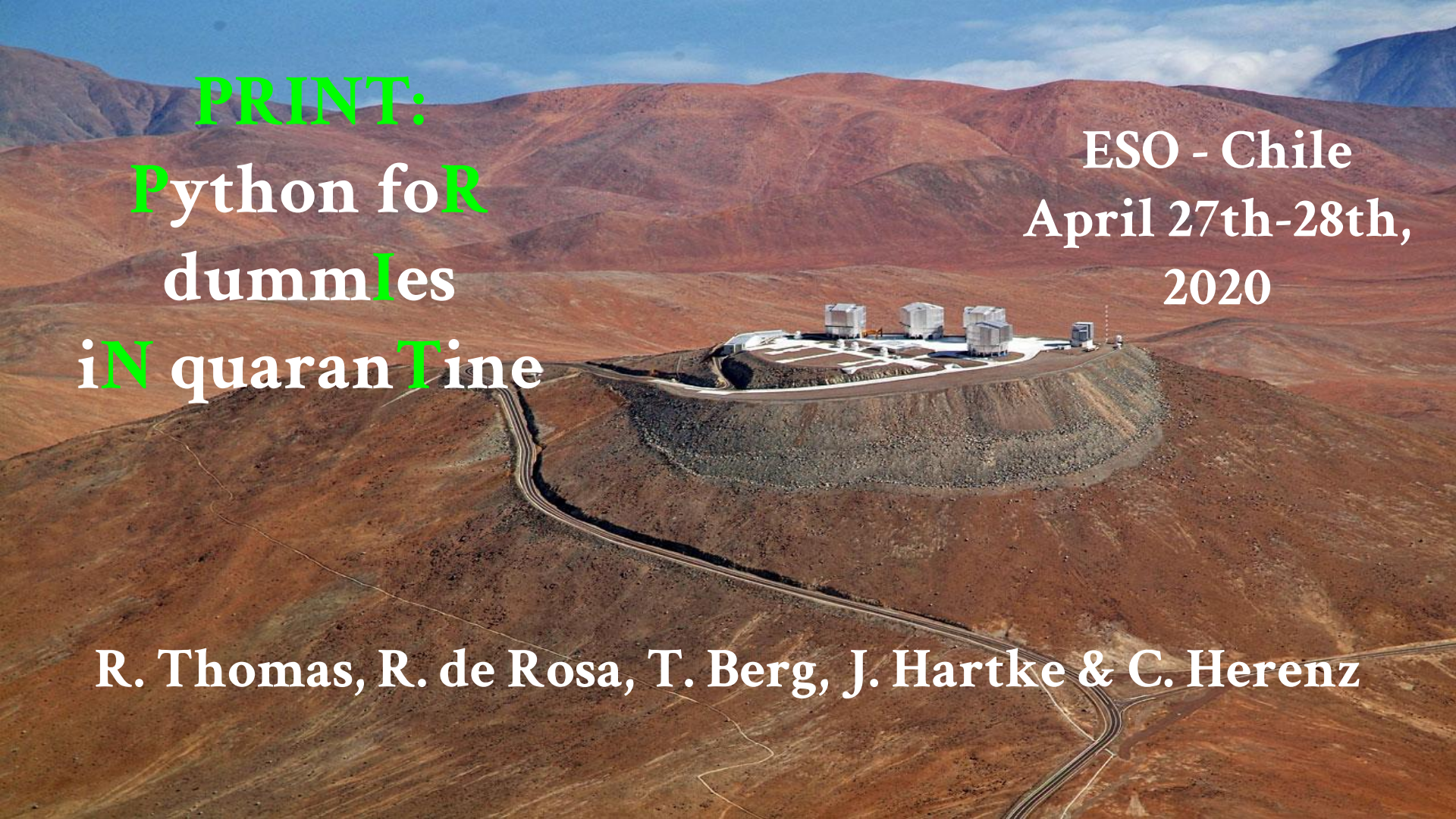


PRINT:
Python foR dummIes iN quaranTine

ESO - Chile
April 27th-28th, 2020

R. Thomas, R. de Rosa, T. Berg, J. Hartke & C. Herenz

Program reminder

Today:

09-09:45: *Introduction to Python*

09:45-10:30: *Variable, Operation, built-in functions and errors*

10:30-11:00: *Working with strings [Robert]*

11:00-11:30: *Break*

11:30-12:00: *Loops and conditional [Johanna]*

12:00-12:45: *Data structures: list, tuples and dictionaries [Trystyn]*

Program reminder

Tomorrow:

09-09:45: *Working with files [Robert]*

09:45-10:30: *Functions in Python [Christian]*

10:30-11:00: *Plotting with matplotlib [Johanna]*

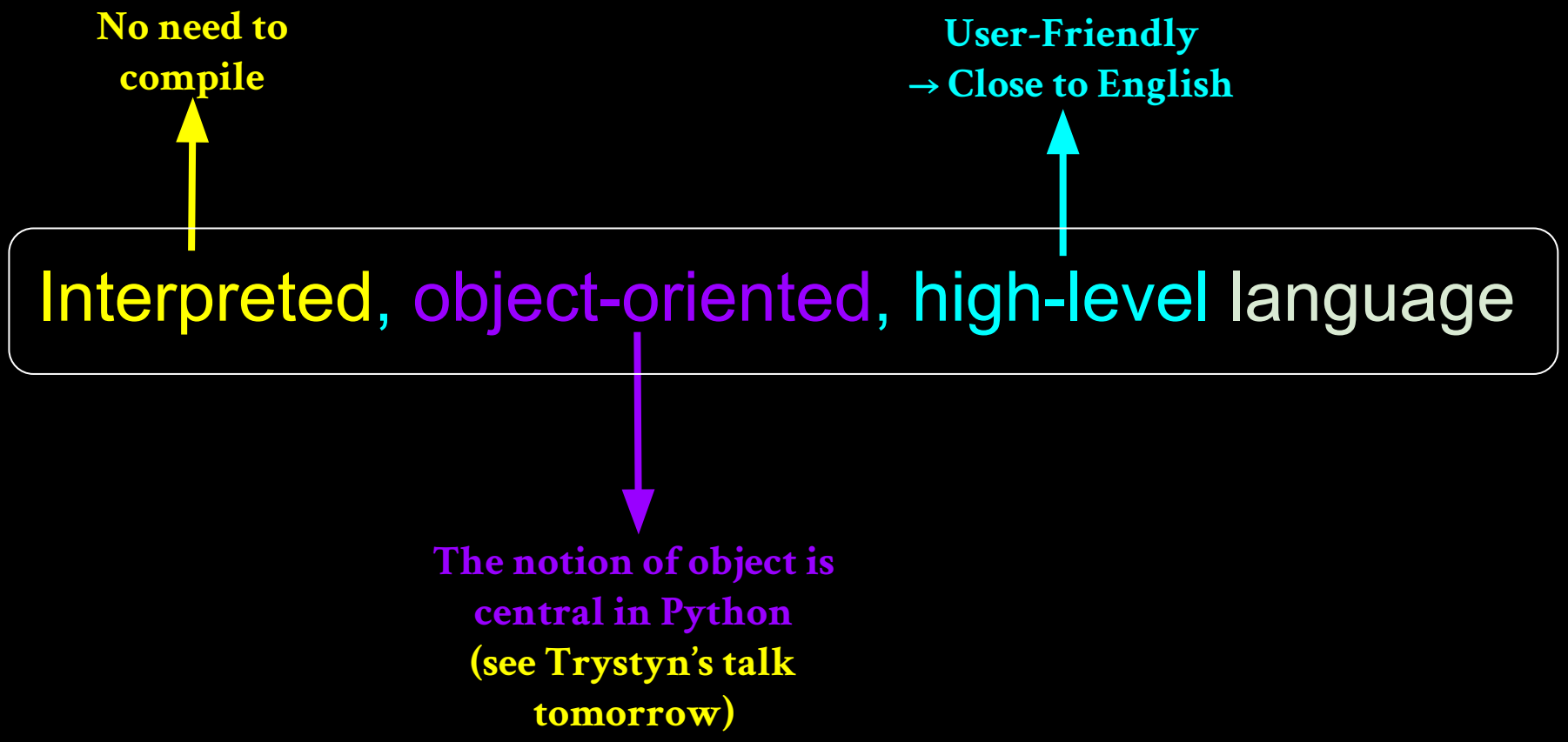
11:00-11:30: *Break*

11:30-12:00: *Classes: Object oriented programming [Trystyn]*

12:00-12:30 *A quick tour of the Python standard Library [Romain]*

12:30-12:45 *Wrap-up [Romain]*

Let's get started! What is Python?



Let's get started! What is Python?

Python was invented in the late 80s / Early 90s by Guido Van Rossum in the Netherland who called it after the *Monthy Python*

Releases:

-First Version v0.9.0 released in 02/1991
-v1.0 released in 01/1994.
-v2.0 released in 10/2000 → v2.7 is still used by a lot of people but discontinued
-v3.0 released in 12/2008 → We use v3.5+ it in the workshop
-v4.0 released in ?????????

Python is distributed under the General Public Licence (GPL)

What is Python? How popular?

Worldwide, Apr 2020 compared to a year ago:

Rank	Change	Language	Share	Trend
1		Python	30.61 %	+3.9 %
2		Java	18.45 %	-1.9 %
3		Javascript	7.91 %	-0.4 %
4		C#	7.27 %	-0.0 %
5		PHP	6.07 %	-1.1 %
6		C/C++	5.76 %	-0.2 %
7		R	3.8 %	-0.2 %
8		Objective-C	2.4 %	-0.4 %
9		Swift	2.23 %	-0.2 %

Source: PYPL

Python is one of the most popular language in the world

→ Two important consequences

1- Huge community

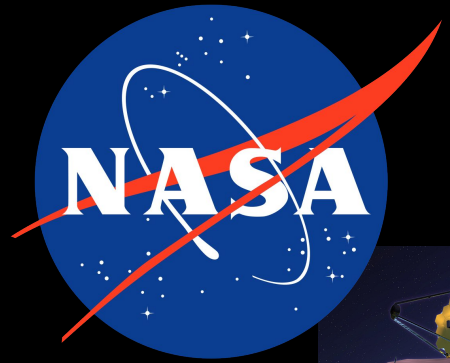
→ You can find help everywhere

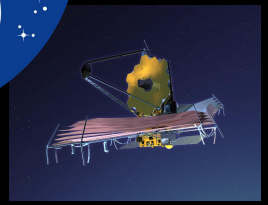
2-Countless pieces of codes/libraries

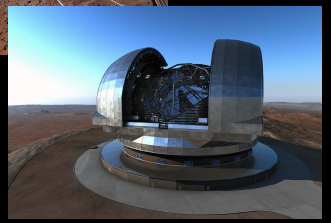
→ Someone already did what you want to do….

Where is it used?

Where is it used? Science!!!







Where is it used? Websites!

Quora

Learning Python...OK..But which one??

Python 2.X

Released in 2000

+A lot of material are still in python 2

-No more bug fixes or security update

-Support for a lot of libraries will stop soon

End of Life: 2020

Python 3.X

Release in 2008 with some compatibility problem

+Most of libraries are Py3.X compatible

+New version of libraries are always going to Py3

+This is the current state of the language

We use python 3.5+ for this camp

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Learning Python? How long does it take?

FOREVER*

→ As any language you learn, it is long and requires practice!
And you never stop learning…

The best way: take a project and do it in Python

The second best way: take a broken code and debug it…

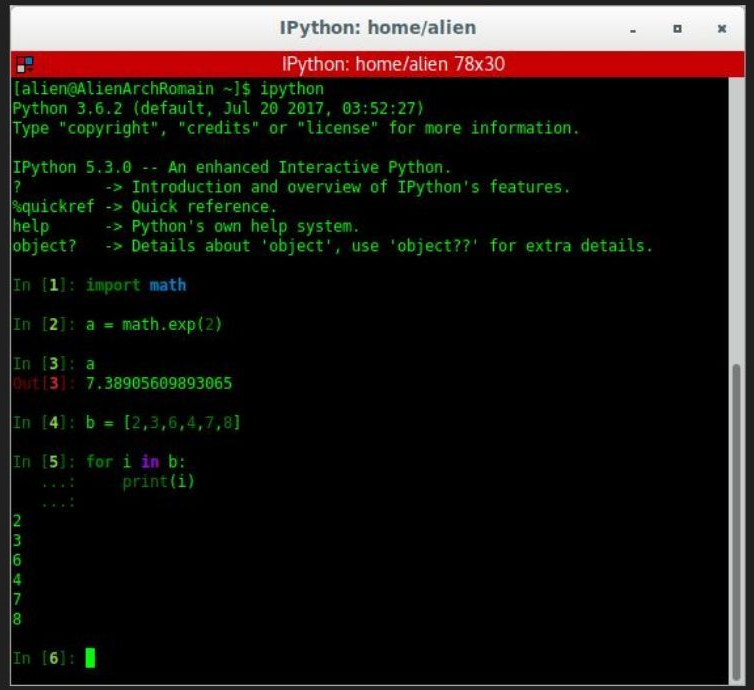
*sorry

Where do we write Python codes?

Where do I write python code?

You have multiple choices!

In the python interpreter (with python or ipython)



-Easy to use (you write your line of code and press enter)

- Nice environment to test

- You get the help of the functions directly accessible

-Does not save your work in an external file

Where do I write python code?

In an external file, with your favorite text editor or python IDE
→ You will create a *.py file

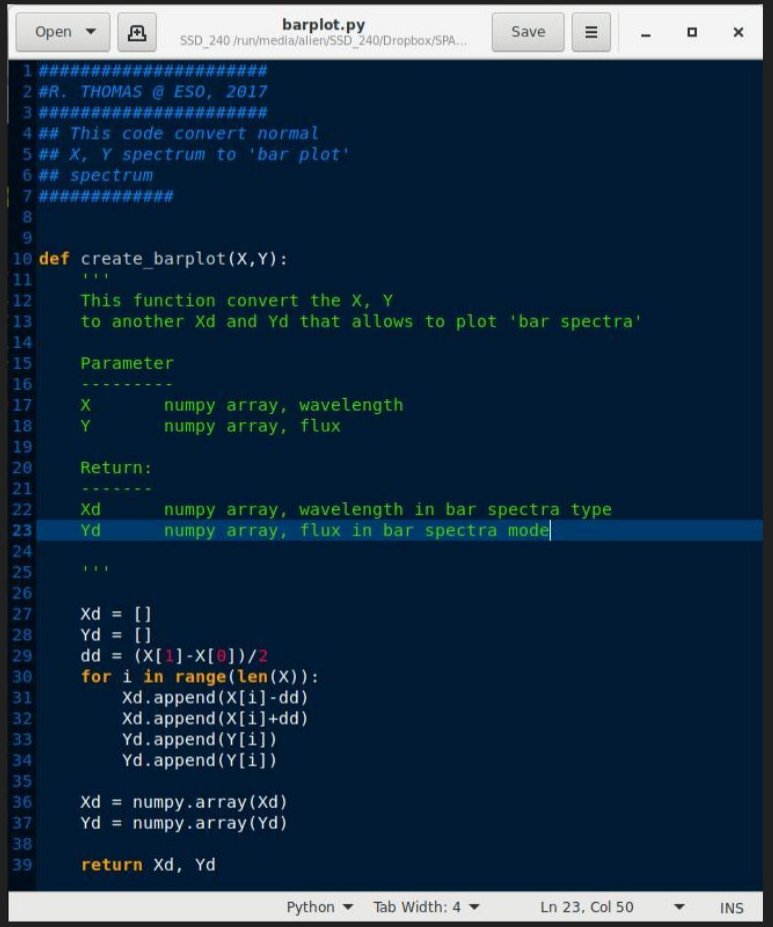
-You keep your code! (so you can share it!)

-You can create reusable modules

-Makes you organize your code and make it clearer

- Require a more organised work and thinking

You have multiple choices!



Where do I write python code?

You have multiple choices!

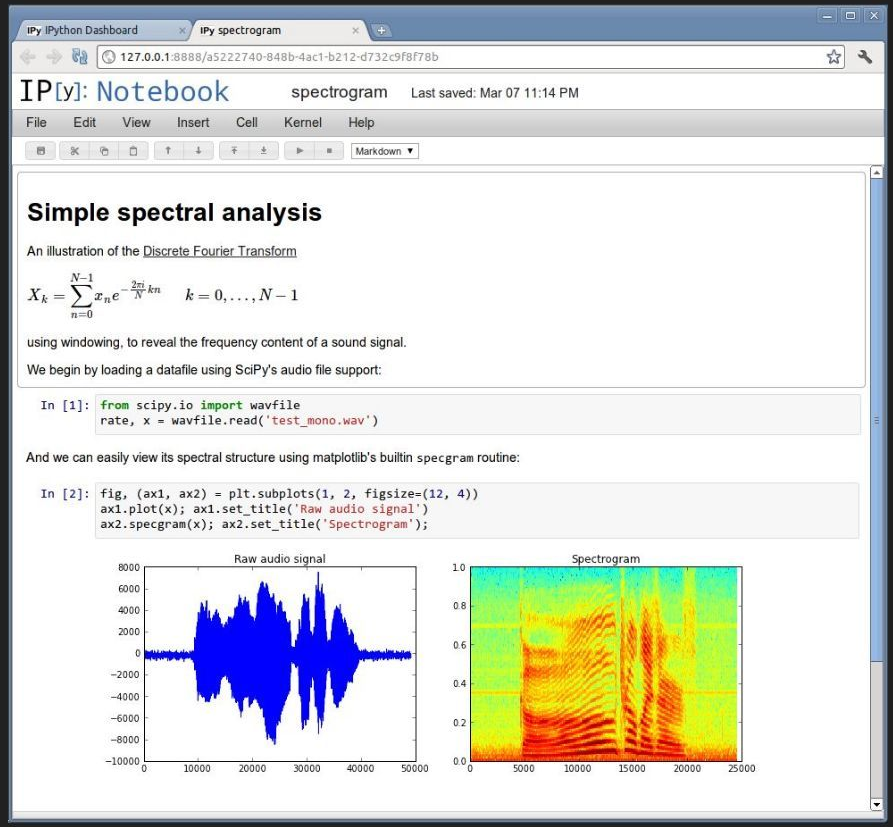
In a python notebook
→ you will create a *.ipynb file

-Web interface

-It is an *advanced* ipython

-You keep your code! (so you can share it!)

-Especially suitable for exercices and demonstration



The Python Standard Library:

Natively available Python modules
→They come with your installation

Adding extra packages:

From the Python Package Index [PyPi]:

Contains more than 100,000 packages

→ Four useful commands:

- pip search + modul

will display a list of package with the word you are giving

- pip install + modul [+ '--user']

will install the package in your python distribution

- pip uninstall + modul

will remove the package from your distribution

- pip freeze

will list all the pip-installed packages in your distribution with the version number

Writing and *commenting* and *documenting* code:

Python comes with rules about how to write a good code. They are described in the PEP8 and PEP257 documents (*Python Enhancement Proposal*). If you ignore them your code will work (don't worry) but following them will make your code more readable.

- Python is indentation sensitive
  → one indentation = 4 spaces
- Imports
  → one import per line, no wildcard imports
- Avoid too long lines
  → (max 80-100 characters / line)
- ***A code is read much more often than it is written*** - Guido van Rossum
  → Comment your code!!!!!!

- doctsrings: A format to document fct/classes/modules. Ex: numpydoc

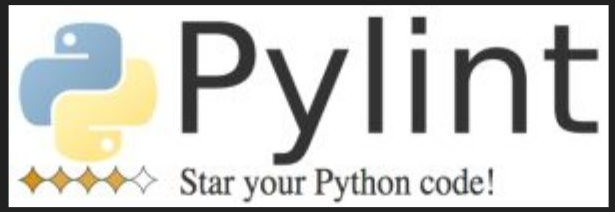
```
def function(param1, param2):
    """Example function.

    The return type must be duplicated in the docstring to comply
    with the NumPy docstring style.

    Parameters
    ----------
    param1
        type, short description.
    param2
        type, short description.

    Returns
    -------
    bool
        True if successful, False otherwise.
```

Useful tools and resources



supports a number of features, from coding standards to error detection, and it also helps with refactoring (by detecting duplicated code).

Spyder & PyCharm are widely used development environment for python

Something you do not understand?
Something you do not know how to do?

If you want to look at advanced codes you can go there →

I will not propose books or websites here with python lectures.
You can just type 'python lectures' , 'python for beginners' in google and you will find thousands of solutions (do not forget youtube, there are plenty of videos with python classes)

Enjoy these 2 ½ half days of Python!!!

And huge thanks to the speakers:

Robert, Johanna, Trystyn and Christian