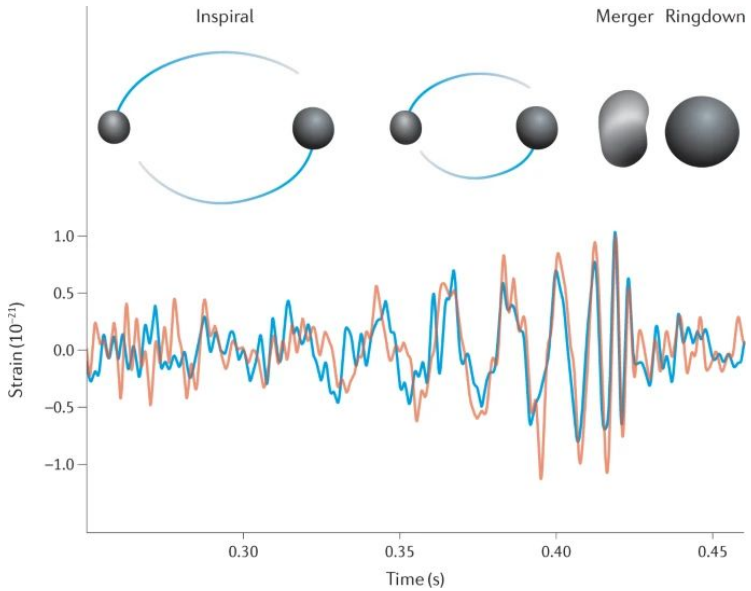
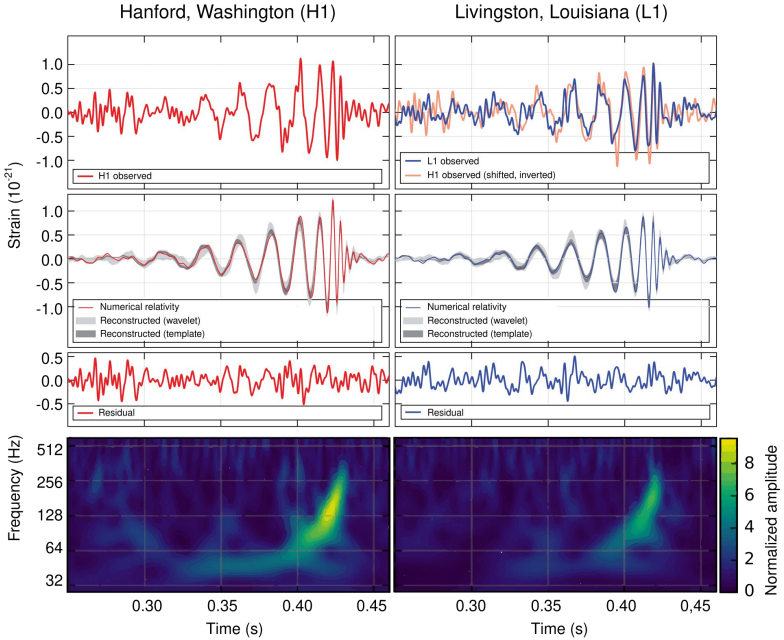
GW Open Data Workshop 2025, May 12-14





Some textbooks on General Relativity and GWs …

- Bernard F. Schutz, *Gravity from the Ground Up* [Cambridge University Press, 2003]
- James B. Hartle, *Gravity, An Introduction to Einstein's General Relativity* [Addison-Wesley, 2003]
- Leonard Susskind, *General Relativity: The Theoretical Minimum* [Basic Books, 2023]
- Bernard F. Schutz, *A First Course in General Relativity, 3rd Ed* [CUP, 2022]
- Roger D. Blandford, Kip S. Thorne, *Modern Classical Physics*, Chapters 24-28 [Princeton University Press, 2017]
- Mike Guidry, *Modern General Relativity: Black Holes, Gravitational Waves, and Cosmology* [CUP, 2019]
- Ray d'Inverno, J. Vickers, *Introducing Einstein's Relativity: A Deeper Understanding*, 2nd Ed [OUP, 2022]
- Piotr T. Chruściel, *Elements of General Relativity*, [Birkhäuser, 2020]
- V. Ferrari, L. Gualtieri, P. Pani, *General Relativity and its Applications*, [CRC Press, 2020]
- Sean Carroll, *Spacetime and Geometry* [Addison-Wesley, 2004]
- Charles W. Misner, Kip S. Thorne, and John A. Wheeler, *Gravitation* [Freeman, 1973]
- Robert M. Wald, *General Relativity* [University of Chicago Press, 1984]

Practical infos and contacts

Gravitational Waves Open Data Workshop- Aix Marseille University

12 mag 2025, 09:30 → 14 mag 2025, 12:30 Europe/Paris

CCIN2P3

Descrizione

The GWOSC is organizing the annual Gravitational Wave Open Data Workshop 2025. The workshop includes a set of lectures followed by hands-on tutorial sessions. Participants will learn state-of-the-art data analysis tools used by the LIGO-Virgo-KAGRA Collaboration to detect and analyze the gravitational wave signals (see the schedule). Participation can be in-person or remote (either individually or via a study hub).

The CPPM and CPT is organizing a Study Hub. This is a possibility for people who can't attend the in-person event to watch the lectures and work on the hands-on sessions **with the help of local experts and mentors**.

Everybody interested is welcome (master student, PhD student, post-doc, faculty staff, engineers) from Marseille or elsewhere.

Optionally, participants will receive a certificate if they complete the data challenge designed to test their new skill in GW data analysis.

Practical information

- **When: It will take place from May 12 to May 14**. The room and tutors will be available from 9:30AM to 12:30AM PM (CEST).
- **Where:** The study hub will take place at Faculty of Sciences - Aix-Marseille University (163 Av. de Luminy, 13009 Marseille, Francia), the **room is the E.00.11 in TPR1 Building**
- **How:** To participate, simply use the link below to register. The deadline is May 10th. **Participation is limited to 20 persons**.

How to participate

- We will follow the same programme of GWOSC, working together on tutorials and the challenge.
- Participants are encouraged to watch the lectures as soon as they are available on the website but we will also watch them during the study hub.
- **Internet access and a computer for every participant will be provided for every participant but you can also bring your own laptop**.

First we need to set up the workshop…

… but don’t worry, be patient and we will do it together

Setup instructions

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Click here and go to

Tutorials

This workshop uses software tutorials to introduce GW data analysis. Please be aware that the tutorials will be under some development before the start of the workshop, so they are subject to change.

- You'll need a computer and internet connection. Any operating system will do.
- Tutorials may be run locally on your computer, or online in the browser.
- Some previous experience with the Python language is recommended.

Visit the software tutorial repo page and setup instructions page to learn how to run them.

Setup instructions

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Click here to see different setup options

Setup instructions: Option 1 (Google Colab)

Option 1: Google Colab

🟢 Easy (No software installation; Works for any OS)

Video instructions

1. To run the notebooks, click the badge: Open in Colab
2. Double click the notebook of your choice
3. At the top of the notebook, uncomment any `pip install` commands by removing the `#`

   `#! pip install -q 'gwosc==0.5.4` <-- Remove the `#` and run

   Warnings: a couple of warning messages are likely to show up, both of them are harmless.

   - `Unrecognized runtime "xxxx"; defaulting to "python3"`

     This pop-up simply notifies you that this notebook has been created with a Python environment different than the default one of Colab. That's not a big deal because you will install all the missing dependencies with the command above.

   - `WARNING: This notebook was not authored by Google.`

     Same as before. Just close the pop-up and go ahead without worrying too much.

4. Click `run all` from the `runtime` menu at the top

If you are not familiar with google Colab, you can beforehand take a look at the guides offered by Google at this link, in the "Examples" tab. In particular, it is recommended to have a certain understanding of the main features of notebooks, which you can learn in this tutorial.

Setup instructions: Option 2 (mybinder)

Option 2: Run in mybinder

🟢 Easy (No software installation; Works for any OS) - Warning: note that `mybinder` can take several minutes to load.

Video instructions

To run the notebooks, click the badge: launch binder

This will build a Docker image (if not already present) with the dependency file `environment.yml`. Then a JupyterHub server will be open hosting the contents of the repo. To find the Tutorials, click the folders `Tutorials`, and then `Day 1`, `Day 2`, or `Day 3` to find the tutorials.

Setup instructions: Option 1 or 2 (not recommended)

Tutorials

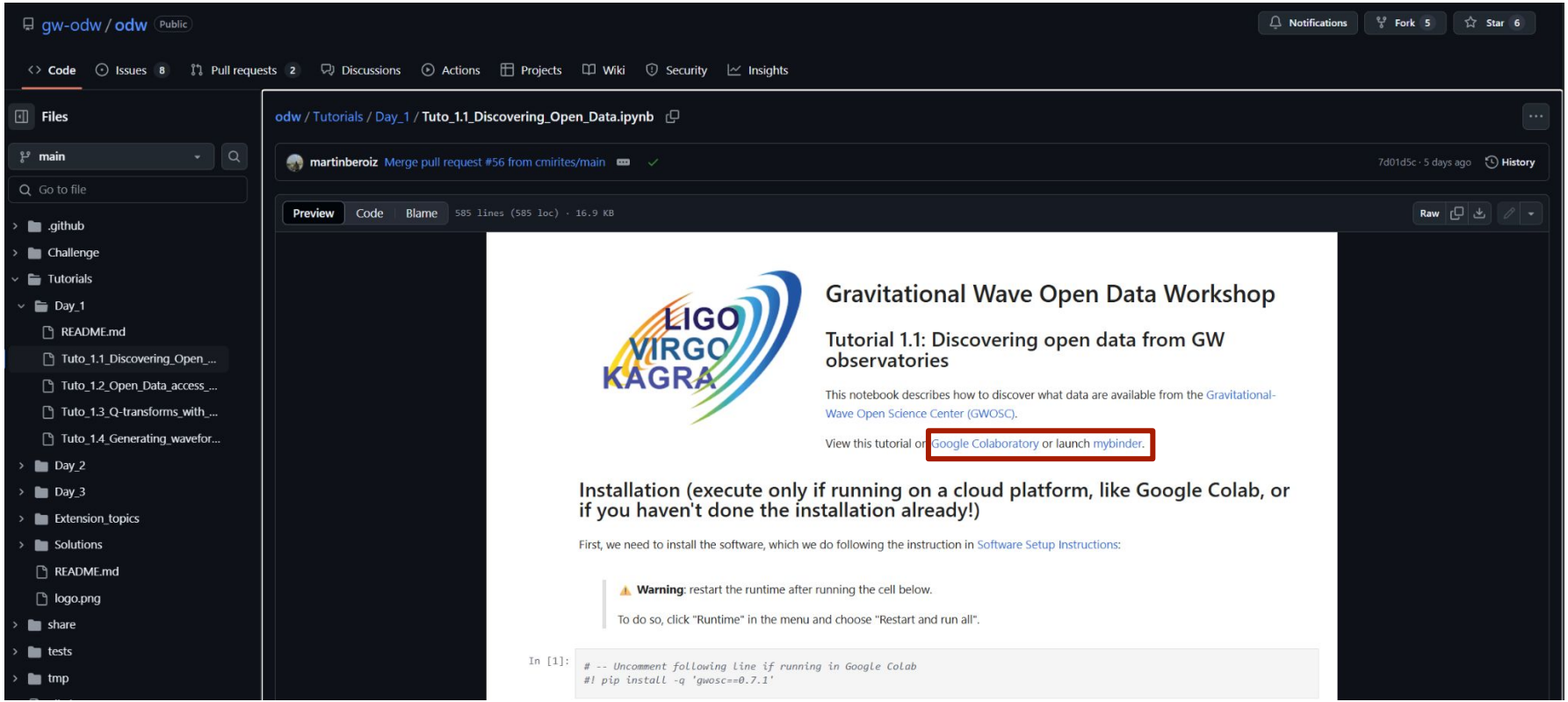
This workshop uses software tutorials to introduce GW data analysis. Please be aware that the tutorials will be under some development before the start of the workshop, so they are subject to change.

- You'll need a computer and internet connection. Any operating system will do.
- Tutorials may be run locally on your computer, or online in the browser.
- Some previous experience with the Python language is recommended.

Visit the software tutorial repo page and setup instructions page to learn how to run them.

Click here

Setup instructions: Option 1 or 2 (not recommended)



Setup instructions: Option 3 (conda)

Option 3: You have a Linux or Apple/Mac computer -- Use conda

🟡 Intermediate (Some software installation; Will not work on Windows PC)

Video instructions

We provide a Conda environment with all the required packages. This guide will walk you through the configuration of this environment (named `odw-py311`).

1. Install Miniconda by following the installation instructions for your operating system:
   - Linux
   - macOS

   Choose the "Miniconda" installer, not the full Anaconda Distribution. You may need to restart your computer after installation.
2. Add the conda-forge channel

   ```
   conda config --add channels conda-forge
   ```
3. Create the environment.

   ```
   conda env create --file environment.yml
   ```
4. Activate the environment.

   ```
   conda activate odw-py311
   ```
5. Clone the workshop git repo

   ```
   git clone https://github.com/gw-odw/odw.git
   ```
6. Move into the directory with the workshop git repo

   ```
   cd odw
   ```
7. Build a custom jupyter kernel using the command

   ```
   python -m ipykernel install --user --name odw-py311 --display-name "Python (odw-py311)"
   ```
8. Start the Jupyter notebook server

   `jupyter notebook` and select the kernel `odw-py311` if this is not done by default.

Option 4: Linux install on Windows with dedicated app (Windows 10 or 11)

🟠 Advanced (For Windows 10 or 11)

If you are using Windows and would like to run the notebooks directly, install Windows Subsystem for Linux. There are additional instructions here for getting started with the notebooks. Note that even if Conda works many packages needed for the Tutorials are not running on Windows at all, so we suggest to follow one of the previous options and not to run the Tutorials directly on Windows. Please indicate to us any problem or misunderstanding that you meet when following these steps. You can make comment directly on ask.igwn.org

HIGHLY RECOMMENDED !!
(but not mandatory)

Setup instructions: Option 3 (conda)

We provide a Conda environment with all the required packages. This guide will walk you through the configuration of this environment (named `odw-py311`).

1. Install Miniconda by following the installation instructions for your operating system:
   - Linux
   - macOS

   Choose the "Miniconda" installer, not the full Anaconda Distribution. You may need to restart your computer after installation.

2. Add the conda-forge channel

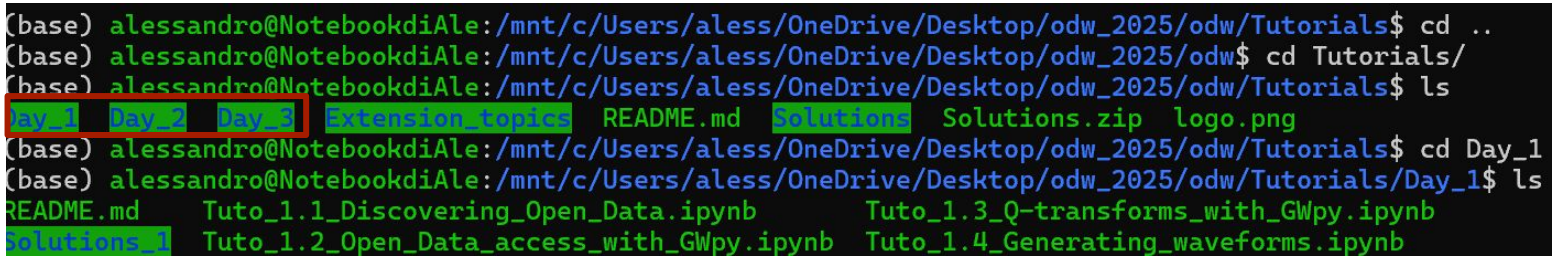
   ```
   conda config --add channels conda-forge
   ```

Before going to bullet point 3 I suggest to clone the repository into your laptop. Open your terminal, go to your desktop and run the command:

git clone https://github.com/gw-odw/odw

Setup instructions: Option 3 (conda)

I created the odw_2025 repository first and then clone with git clone but you can also run the command without creating a new repository



You will find the repositories with all the notebooks (e.g. Day_1/Tuto_1.1_Discovering_Open_Data.ipynb)

P.S. Try to open “Solutions” but you won’t find anything :)

Setup instructions: Option 3 (conda)

3. Create the environment.

```
conda env create --file environment.yml
```

4. Activate the environment.

```
conda activate odw-py311
```

5. Clone the workshop git repo

```
git clone https://github.com/gw-odw/odw.git
```

ALREADY DONE !

6. Move into the directory with the workshop git repo

```
cd odw
```

7. Build a custom jupyter kernel using the command

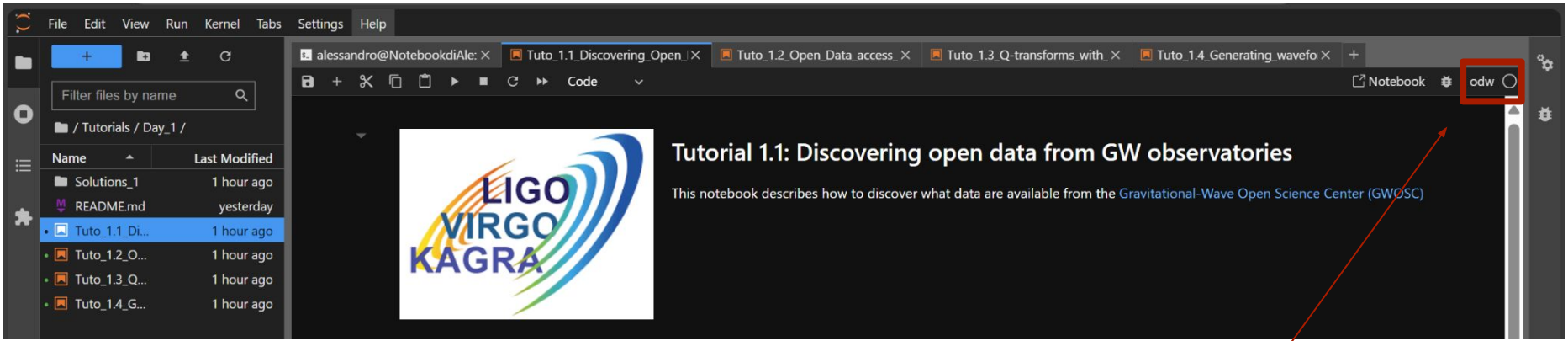
```
python -m ipykernel install --user --name odw-py311 --display-name "Python (odw-py311)"
```

8. Start the Jupyter notebook server

`jupyter notebook` and select the kernel `odw-py311` if this is not done by default.

Setup instructions: Option 3 (conda)

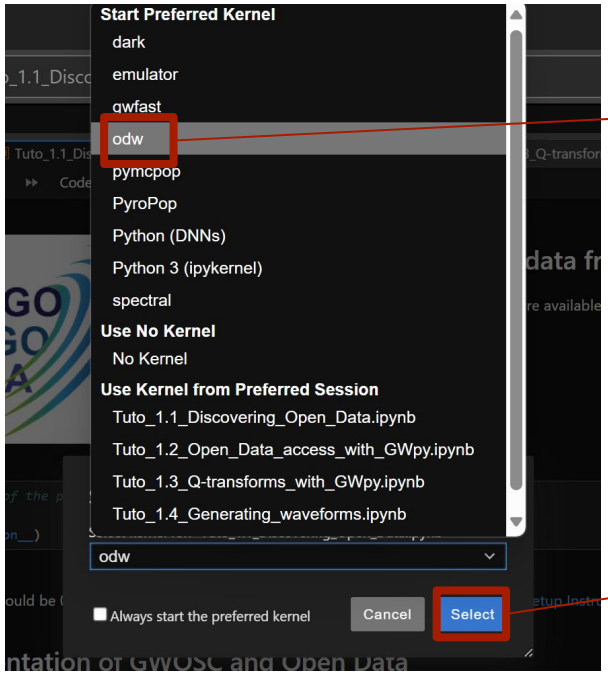
Once you are in the jupyterlab (notebook) interface you have to select the kernel that you created first



Click here, in principle you should see something like “Python 3 (ipykernel)”. Once you change it, it will remain “odw”

Setup instructions: Option 3 (conda)

Once you are in the jupyterlab (notebook) interface you have to select the kernel that you created first



Select the one with the name that you chose in the previous command line:

python -m ipykernel install --user --name odw-py311 --display-name "my_kernel_name"

At the end press “Select”

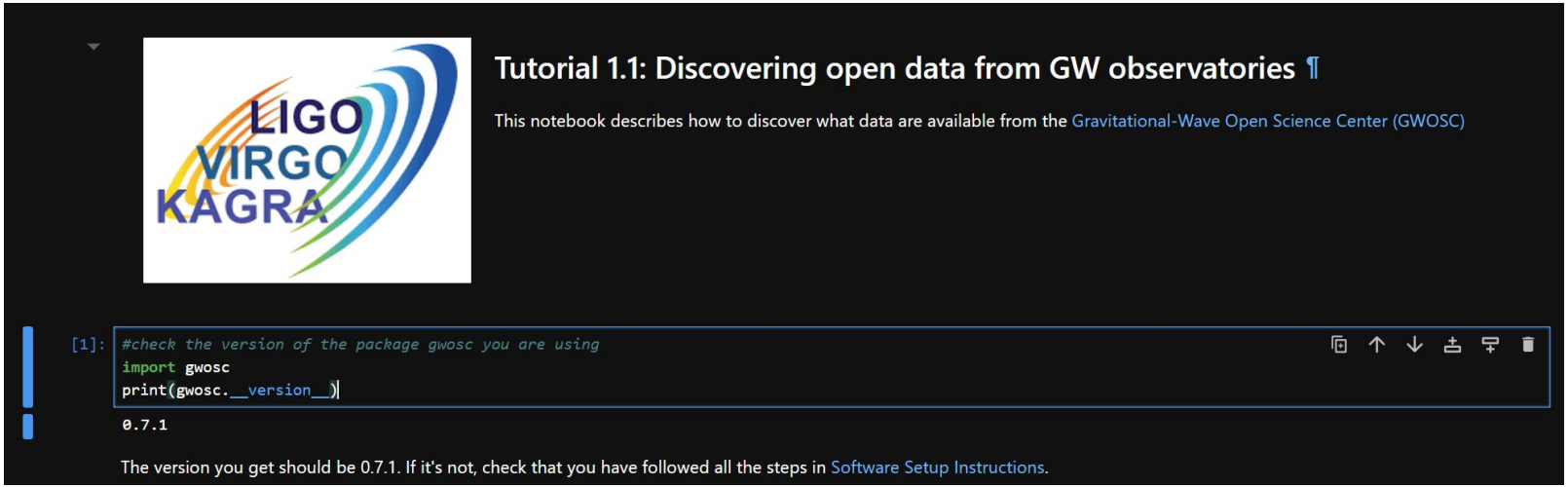
Setup instructions: problems with Jupyter?

If jupyter does not start after running the command:
jupyterlab

```
(base) alessandro@NotebookdiAle:/mnt/c/Users/aless/OneDrive/Desktop/odw_2025/odw$ jupyter lab
[I 2025-05-11 16:53:21.615 ServerApp] jupyter_lsp | extension was successfully linked.
[I 2025-05-11 16:53:21.620 ServerApp] jupyter_server_terminals | extension was successfully linked.
[I 2025-05-11 16:53:21.627 ServerApp] jupyterlab | extension was successfully linked.
[I 2025-05-11 16:53:21.632 ServerApp] notebook | extension was successfully linked.
[I 2025-05-11 16:53:22.034 ServerApp] notebook_shim | extension was successfully linked.
[I 2025-05-11 16:53:22.062 ServerApp] notebook_shim | extension was successfully loaded.
[I 2025-05-11 16:53:22.075 ServerApp] jupyter_lsp | extension was successfully loaded.
[I 2025-05-11 16:53:22.076 ServerApp] jupyter_server_terminals | extension was successfully loaded.
[I 2025-05-11 16:53:22.086 LabApp] JupyterLab extension loaded from /home/alessandro/.local/lib/python3.10/site-packages/jupyterlab
[I 2025-05-11 16:53:22.086 LabApp] JupyterLab application directory is /home/alessandro/.local/share/jupyter/lab
[I 2025-05-11 16:53:22.087 LabApp] Extension Manager is 'pypi'.
[I 2025-05-11 16:53:22.091 ServerApp] jupyterlab | extension was successfully loaded.
[I 2025-05-11 16:53:22.094 ServerApp] notebook | extension was successfully loaded.
[I 2025-05-11 16:53:22.095 ServerApp] The port 8888 is already in use, trying another port.
[I 2025-05-11 16:53:22.095 ServerApp] The port 8889 is already in use, trying another port.
[I 2025-05-11 16:53:22.095 ServerApp] The port 8890 is already in use, trying another port.
[I 2025-05-11 16:53:22.096 ServerApp] Serving notebooks from local directory: /mnt/c/Users/aless/OneDrive/Desktop/odw_2025/odw
[I 2025-05-11 16:53:22.096 ServerApp] Jupyter Server 2.14.2 is running at:
[I 2025-05-11 16:53:22.096 ServerApp] http://localhost:8891/lab?token=45a333e2490733be6171513b398945f39dd9409acb34476f
[I 2025-05-11 16:53:22.096 ServerApp]     http://127.0.0.1:8891/lab?token=45a333e2490733be6171513b398945f39dd9409acb34476f
[I 2025-05-11 16:53:22.096 ServerApp] Use Control-C to stop this server and shut down all kernels (twice to skip confirmation).
[C 2025-05-11 16:53:25.288 ServerApp]
```

Copy and paste this line into one of your browsers

Now you're ready to start!



Press "Ctrl + Enter" and run the cells