Data Acquisition, Storage and Management

Last updated: 05/30/2016

This policy is mandatory for technicians, visiting scholars, undergraduate, summer and graduate students, postdoctoral fellows, research associates, assistant scientists and all other Netz Lab members. The following definitions apply:

[1] **Research Data** is defined as information recorded in physical form, regardless of form or the media on which it may be recorded. For the purposes of this policy, **Research Data** is further defined as including any records that would be used for the reconstruction and evaluation of reported or otherwise published results. Research Data also includes materials such as unmodified biological specimens, environmental samples, and equipment. Examples of Research Data and Materials include: 1) laboratory notebooks; 2) notes of any type; 3) photographs; 4) films; 5) digital images; 6) original biological and environmental samples; 7) protocols; 8) numbers; 9) graphs; 10) charts; 11) numerical raw and processed experimental results; 12) instrumental outputs from which **Research Data** can be derived and 13) other deliverables under sponsored agreements (e.g., reports, summaries, presentations, spreadsheets, meeting minutes, etc.).

[2] **The University owns all Research Data** generated by research projects conducted at or under the auspices of the Johns Hopkins University regardless of funding source, unless specific terms of sponsorship, other agreements or University policy supersede these rights.

[3] The Primary Investigator (Netz Arroyo) is responsible for selection of an appropriate method of **storing and archiving Research Data**, and for determining what needs to be retained in sufficient detail and for an adequate period of time to enable appropriate responses to questions about accuracy, authenticity, primacy, and compliance with laws and regulations governing the conduct of research.

Instructions for Data Storage

Each permanent lab member will be granted access to the Netz Lab Dropbox folder where all data is to be saved and stored. **DO NOT** save data on your personal computer or on the hard drive of laboratory workstations. The Netz Lab Dropbox folder is organized in six sections:
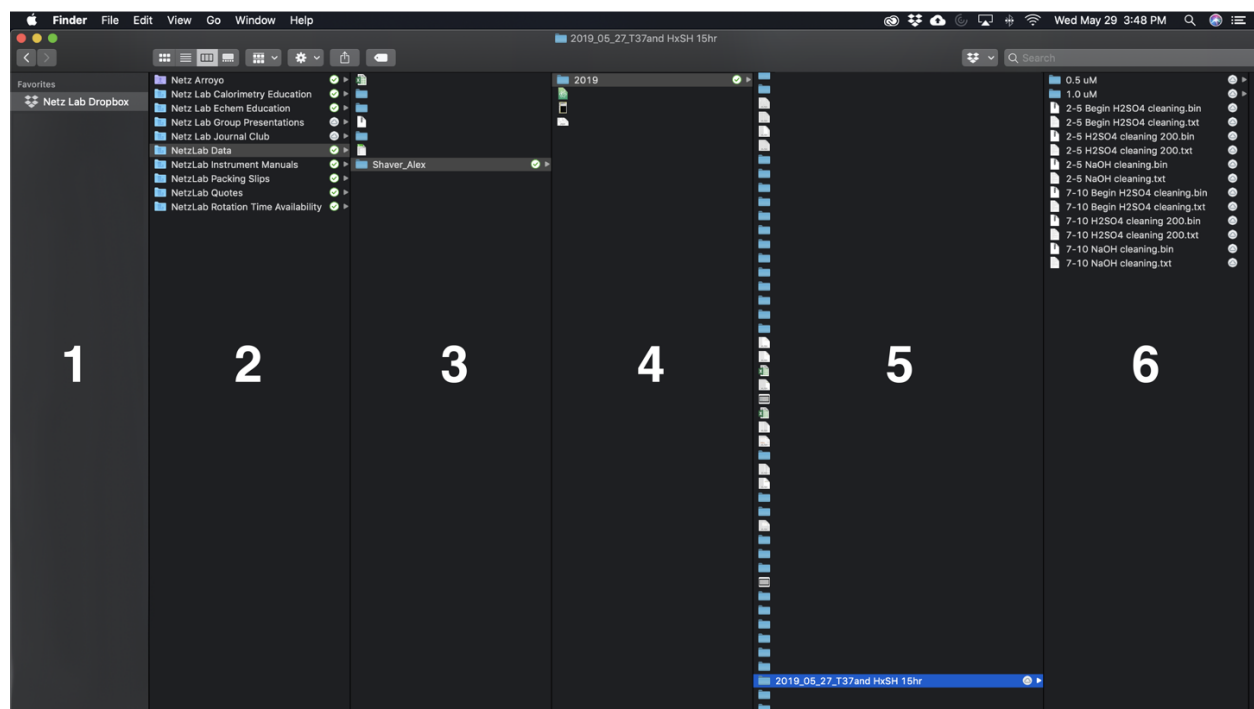
Section [**1**] is the main folder of a business account, managed by **PI** Netz Arroyo.

Section [**2**] contains all lab-shared folders and only one personal, private folder (coded in purple color) for lab members to use at their discretion. The personal folder will be privately migrated to a regular account once a member leaves the Netz Lab. The shared folders are visible to all members of the lab and to **PI** Netz Arroyo. **All data generated during the course of our research activities must be stored in the "Netz Lab Data" folder**.

Section [**3**] contains individual folders for each of the lab members. The nomenclature to be used is: "LastName_FirstName". In the example above, the folder is named "Shaver_Alex".

Section [**4**] contains folders named by the year in which data was collected (e.g., 2019, 2020, 2021, etc.).

Section [**5**] contains all data folders generated in any single year. The nomenclature to create new folders is: "Year_Month_Day_Description". For example, in the screenshot above this is "2019_05_27_T37and HxSH 15hr". Any other files located within this section, including non-folders, must be named following the same nomenclature. This includes any excel, igor pro, origin pro, illustrator, photoshop, acrobat or any other files and images containing processed data.

Section [**6**] contains all raw data files collected in a given day. The nomenclature used in this section is free, but must be descriptive of the experiments performed and allow quick, retroactive data identification.

Instructions for Data Acquisition

Experimental data must be directly stored in the Netz Lab Dropbox folder following the above-described procedures. When applicable, data files must be stored both in raw instrument and text formats. For example, when running electrochemical experiments using CH Instruments equipment, matching .bin and .txt files must be saved. The same rule applies to data collected from any other instrument in our lab or external laboratories.

Instructions for Laboratory Notebook Recordkeeping

All lab members will be given paper laboratory notebooks to be used for recording notes, experimental observations, sketching ideas and drawing experimental designs. These must be submitted to **PI** Netz Arroyo when full and before a new notebook is started, or when leaving the lab. Paper notebooks are given to lab members for convenience. However, their contents must be migrated on a weekly basis to an electronic notebook hosted in Microsoft Teams (JHU-granted institutional account) and based in OneNote. Below is a screenshot of this e-notebook:
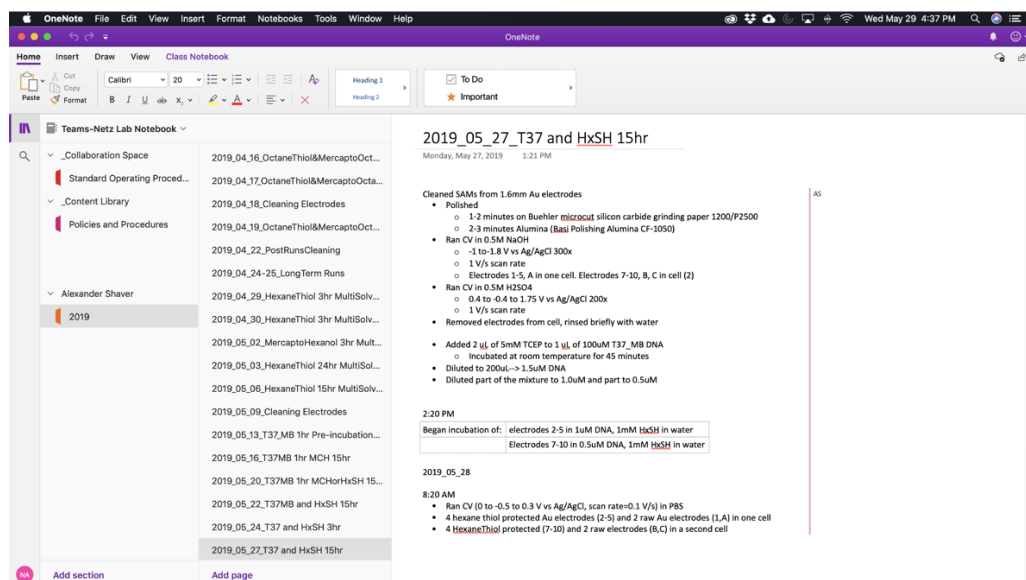
Access to a Microsoft Teams e-notebook will be given to each member (permanent or visiting) of the Netz Lab. The e-notebook is only visible to the individual and to **PI** Netz Arroyo. This facilitates the supervision of recordkeeping and teaching of correct approaches to logging information. The use of technological aids such as photos, videos, images, graphs, spreadsheets, voice-recording and sketches is supported by the e-notebook and encouraged. Lab members will hold monthly meetings with **PI** Netz Arroyo to discuss the contents of their paper and e-notebooks.

The nomenclature used for each page of the e-notebook must match any data records in the Netz Lab Dropbox Folder. This is true in the example image above, second column, where all entries are recorded using the nomenclature Year_Month_Day_Description. All e-notebook entries should be titled with this nomenclature. The contents of each e-notebook page should include: experiment hypothesis, methods employed, observations and results. If optimizing or repeating an experiment, all alterations to the experimental protocol must be recorded.

Instructions for Publication Data

Each lab member must include a folder titled "Manuscripts" in the Netz Lab Dropbox folder where publication data will be stored. The parent folder "Manuscripts" will contain one subfolder per each publication to be submitted by the member. The publication subfolders should be named following the nomenclature "Year_Description_LastName_FirstName." This is illustrated in the image below with the example folder 2019_PythonSACMES_Curtis_Sam:
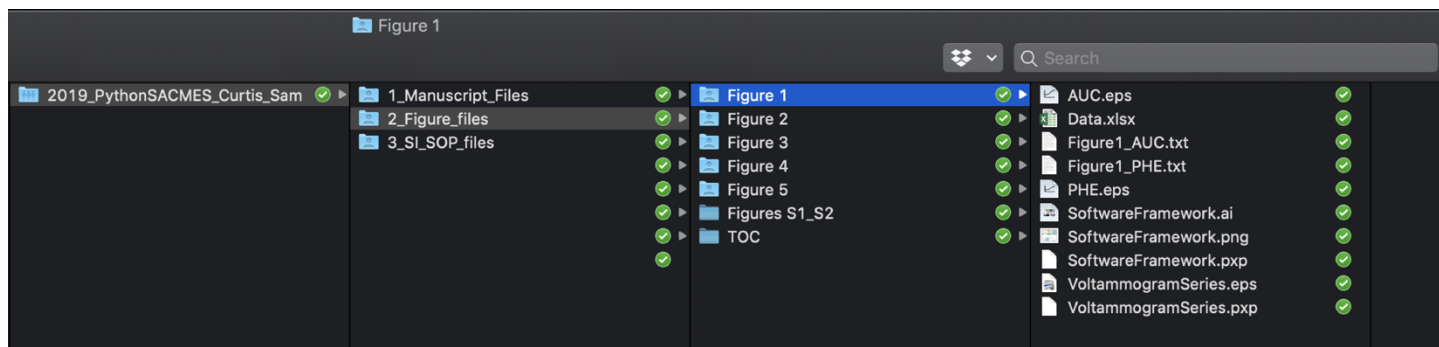
Each publication subfolder must include folders for Manuscript_Files (all the versions of the manuscript), Figure_Files (all raw and processed data), and SI_Files (all the versions of the supplementary information). When assembling figures, a separate subfolder must be created per figure in the manuscript and in the supplementary information document. These should consist of folders containing the raw data used to build each figure, all documents used to process the data for publication (illustrator, photoshop, excel, igor pro, origin pro, etc. files), and a word document describing, step by step, how the data was processed to create the final figures. Such instructions must be sufficiently clear to allow any member of the lab to re-build the figures from scratch.

General instructions when preparing a manuscript are:

- Record all the steps followed when editing figures
- Prepare a table correlating each dataset used to 1) a figure in the manuscript or SI document, 2) the date when the data was collected and 3) the date the figure was created. Also include any dates corresponding to figure modifications.
- **PI** Netz Arroyo will supervise the organization and correct handling of data during figure assembly and published data storage.

Grant data: The same guidelines must be followed when assembling figures for federal or non-federal grants. This will be done for all grants where Netz Arroyo is **PI** during submission.

Netz Lab
Johns Hopkins University

<u>Policy for Data Retention</u>

As per the JHU policy, all data, which includes notebooks, raw files, and associated records for publication and grant, will be retained by the Netz Lab and must be accessible to the PI, lab members and all authors.

<u>Review and Revisions to this Data Management Policy</u>

The Netz Lab will use this policy effective immediately. All new personnel will receive and sign a copy of the policy before they begin research. On an annual basis, we will jointly review the policy at a lab meeting and discuss any necessary changes.

<u>Acknowledgment of Standard Operating Procedure Guidelines and Policies</u>

I certify that I have read and understood the contents of this document and that I will abide by all the policies and guidelines described in it.

| _____ | _____ | _____ |
| Member Name | Signature | Date |