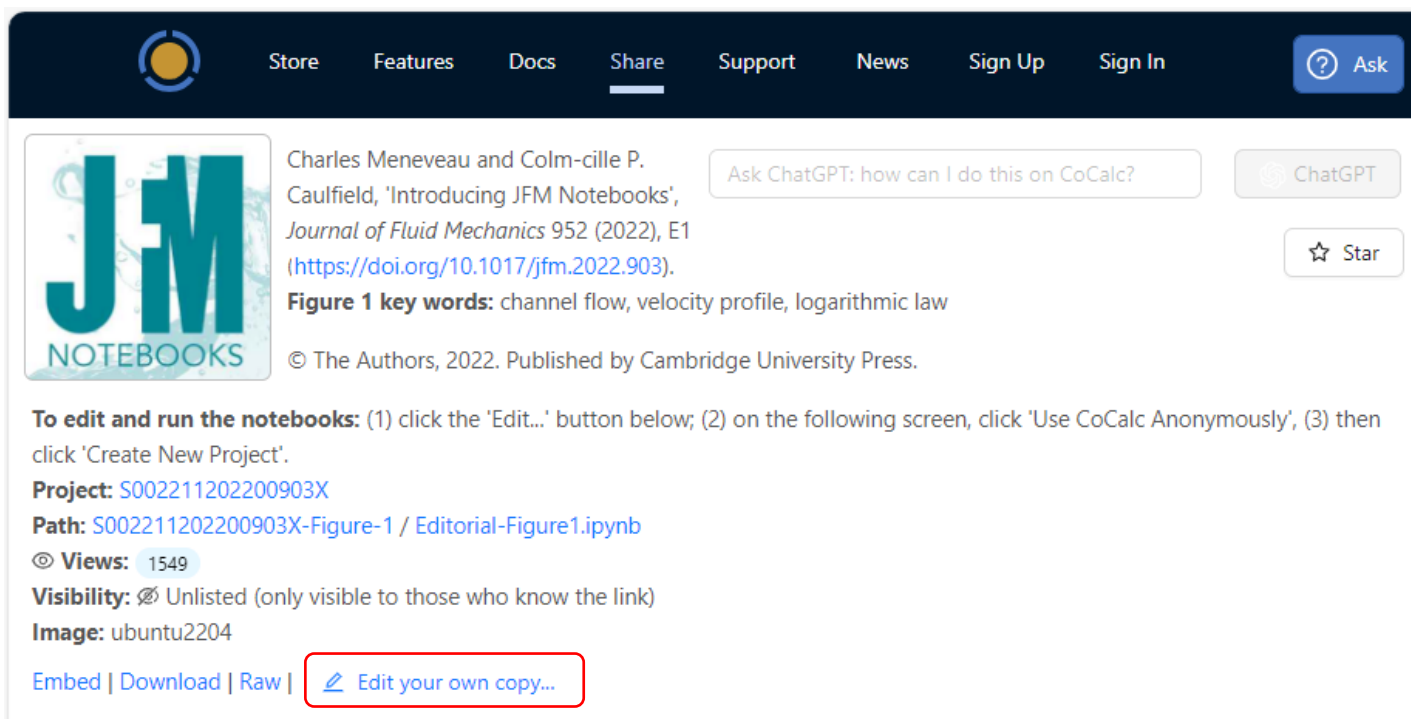


Further details and documentation on using CoCalc can be found here: <https://doc.cocalc.com/>.

## JFM Notebooks: Viewing and Interacting Guide

1. Click 'Edit your own copy...'



The screenshot shows a CoCalc notebook interface. At the top is a dark navigation bar with a logo on the left and links for Store, Features, Docs, Share, Support, News, Sign Up, and Sign In on the right. A blue 'Ask' button with a question mark icon is also present. Below the navigation bar, the notebook title 'JFM NOTEBOOKS' is displayed in a large, stylized font. To the right of the title, the author information is shown: Charles Meneveau and Colm-cille P. Caulfield, 'Introducing JFM Notebooks', *Journal of Fluid Mechanics* 952 (2022), E1 (<https://doi.org/10.1017/jfm.2022.903>). Below this, the 'Figure 1 key words' are listed: channel flow, velocity profile, logarithmic law. A copyright notice follows: © The Authors, 2022. Published by Cambridge University Press. On the right side of the notebook page, there are three buttons: 'Ask ChatGPT: how can I do this on CoCalc?' (with a ChatGPT icon), 'ChatGPT', and 'Star'. Below the author information, there is a section titled 'To edit and run the notebooks:' with instructions: (1) click the 'Edit...' button below; (2) on the following screen, click 'Use CoCalc Anonymously', (3) then click 'Create New Project'. Below this, the 'Project' ID is S002211202200903X, the 'Path' is S002211202200903X-Figure-1 / Editorial-Figure1.ipynb, the 'Views' count is 1549, the 'Visibility' is 'Unlisted (only visible to those who know the link)', and the 'Image' is ubuntu2204. At the bottom of the notebook page, there are links for 'Embed | Download | Raw |' and a red-bordered button labeled 'Edit your own copy...'. The 'Share' link in the top navigation bar is underlined.

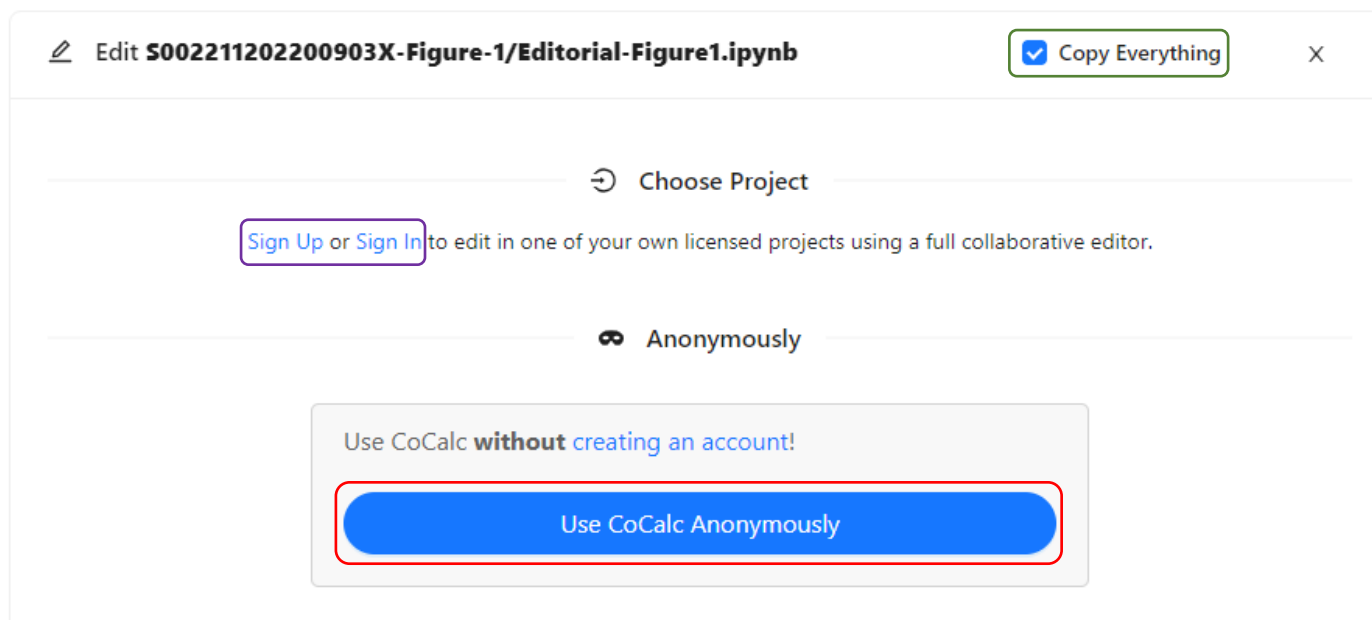
Further details and documentation on using CoCalc can be found here: <https://doc.cocalc.com/>.

2. Click 'Use CoCalc Anonymously' which does not require any account setup

OR

Click to 'Sign In' to your account or click 'Sign Up' to create an account (free and paid options)

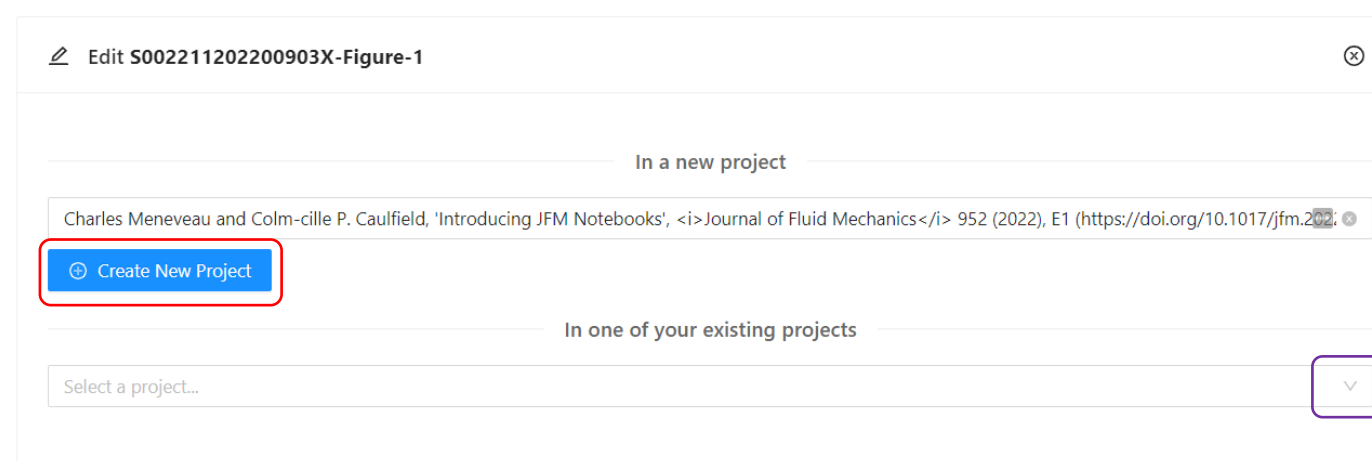
Ensure Copy Everything remains ticked to ensure all associated files (e.g. data) are copied in to the new project.



3. Click 'Create New Project' (you can choose to rename the new project)

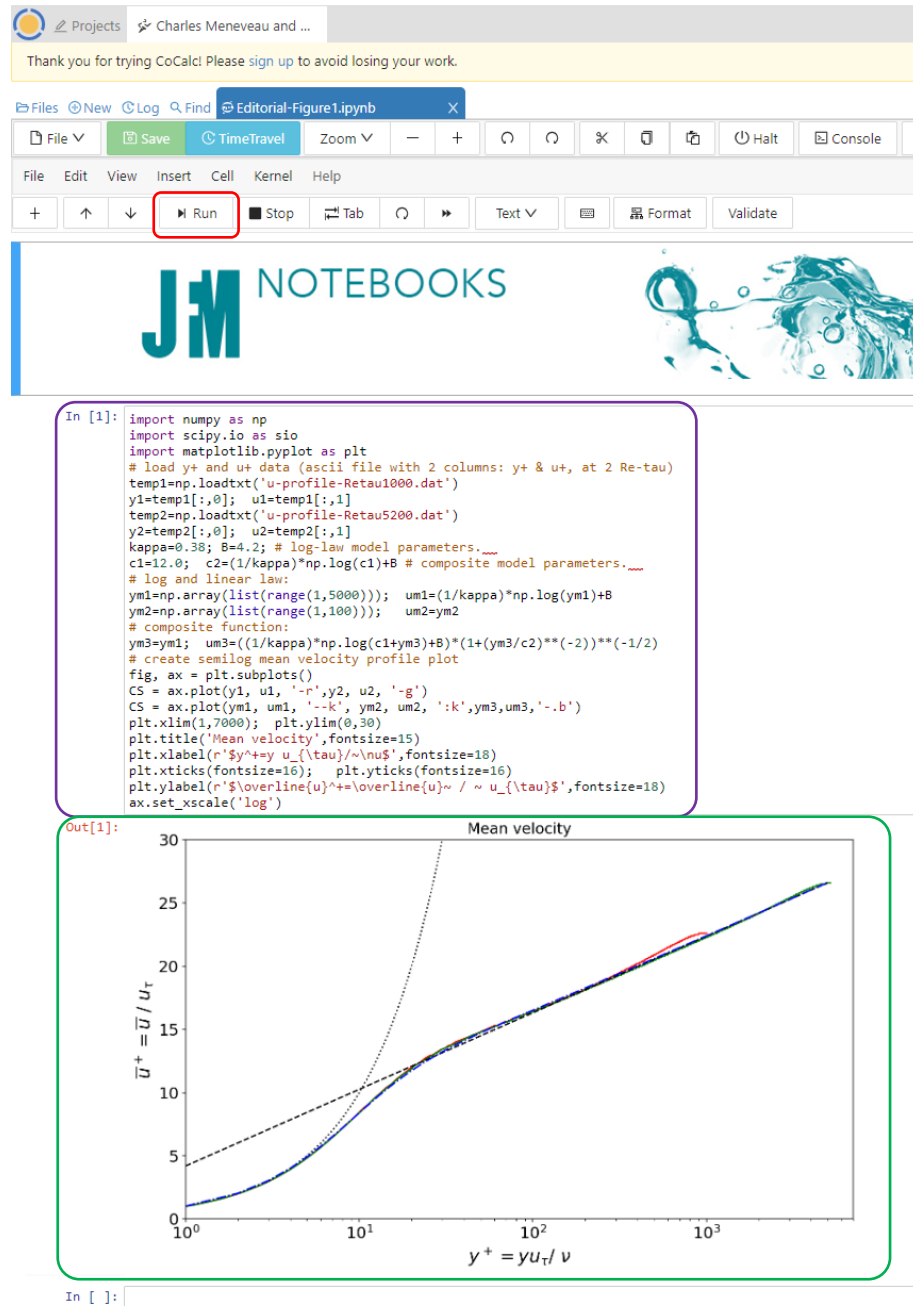
OR

You can choose from your existing projects in the dropdown menu, if you are signed in.



Further details and documentation on using CoCalc can be found here: <https://doc.cocalc.com/>.

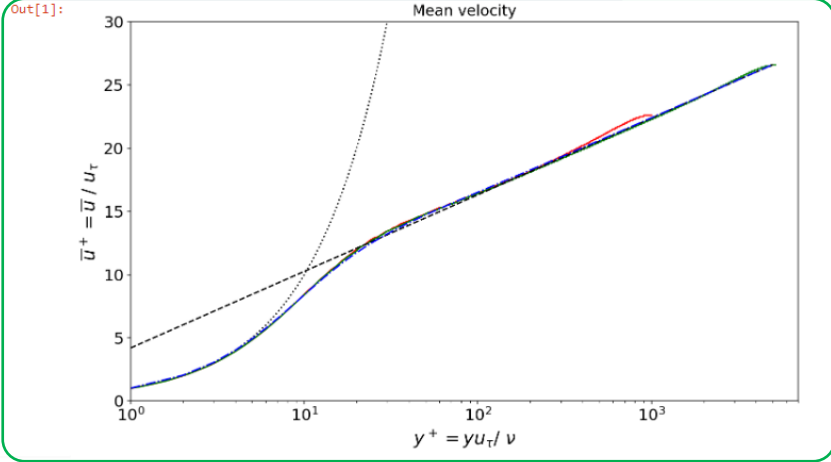
- Interact with the notebook by changing code in the input box then clicking 'Run' to update the output.



The screenshot displays the CoCalc web interface for a Jupyter notebook. The top navigation bar includes 'Projects', 'Files', 'New', 'Log', 'Find', and 'Editorial-Figure1.ipynb'. A yellow banner at the top reads 'Thank you for trying CoCalc! Please sign up to avoid losing your work.' The main toolbar contains 'File', 'Edit', 'View', 'Insert', 'Cell', 'Kernel', and 'Help' menus, along with buttons for '+', 'Run', 'Stop', 'Tab', 'Text', 'Format', and 'Validate'. The 'Run' button is highlighted with a red box. Below the toolbar is the 'JM NOTEBOOKS' header with a decorative image of water splashing. The notebook content is divided into an input cell and an output cell. The input cell, labeled 'In [1]:', contains Python code for data loading, model fitting, and plotting. The output cell, labeled 'Out[1]:', shows a plot titled 'Mean velocity' with the y-axis labeled  $\bar{U}^+ = \bar{U} / u_\tau$  and the x-axis labeled  $y^+ = yu_\tau / \nu$ . The plot features a semi-log scale, with the x-axis ranging from  $10^0$  to  $10^3$  and the y-axis from 0 to 30. It displays experimental data points (red and blue dots) and a fitted curve (black line) that follows a logarithmic trend at higher  $y^+$  values.

```
In [1]: import numpy as np
import scipy.io as sio
import matplotlib.pyplot as plt
# load y+ and u+ data (ascii file with 2 columns: y+ & u+, at 2 Re-tau)
temp1=np.loadtxt('u-profile-Retau1000.dat')
y1=temp1[:,0]; u1=temp1[:,1]
temp2=np.loadtxt('u-profile-Retau5200.dat')
y2=temp2[:,0]; u2=temp2[:,1]
kappa=0.38; B=4.2; # log-law model parameters.....
c1=12.0; c2=(1/kappa)*np.log(c1)+B # composite model parameters.....
# log and linear law:
ym1=np.array(list(range(1,5000))); um1=(1/kappa)*np.log(ym1)+B
ym2=np.array(list(range(1,100))); um2=ym2
# composite function:
ym3=ym1; um3=((1/kappa)*np.log(c1+ym3)+B)*(1+(ym3/c2)**(-2))**(-1/2)
# create semilog mean velocity profile plot
fig, ax = plt.subplots()
CS = ax.plot(y1, u1, '-r', y2, u2, '-g')
CS = ax.plot(ym1, um1, '-k', ym2, um2, ':k', ym3, um3, '-.b')
plt.xlim(1,7000); plt.ylim(0,30)
plt.title('Mean velocity', fontsize=15)
plt.xlabel(r'$y^+=y u_\tau / \nu$', fontsize=18)
plt.xticks(fontsize=16); plt.yticks(fontsize=16)
plt.ylabel(r'$\overline{U}^+=\overline{U} / u_\tau$', fontsize=18)
ax.set_xscale('log')
```

Out[1]:



In [ ]:

Further details and documentation on using CoCalc can be found here: <https://doc.cocalc.com/>.