welcome to the SunPy workshop!

grab some pizza and do one of the following:

[1] if you have Anaconda, install SunPy:

```
> conda install sunpy
```

[2] if you don't have Anaconda, find a buddy that does

sunpy / SPD_2017

Watch 4 Star 0 Fork 0

Code Issues 0 Pull requests 0 Projects 0 Wiki Insights

Repository for the SunPy workshop at SPD 2017

9 commits **1** branch **0** releases **2** contributors

Branch: master New pull request Create new file Upload files Find file Clone or download

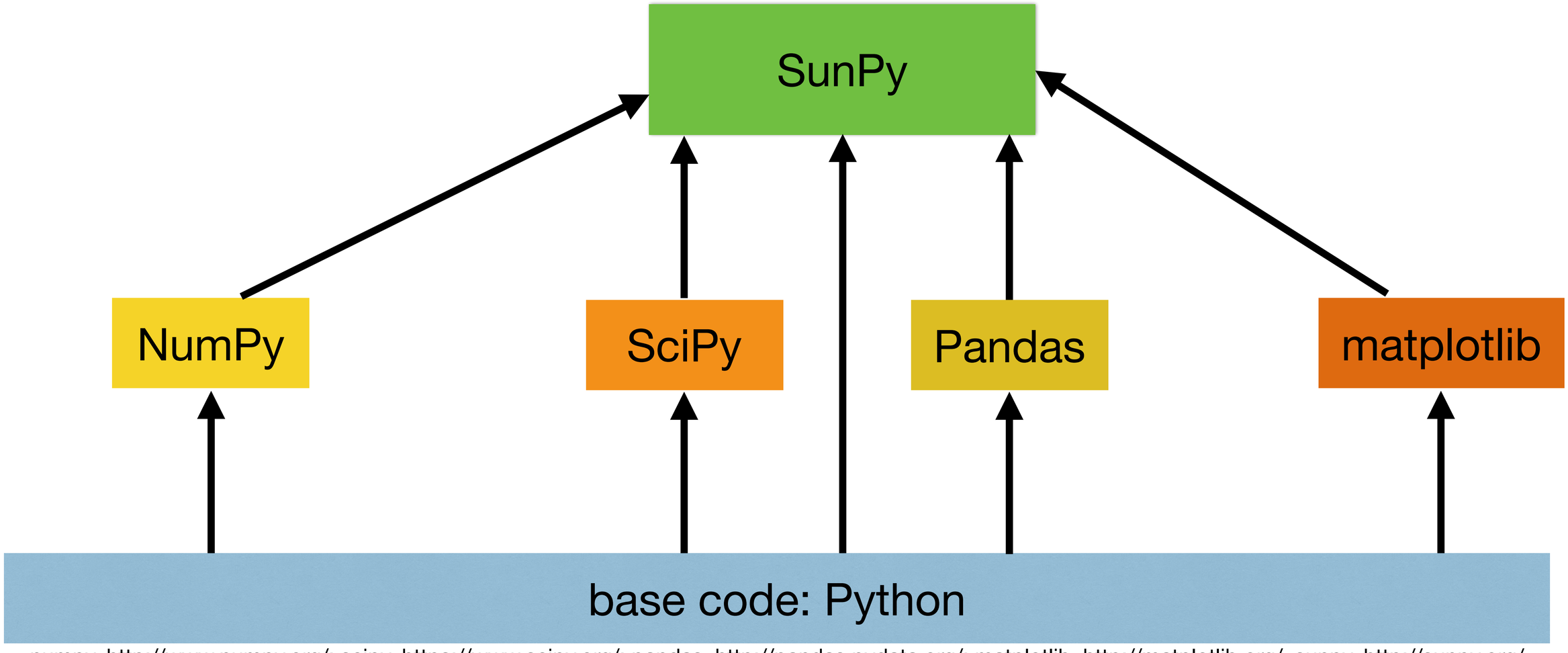
DanRyanIrish spectral line fitting notebook and file. Latest commit da5a2c4 5 hours ago

sample-photos	added sample photos to repository.	a day ago
EVS_L2_2011045_01_005_01.fit	spectral line fitting notebook and file.	5 hours ago
README.md	Update README.md	a day ago
eclipse_example.ipynb	added eclipse notebook	2 days ago
fido_example.ipynb	Added an example notebook on the unified downloader fido.	12 days ago
jsoc_example.ipynb	added jsoc example notebook	2 days ago
python_tutorial_fitting_a_spectral_lin...	spectral line fitting notebook and file.	5 hours ago
timeseries_example.ipynb	added a timeseries example notebook	6 days ago

5 Reasons Why I Think Python is Awesome

Monica Bobra
Stanford University
mbobra@stanford.edu

#1 the sheer number of packages



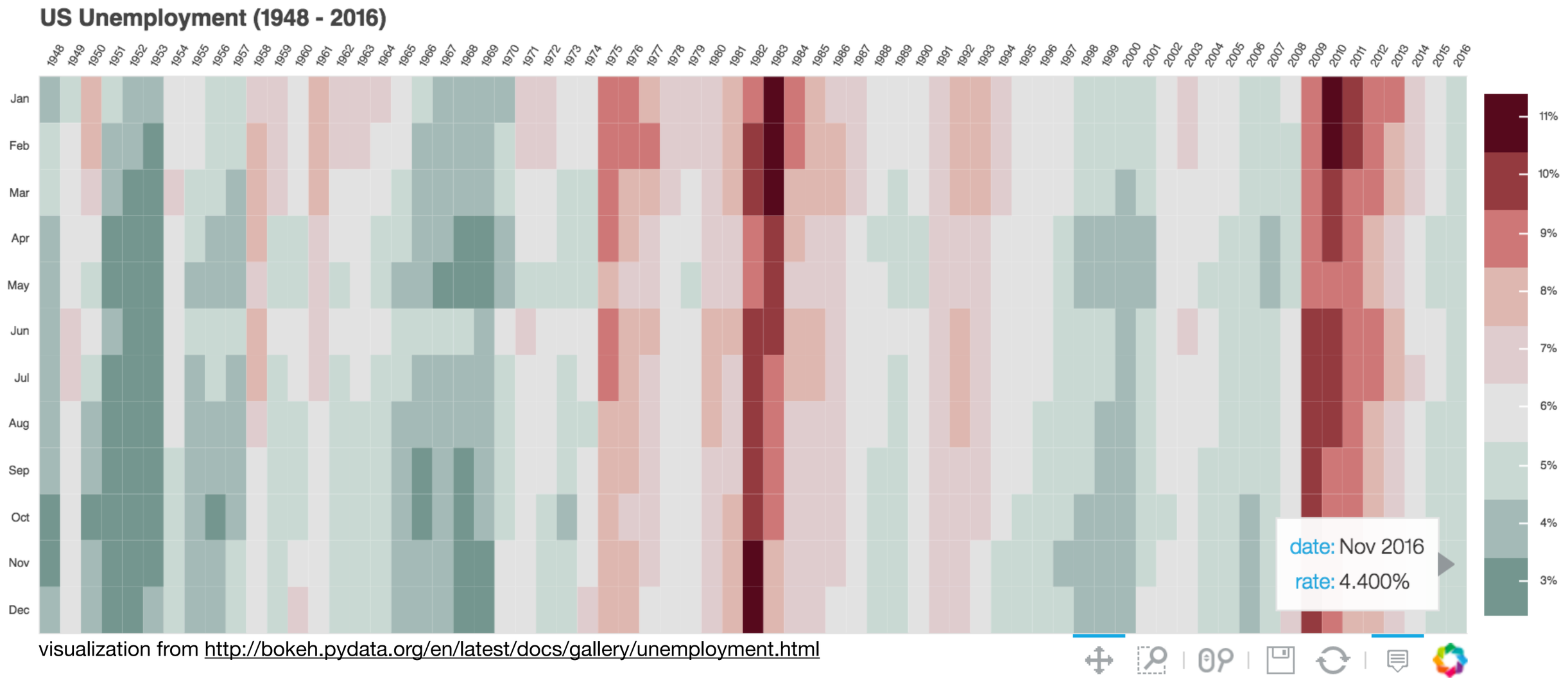
numpy, http://www.numpy.org/; scipy, https://www.scipy.org/; pandas, http://pandas.pydata.org/; matplotlib, http://matplotlib.org/, sunpy, http://sunpy.org/

#1 the sheer number of packages

according to the Python Package Index (PyPI), there are 115,271 packages as of today

PyPI, https://pypi.python.org/pypi

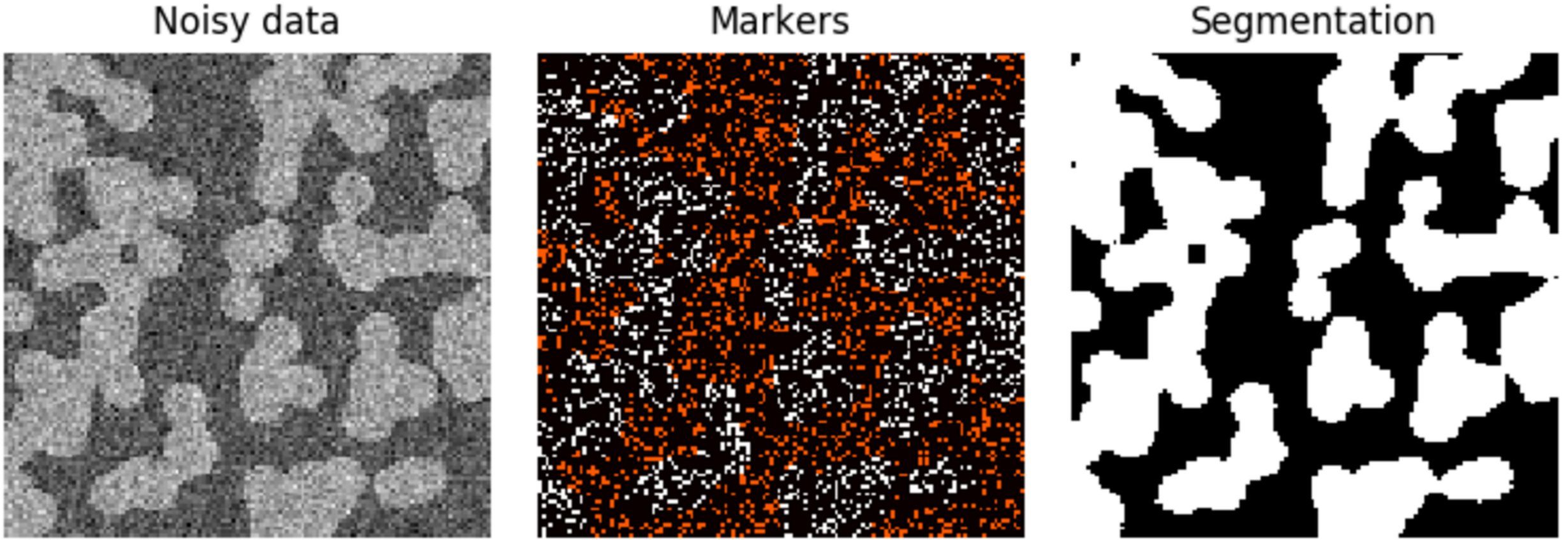
interactive data visualization



visualization from http://bokeh.pydata.org/en/latest/docs/gallery/unemployment.html

bokeh, http://bokeh.pydata.org/
mpld3, https://mpld3.github.io/
seaborn, http://seaborn.pydata.org/

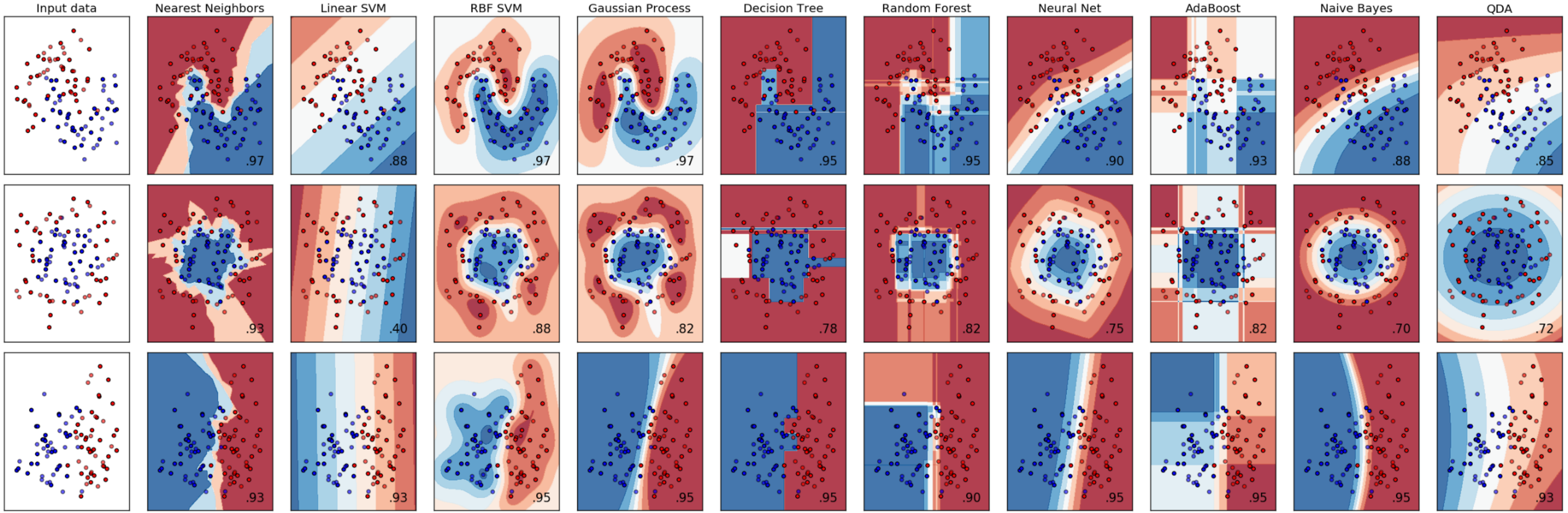
computer vision



example from http://scikit-image.org/docs/stable/auto_examples/segmentation/plot_random_walker_segmentation.html

scikit-image, http://scikit-image.org/
opencv, http://opencv.org/
pillow, https://pillow.readthedocs.io

machine learning



visualization from http://scikit-learn.org/stable/auto_examples/classification/plot_classifier_comparison.html

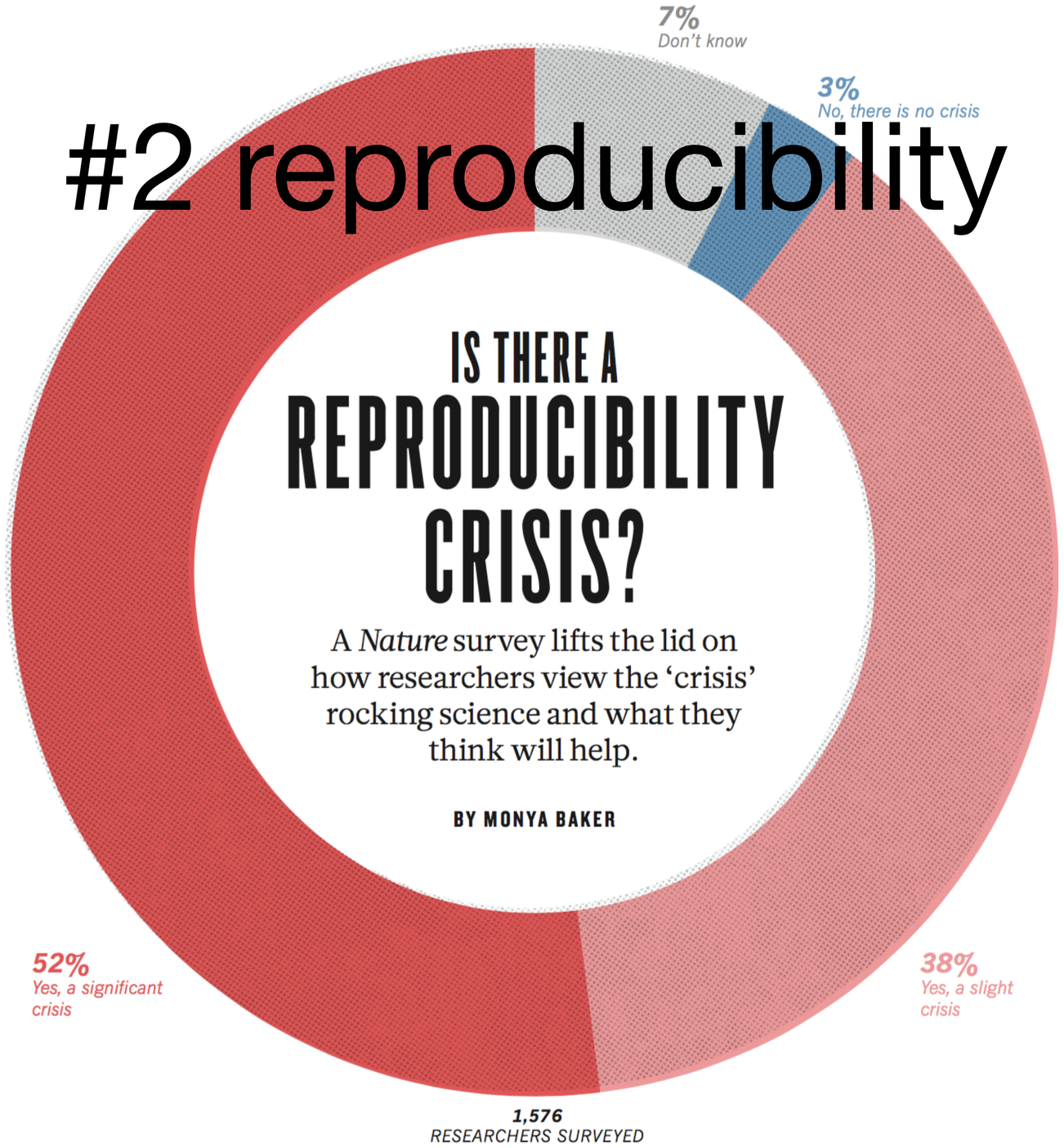
scikit-learn, http://scikit-learn.org/
caffe, http://caffe.berkeleyvision.org/

related fields

PlasmaPy

sunpy, http://sunpy.org/, The SunPy Community (2015)
astropy, http://www.astropy.org/, The Astropy Collaboration (2013)
plasmapy, https://github.com/PlasmaPy/PlasmaPy, Murphy et al. (2016)
spacepy, https://pythonhosted.org/SpacePy/, Morley et al. (2011)

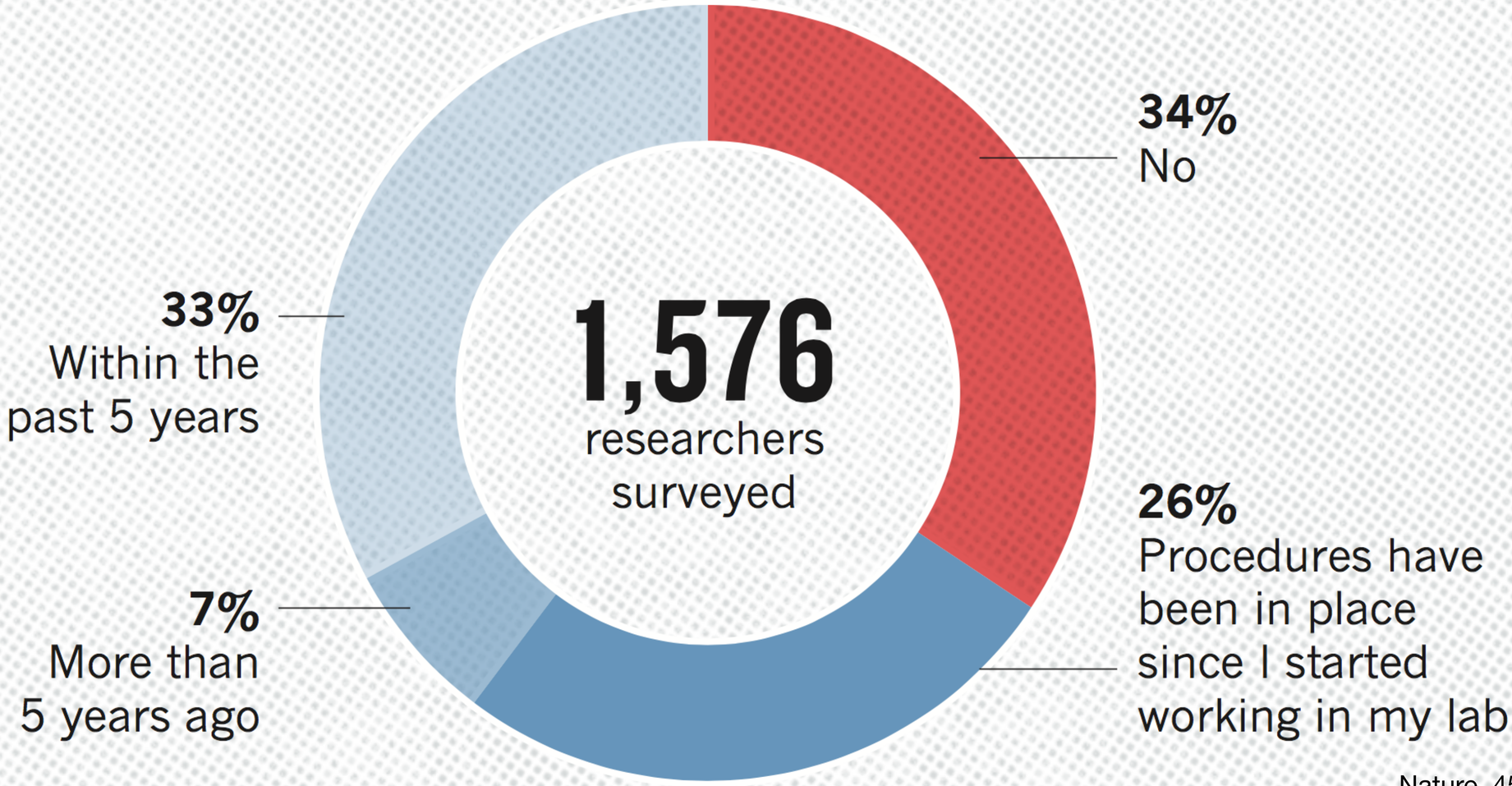
#2 reproducibility



Nature, 452, 533, May 2016

HAVE YOU ESTABLISHED PROCEDURES FOR REPRODUCIBILITY?

Among the most popular strategies was having different lab members redo experiments.



Nature, 452, 533, May 2016

TOOLBOX

INTERACTIVE NOTEBOOKS: SHARING THE CODE

The free IPython notebook makes data analysis easier to record, understand and reproduce.

ILLUSTRATION BY THE PROJECT TWINS

Nature, 152 515, Nov 2014

Reproducible academic publications

This section contains academic papers that have been published in the peer-reviewed literature or pre-print sites such as the ArXiv that include one or more notebooks that enable (even if only partially) readers to reproduce the results of the publication. If you include a publication here, please link to the journal article as well as providing the nbviewer notebook link (and any other relevant resources associated with the paper).

1. Discovery of Gravitational Waves by the LIGO collaboration. That page, from the LIGO Open Science Center, contains multiple notebooks for various datasets corresponding to different events; this binder lets you run the code right away. More details on the GW150914 event as well as the original main Physical Review Letters paper, "Observation of Gravitational Waves from a Binary Black Hole Merger".

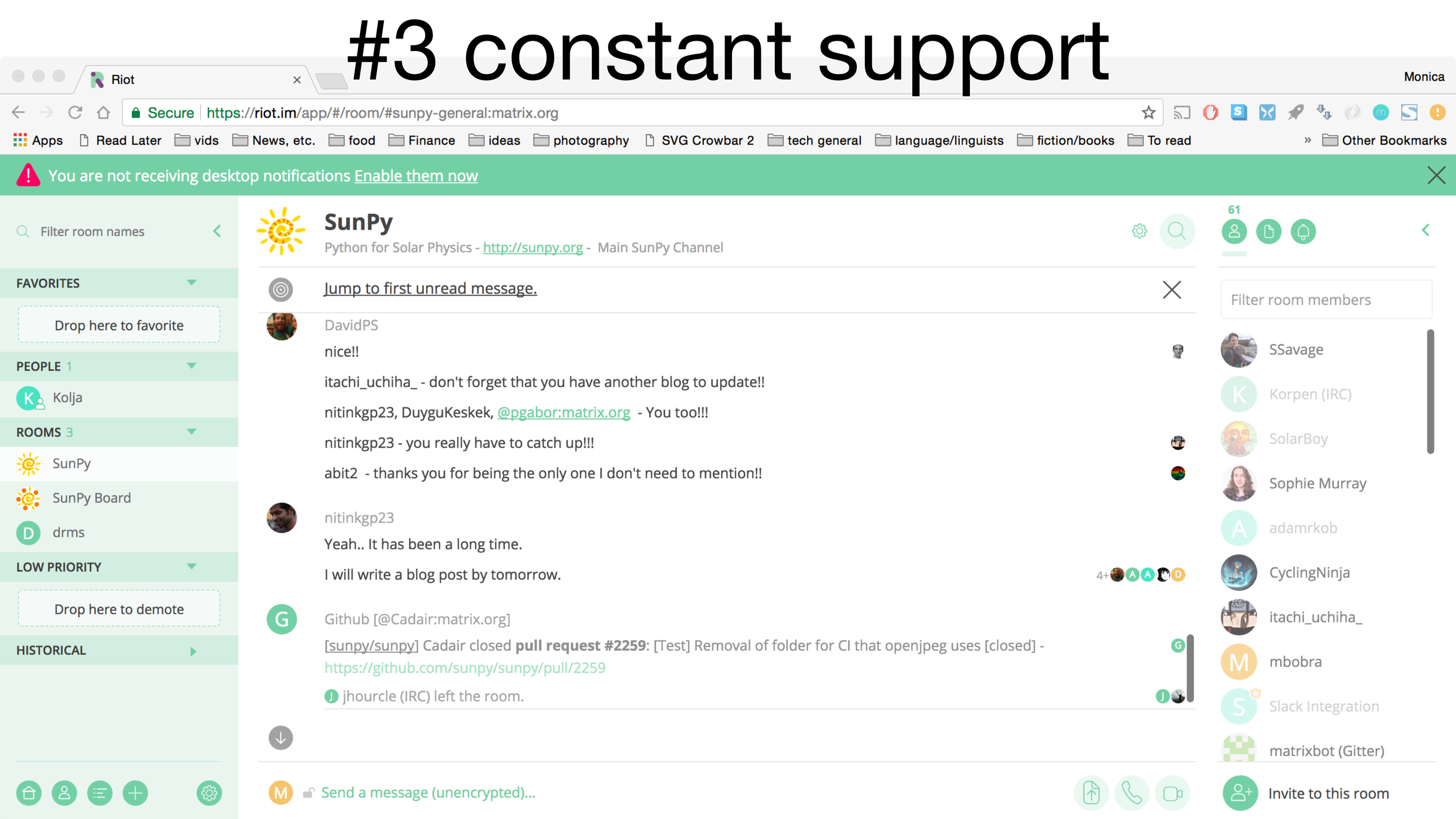
2. Characterizing Strain Variation in Engineered E. coli Using a Multi-Omics-Based Workflow, by Brunk et al.

3. Predicting Coronal Mass Ejections Using Machine Learning Methods by Monica Bobra and Stathis Ilonidis (Astrophysical Journal, 2016). An IPython notebook, which reproduces all the results, has been permanently deposited in the Stanford Digital Repository.

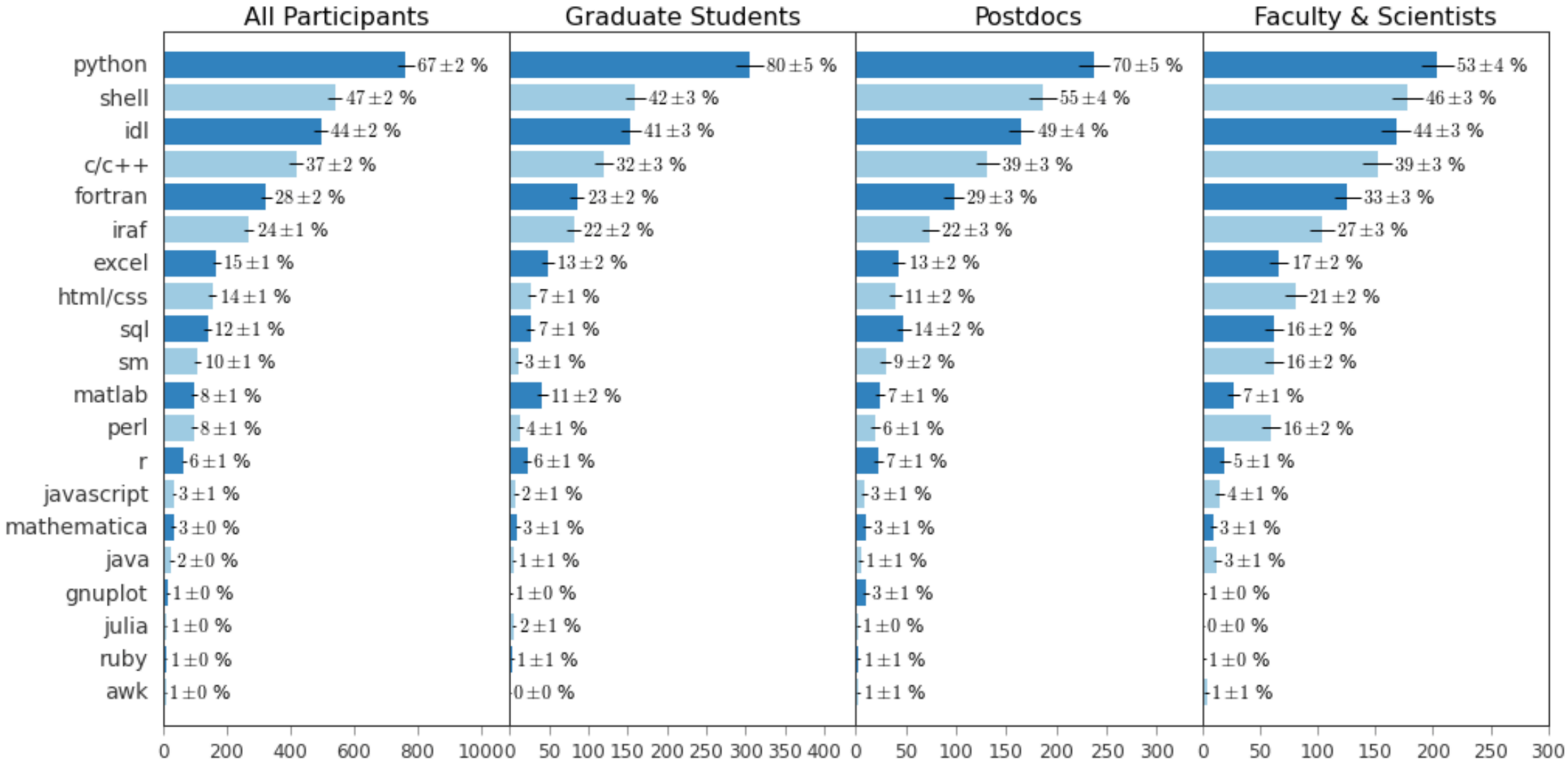
4. The Paper of the Future by Alyssa Goodman et al. (Authorea Preprint, 2017). This article explains and shows with demonstrations how scholarly "papers" can morph into long-lasting rich records of scientific discourse, enriched with deep data and code linkages, interactive figures, audio, video, and commenting. It includes an interactive d3.js visualization and has an astronomical data figure with an IPYthon Notebook "behind" it.

Nature, 152 515, Nov 2014

#3 constant support



#4 large community



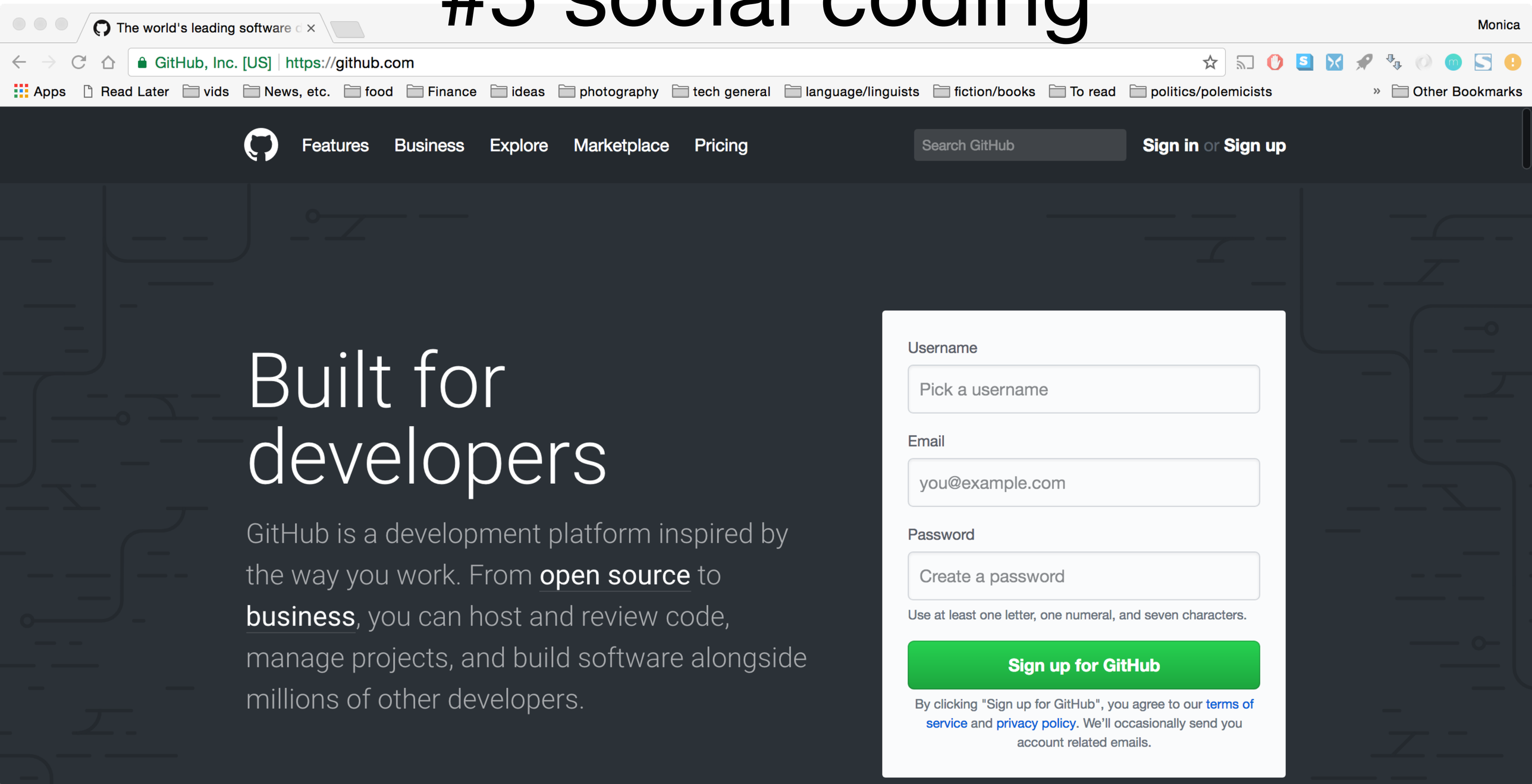
Momcheva & Tollerud (2015)

#4 large community

Programming Language	2017	2012	2007	2002	1997	1992	1987
Java	1	1	1	1	15	-	-
C	2	2	2	2	1	1	1
C++	3	3	3	3	2	2	5
C#	4	4	7	14	-	-	-
Python	5	7	6	11	27	-	-
Visual Basic .NET	6	19	-	-	-	-	-
PHP	7	6	4	5	-	-	-
JavaScript	8	9	8	8	22	-	-
Perl	9	8	5	4	4	10	-
Assembly language	10	-	-	-	-	-	-

TIOBE index, www.tiobe.com

#5 social coding



#5 social coding

“100% of people use software in their research, but very little have formal training.”

—Momcheva and Tollerud (2015)

#5 social coding

PEP 8

Travis CI

pytest

SPHINX

PYTHON DOCUMENTATION GENERATOR

Read the Docs

Create, host, and browse documentation.

more resources

- SunPy Guide: http://docs.sunpy.org/en/stable/guide/index.html
- Open Astronomy course: https://github.com/OpenAstronomy/crash_course
- SunPy workshops: https://github.com/sunpy/presentations