

jupyter[°] Pop-up

@JupyterCon | #JupyterPopUp



State of Jupyter

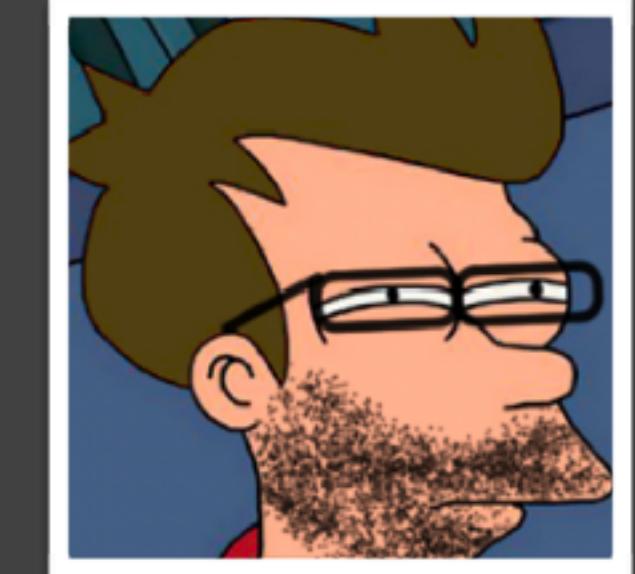
March 21st, 2018

Matthias Bussonnier

bussonniermatthias@gmail.com

GitHub: @carreau

Twitter: @mbussonn



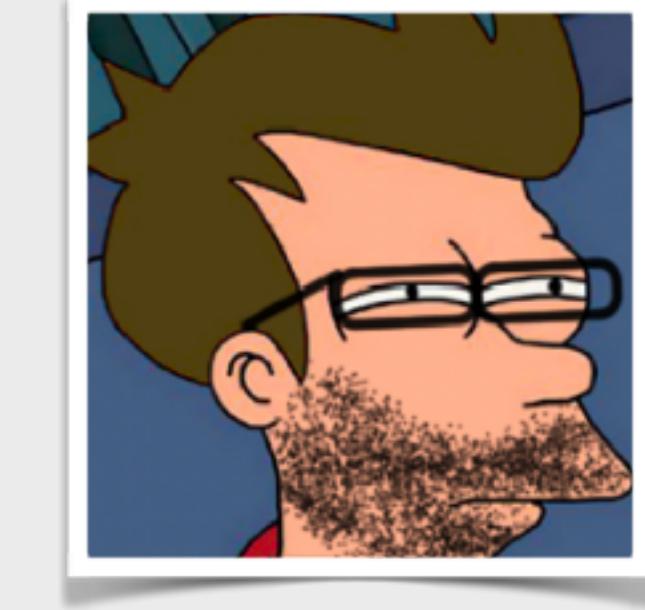


NUMFOCUS
OPEN CODE = BETTER SCIENCE

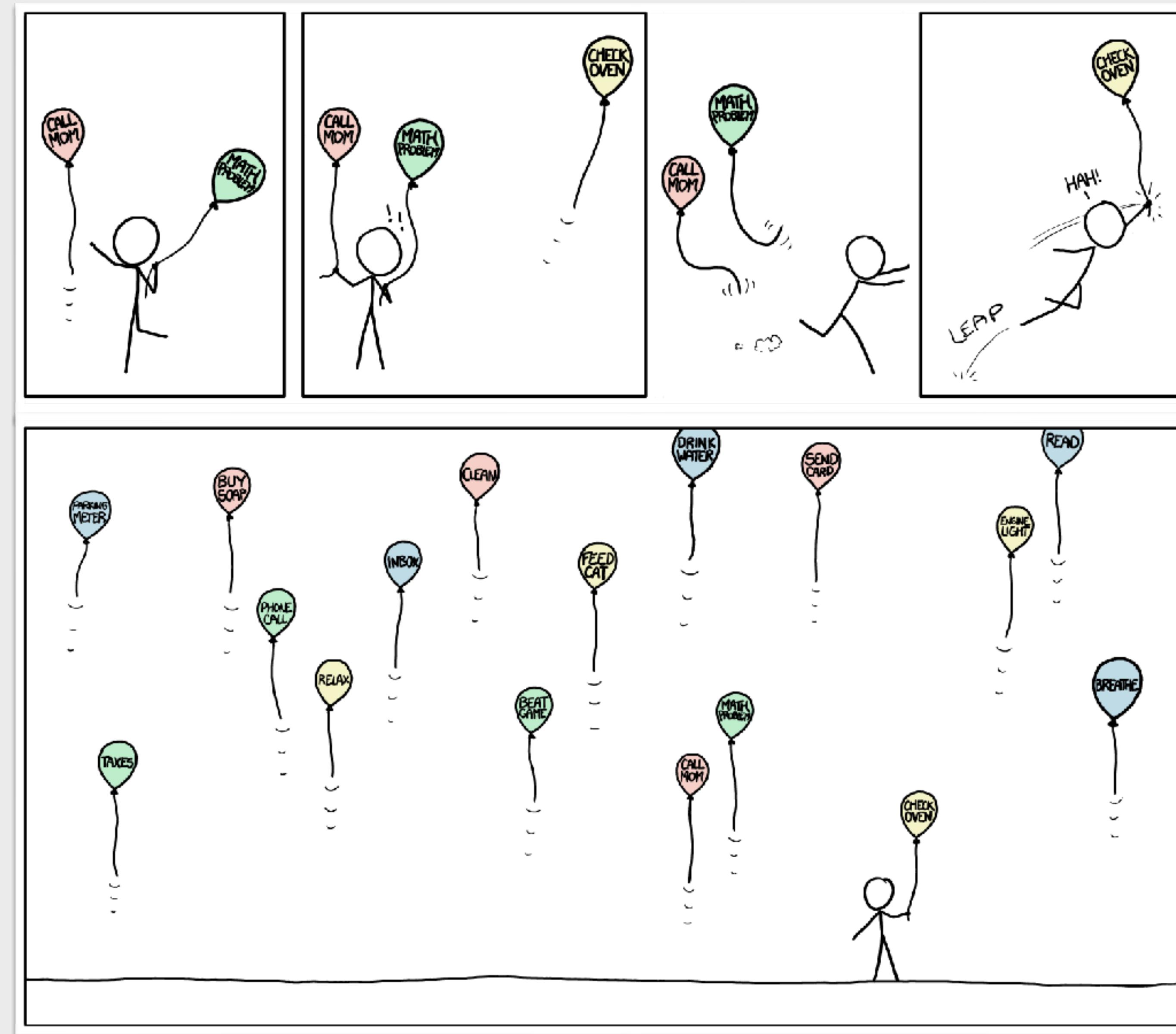
About Me



Matthias Bussonnier



Core developer of IPython/Jupyter since 2012,
Founding and Steering Council member.



Randall Munroe
(<https://xkcd.com/1106/>)

IPython – 2001

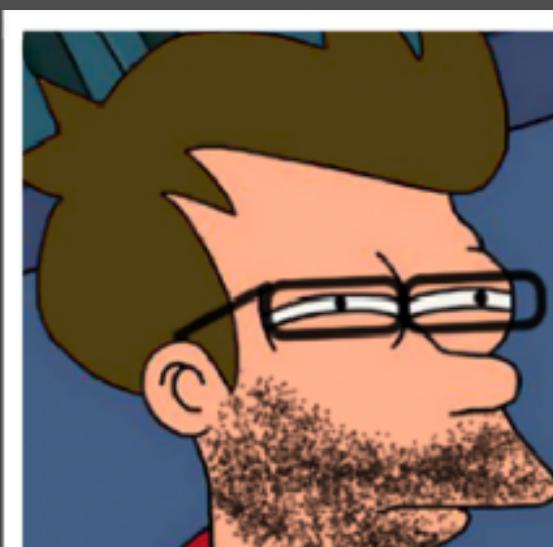
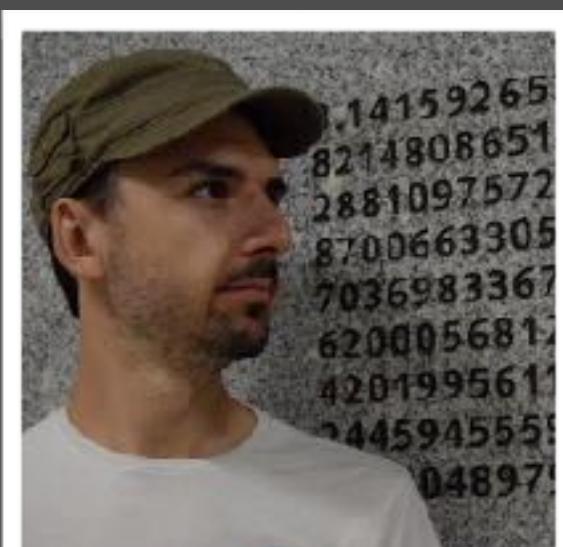


```
IPython
$ ipython
Python 3.6.0
Type 'copyright', 'credits' or 'license' for more information
IPython 6.0.0.dev -- An enhanced Interactive Python. Type '?' for help.

In [1]: from string import hexdigits
....: from random import choice
....:
....: def randhex(length=10):
....:     return '0x'+''.join([choice(hexdigits) for x in range(10)]).l
...:                                         ljust
...:                                         lower
...:                                         lstrip
```



The Notebook – 2012



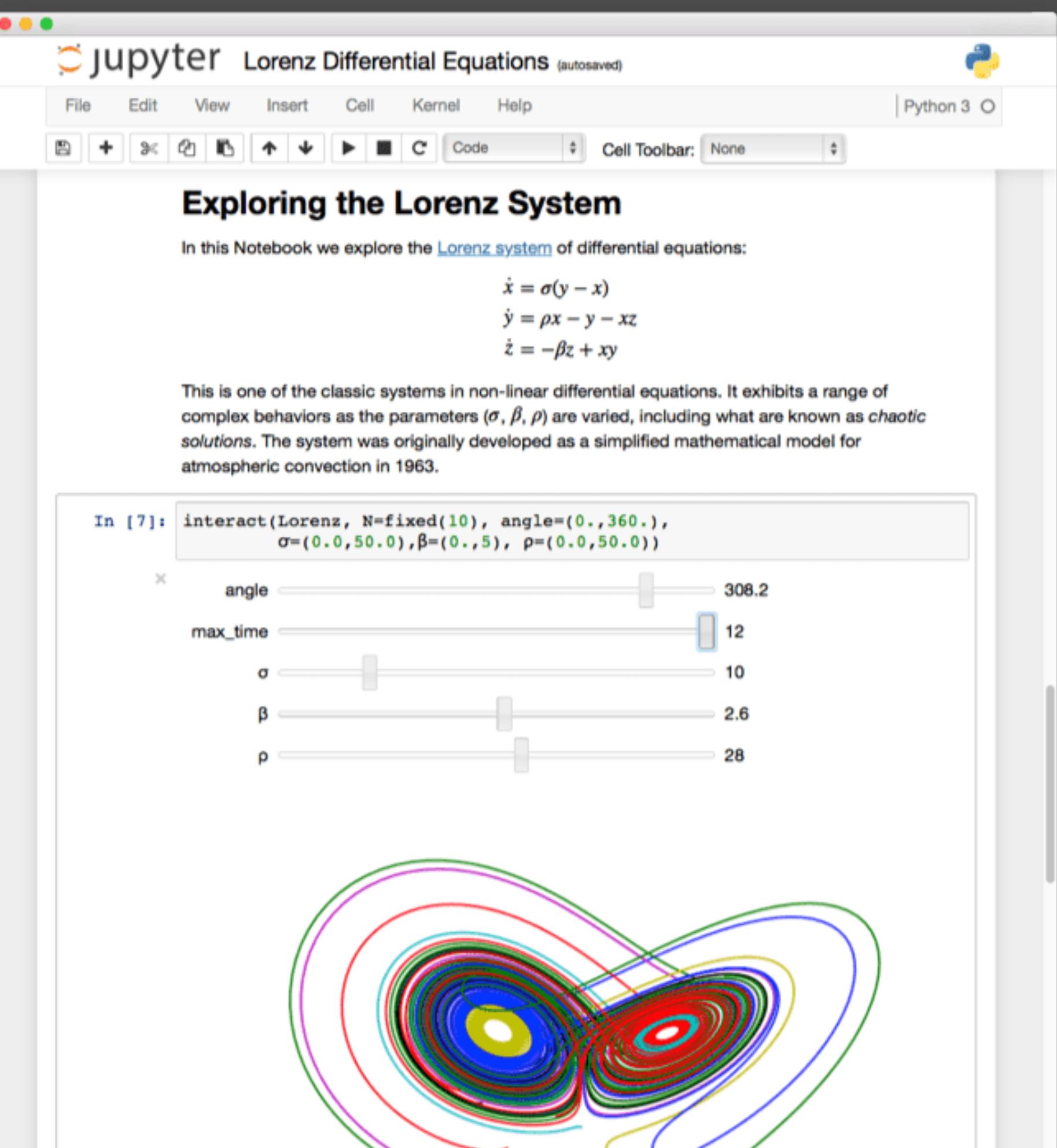
This screenshot shows the Jupyter Notebook interface. On the left, there's a sidebar with the Jupyter logo and the text "Welcome to the". Below it, a "WARNING" box says "Don't rely on this server". At the bottom, there's a "Run some Python code" section with instructions and a "Full tutorial for using the" link.

```
In [7]: interact(Lorenz, N=fixed(10), angle=(0.,360.),
               σ=(0.0,50.0),β=(0.,5), ρ=(0.0,50.0))
```

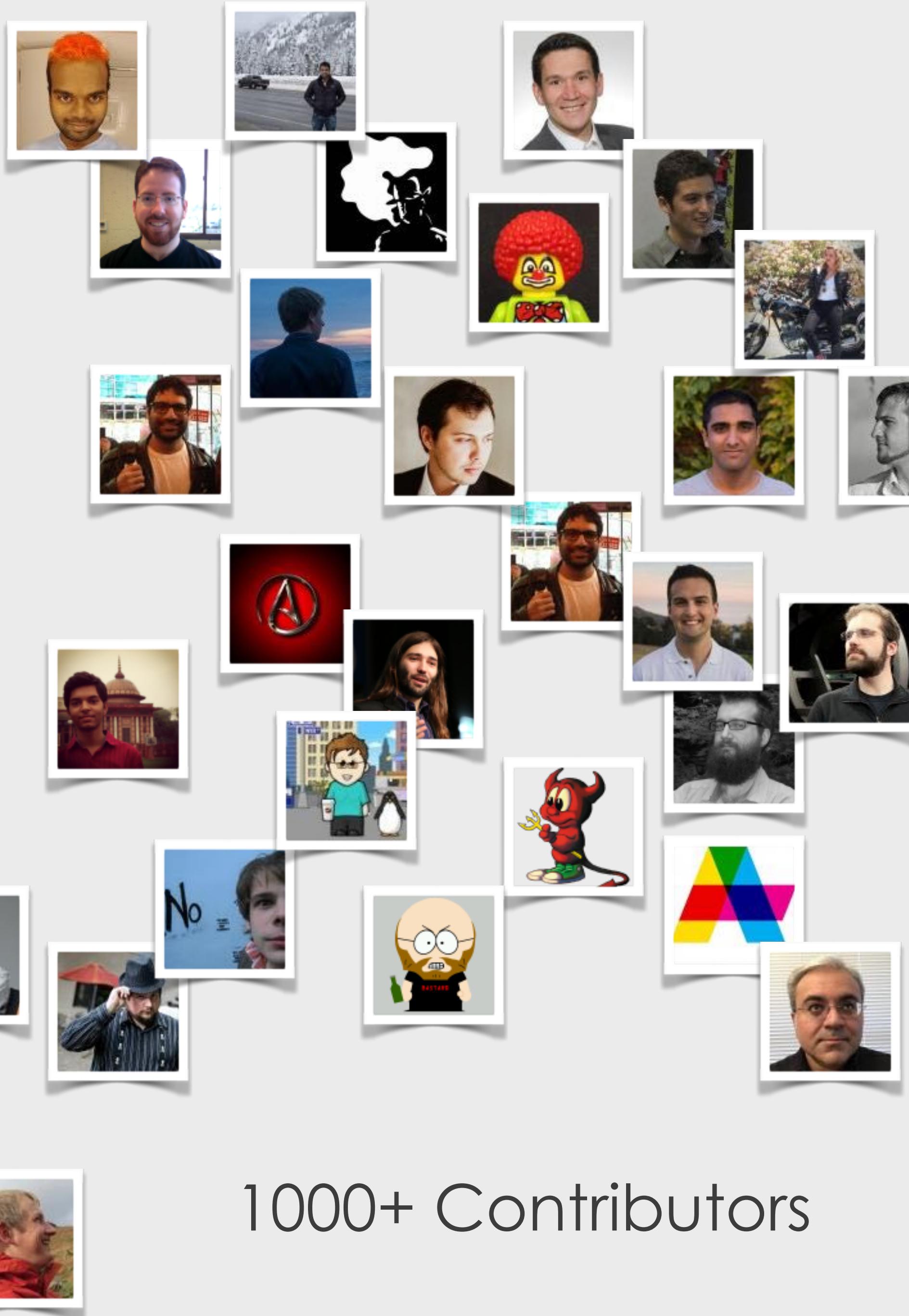
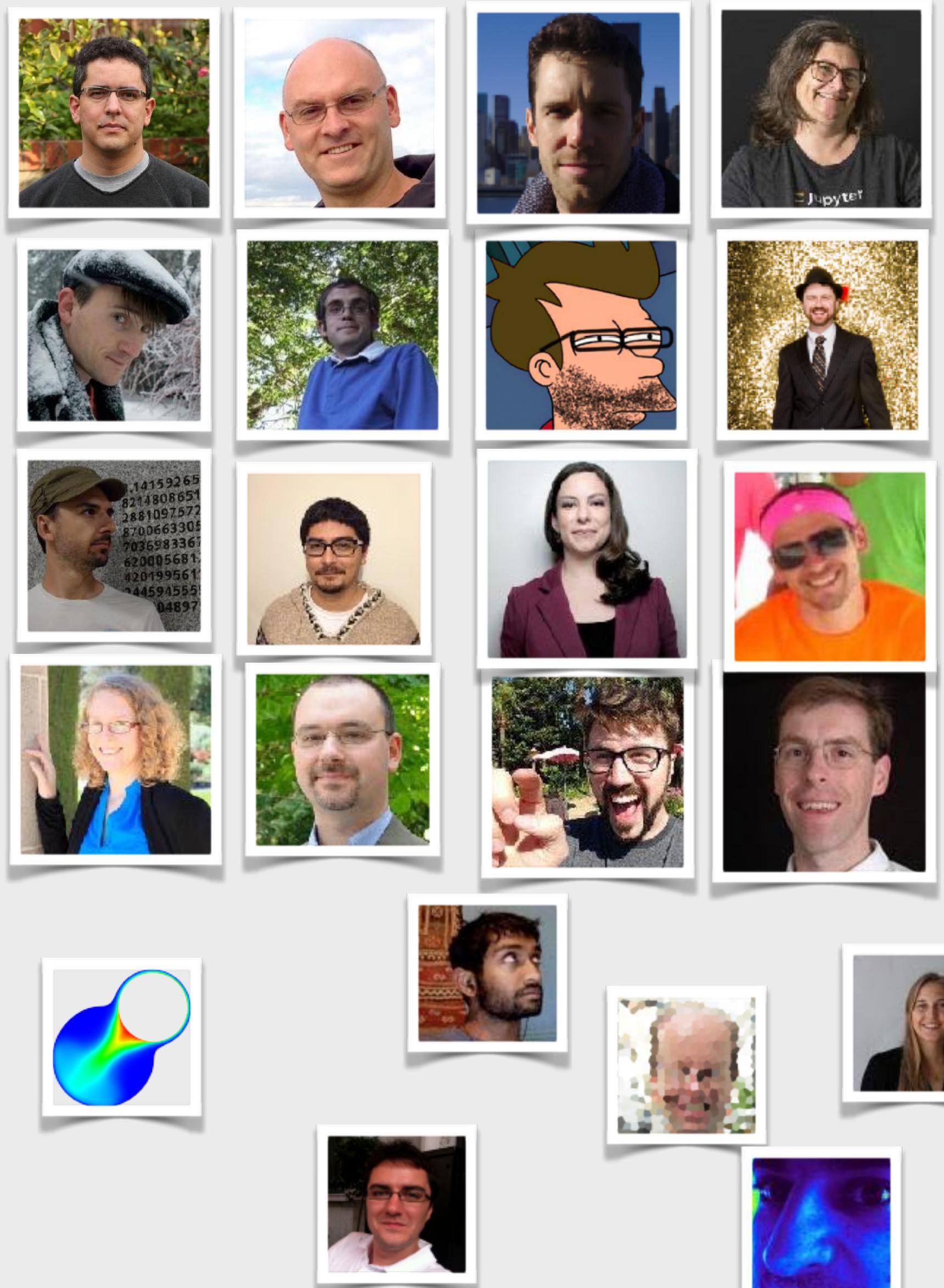
1. Click on the cell to select it
2. Press SHIFT+ENTER

```
In [ ]: #matplotlib inline
```

```
import pandas as pd
import numpy as np
import matplotlib
```



Jupyter – 2014



1000+ Contributors



~ 20 core members
~1/2 academics
&1/2 private sector

For the majority:
Not a Full-Time Job



Berkeley
UNIVERSITY OF CALIFORNIA

GORDON AND BETTY
MOORE
FOUNDATION

O'REILLY®

Bloomberg

QuantStack
Scientific Computing



Alfred P. Sloan
FOUNDATION

NETFLIX

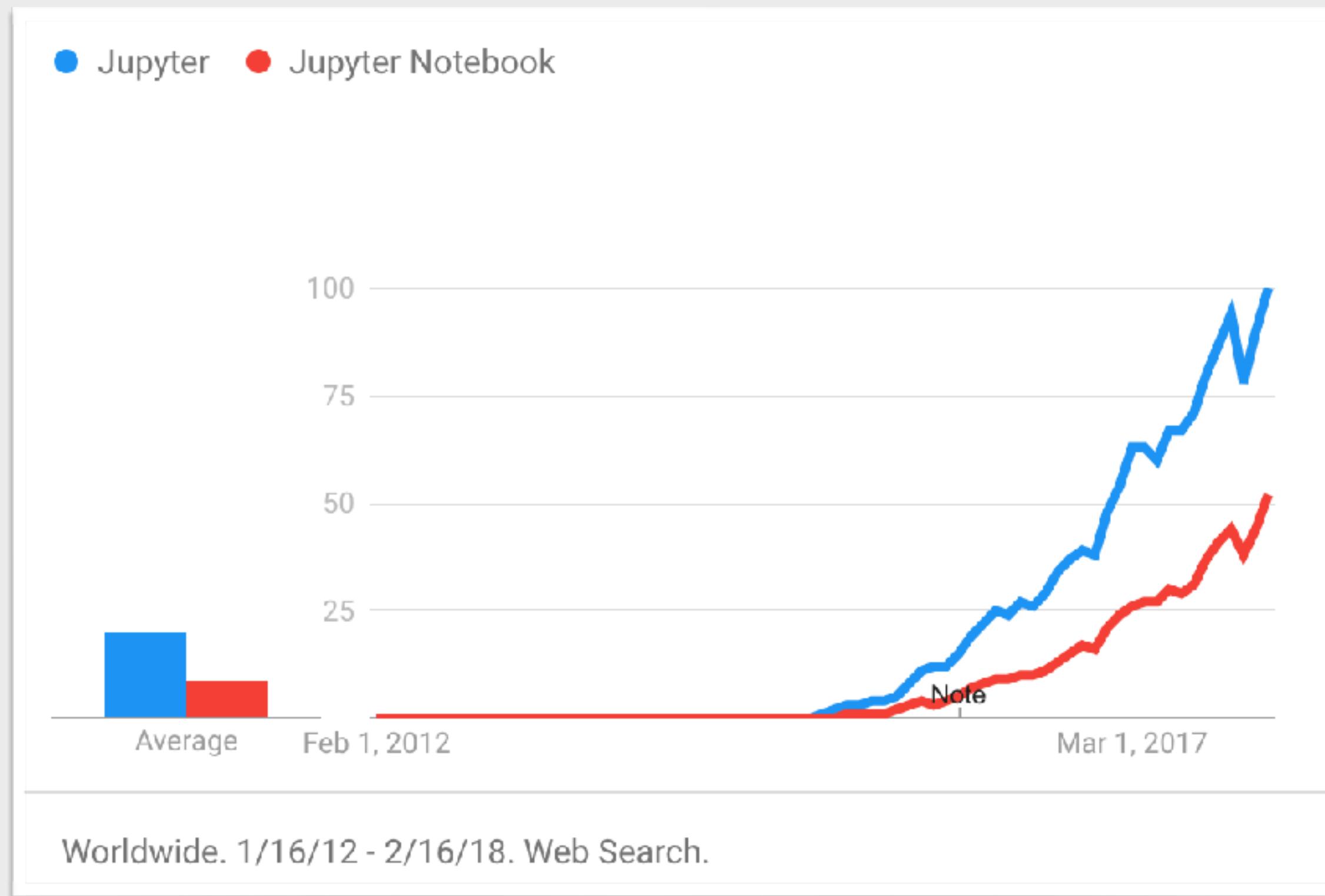
QUANSIGHT

CAL POLY
SAN LUIS OBISPO

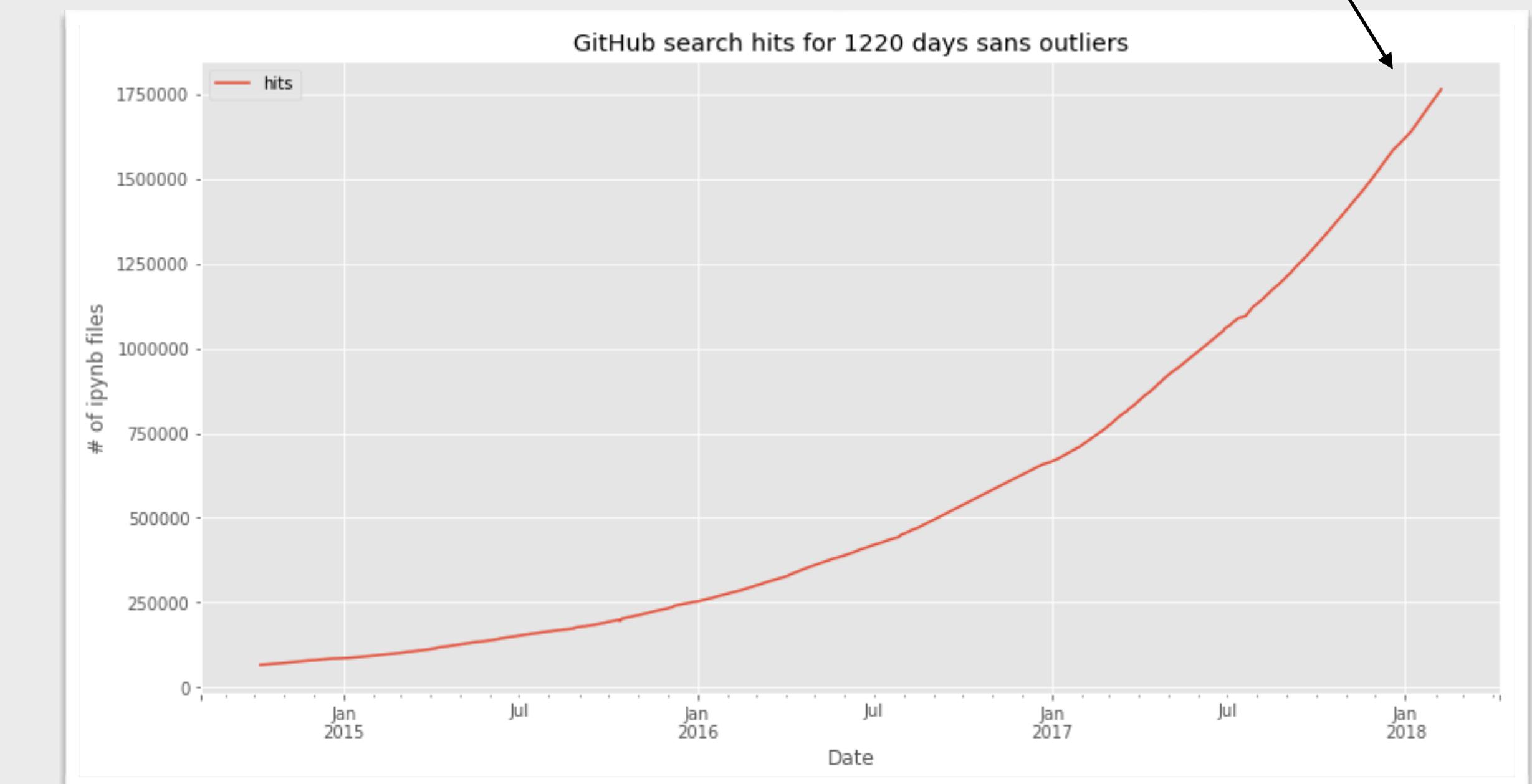
THE LEONA M. AND HARRY B.
HELMSLEY
CHARITABLE TRUST

NUMFOCUS
OPEN CODE = BETTER SCIENCE

A few Numbers

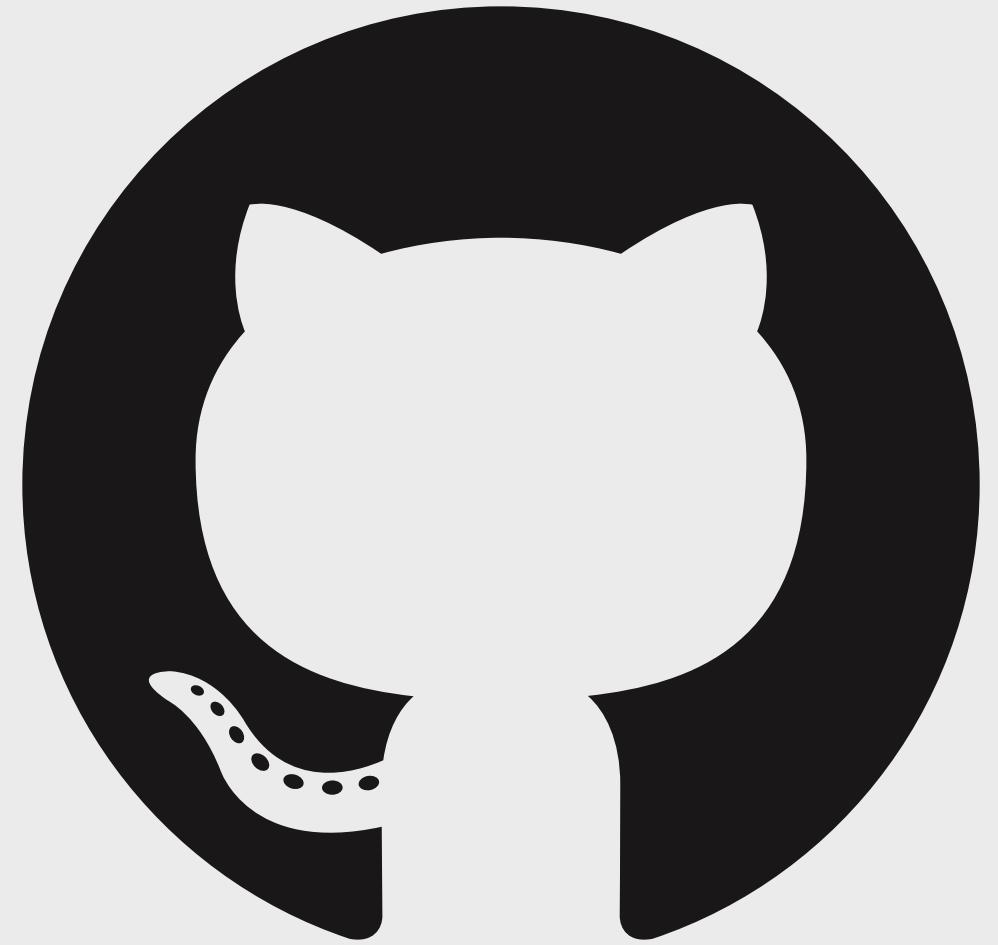


~1.7M notebooks
on GitHub in Jan 2018



<https://github.com/parente/nbestimate>



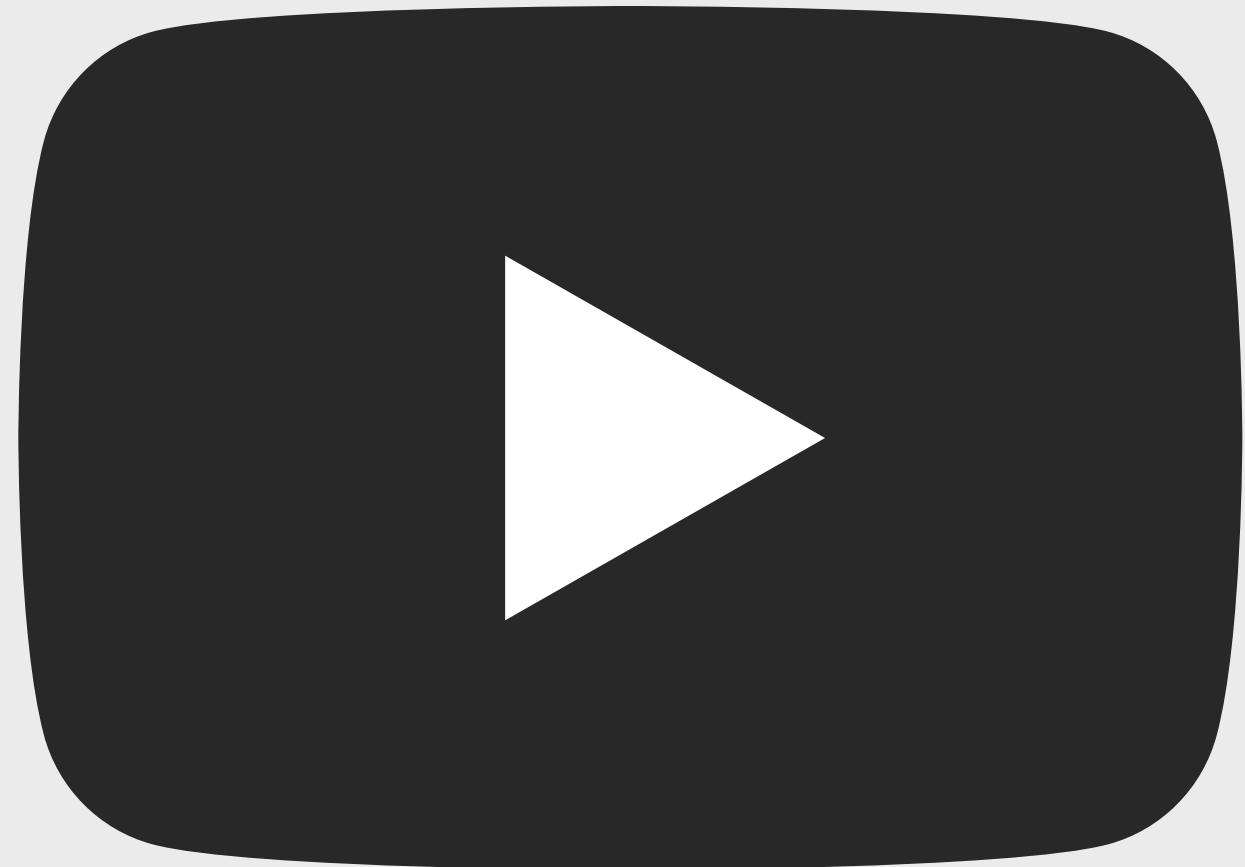


150+ repositories across multiple organisations
(IPython, Jupyter, JupyterHub, JupyterLab, ...)
at 2 release/year that's ~ 1 release per day

1000+ Contributors

8+ Millions Users,
(with conservative estimates)

Worldwide ~21M developers – North America ~4.4M
VS Code ~2.6 M Active Users
GitHub 24M Users



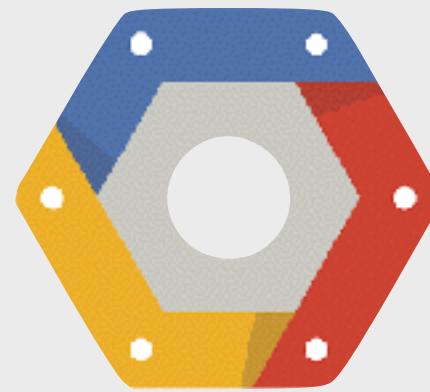
youtube.com/c/ipython

Developers meetings are recorded and available online

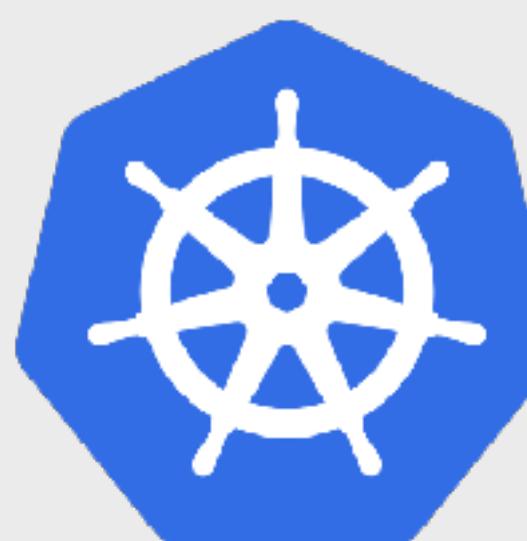
Education



Jupyter in education



Azure Notebook



...

- NBGrader
- Multiple Extensions

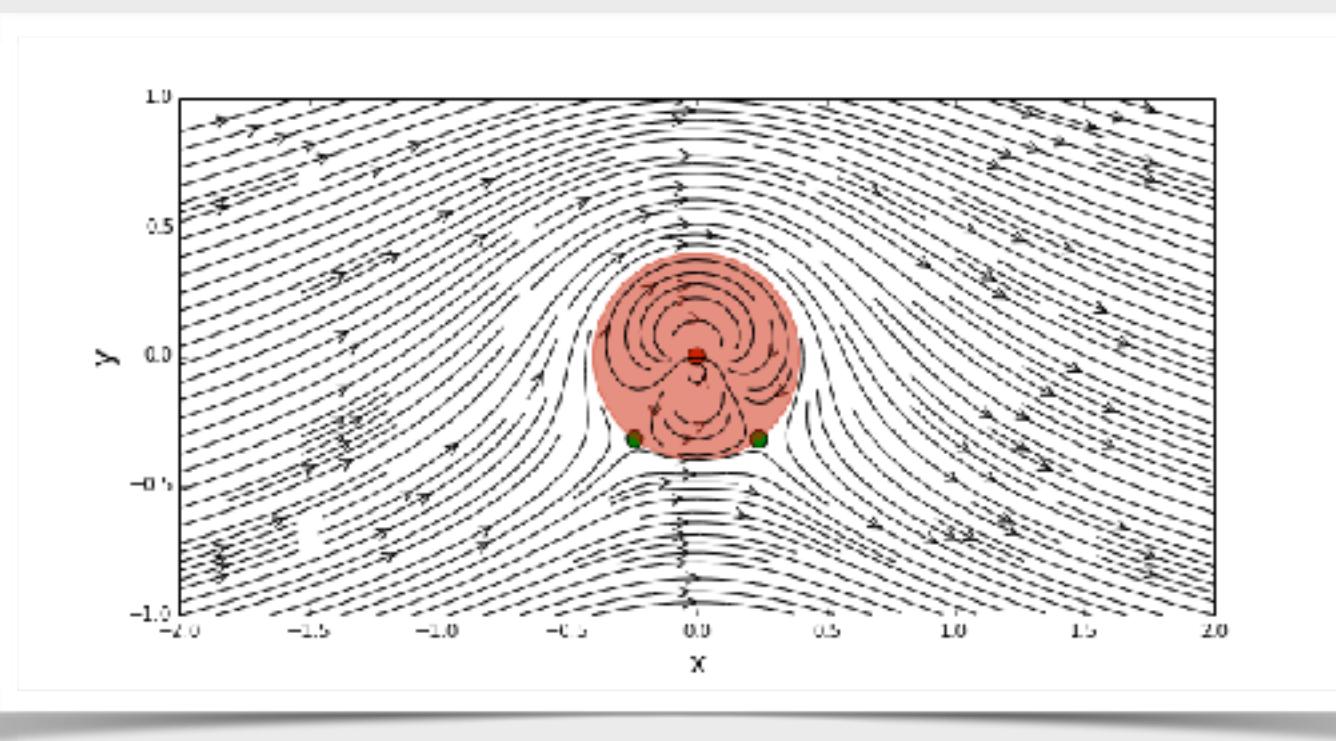


DataHub
datahub.berkeley.edu

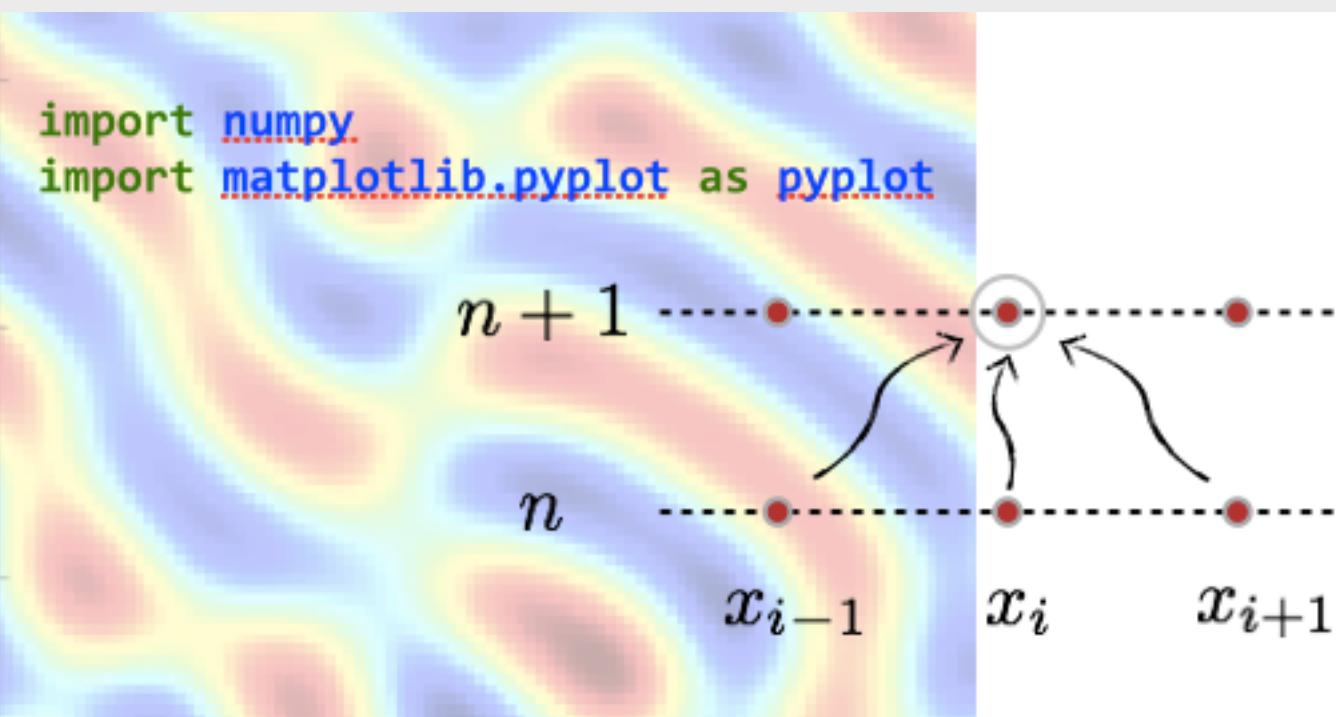
2 500+ Students



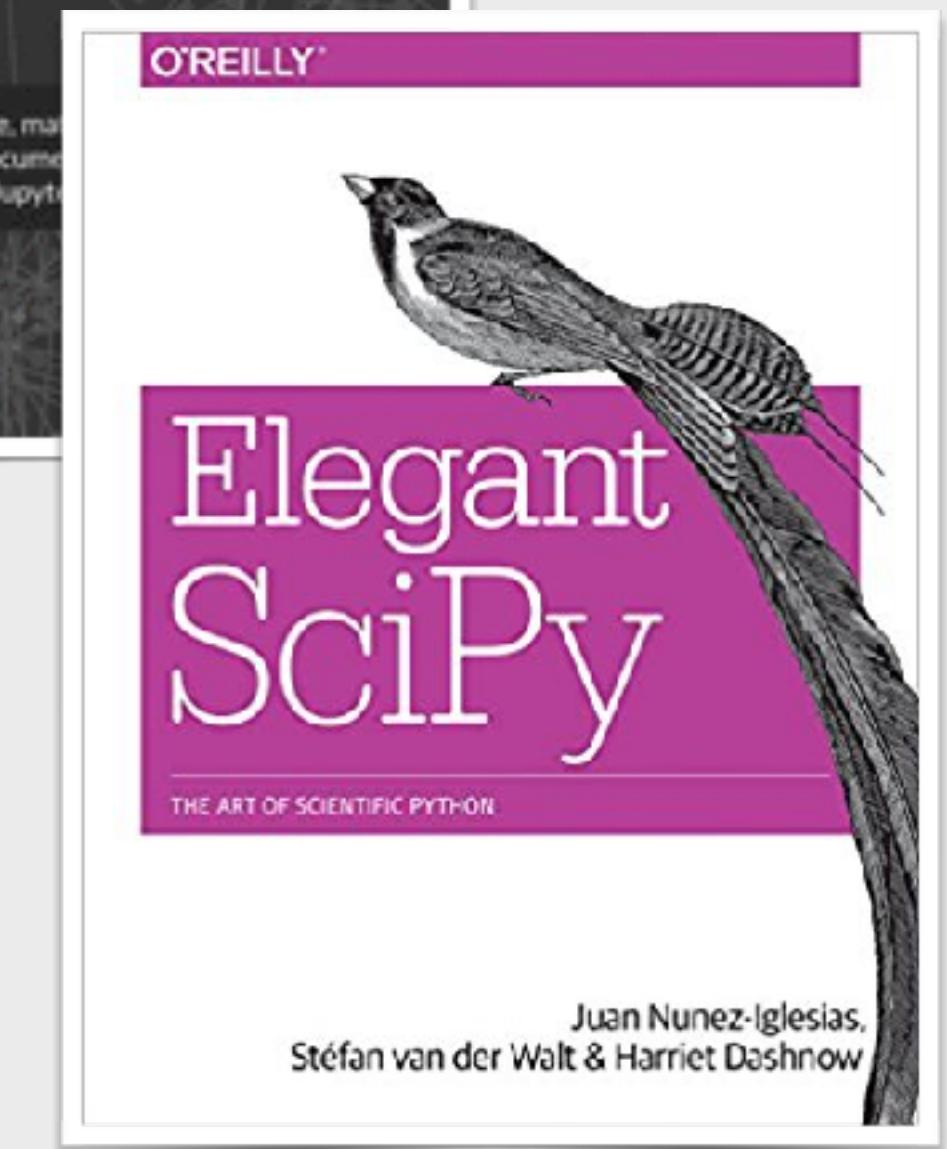
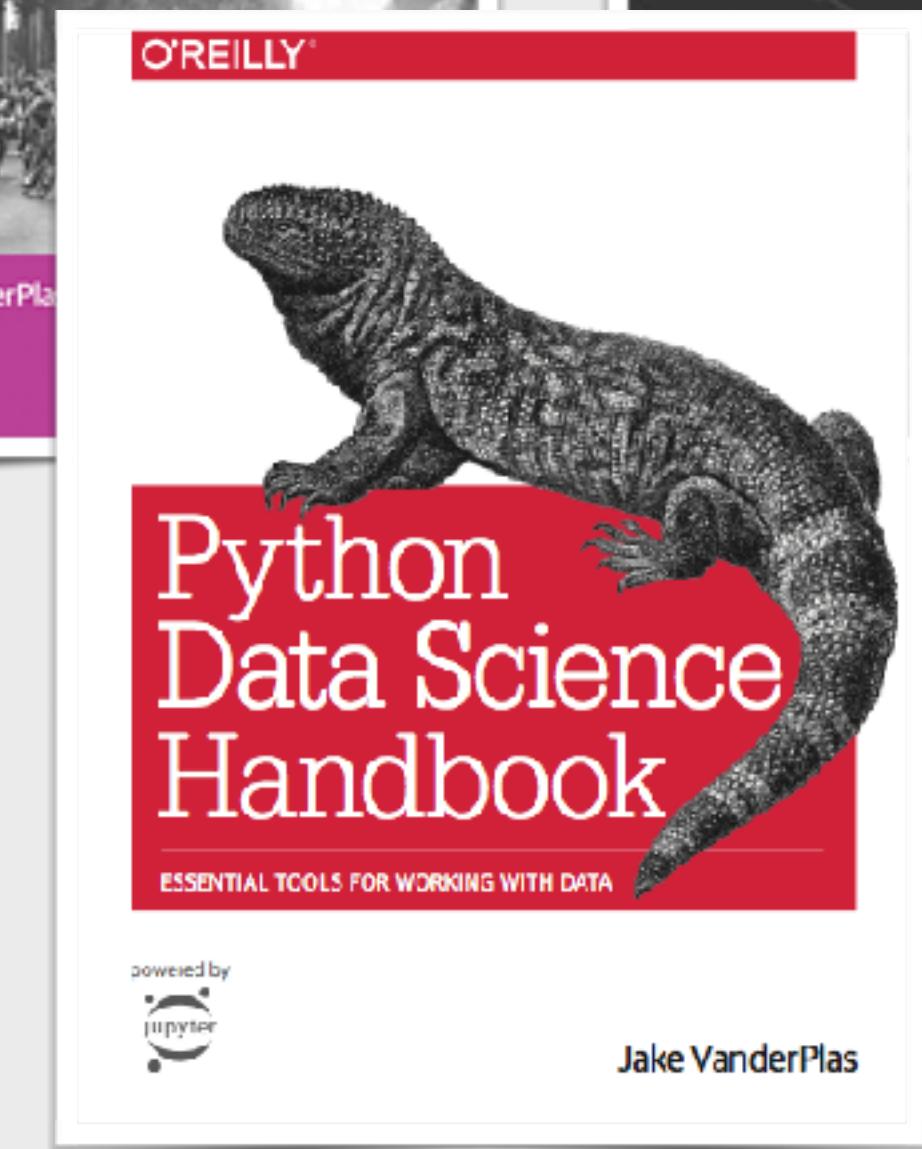
<http://www.ds100.org/>



AeroPython



Numerical Mooc



Jupyter Notebook is and will be the platform used in Data Science

Education Mailing List



jupyter-education@googlegroups.com

Jupyter ❤ Machine Learning/AI



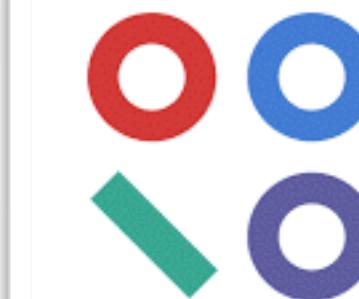
kaggle

K Keras

TensorFlow



Amazon SageMaker



R-Brain



Google Colaboratory

GRYD



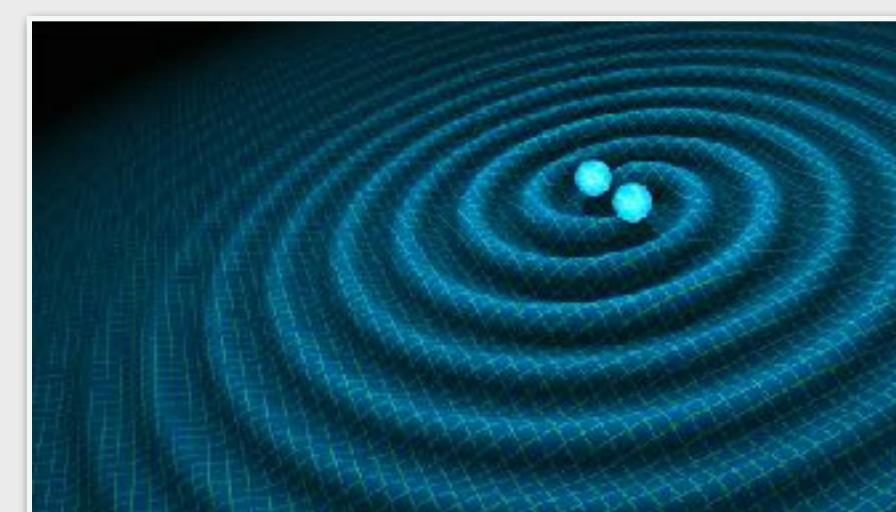
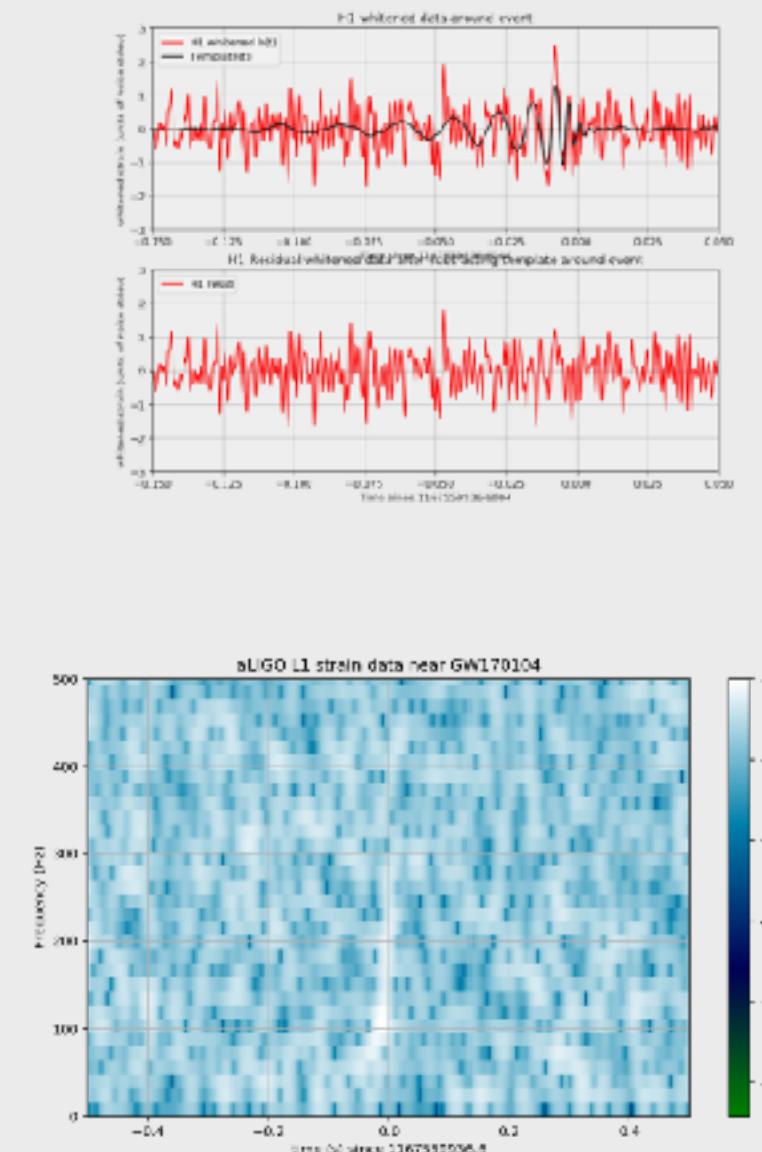
...

CODE OCEAN

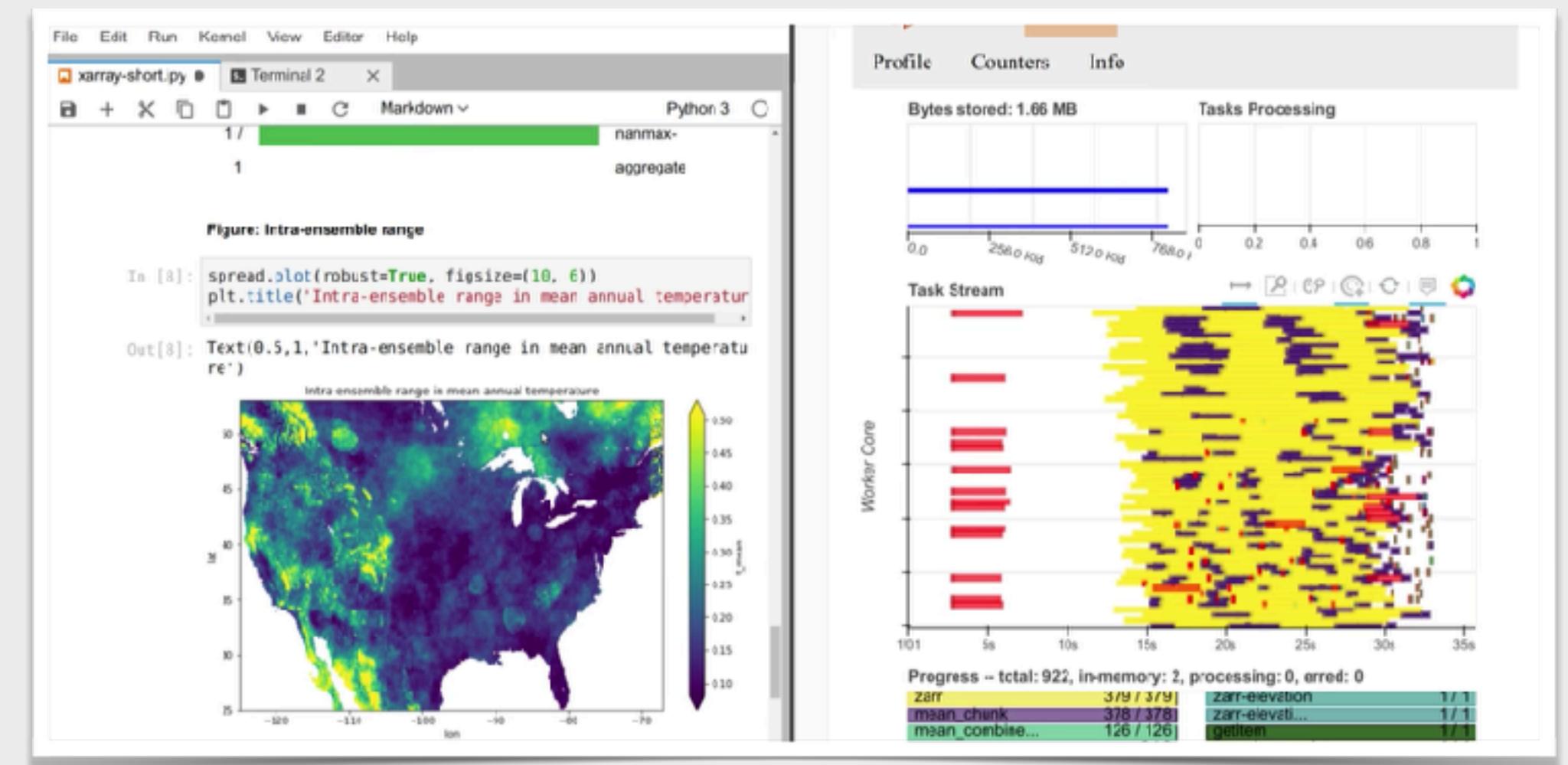
Jupyter in Science and HPC



Ligo (Gravitational waves discovery)



In the cloud Climate Science (Pangeo)



pangeo-data.github.io

Replacing traditional HPC/SSH workflow ?

Customised Notebooks



Knowledge Repo



Feed Favorites About Stats Write a Post!

Knowledge Feed

Search for Knowledge

prev < > next

How Well Does Nps Predict Rebooking?

Author(s) : Lisa Qian
Date: 2016-02-24
Tags: #topics/reviews, #other/nps, #other/rebooking, #other/external-blog, #metrics/nps, #topics/rebooking

Data scientists at Airbnb collect and use data to optimize products, identify problem areas, and inform business decisions. For most guests, however, the defining moments of the Airbnb experience happen in the real world when they are traveling to their listing, being greeted by their host, settling into the listing, and exploring the destination. These are the moments that make or break the Airbnb experience, no matter how great we make our website. The purpose of this post is to show how we can use data to understand the quality of the trip experience, and in particular how the Net promoter score adds value.

[Read post](#)

2 1 0

1 Year Rebooking Rate by Trip Length

Trip Length (Nights)	Rebooking Rate (%)
5	~8.5
6	~8.2
7	~8.0
8	~7.8
9	~7.6
10	~7.4
11	~7.5
12	~7.7
13	~7.8
14	~7.9
15	~7.8

New Metric Historically Performed Better On Experiments

Author(s) : Junshuo Liao
Date: 2016-02-24
Tags: #topics/experiments, #metrics/blog-post-metric

The booking team developed a new metric to measure _____. Following **prior research** that showed the metric may be useful for measuring _____, we decided to see how previous successful experiments changed the metric. We found that:

- ____ types of experiments consistently showed lift in the metric
- ____ types of experiments did not show consistent effects on the metric.
- We were generally able to get sufficient power for the metric on 80% of the experiments

These results lead us to believe this metric may be a good submetric for judging ancillary benefits of our product changes.

[Read post](#)

2 0 0

Previous Experiments on _____ metric

Experiment	Delta %	Status
1	-5%	Negative
2	+2%	Positive
3	+3%	Positive
4	+1%	Positive

NodeBook



STITCH FIX

Nodebook

Tools Integrations

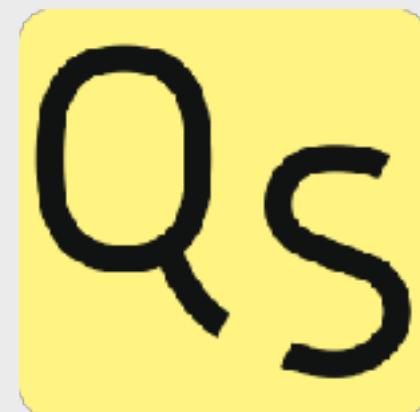


Tools Integrations

Kernels: Python, Julia, R, Haskell, Perl, Fortran, Ruby, Javascript, C/C++, Go, Scala, Elixir... 60+



Xeus Cling



QuantStack

```
In [3]: #include <string>
#include <fstream>

#include "xtl/xbase64.hpp"
#include "xeus/xjson.hpp"

namespace au
{
    struct audio
    {
        inline audio(const std::string& filename)
        {
            std::ifstream fin(filename);
            m_buffer << fin.rdbuf();
        }

        std::stringstream m_buffer;
    };

    xeus::xjson mime_bundle_repr() const
    {
        auto bundle = xeus::xjson::object();
        bundle["text/html"] = std::string("<audio controls>" + xtl::base64_encode(im->m_buffer.str()) + "</audio>");
        return bundle;
    }
}

In [4]: au::audio drums("audio/audio.wav")
drums
```

In [1]: #include <string>
#include <fstream>

#include "xtl/xbase64.hpp"
#include "xeus/xjson.hpp"

namespace im
{
 struct image
 {
 inline image(const std::string& filename)
 {
 std::ifstream fin(filename, std::ios::binary);
 m_buffer << fin.rdbuf();
 }

 std::stringstream m_buffer;
 };

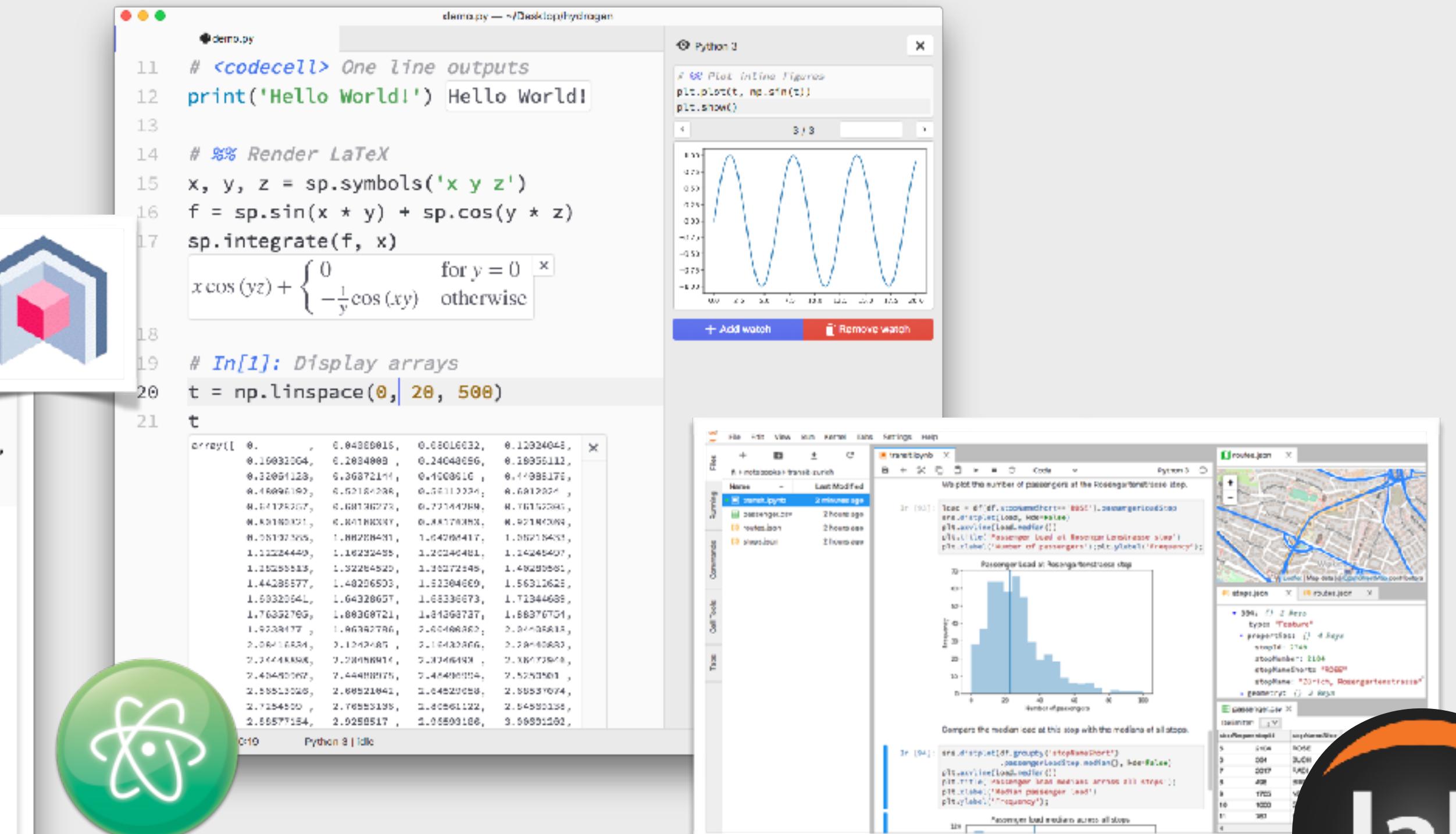
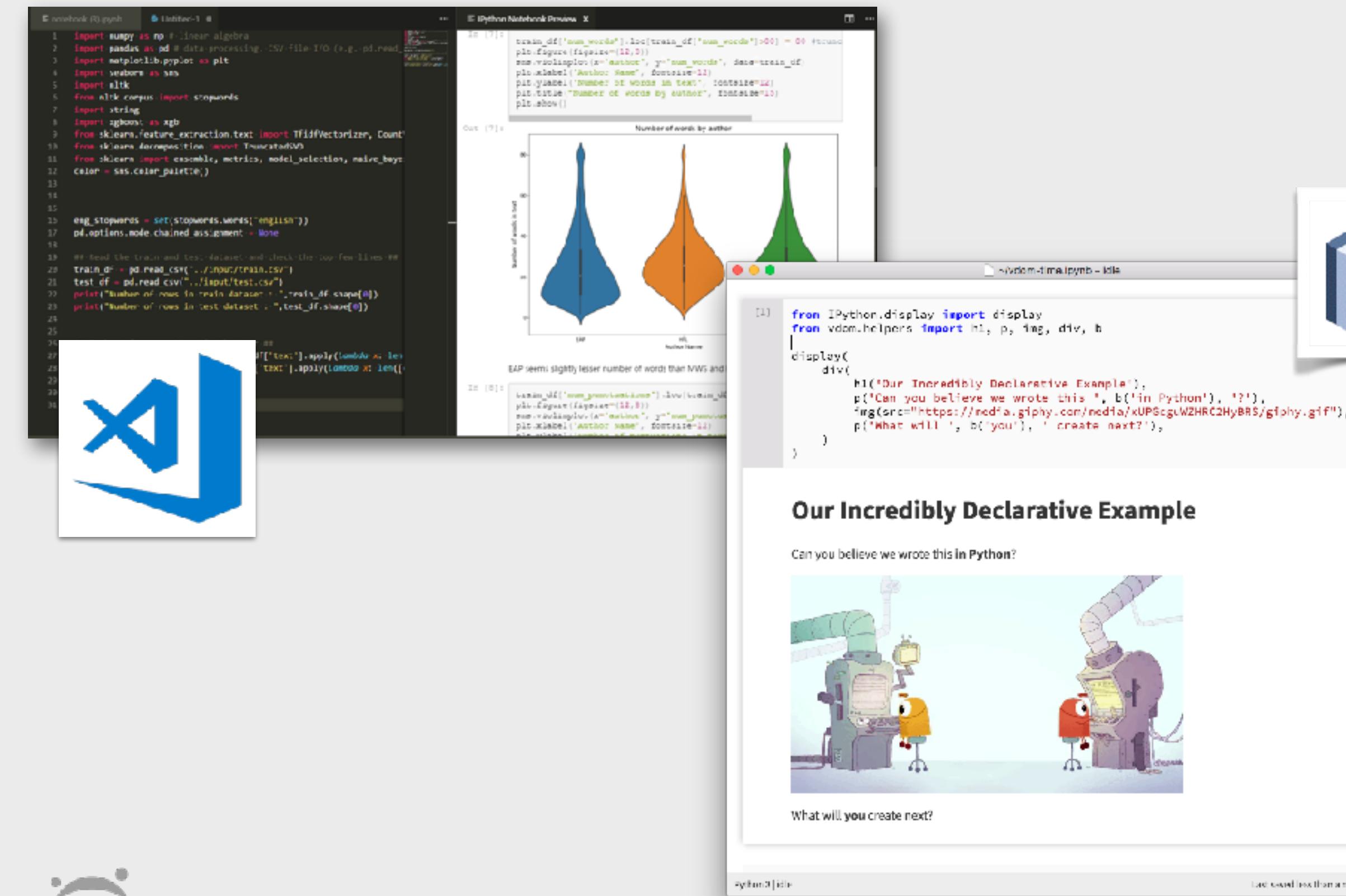
 xeus::xjson mime_bundle_repr(const image* im) const
 {
 auto bundle = xeus::xjson::object();
 bundle["image/png"] = xtl::base64_encode(im->m_buffer.str());
 return bundle;
 }
}

```
In [2]: im::image marie("images/marie.png");
marie
```

Out[2]: A black and white portrait photograph of Marie Curie, a woman with dark hair pulled back, wearing a dark dress with a white lace collar.

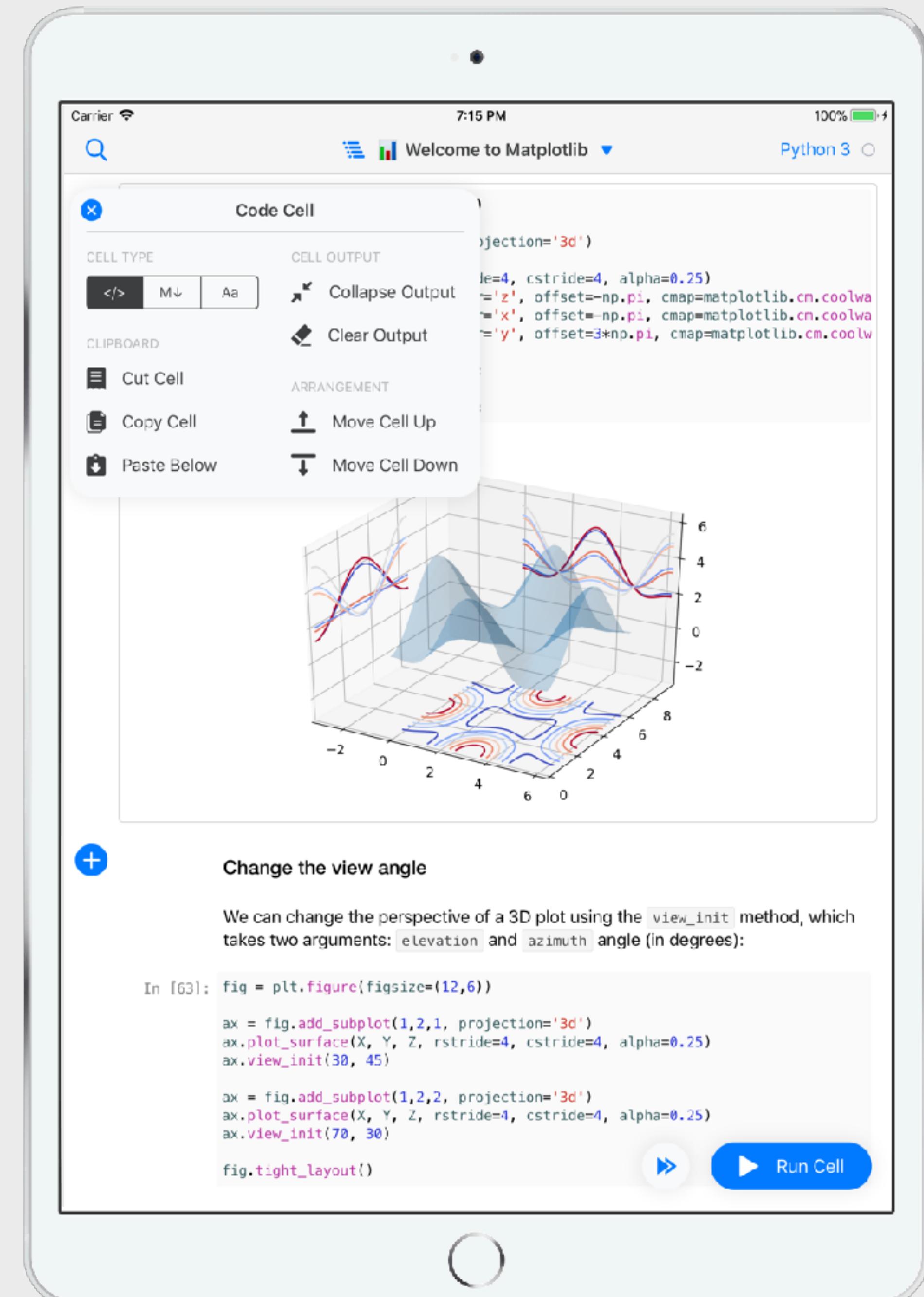
Tools Integrations

Frontends: Notebook, JupyterLab, CLI, Vim, Emacs,
Visual Studio Code, Atom, Nteract, Juno...



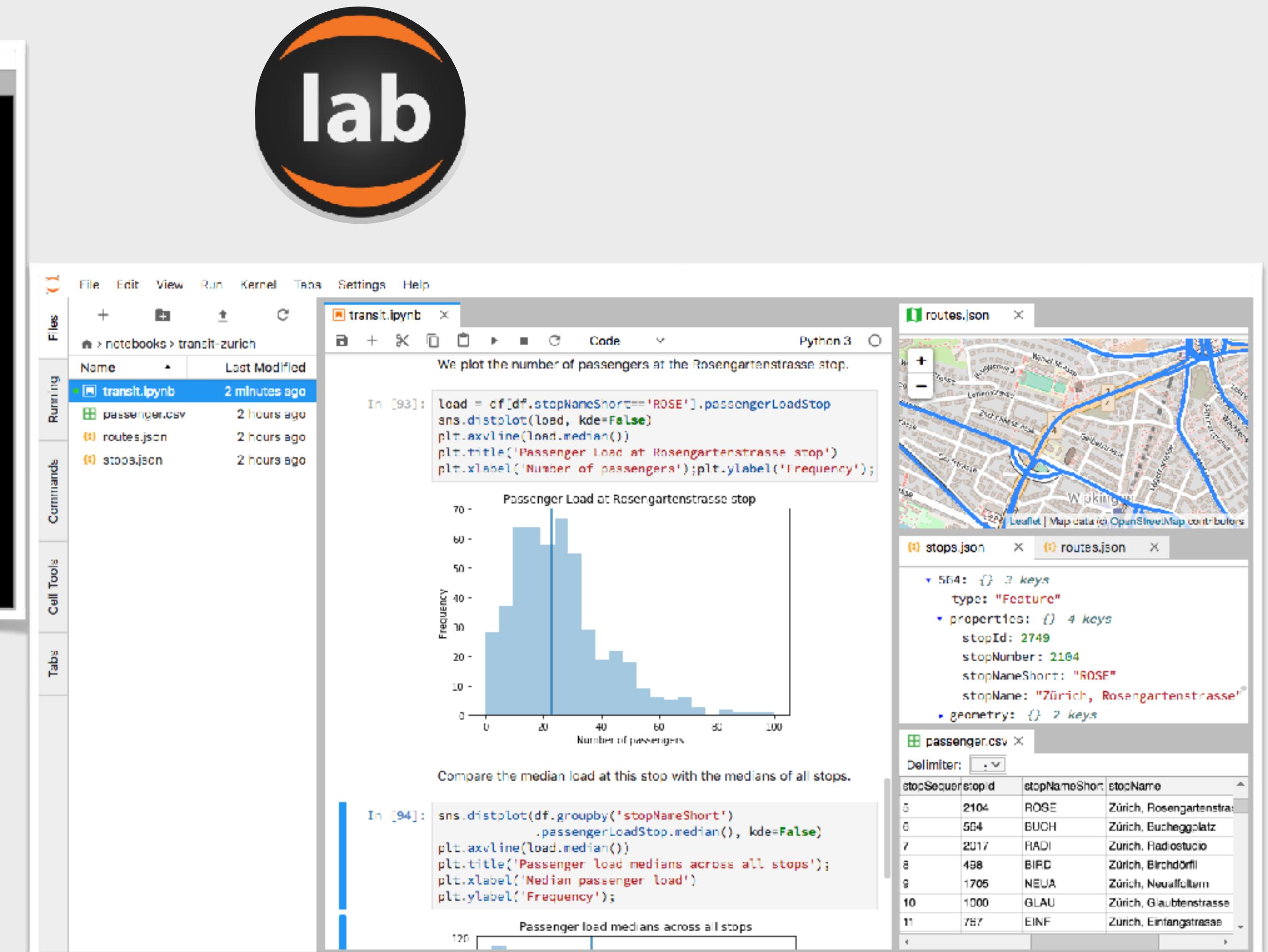
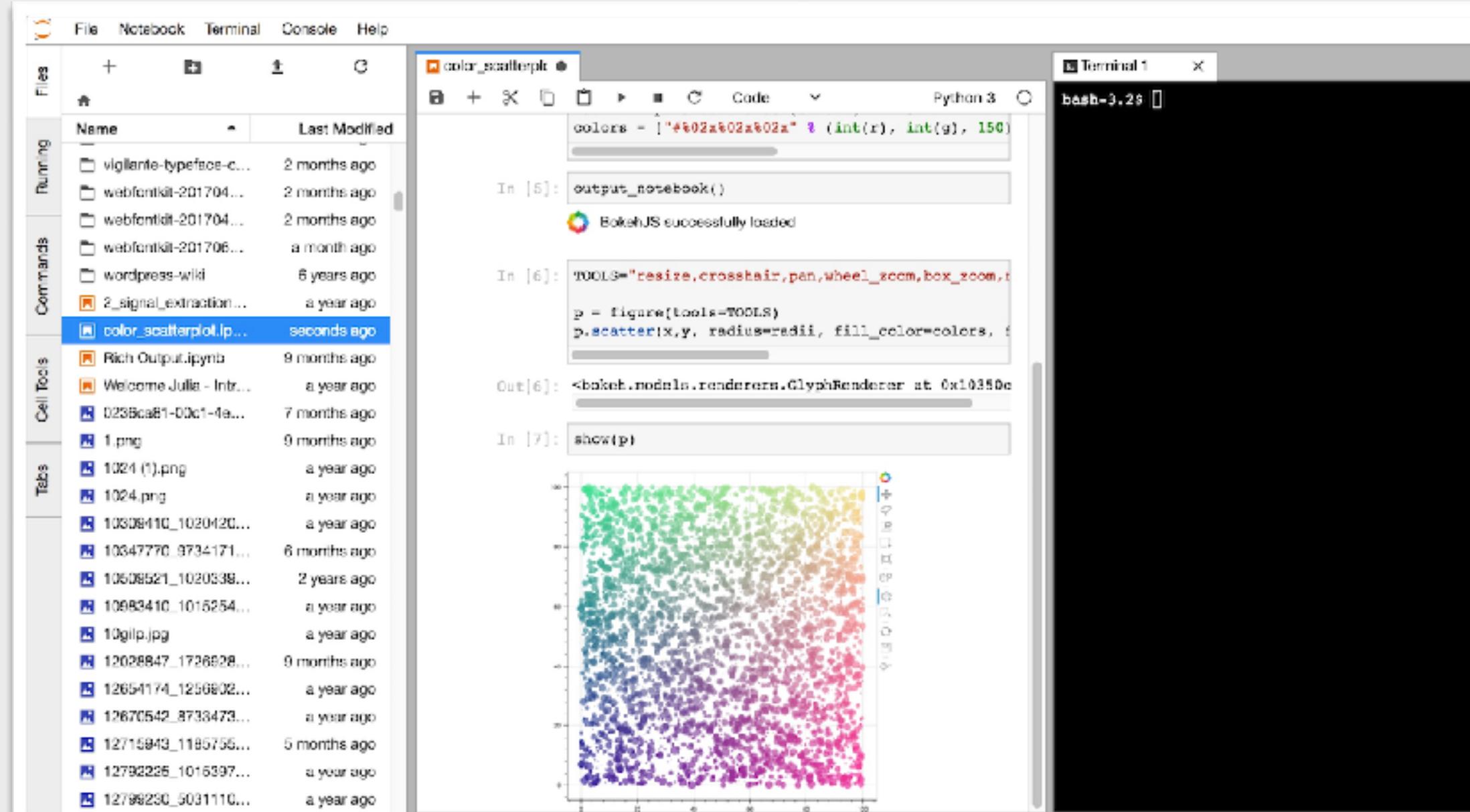


Juno



<https://juno.sh>

JupyterLab



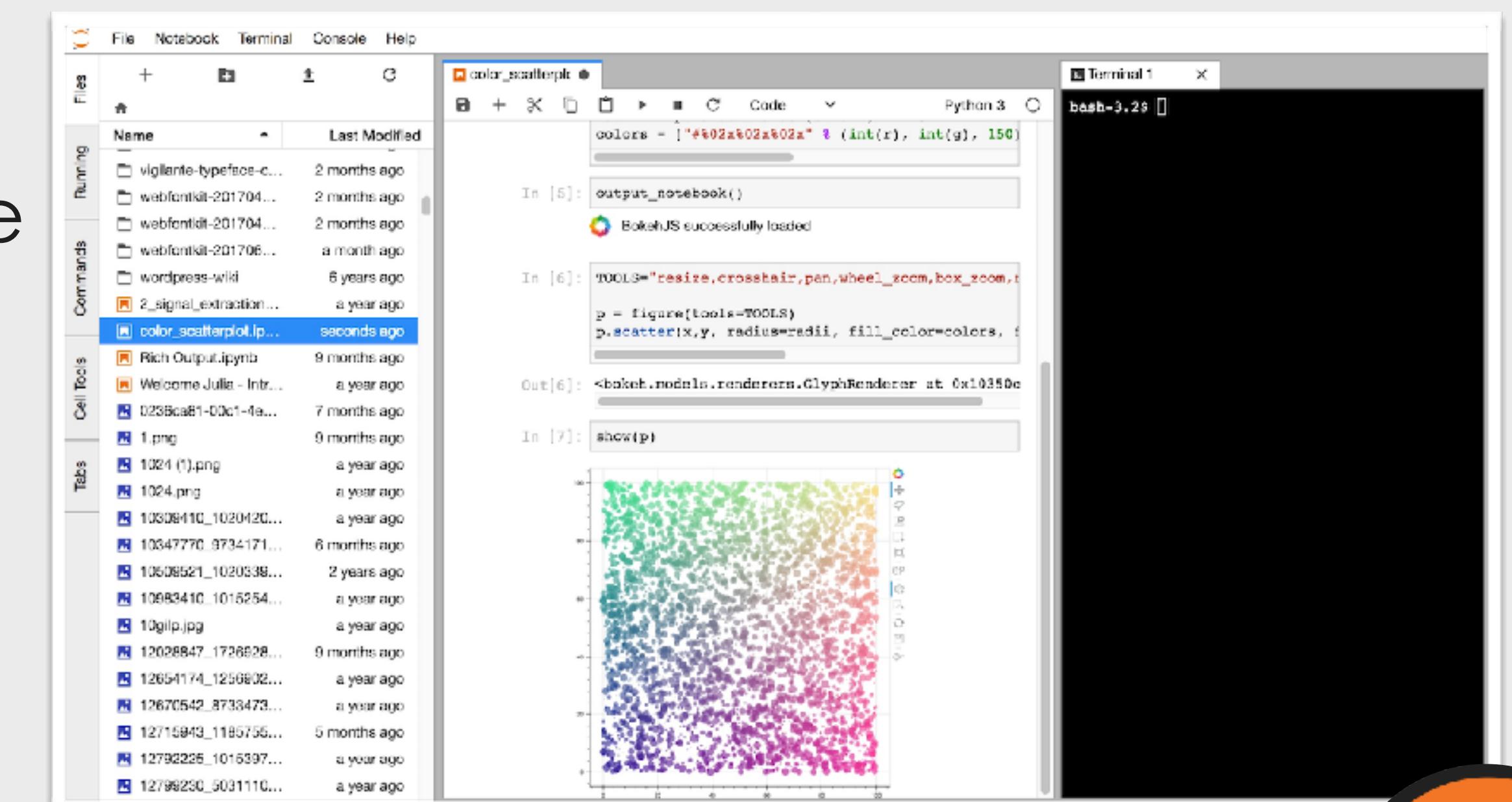
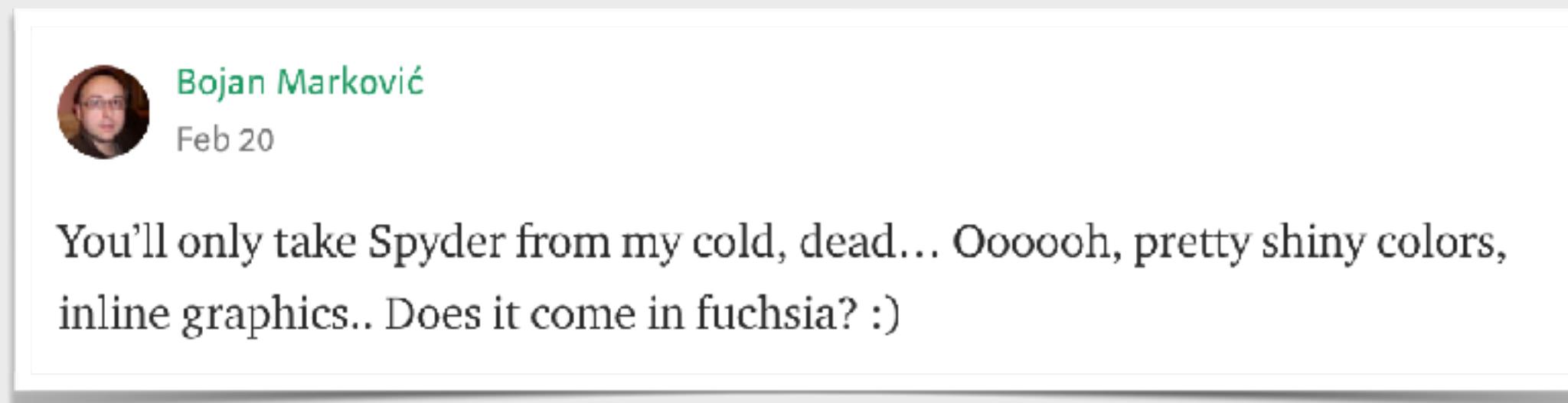
<https://blog.jupyter.org/jupyterlab-is-ready-for-users-5a6f039b8906>

JupyterLab

- Install Side by Side with Classic Notebook

- No Change in File Format, or protocol

- Better Architecture (all extensions are first class)

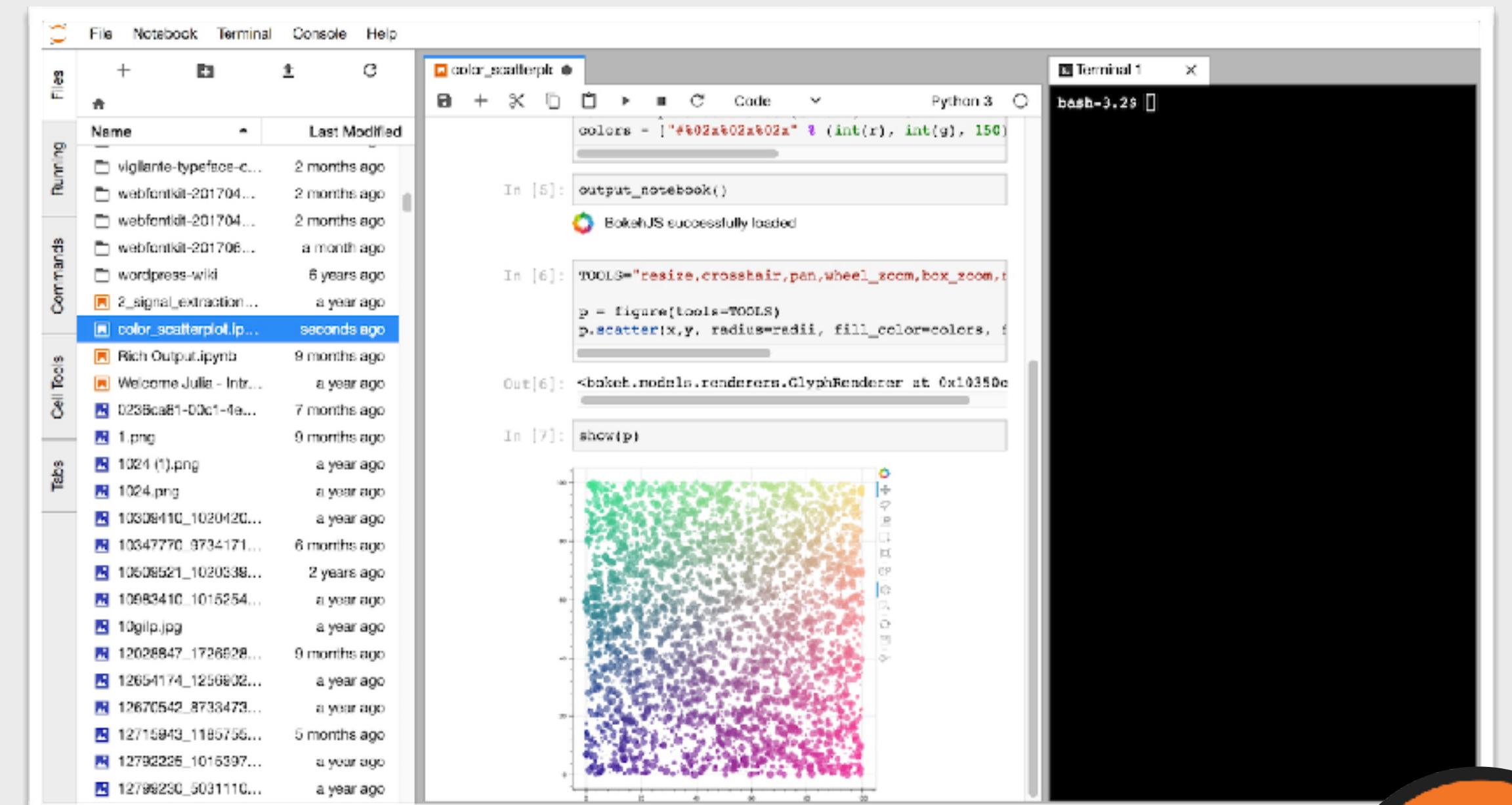


- Classic Notebook will be deprecated at some point



JupyterLab

- Ready for users
- Ready for Classic Extensions to be ported
- Will have all the new features





JupyterHub

- Key Infrastructure for Multi-tenant system
- Not limited to Notebook



...

- Key Piece in reproducible research



- Integration into existing environment



Things to Come



Real Time Collaboration



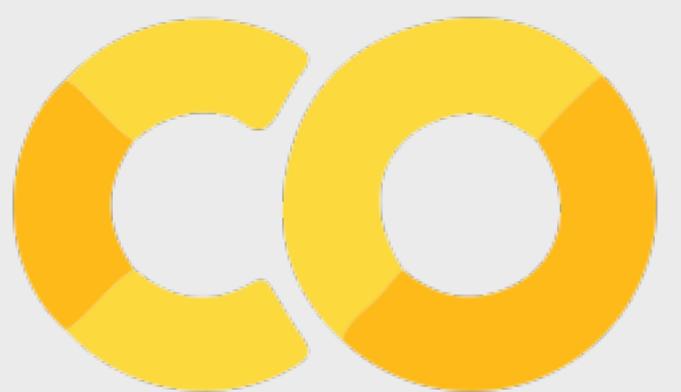
The Good:

It works* !

The Bad

Google Drive RT API is deprecated

Services implementing Real-Time



Google Colaboratory



Road to 1.0

- Scaling horizontally and Vertically
 - 100k+ Users
- Sharing/Integration with RT collaboration
- Binder and Federation
- Auditability (Hippa, GDPR...)





O'REILLY®

jupytercon

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August 21-24, 2018

New York, NY

jupytercon.com



You



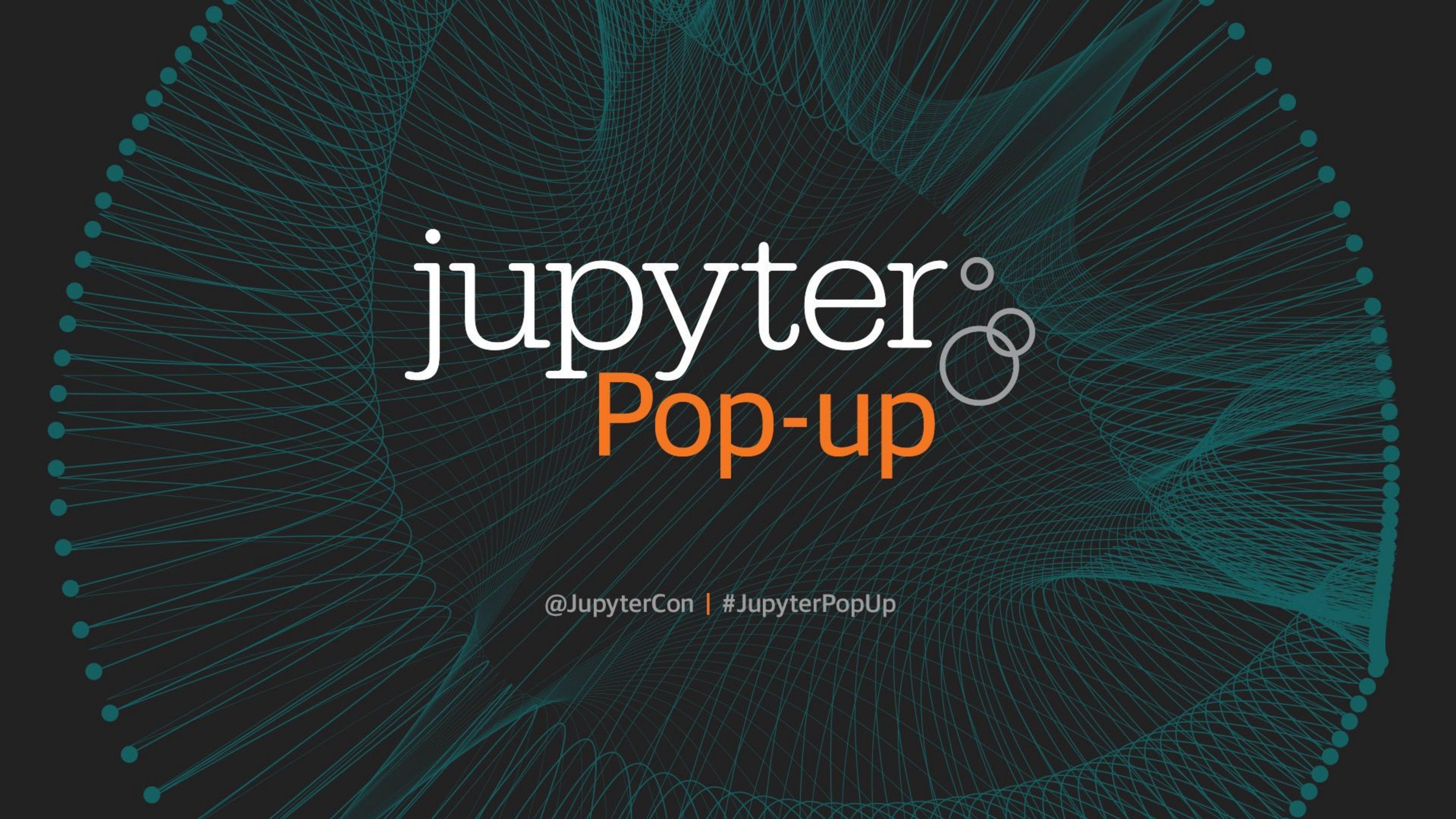
Give Feedback

Participate

Showcase

Thanks





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