

# Scipy 2013 - NumPy and IPython

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# Materials

- GitHub Repository: <http://git.io/bocNDg>
- Materials ZipFile: <http://git.io/G5i5qA>
- Anaconda: <https://store.continuum.io/>
- In case of no network: grab one of the three USB-Keys
  - They read *Bruker*

# About The Speaker

- Valentin Haenel from Berlin, Germany
- Freelance software developer and consultant
- Specialise in Git consulting and scientific software tooling

# The Scientists Needs

- Acquire data
  - Simulation
  - Experiment
- Manipulate and process that data
- Visualize results
- Communicate results
  - Produce figures for reports or publications
  - Write presentations.

# Why Python

- Easy to learn, easy to read, easy to maintain
- Thriving ecosystem of scientific libraries
- Vibrant community
- Numpy and IPython
- Commercial support

# The Scientific Python Ecosystem

- Numpy
  - IPython
  - Scipy
  - Matplotlib
- 
- Pandas
  - Sympy
  - Scikits-Learn
  - PyTables
  - Cython

# About this Tutorial

- **IPython** (1 hour)
  - Using the IPython notebook
  - Help system, magic functions, aliases and history
- **Numpy** (3 hours)
  - Basic arrays, dtypes and numerical operations
  - Indexing, slicing, reshaping and broadcasting
  - Copies, views and fancy indexing
- The tutorial will feature short bursts of small exercises every 5-10 minutes.
- Some of the tutors from the other tutorials are here to help.
- We can have a break in the middle.

# About the Material

- **Ipython**

- An IPython notebook demonstrating the IPython notebook
- A demo session of the IPython shell

- **Numpy** (3 hours)

- Two IPython notebooks
- (Semi-)Automatically converted from [Python Scientific Lecture Notes](#)
- The generated HTML is included in the GitHub Repository / Zip file and available online



# How to Follow

- Grab the IPython notebook, try out the examples, work on the exercises, all from within the notebook.
- Alternatively: view the HTML and copy and paste the examples into an IPython shell or a Python file.

# About IPython

- De facto Python interpreter with bells and whistles
- Since 2011: available in the browser as *IPython notebook*:

```
$ ipython notebook --pylab=inline
```

- The URL to access the notebook will be printed
- Numpy and Matplotlib tools are available (pylab mode)
- Plots will be displayed inside the notebook (inline mode)