

SunPy 2.0



SunPy 2.0
The community-developed open-source solar data analysis environment for Python
Sophie A. Murray on behalf of the SunPy Community



What's new?

No just released SunPy 2.0!
Here are functionality updates:

- Updates to the Fido data source and retrieval tool.
- Various fixes to sunpyviz.
- Integration of different data sources into sunpy coordinates, enabling viewing of images with the respective package.
- Improved documentation and better cell for some image packages.

Read the full details on the [changelog](#), and check out the recent SunPy papers published in [April](#) and [2020](#).

Affiliated Packages

Affiliated packages are well-maintained, open-source software packages that are useful to solar physicists and integrate smoothly into the SunPy ecosystem. To aid discoverability, all affiliated packages are listed on the SunPy website.

- [snpviz](#) for analyzing data from SOHO/ASO
- [snpviz](#) for complex data queries
- [snpviz](#) for multi-dimensional arrays
- [snpviz](#) for potential field extrapolations
- [snpviz](#) for Fourier based correlation tracking
- [snpviz](#) for solar radio spectrograms
- [snpviz](#) for image processing
- [snpviz](#) for the spectrographs

Learn more about these packages and the affiliation process at [sunpy.org/affiliated](#). Get in touch if you have a code package that you think would be suitable for affiliation with SunPy!

What is SunPy?

SunPy facilitates and promotes the use and development of community open-source Python data analysis packages for solar physics.

Find more about SunPy code functionality at [docs.sunpy.org](#). Some core packages include:

- Data retrieval and IO
- Image and time series visualization
- Time coordinates

The recommended way to install SunPy is with [conda](#). To install SunPy, some details are outlined on the following two commands:

It would only [append/downloads/conda](#) days

For detailed instructions, read our [installation guide](#).

For some examples of using SunPy see our [gallery](#), and check out our [community guide](#).



Example of a SunPy visualization showing the evolution of the 113 Å wavelength channel of the Advanced Imaging Solar Spectrometer Observatory.

Get involved

We currently have a few open community roles:

- Continuous Integration Maintainer
- Package Manager
- Webmaster
- Lead/Reviewer
- Affiliated Package Liaison

Find more about them at [sunpy.org/development/community-roles](#).

We would like to encourage any interested parties to apply to roles which are currently unfilled by contacting the lead SunPy developer on the [disrupt](#) lead developer. See the [Governance](#) page for more info.

Contact us

Send us a message, bug, issue or idea for an affiliated package, want to start contributing some code?

- Message us on our [Mattermost](#) or [chat](#).
- Ask on the [mailing list](#).
- Submit a [GitHub issue](#).
- Join a [meeting](#).

We have weekly community calls on Wednesday at 17:00 UTC. Anyone can and is encouraged to get involved and ask back forward to existing good. Please be aware that our focus is [code](#) or [science](#) that we can all learn from everyone should be happy with each other.

Follow us on Twitter [@SunPyProject](#), subscribe to the [SunPy blog](#), and learn more about the project on our website [sunpy.org](#).

Be sure to check out whether a poster makes the SunPy community.

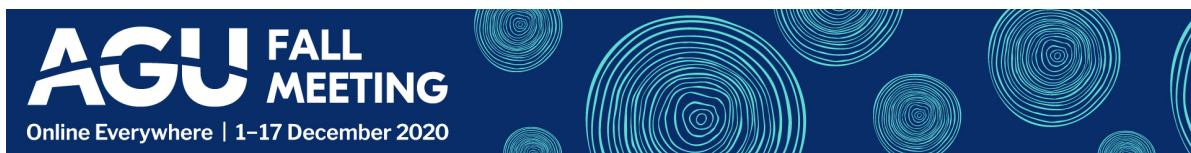
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The community-developed open-source solar data analysis environment for Python

Sophie A. Murray on behalf of the SunPy Community



PRESENTED AT:



WHAT'S NEW?

We just released SunPy 2.0!

Some new functionality includes:

- Updates to the Fido data search and retrieval tool.
- Various fixes to `sunpy.map`.
- Integration of differential rotation into `sunpy.coordinates`, enabling warping of images with the `reproject` package.
- `aiaprep` deprecated in favour of the new `aiapy` package.

Read the full details on the changelog (<https://docs.sunpy.org/en/stable/whatsnew/2.0.html>), and check out the recent SunPy papers published in ApJ (<https://iopscience.iop.org/article/10.3847/1538-4357/ab4f7a>) and JOSS (<https://doi.org/10.21105/joss.01832>).

AFFILIATED PACKAGES

Affiliated packages are well-maintained, open source software packages that are useful to solar physicists and integrate well with the SunPy ecosystem. To aid discoverability, all affiliated packages are listed on the SunPy website:

- aiapy (https://gitlab.com/LMSAL_HUB/aia_hub/aiapy) for analysing data from SDO/AIA
- drms (<https://github.com/sunpy/drms>) for complex data queries
- NDCube (<https://github.com/sunpy/ndcube>) for multi-dimensional arrays
- pfsspy (<https://github.com/dstansby/pfsspy/>) for potential field extrapolations
- pyflct (<https://github.com/sunpy/pyflct>) for Fourier local correlation tracking
- radiospectra (<https://github.com/sunpy/radiospectra>) for solar radio spectrograms
- sunkit-image (<https://github.com/sunpy/sunkit-image/>) for image processing
- sunraster (<https://github.com/sunpy/sunraster>) for slit spectrographs

Learn more about these packages and the affiliation process at sunpy.org/project/affiliated (<https://sunpy.org/project/affiliated.html>). Get in touch if you have a code package that you think would be suitable for affiliation with SunPy!

WHAT IS SUNPY?

SunPy facilitates and promotes the use and development of community open source Python data analysis packages for solar physics.

Read more about SunPy code functionality at docs.sunpy.org (<http://docs.sunpy.org>)! Some core packages include:

- Data retrievers and IO
- Image and time series visualisation
- Solar coordinates

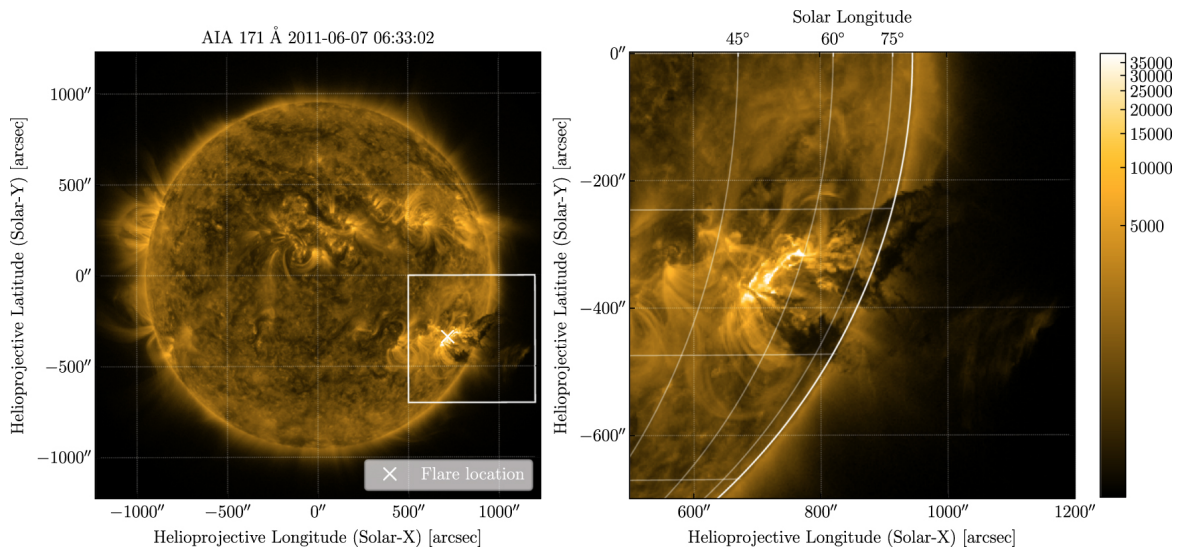
The recommended way to install SunPy is with conda. To install SunPy, once conda is installed run the following two commands:

```
$ conda config --append channels conda-forge
```

```
$ conda install sunpy
```

For detailed instructions read our installation guide (<http://docs.sunpy.org/en/latest/guide/installation/index.html>).

For some examples of using SunPy see our gallery (<https://docs.sunpy.org/en/stable/generated/gallery/index.html>), and check out our newcomer's guide (https://docs.sunpy.org/en/latest/dev_guide/newcomers.html).



Example of a SunPy Map visualization from observations of the 171 Å wavelength channel of the AIA instrument onboard Solar Dynamics Observatory.

GET INVOLVED

We currently have a few open community roles:

- Continuous Integration Maintainer
- Release Manager
- Webmaster
- Lead Newcomer
- Affiliated Package Liaison

Read more about them at sunpy.org/project/#community-roles (<https://sunpy.org/project/>).

We would like to encourage any interested parties to apply to roles which are currently unfilled by contacting the lead SunPy developer or the deputy lead developer. See the 'Contact us' box below for more info.

CONTACT US

Need help, found a bug, have an idea for an affiliated package, want to start contributing some code?

- Message us on our Element.io channel (<https://openastronomy.element.io/#/room/#sunpy:openastronomy.org>).
- Ask on the mailing list (<https://groups.google.com/forum/#%21forum/sunpy>).
- Submit a GitHub issue (<https://github.com/sunpy/sunpy/issues>).
- Join a meeting (<https://calendar.google.com/calendar/embed?src=g9c9eakg98b5cbogd7m5ta6h8s@group.calendar.google.com&pli=1>).

We have weekly community calls on Wednesday at 17:00 UTC.

Anyone can and is encouraged to get involved and we look forward to meeting you! Please be aware that we have a Code of Conduct (<https://sunpy.org/coc>) that sets out how everyone should behave with each other.

Follow us on Twitter [@SunPyProject](https://twitter.com/sunpyproject) (<https://twitter.com/sunpyproject>), subscribe to the Sunpy [blog](http://sunpy.org/blog) (<http://sunpy.org/blog>), and learn much more about the project on our website [sunpy.org](https://www.sunpy.org) (<https://www.sunpy.org>).

Be sure to check out another e-poster about the SunPy community software survey (<https://agu2020fallmeeting-agu.ipostersessions.com/default.aspx?s=4F-10-44-89-43-E2-CA-50-01-36-38-1C-D3-37-B7-08&guestview=true>)!

AUTHOR INFORMATION

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ABSTRACT

The SunPy project facilitates and promotes the use and development of several community-led, free, and open-source data analysis software packages for solar physics based on the scientific Python environment. The project achieves this goal by developing and maintaining the SunPy core package and supporting an ecosystem of affiliated packages. The SunPy community is pleased to announce the release of version 2.0! Some highlights for this release include updates to the Fido data search and retrieval tool, various fixes to the sunpy.map sub package, and integration of differential rotation into the sunpy.coordinates framework. Also new in SunPy 2.0 is the aiapy package for analyzing data from SDO/AIA, which replaces aiaprep. Learn more about how to install and use the publicly available code at sunpy.org (<https://sunpy.org>), as well as information about how to get involved with the community!

REFERENCES

Citing SunPy in Publications

Please add the following line within your methods, conclusion or acknowledgements sections:

This research used version X.Y.Z (software citation) of the SunPy open source software package (project citation).

The project citation should be to the [SunPy paper](https://iopscience.iop.org/article/10.3847/1538-4357/ab4f7a) (<https://iopscience.iop.org/article/10.3847/1538-4357/ab4f7a>), and the software citation should be the specific Zenodo DOI for the version used in your work. Below is the BibTex entry for the most recent SunPy paper. You can also get this information with `sunpy.__citation__`.

```
@ARTICLE{sunpy_community2020,
```

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doi = {10.3847/1538-4357/ab4f7a},
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```
url = {https://iopscience.iop.org/article/10.3847/1538-4357/ab4f7a},
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author = {{The SunPy Community} and Barnes, Will T. and Bobra, Monica G. and Christe, Steven D. and Freij, Nabil and Hayes, Laura A. and Ireland, Jack and Mumford, Stuart and Perez-Suarez, David and Ryan, Daniel F. and Shih, Albert Y. and Chanda, Prateek and Glogowski, Kolja and Hewett, Russell and Hughitt, V. Keith and Hill, Andrew and Hiware, Kaustubh and Inglis, Andrew and Kirk, Michael S. F. and Konge, Sudarshan and Mason, James Paul and Maloney, Shane Anthony and Murray, Sophie A. and Panda, Asish and Park, Jongyeob and Pereira, Tiago M. D. and Reardon, Kevin and Savage, Sabrina and Sipőcz, Brigitta M. and Stansby, David and Jain, Yash and Taylor, Garrison and Yadav, Tannmay and Rajul, and Dang, Trung Kien},
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title = {The SunPy Project: Open Source Development and Status of the Version 1.0 Core Package},
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journal = {The Astrophysical Journal},
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volume = {890},
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issue = {1},
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pages = {68-},
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publisher = {American Astronomical Society},
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```
year = {2020} }
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