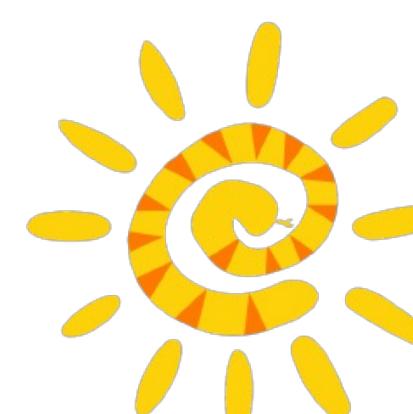


The SunPy Project:

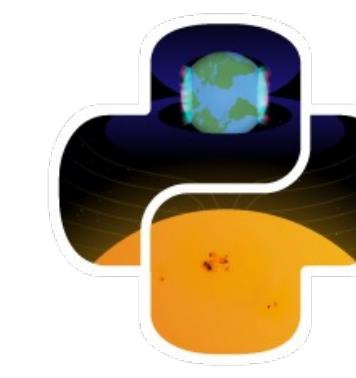
An Interoperable Ecosystem for Solar Data Analysis

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The SunPy Project

- The SunPy project is an organization whose mission is to develop and facilitate a high-quality, easy-to-use, community-led, free and open-source solar data analysis ecosystem based on the scientific Python environment.
- It consists of a community of scientists and software developers that develop and maintain a number of Python packages including the sunpy core package, and support an ecosystem of affiliated packages.
- With the increasing catalogue of solar data from both space (e.g. SDO, Solar Orbiter, Parker Solar Probe) and ground-based (e.g. DKIST, EOVSA) observatories, the SunPy project facilitates an ecosystem of software tools to analyse these data.

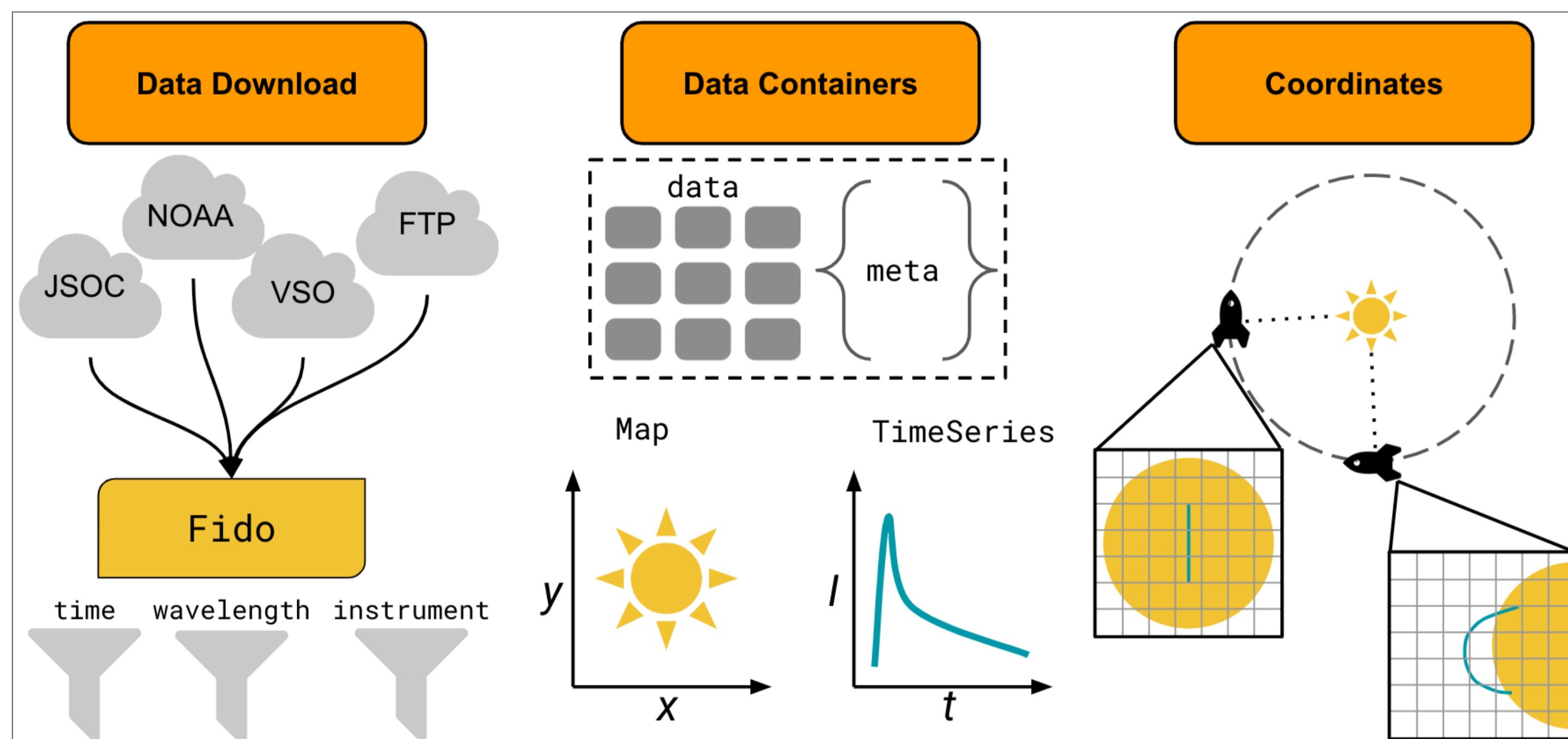
Development & Community

- Openly-developed, and community-led - all code is hosted and developed on GitHub – anyone can contribute and provide feedback.
- Builds upon existing tools, for example sunpy heavily depends on the astropy package
- SunPy fosters an active community of developers and users within the solar and heliophysics research communities including the Python in Heliophysics Community (PyHC).

sunpy core package

- The sunpy core package is a central pillar to the SunPy project, and provides the fundamental tools for accessing, loading, and interacting with solar physics data in Python – a summary is given below.
- There is a new release of the core package with feature enhancements approximately every six months. The current released version of sunpy is 4.1.

A summary of the capabilities of the sunpy core package:

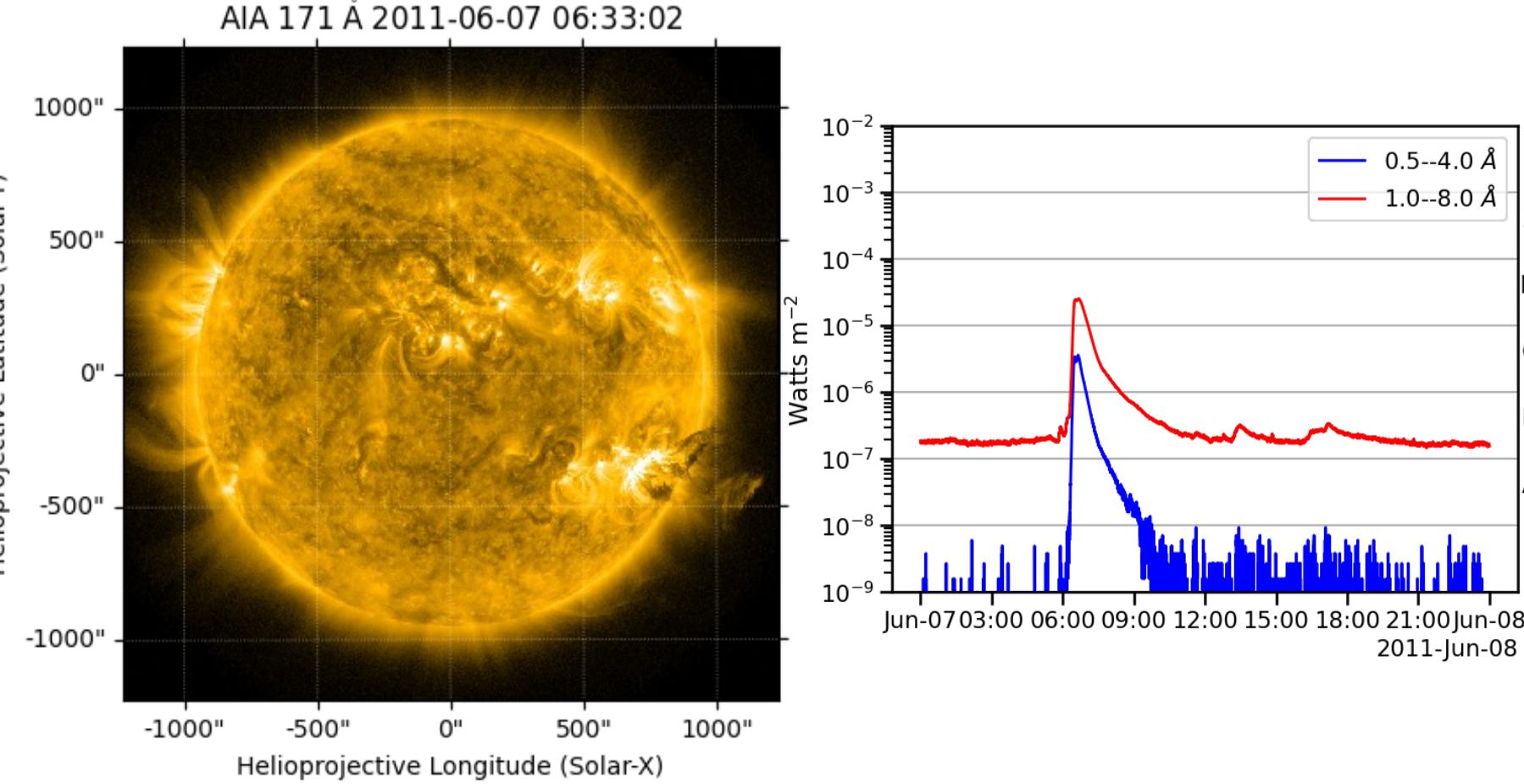


Data Download: Fido interface is a unified API for searching and downloading solar data from various search engines and data sources. *Easily extendable!*

Data Containers:

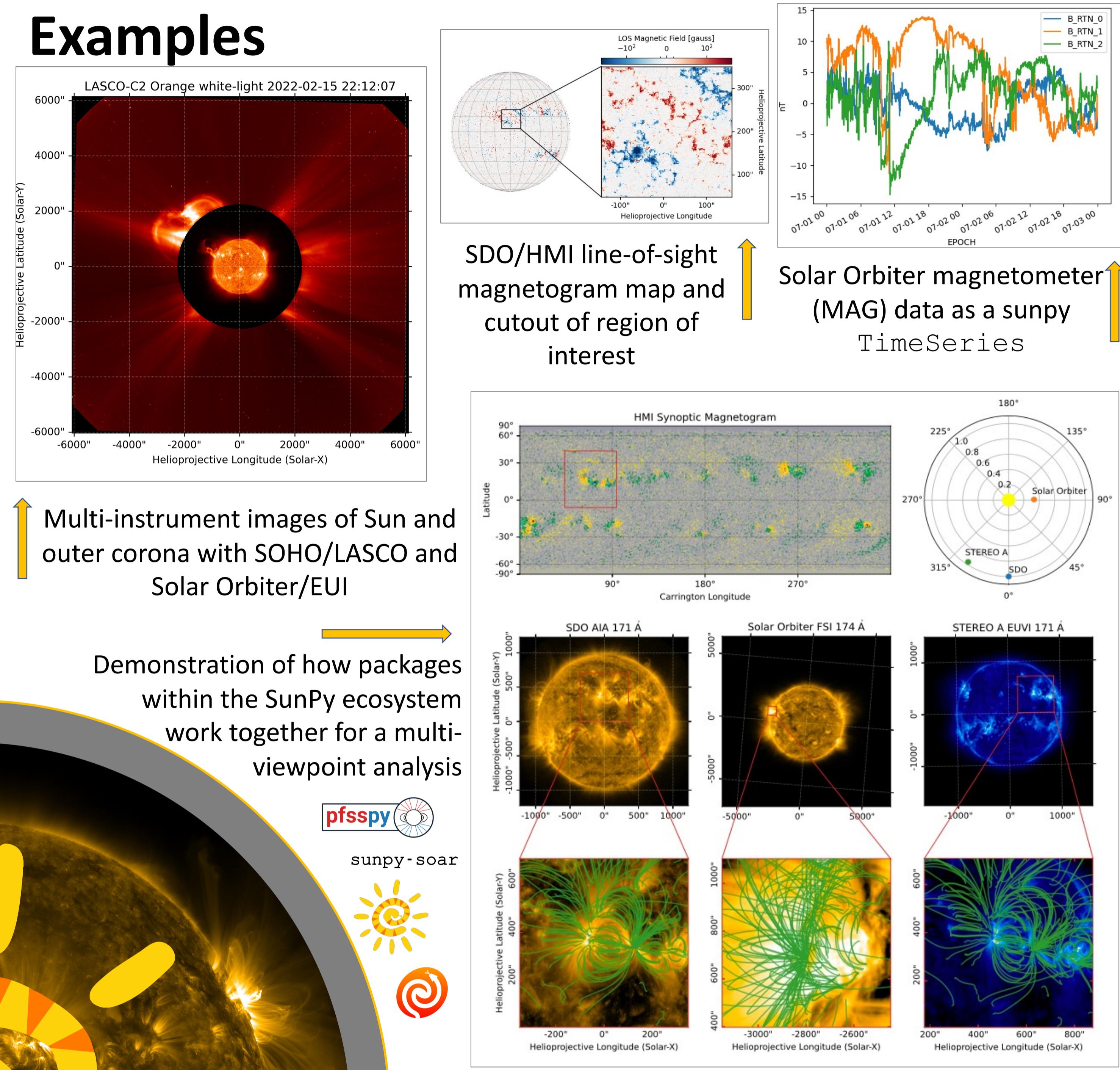
Map: container for 2-D coordinate aware image data (e.g. images of Sun)

TimeSeries: container for measurements as function of time (e.g. both in-situ and remote sensing)



Coordinates: by extending the astropy framework, sunpy core provides definitions of, and transformations between, common solar coordinate systems. *Important for multi-viewpoint coordinated observations!*

Examples



Affiliated Packages

- SunPy affiliated packages provide additional tools and functionality to the solar community that are considered outside the scope of sunpy core.
- Affiliated packages extend and build on top of the core package and are interoperable within the SunPy ecosystem, e.g. instrument specific packages.
- A set of standards and criteria are required to become an affiliated package and an open review process is performed.

Some examples of SunPy-affiliated packages:



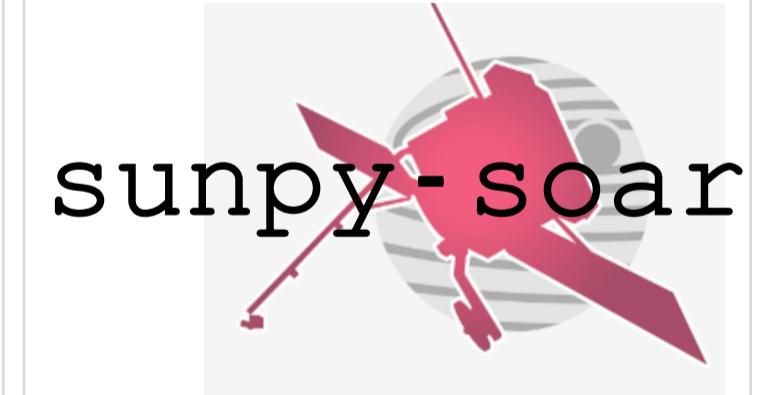
ndcube: provides functionality to link astronomical data and coordinates in single objects.



aiapy: package for analyzing data from the AIA instrument onboard NASA's SDO.



pfsspy: package for carrying out potential field source surface modelling.



sunpy-soar: package plugin for accessing data from the Solar Orbiter Archive (SOAR).

See more at sunpy.org/project/affiliated.html

Solar Orbiter Support within SunPy

Solar Orbiter data can be analysed within the SunPy ecosystem. With sunpy-soar, data can be queried and downloaded using sunpy's Fido client. Both the Map and TimeSeries containers support many data products, including images from EUI and timeseries from MAG.



Find out more & get involved!

The SunPy project is always looking for ways to improve the accessibility of the project and to grow the community –

Please reach out and get involved! ☀️🚀

- GitHub: github.com/sunpy
- Matrix chat: [sunpy.org/chat](https://matrix.org/#/#sunpy:sunpy.org)
- Discussion forum: <https://community.openastronomy.org/c/sunpy/5>
- Mailing list: <https://groups.google.com/g/sunpy>
- Weekly community meeting every Wednesday at 17:00 UTC sunpy.org/jitsi

