MSE 598 Lecture #1: Intro to 4CeeD

https://learn.4ceed.illinois.edu/

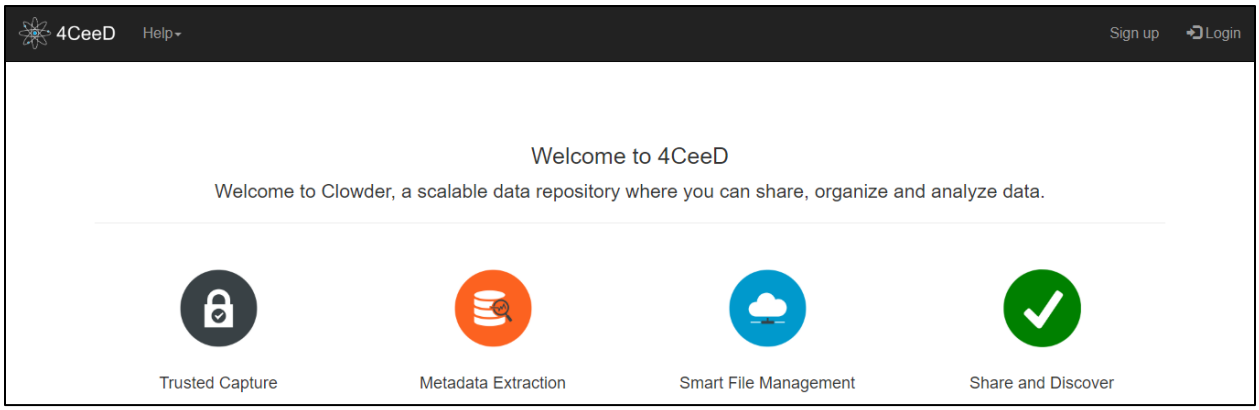
(Note: Must be on IllinoisNet or VPN to University Wifi)
(Note: Works best on Chrome Browser. Has issues on FireFox and Microsoft Edge)

Learning about 4CeeD (2022)

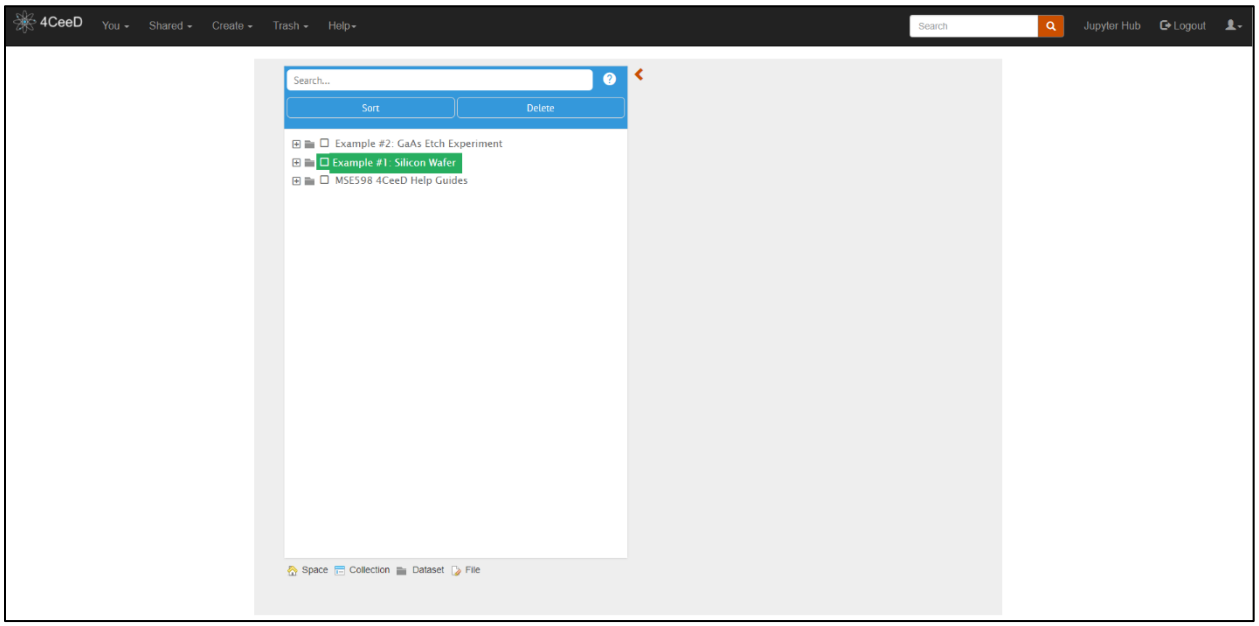
1) Breakout Session #1: Logging into 4CeeD and Exploring

Please log into 4CeeD with the account that you made. If you haven't made an account yet, please click on the "sign-up" tab and follow the instructions of the **MSE598_4CeeD_CreateAnAccount.docx**. If you are having difficulties logging in, you may need to VPN into the University network for security purposes. Also please use Google Chrome, any other web browser typically has issues with 4CeeD.

a. From the homepage, click **Login** on the upper right corner

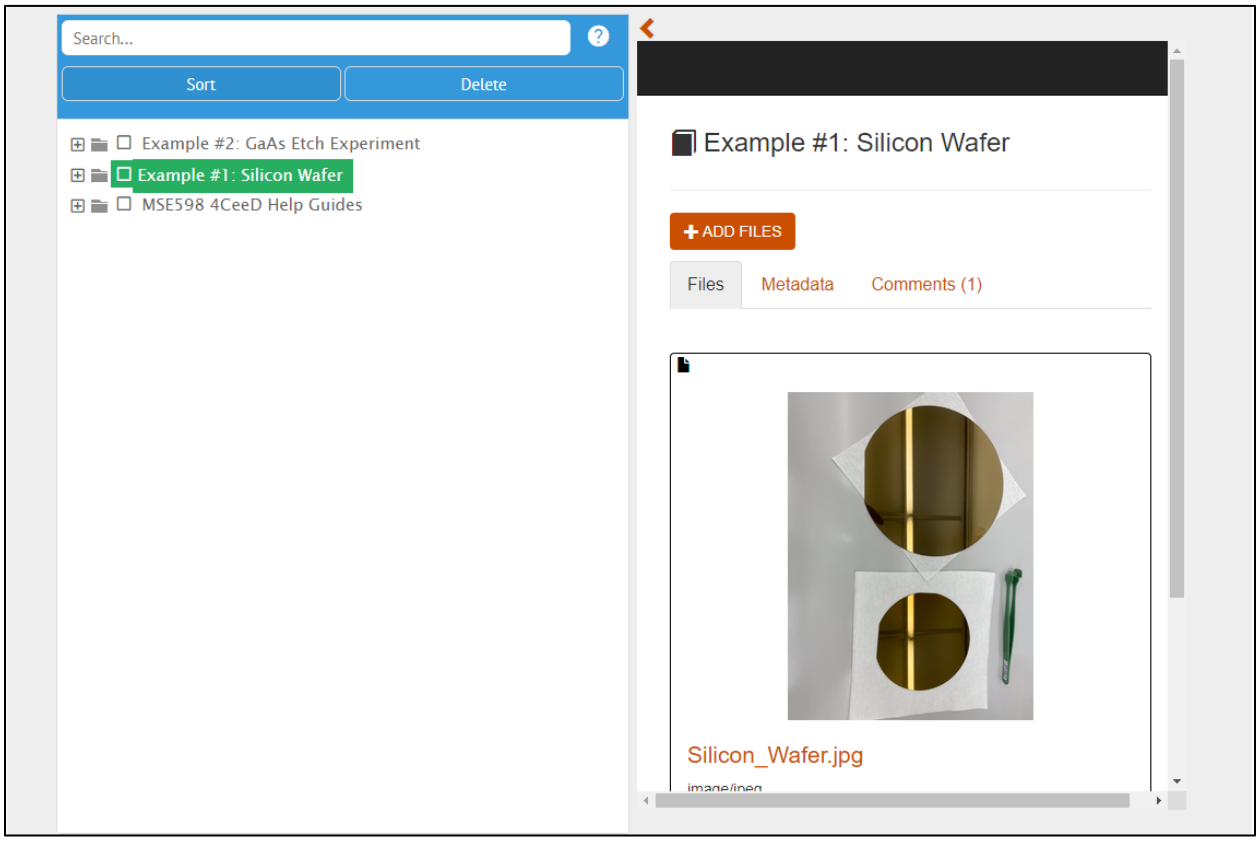


b. You should see the following homepage once you are logged into learn.4CeeD.illinois.edu



Notice that there's three pre-made datasets with pre-loaded data to give you a sense of what stored data looks like.

c. Now, **click on Example #1: Silicon Wafer (Highlighted Green)**.



The scenario here is that you just received new silicon wafers from a vendor and want to document this for inventory purposes. Normally this would be spread across several files (.jpg, .txt) but 4CeeD was designed to compact the visualization of these files into one.

d. Now let's explore the main dataset components: Files, Metadata, and Comments.
   - Files: Stored image or text files pertaining to the dataset.
   - Metadata: Experimental parameters or descriptors stored via key-value pairs.

- Comments: Community posting board that is accessible by collaborators shared with this dataset.

Notice that the image file is pre-viewed to give the user a better understanding of the dataset instead of just a list of file names using traditional file explorer.

e. Now, **click on the "Metadata" tab.**

Here, we've stored the pertaining key-value pairs regarding the Silicon wafer. This data can be modified by the "Edit Metadata Template" where the values can be edited and the parameters can be removed or added.

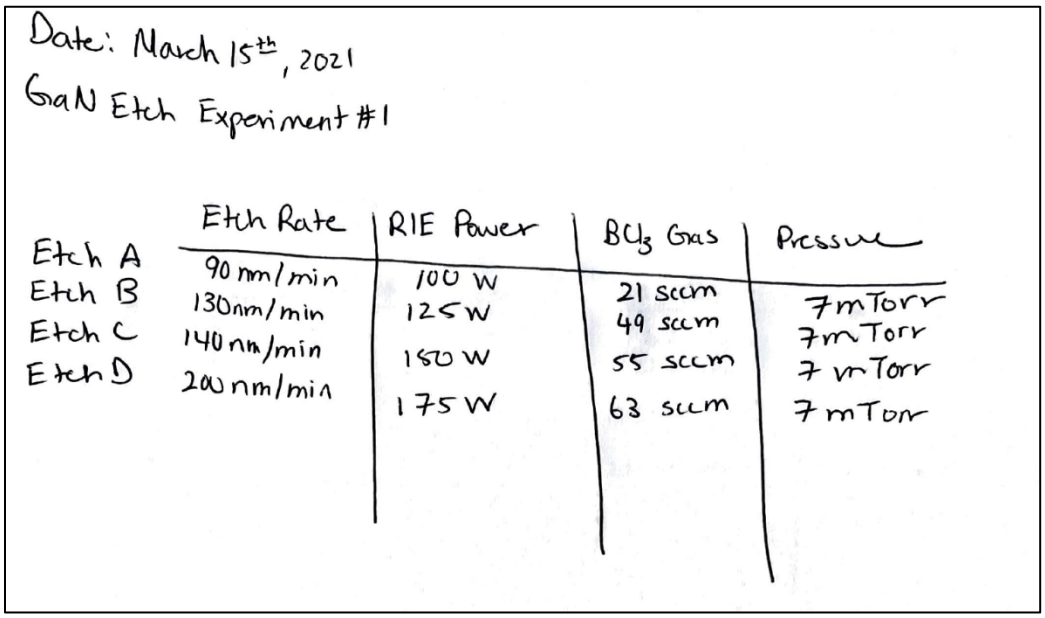
f. Lastly, **click on the "Comments" tab**.

Comments can be posted by the users for "self-notes" or posted by other collaborators who are sharing the 4CeeD dataset. Any dataset that is made can be shared to other 4CeeD users with different levels of access settings. This topic will be explored more in the second lecture.

2) Breakout Session #2: Storing Your Own Data and Using Templates

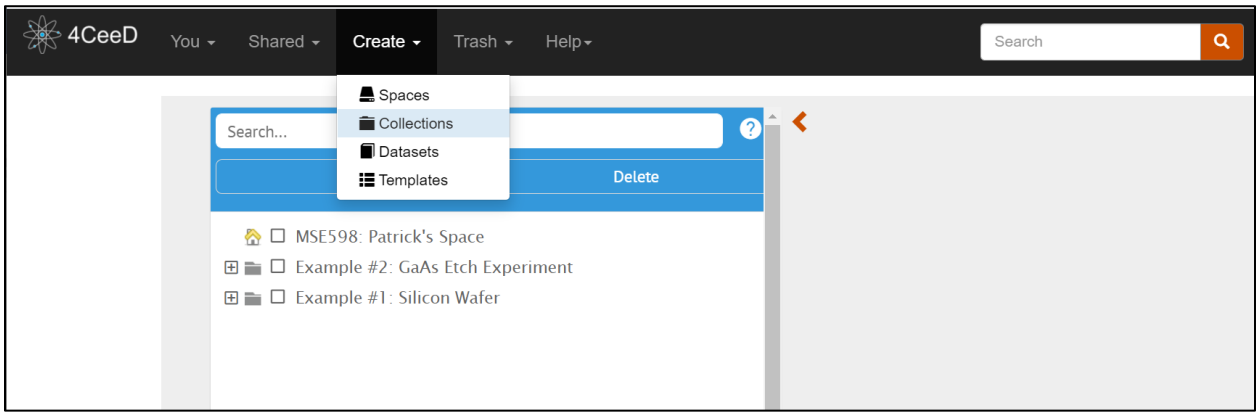
Now let's try having you store data yourself using 4CeeD. This example is to mimic that you've taken handwritten notes that you want to digitize using 4CeeD.

a. **Please open MSE598-GaNEtch-Experiment.pdf**.

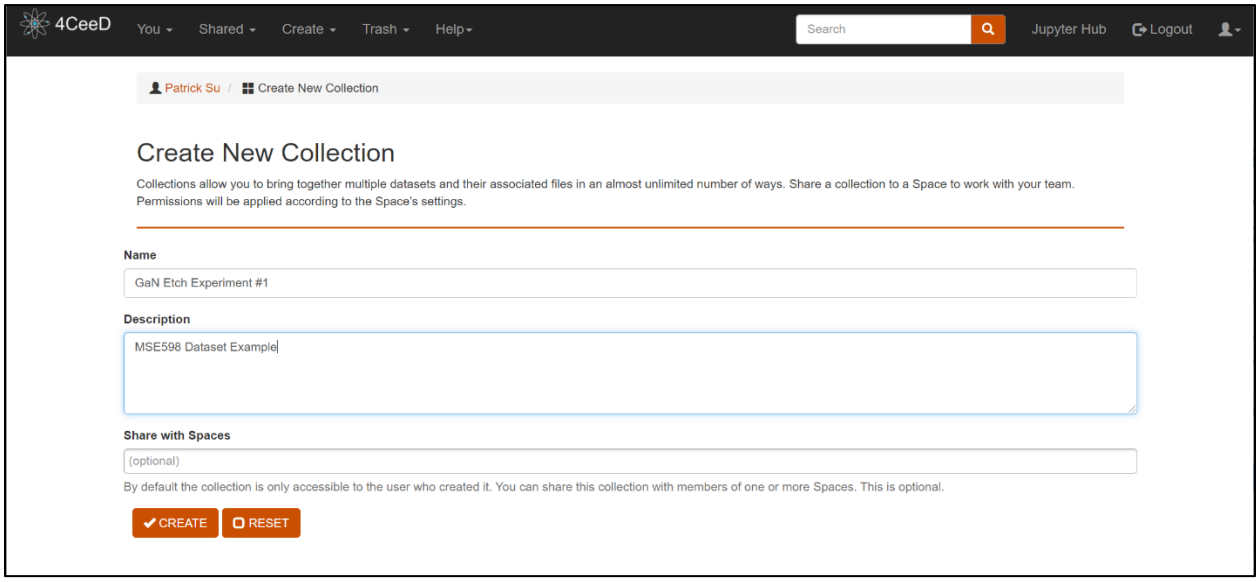


Note that we are looking at one main experiment, GaN Etch Experiment #1 (Collection) with four attempts underneath (Datasets). We'll first create a **Collection** named **GaN Etch Experiment** that contains **four Datasets** named **Etch A, Etch B, Etch C, and Etch D.**

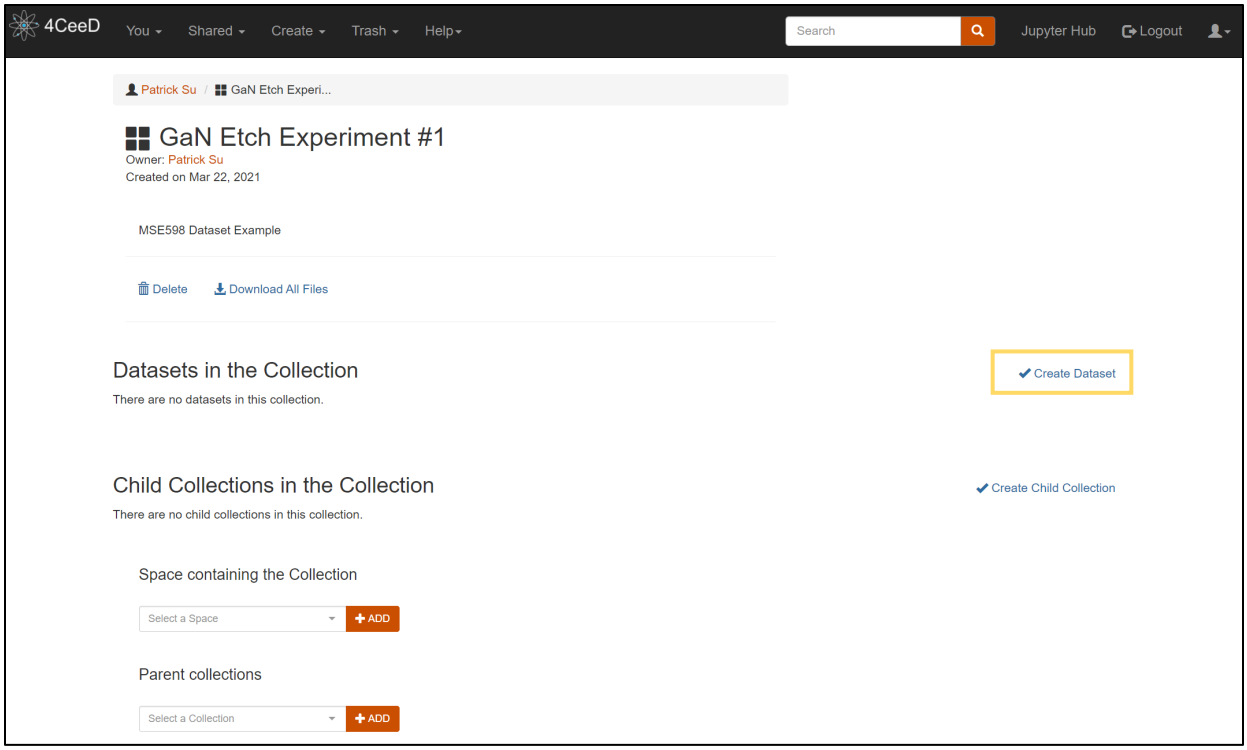
b. **Click on the "Create" dropdown menu and then click "Collections"**



c. **Enter in the "Name" and "Description" and hit "Create"**

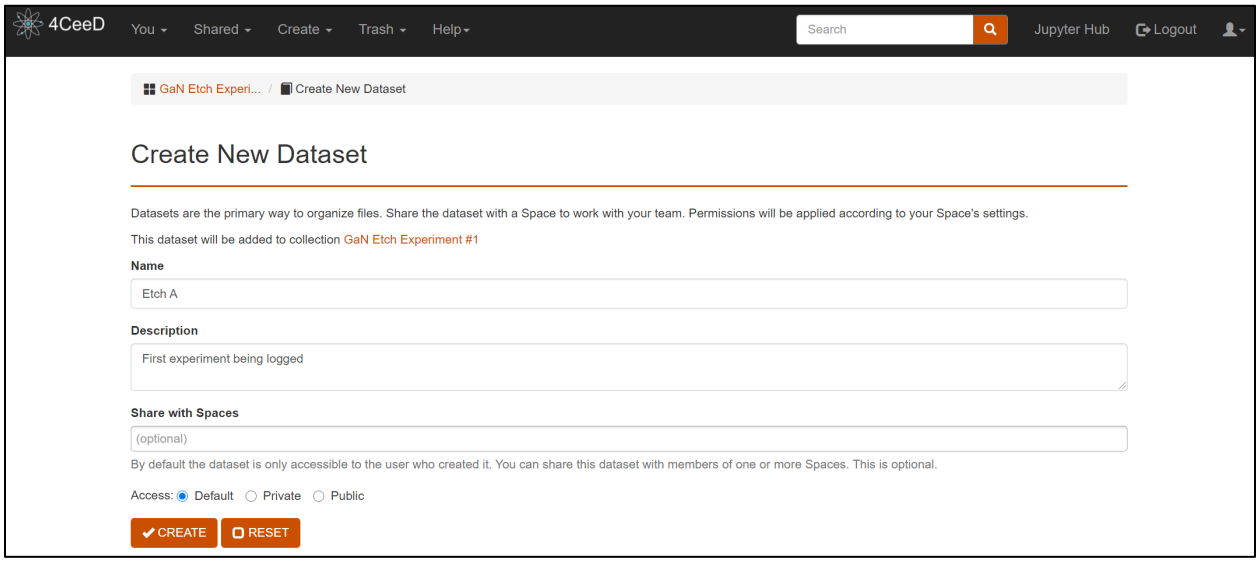


You should now see an empty collection that allows you to either "Create Dataset" or "Create Child Collections" in the current collection.

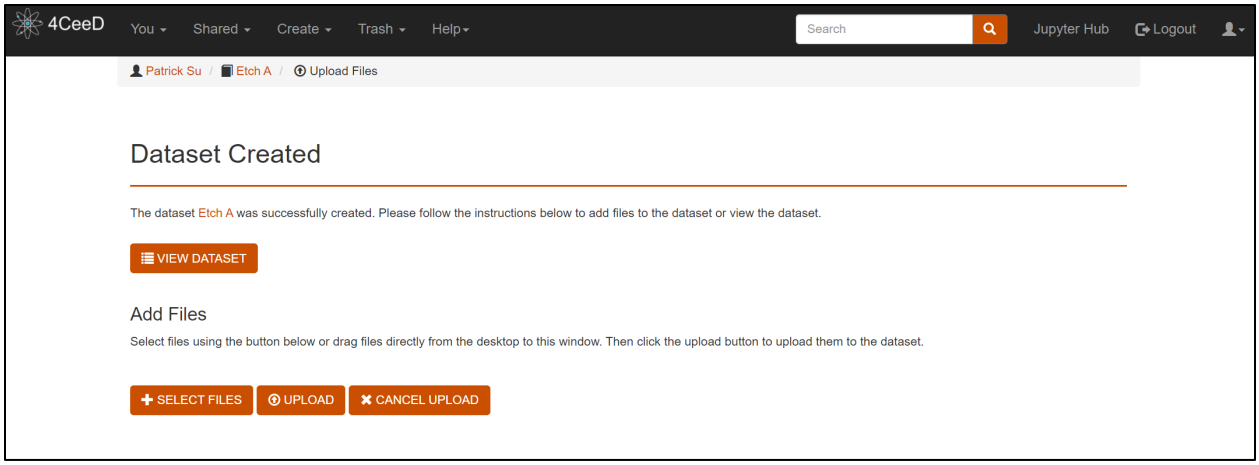


Let's first create our first "Dataset" in this collection and call it Etch A so we can begin digitizing our handwritten notes.

d. **Please click "Create Dataset" outlined in the yellow box in the figure above.**

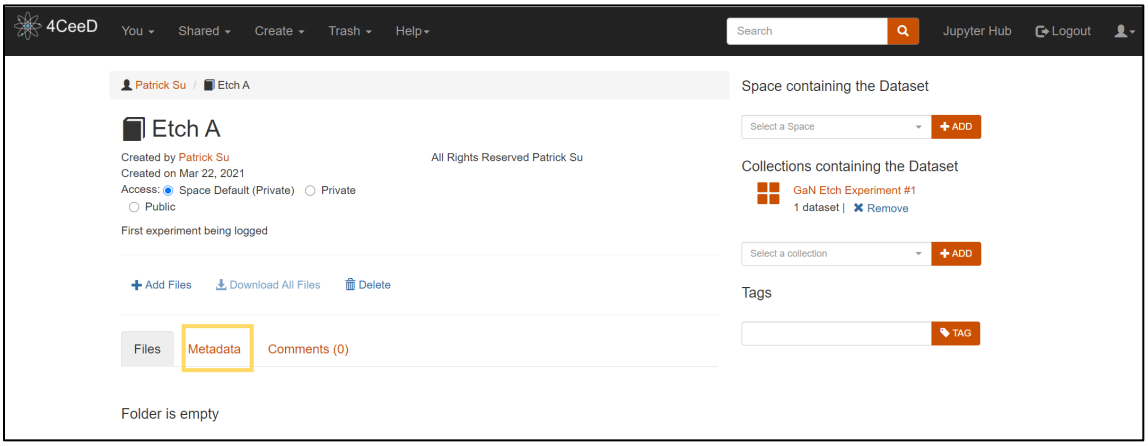


e. **Fill out the name and description box and hit "Create"**

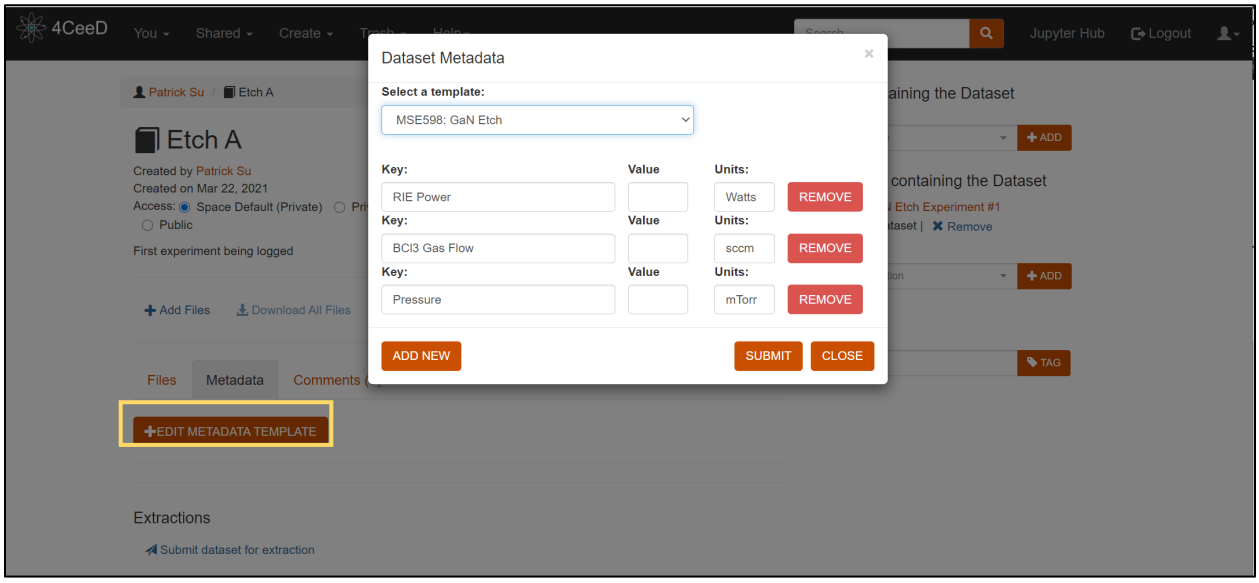


At this point, you can upload any files you'd like pertaining to this dataset like measurement data or images. For this example, we'll skip this step and just go into **"View Dataset"**.

f. **Now let's add our data into the Metadata tab of our dataset.**



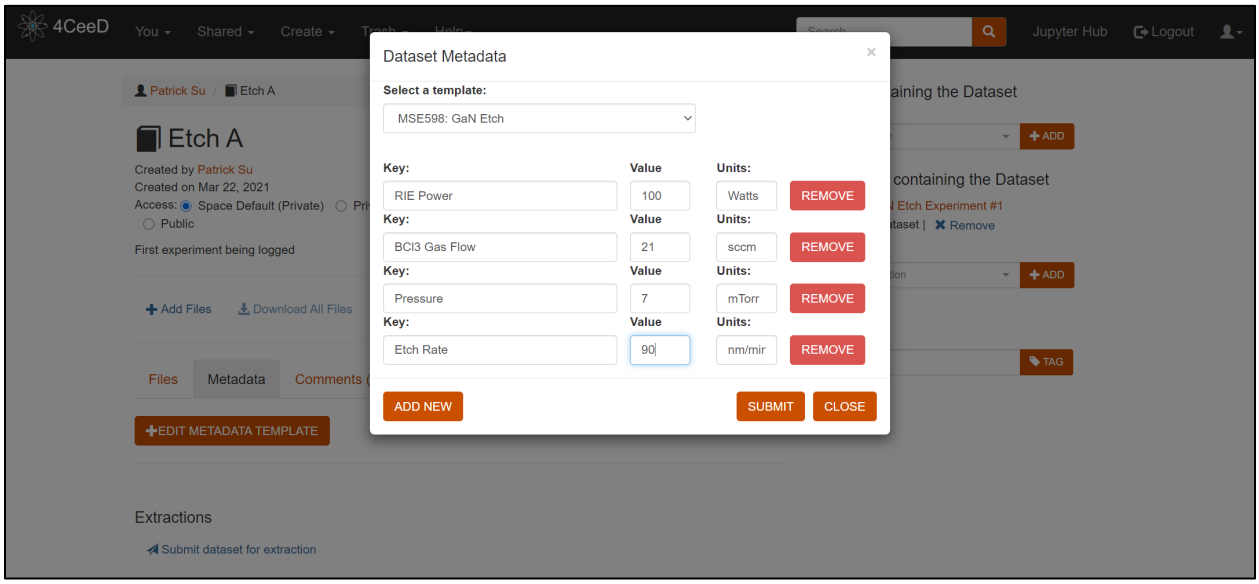
g. **In the metadata tab (highlighted in yellow), go ahead and click "Edit Metadata Template".**



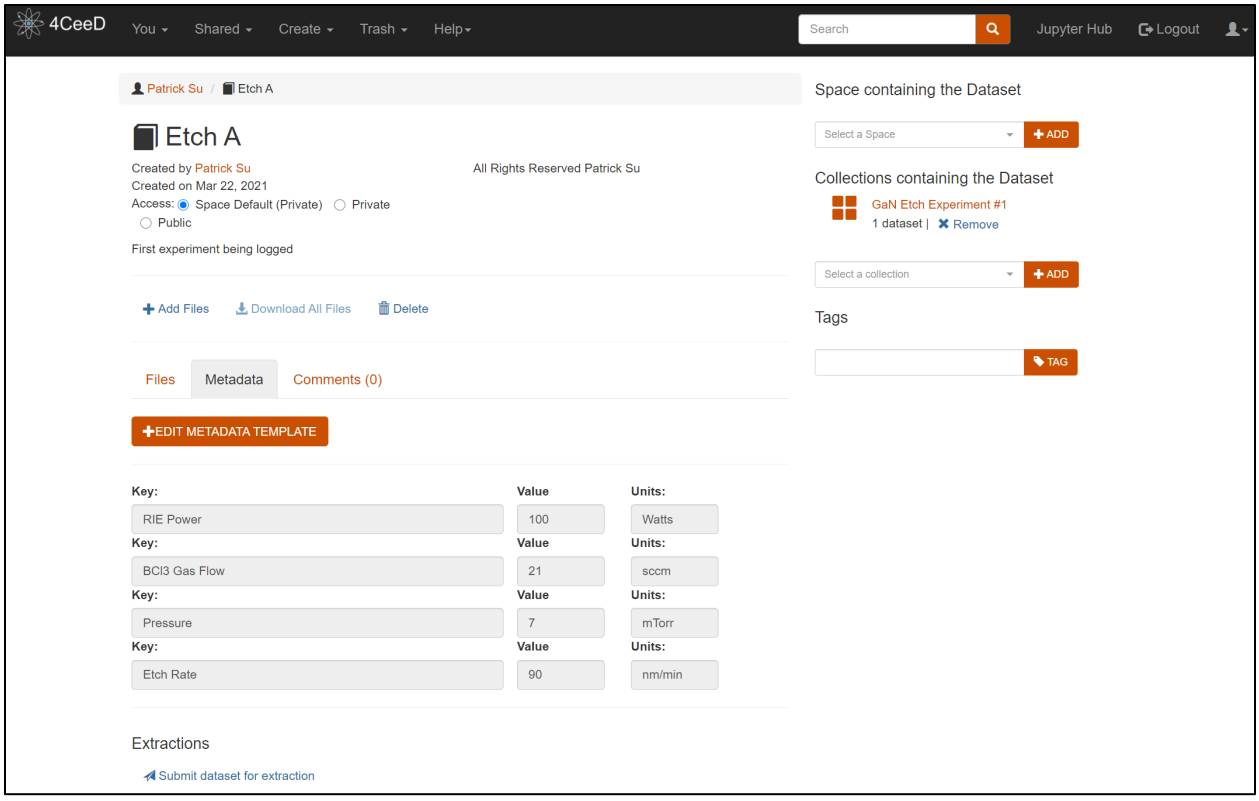
Now let's select a **Template.** A template is a preset list of key-value pairs that makes it easy to upload data of repeated experiments. Here we will choose **near the bottom, MSE598: GaN Etch.**

Note that while RIE Power, BCl3 Gas Flow, and Pressure are listed, Etch Rate is not for this template. That's okay! 4CeeD is flexible and allows us to add another field right in this window by clicking

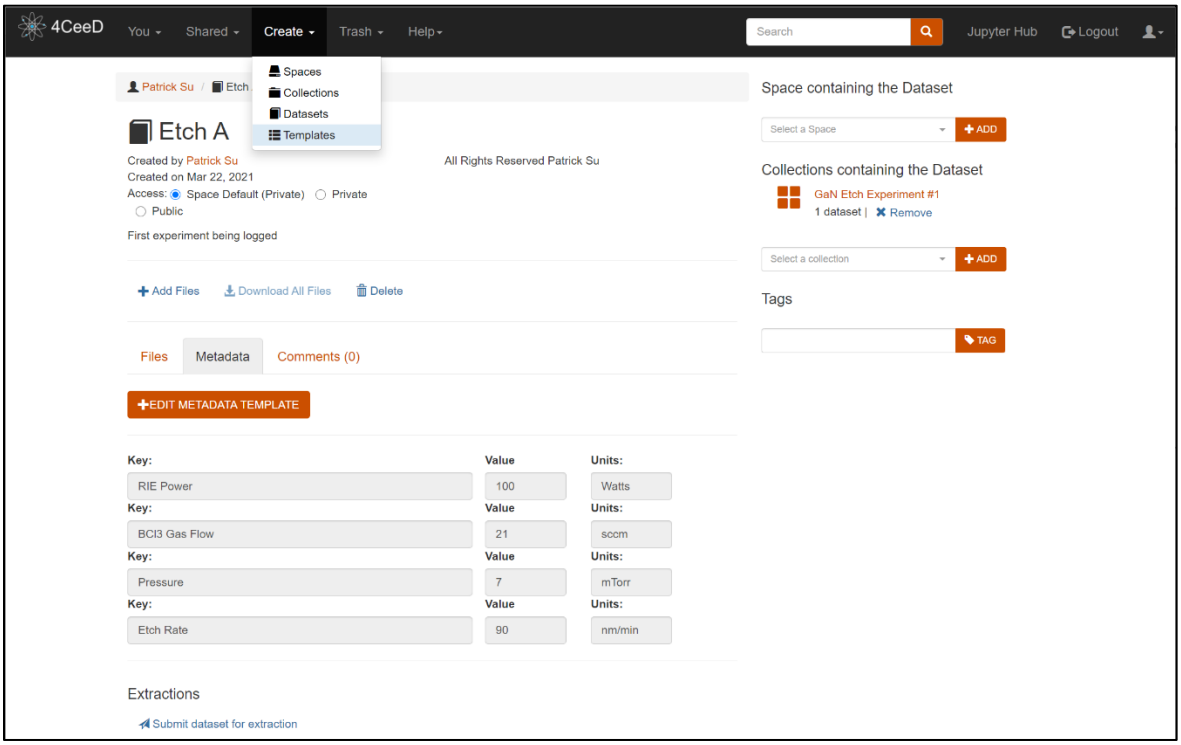
h. **Click "Add New" and add the "Etch Rate" field with "nm/min" as the units. Fill out all the remaining information for Etch A as well and hit submit.**



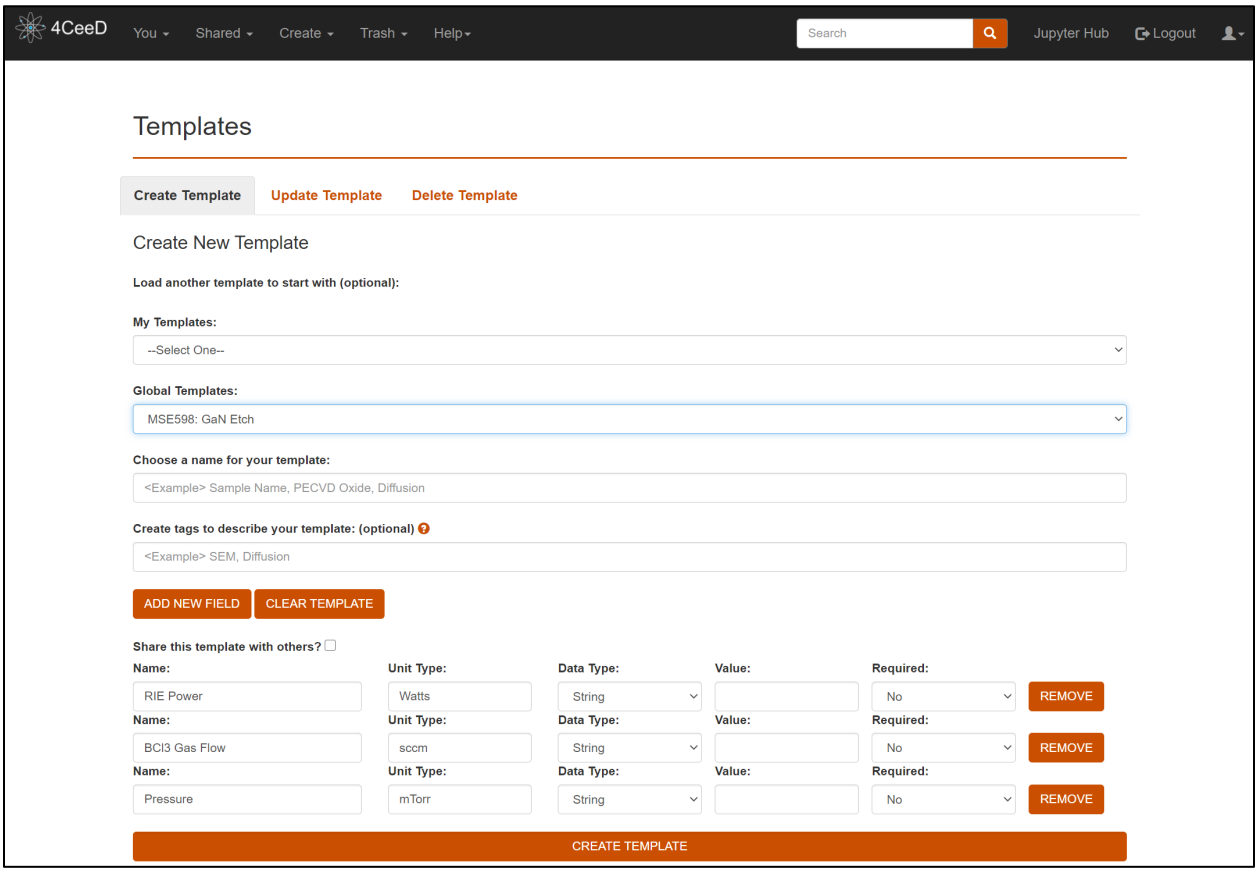
The fields should be stored and can be pre-read by clicking again on the metadata tab. Note that everything is well stored and can be quickly accessed in each dataset.



Now let's try the other way of modifying the actual template to include etch rate and showing you how to store "preset" values that you will use often.

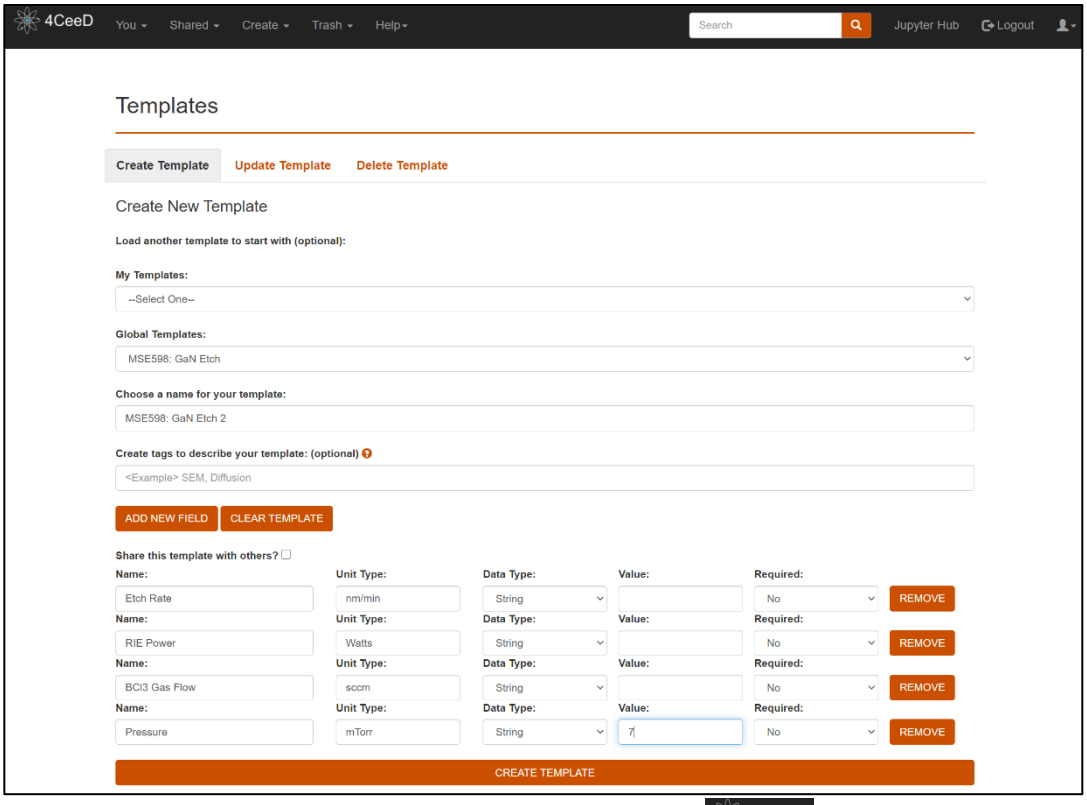


i. **Click on the “Create” dropdown menu and click on “Templates”. Then use the “Global Templates” dropdown menu and click on MSE598: GaN Etch.**

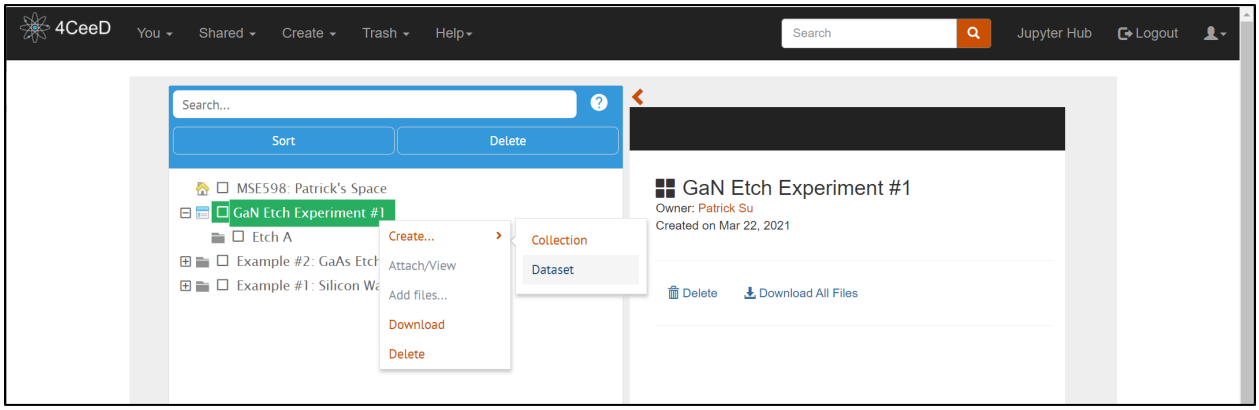


Note that since Etch Rate was the missing key-value pair, we’ll just click **“Add New Field”** to add it. **Don’t forget to name it in “Choose a name for your template”** before you click **“Create Template”.**

Also, go ahead and put the value “7” in the pressure value box. We’ll see what it does in the next dataset we create.



j. Now go back to your dashboard by clicking the 4CeeD Icon. 



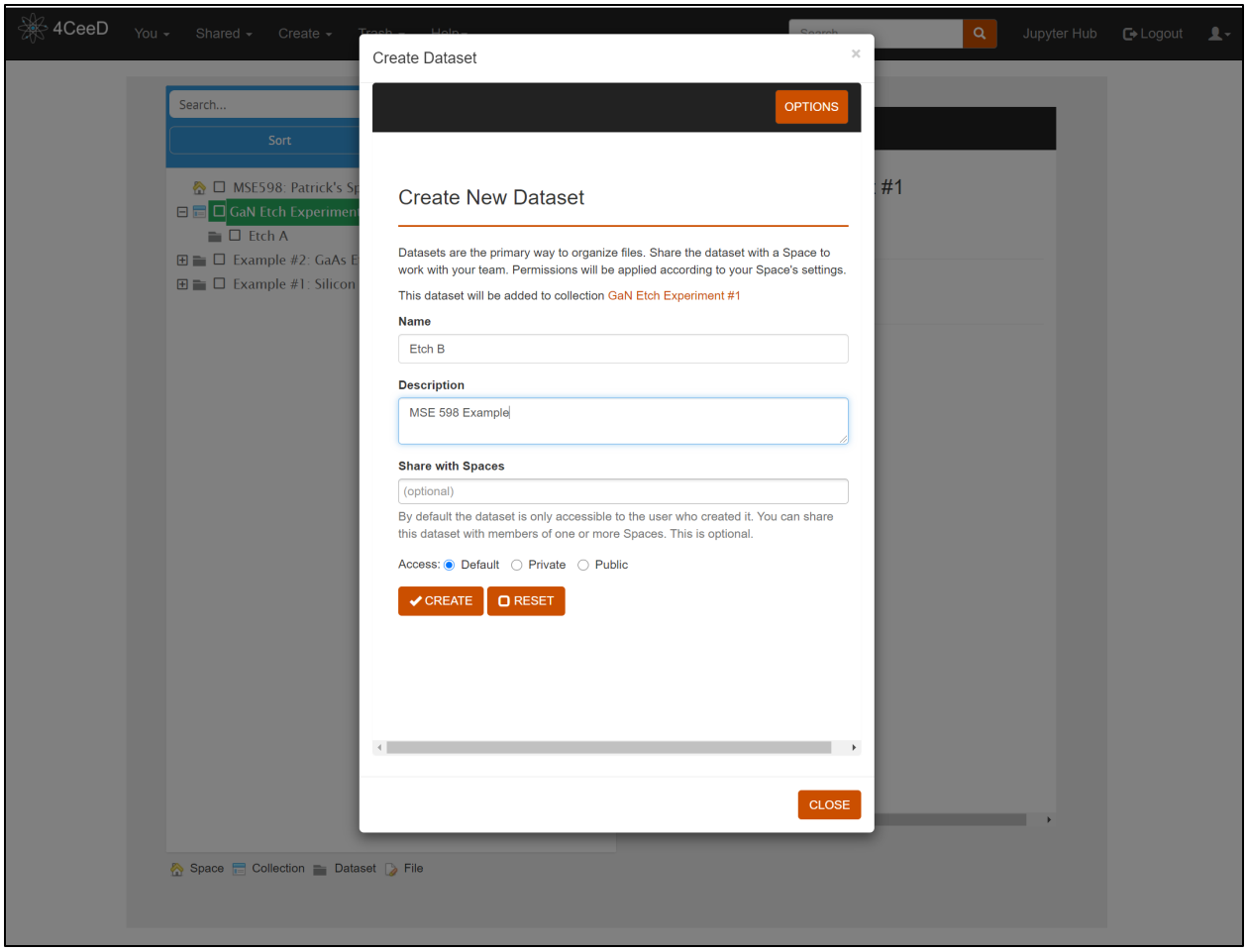
k. "Right-Click" the "GaN Etch Experiemnt #1" collection and go Create -> Dataset.

This time, the "Create Dataset" Screen is more integrated by still has the same fields.

l. **Fill out the "Name" and "Description" fields and click "Create". Just like last time, after you hit "Create", go and "View Dataset".**

m. **Follow the same steps of f – h except using our newly created Template.**

Question: What is different about the template? How about the pressure value?



This is the end of the lecture series #1. If you were able to finish early, try uploading your own data onto 4CeeD using templates and creating templates for your experiments.

If you have any questions, please feel free to reach out to Patrick Su (psu8@illinois.edu) or Robert Kaufman (rbkaufm2@illinois.edu).