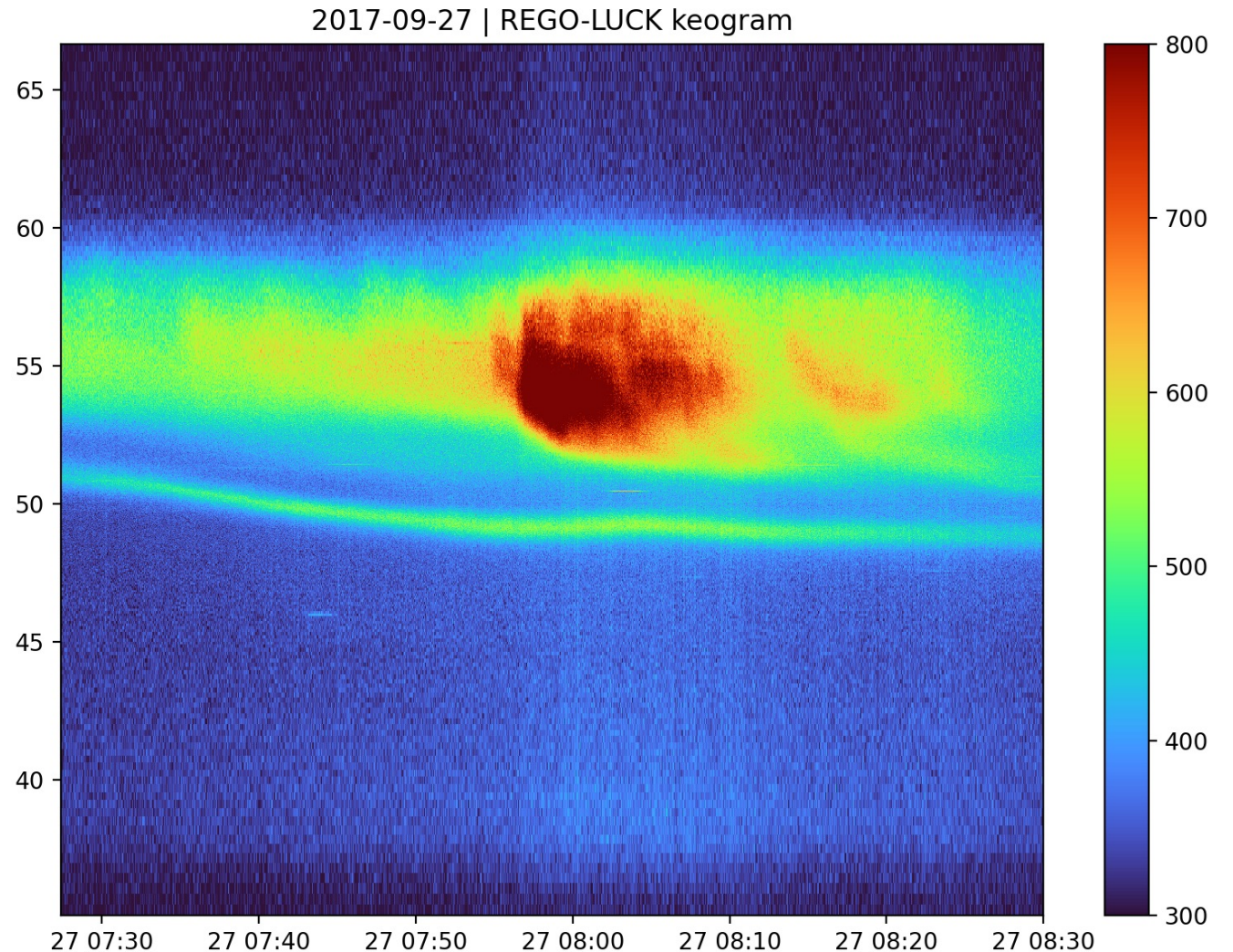>   asilib.load_cal()

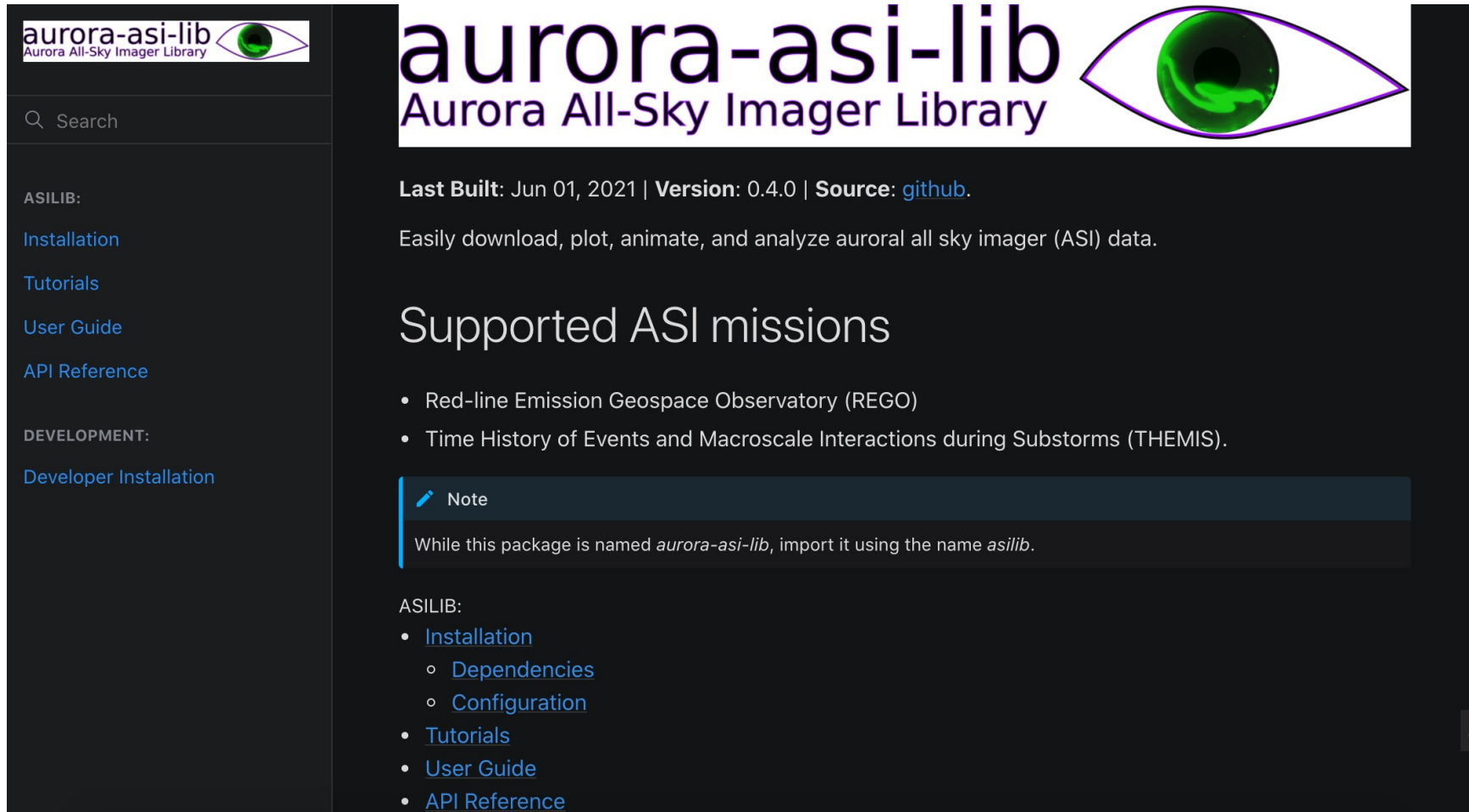If a file is not found, one will be automatically downloaded!

Bulk download data
>   asilib.download_themis_cal()
>   asilib.download_themis_img()

Didn't memorize the commands?
Documentation: aurora-asi-lib.readthedocs.io

One class to rule them all

- The most usable (and fun!?) python libraries have a central class:
  - numpy.array
  - pandas.DataFrame
  - xarray.DataArray
  - pysat.Instrument
 - bs4.BeautifulSoup
  - …

One class to rule them all

- The most usable (and fun!?) python libraries have a central class:
  - numpy.array
  - pandas.DataFrame
  - xarray.DataArray
  - pysat.Instrument
  - bs4.BeautifulSoup
  - …
- And now:
  - asilib.Imager

Ongoing Development Topics

- Handle computer resources effectively

- Project the fisheye images to a map

- Unify the asilib functionality into an asilib.Imager() class

- Integrate with Aurora X

- Update the documentation with examples and tutorials

- And add other imager arrays as plugins.
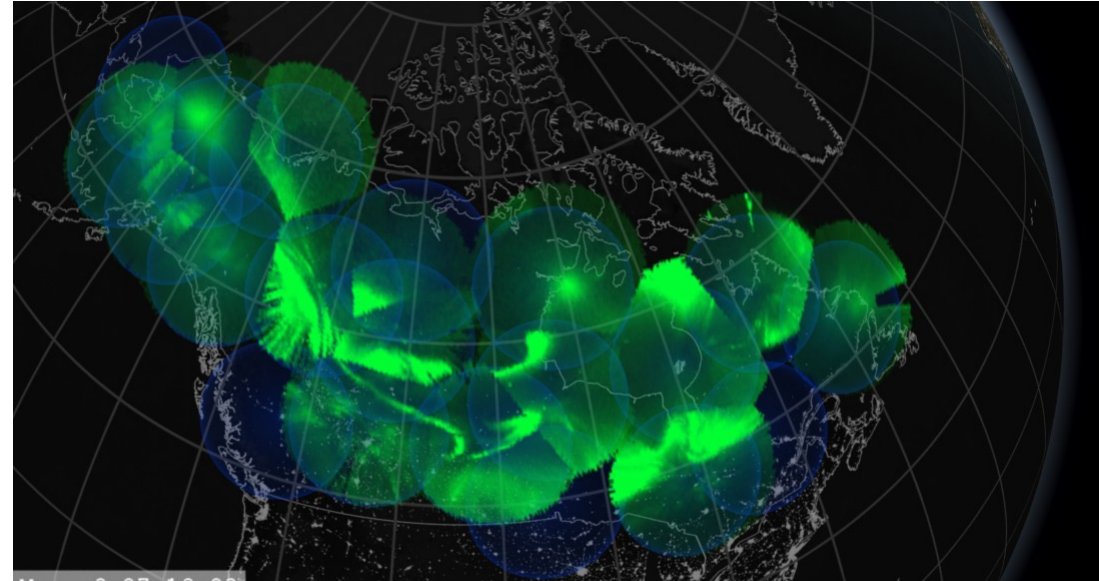
We need your help! Please contact me, mykhaylo.shumko@nasa.gov if you'd like to contribute or have ideas (I am always interested in ways to improve this code)

How to get started

python3 –m pip install aurora-asi-lib (import as asilib)

Documentation: https://aurora-asi-lib.readthedocs.io

Source code: https://github.com/mshumko/aurora-asi-lib

Thank you for listening!