

NanoFab Equipment Management Operation (NEMO) Tutorial

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I. Accessing NEMO

NanoFab Internal/External Users will be able to access N.E.M.O. from NanoFab/Cleanroom tool workstations located in the labs. On the N.E.M.O. log on screen enter in your N.E.M.O. username and password and press "OK" to complete the authentication process and access N.E.M.O. Once the authentication is complete you will be taken to the N.E.M.O. homepage.

If you are a NIST employee or associate you can have access to N.E.M.O from your NIST office network computer workstations as well. In order to access N.E.M.O. from your NIST office network computer workstations you will need to launch a web browser, (Internet Explorer or Mozilla Firefox), and enter <http://nemo.nist.gov> into the web browser's address bar. This will launch the N.E.M.O. log on screen. On the N.E.M.O. log on screen enter in your N.E.M.O. username and password and press "OK" to complete the authentication process and access N.E.M.O. Once the authentication is complete you will be taken to the N.E.M.O. homepage.

If you do not know/have an N.E.M.O. username and password information please contact the [NanoFab User Office](#).

II. Making Reservations

To create **tool reservations** first locate the tool for which you would like to make a reservation. For this example we will create a tool reservation for the **Profilometer 2** for May 24th, 10am to 12pm. From the **Calendar** screen, click on the **Metrology** tool category tree to list the tools under that category. (*Figure 1*)

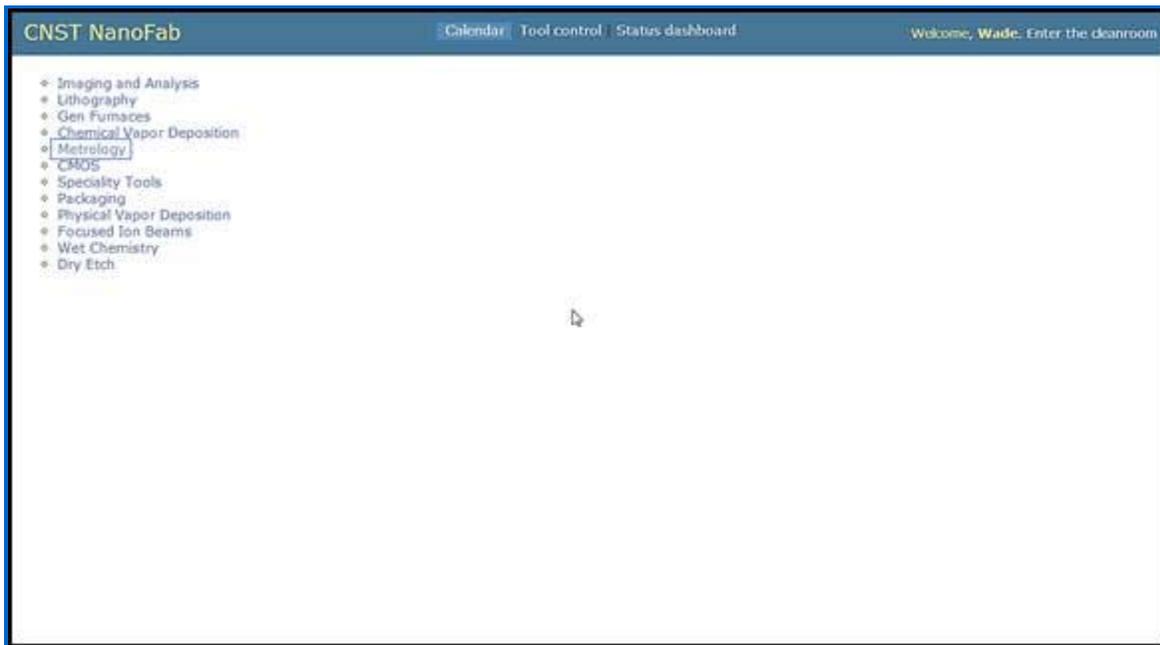


Figure 1: Accessing tools listed in tool category tree.

Click on **Profilometer 2** to display the reservation calendar for this tool. (It will become highlighted once you click on it). (Figure 2)

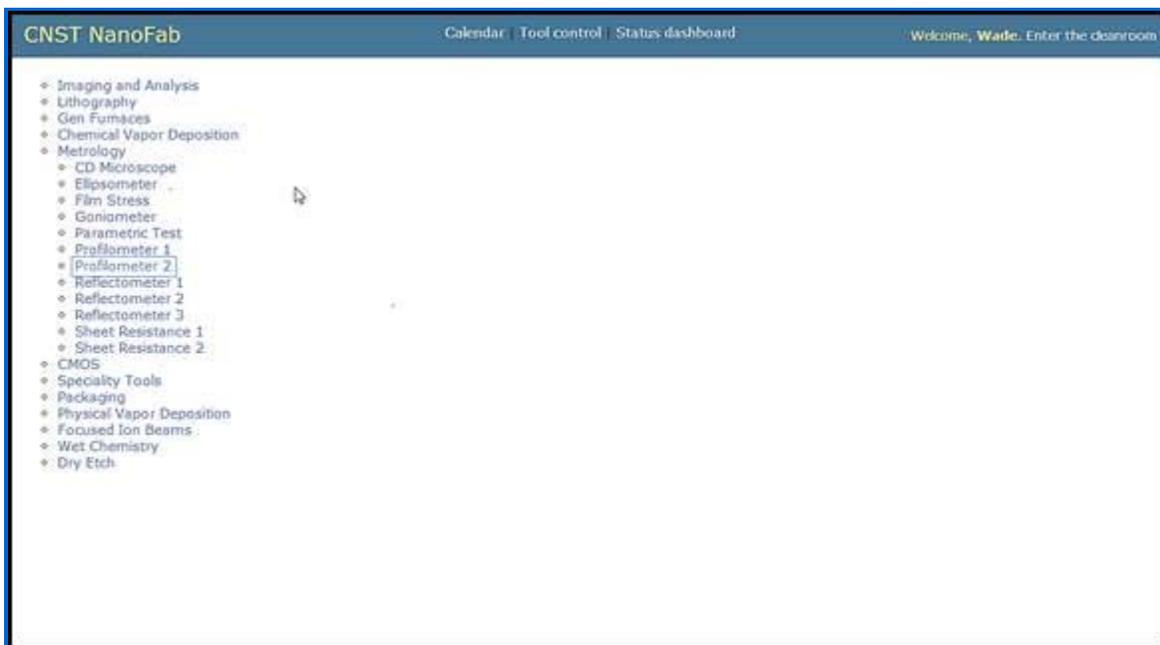


Figure 2: Accessing tool calendar screen.

Click and drag on the calendar screen to create your tool reservation for the **Profilometer 2** for May 24th, 10am to 12pm. (Figure 3)

The screenshot shows the 'Cleanroom Schedule' interface for CNST NanoFab. The top navigation bar includes 'Calendar', 'Tool control', and 'Status dashboard'. A user greeting says 'Welcome, Wade. Enter the cleanroom'. On the left, a tree view lists tool categories: Imaging and Analysis, Lithography, Gen Furnaces, Chemical Vapor Deposition, Metrology (with sub-items like CD Microscope, Ellipsometer, etc.), CMOS, Specialty Tools, Packaging, Physical Vapor Deposition, Focused Ion Beams, Wet Chemistry, and Dry Etch. The main area has tabs for 'Reservations' and 'Usage'. A calendar grid shows dates from Monday, May 20 to Sunday, May 26. A reservation box is visible on Friday, May 24, from 10:00 to 12:00, labeled 'Wade Hall'.

Figure 3: Creating tool reservation.

Click on the tool reservation box to display the tool reservation. You have created a tool reservation for the **Profilometer 2** on May 24th, 10am to 12pm. (Figure 4)

This screenshot shows the same 'Cleanroom Schedule' interface as Figure 3, but with a 'Reservation details' dialog box open over the reservation on May 24th. The dialog box contains the following information: User: Wade Hall, Created by: Wade Hall, Created on: Thursday, May 16th, 2013 @ 3:51 PM, Tool: Profilometer 2, Start: Friday, May 24th, 2013 @ 10:00 AM, End: Friday, May 24th, 2013 @ 12:00 PM, Identifier: 314. A 'Cancel this reservation' button is located at the bottom of the dialog.

Figure 4: Confirming tool reservation.

III. Updating Reservations

To **update** tool reservations first locate the tool reservation that you would like to update. For this example we will update the tool reservation on May 23rd, 10am to 1pm for the **Critical Point Dryer 1**. We will change the tool reservation time to 11am to 1pm. From the **Calendar** screen, click on the **Specialty Tools** tool category tree to list the tools under that category. (Figure 5)

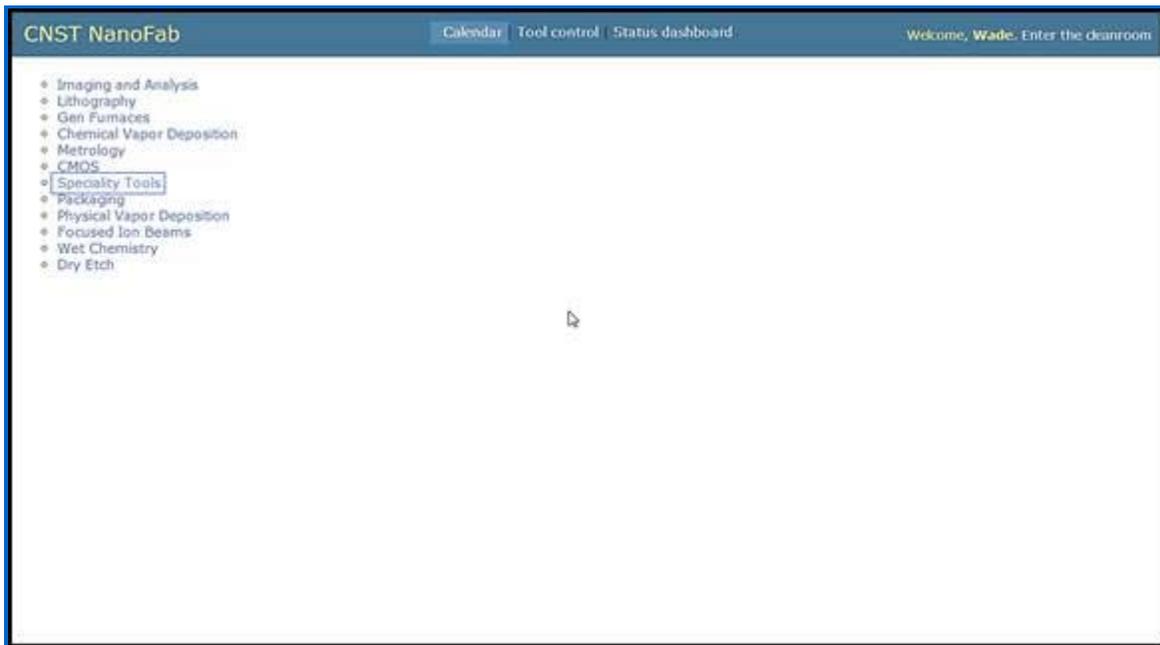


Figure 5: Accessing tools listed in tool category tree.

Click on the **Critical Point Dryer 1** to display the reservation calendar for this tool. (Figure 6)

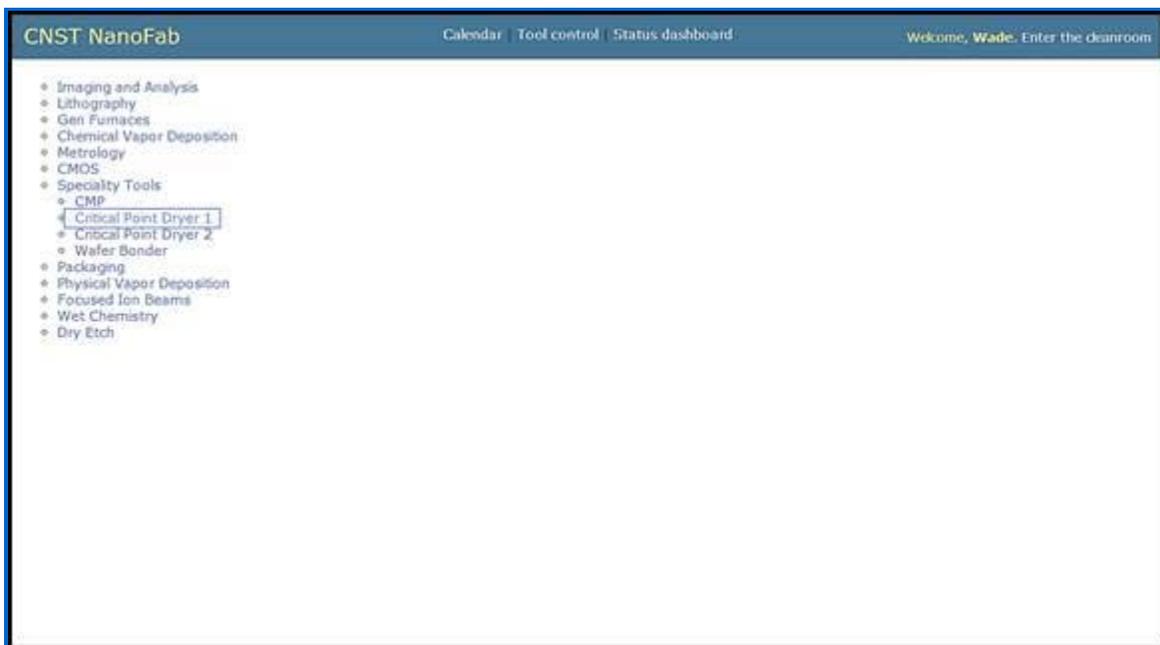


Figure 6: Accessing tool calendar screen

Click on the tool reservation box located on the reservation calendar on May 23rd, 10am to 1pm, and drag the reservation box downward so the start time will be 11am. (Figure 7)

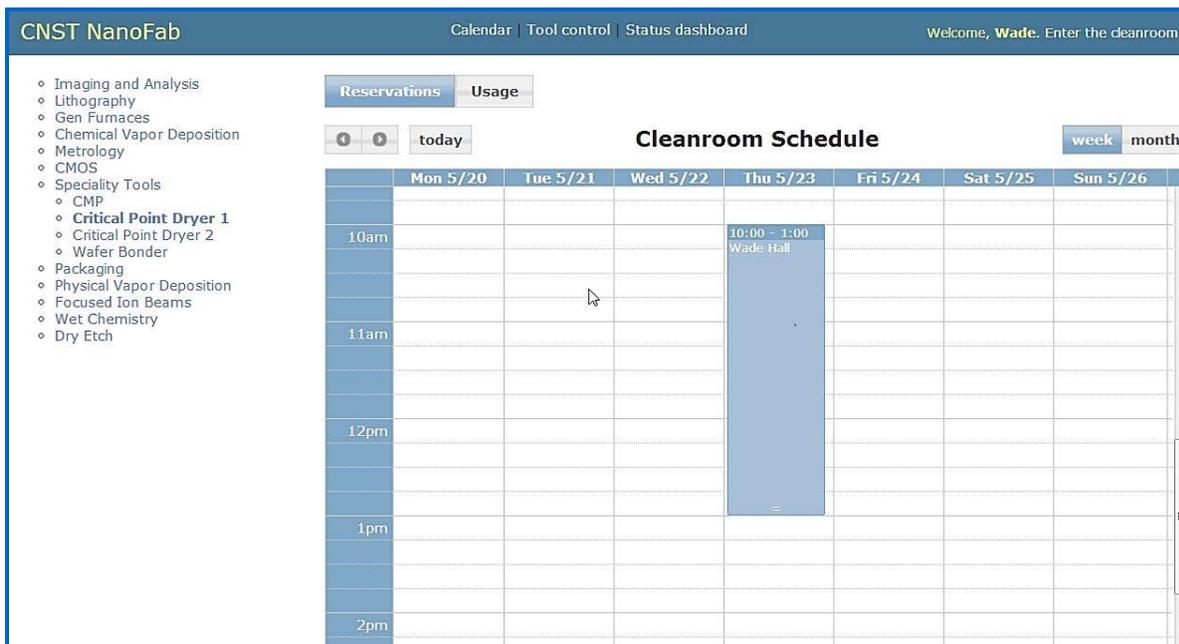


Figure 7: Changing tool reservation start time.

Move the cursor to the bottom of the tool reservation box. Click and drag the bottom of the box upward to 1pm on the calendar. (Figure 8)

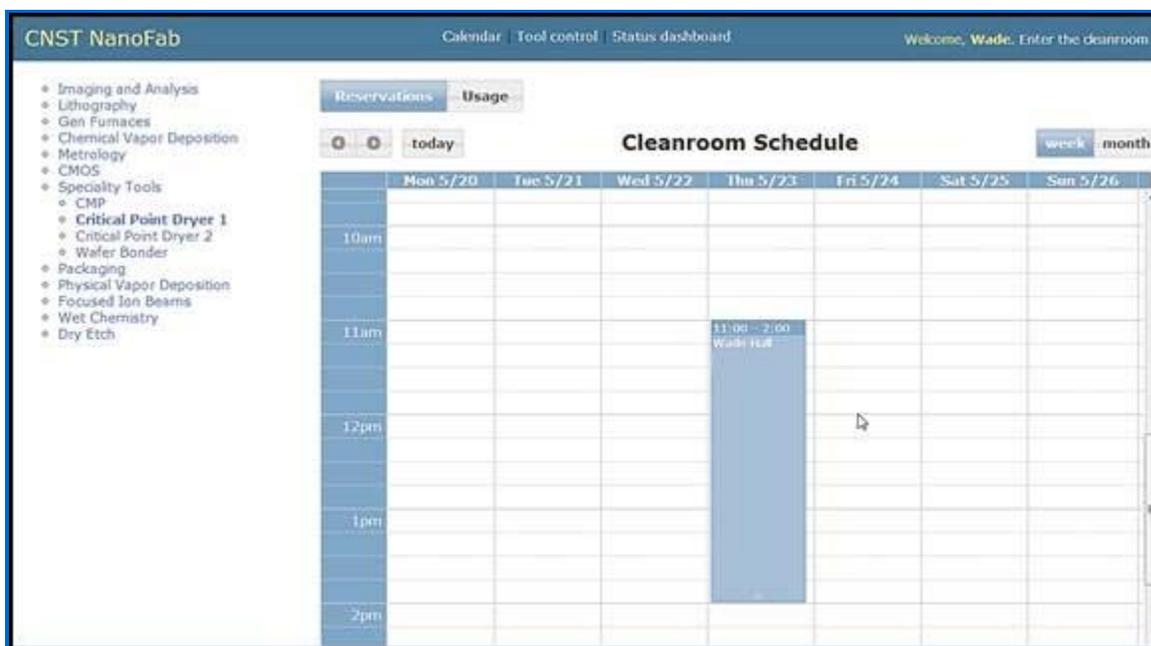


Figure 8: Changing tool reservation end time.

Click on the tool reservation box to confirm your updated tool reservation. You have updated the tool reservation for the **Critical Point Dryer 1** from 10am to 1pm to 11am to 1pm for May 23rd. (Figure 9)

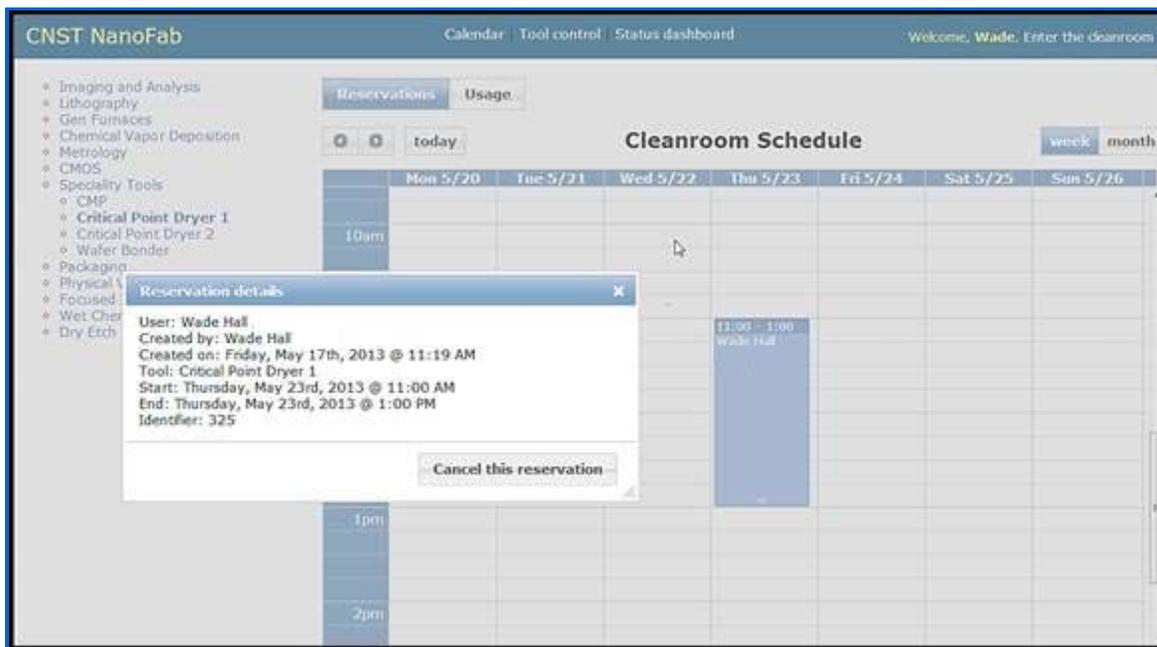


Figure 9: Confirming tool reservation update.

IV. Deleting Tool Reservations

To **delete** tool reservations first locate the tool reservation that you would like to delete. For this example we will delete the tool reservation on May 24th, 9am to 12pm for the **JOEL E-Beam**. From the **Calendar** screen, click on the **Lithography** tool category tree to list the tools under that category. (Figure 10)

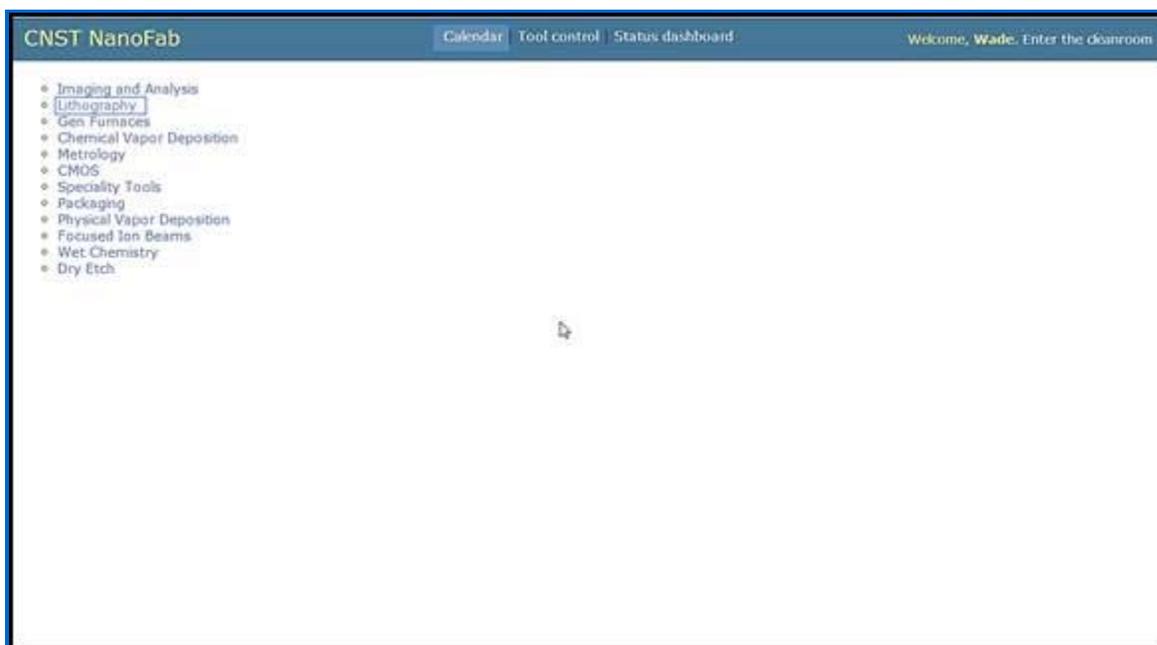


Figure 10: Accessing tools listed in tool category tree.

Click on the **JEOL E-Beam** to display the reservation calendar for this tool. (Figure 11)

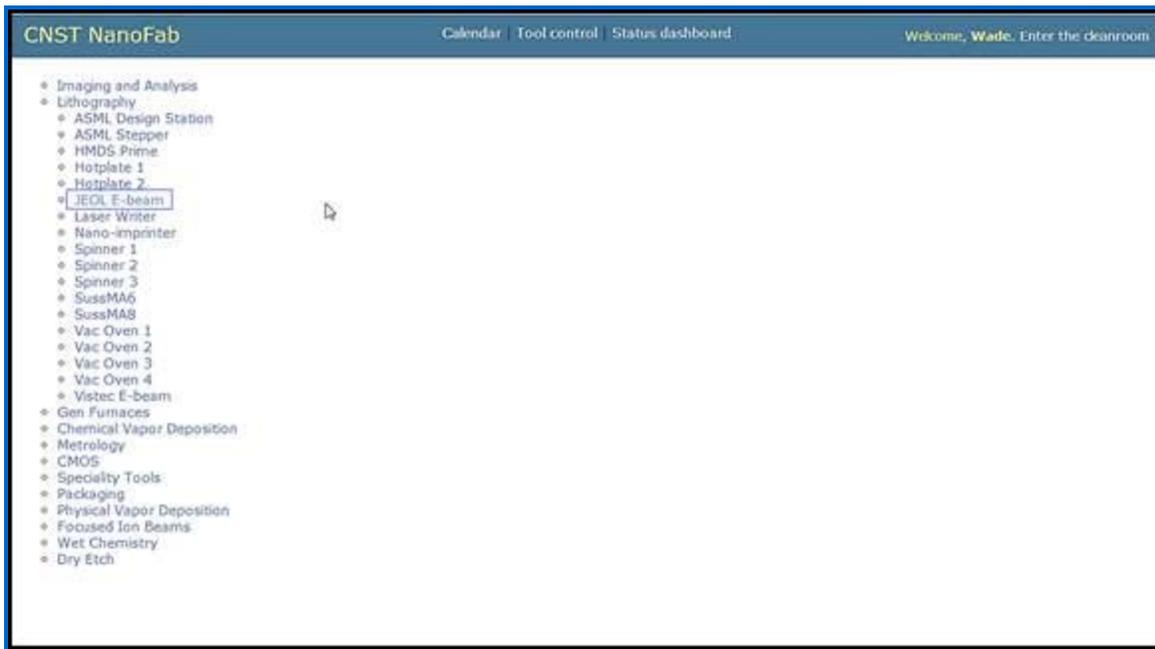


Figure 11: Accessing tool calendar screen.

Click on the tool reservation box located on May 24th, 9am to 12pm. Click on **Cancel this reservation**. (Figure 12)

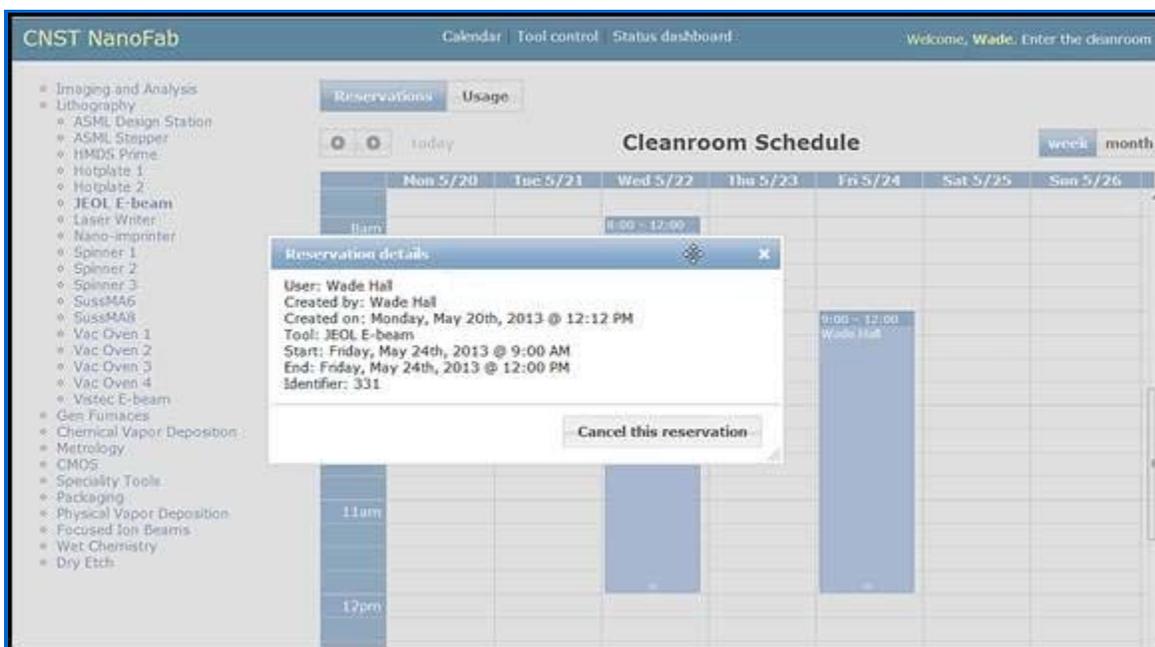


Figure 12: Canceling tool reservation.

You have deleted the tool reservation for May 24th, 9a to 12pm for the **JEOL E-Beam**. (Figure 13)

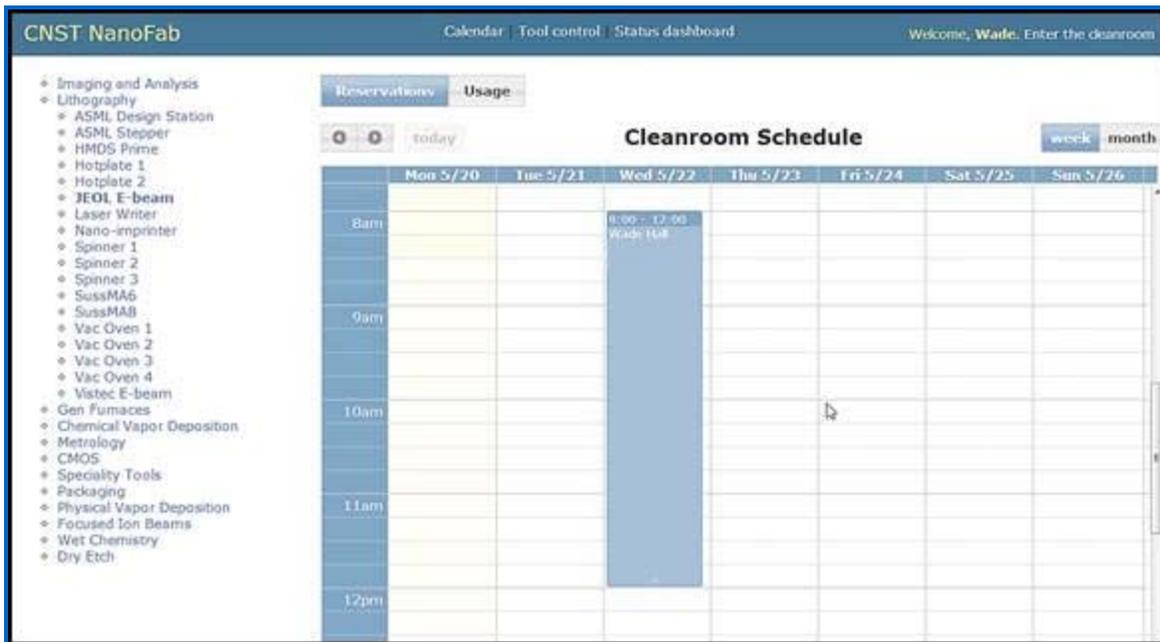


Figure 13: Confirming tool reservation cancellation.

V. Enabling/Disabling Tools

To **enable** tool equipment first locate the tool that you would like to enable. For this example we will enable and disable the **FEI FIB 2**. From the **Tool Control** screen, click on the **Focus Ion Beams** tool category tree to list the tools under that category. (Figure 14)

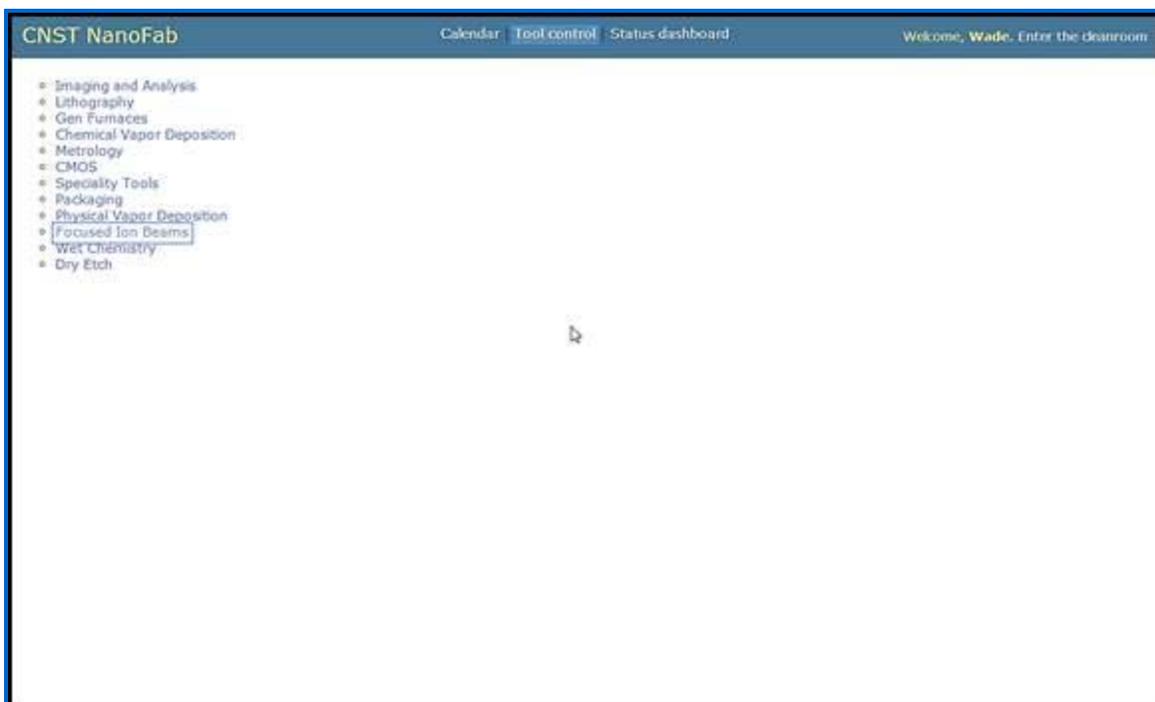


Figure 14: Accessing tools listed in tool category tree.

Click on the **FEI FIB 2**. (Figure 15)

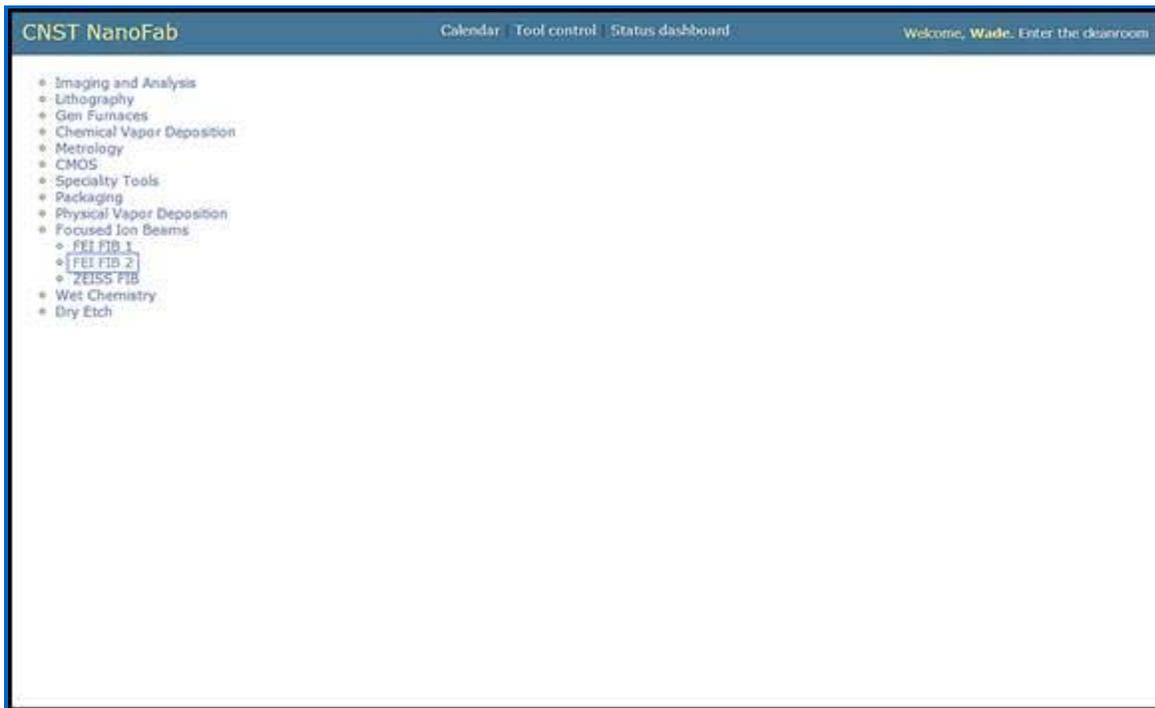


Figure 15: Accessing tool operation screen.

****NOTICE**:** If you have more than one active NanoFab project you will need to choose which project to charge your tool activity time to. If you only have one active NanoFab project it will automatically be displayed here with no choice option. Choose the NanoFab project that you want to charge the tool activity to (*if applicable*). (*Figure 16*)

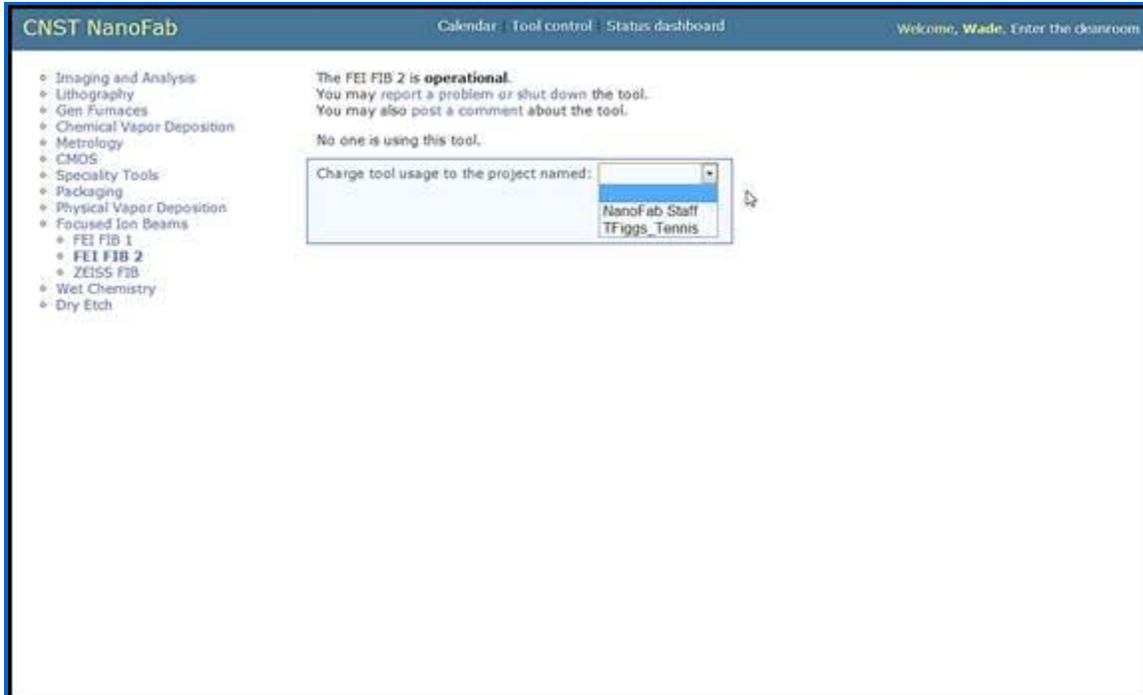


Figure 16: Choosing NanoFab project to charge tool time to (if applicable).

Click on **Start using the FEI FIB 2**. (*Figure 17*)



Figure 17: Enabling the tool.

You have now enabled the **FEI FIB 2** tool. Once you are finished using the tool you will need to **disable** the tool. To disable the tool click on **Finish using the FEI FIB 2**. (Figure 18)

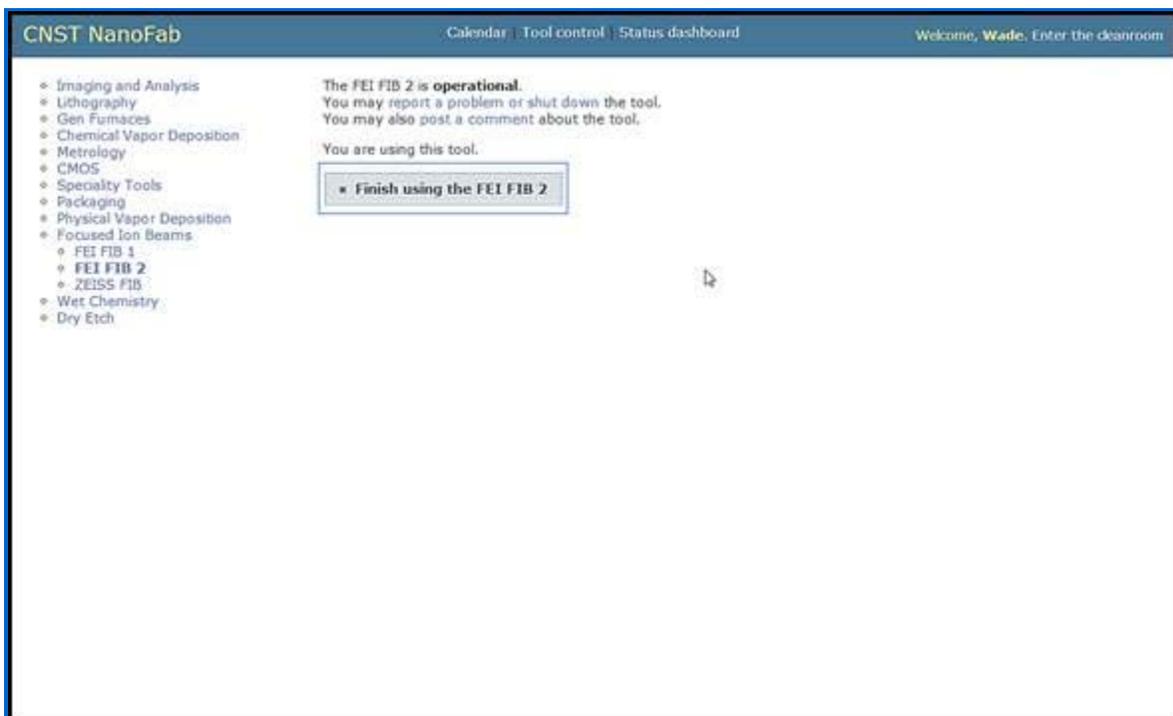


Figure 18: Disabling the tool.

The **FEI FIB 2** tool has now been disabled and is no longer in use. (Figure 19)



Figure 19: Confirming tool is disabled and no longer in use.

VI. Logging in and out of the Cleanroom

****All users must be logged in as a cleanroom user when they are inside the cleanroom****

To log in as a cleanroom user click on **Enter the cleanroom**. (Figure 20)

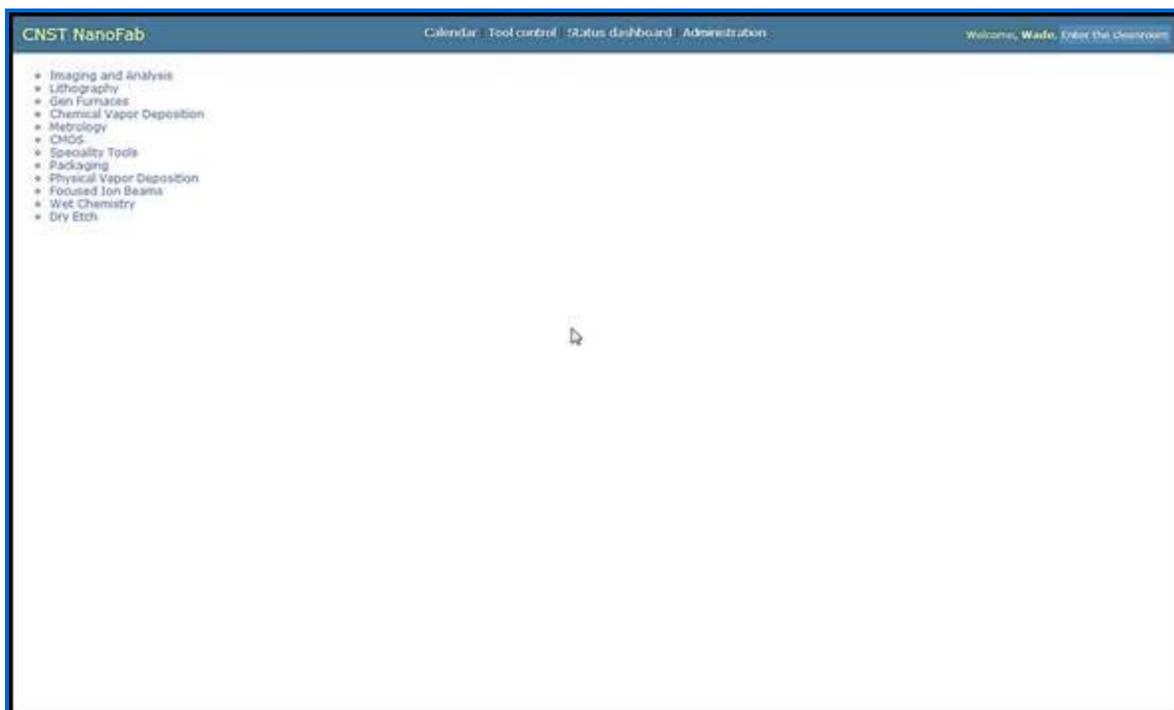


Figure 20: Logging into the cleanroom.

****Notice**** If you have more than one active NanoFab project you will need to choose which project you want to bill your cleanroom access time to. If you only have one active NanoFab project this option will not be available to you. Click on the NanoFab project

that you want to bill your cleanroom access time to. (Figure 21)

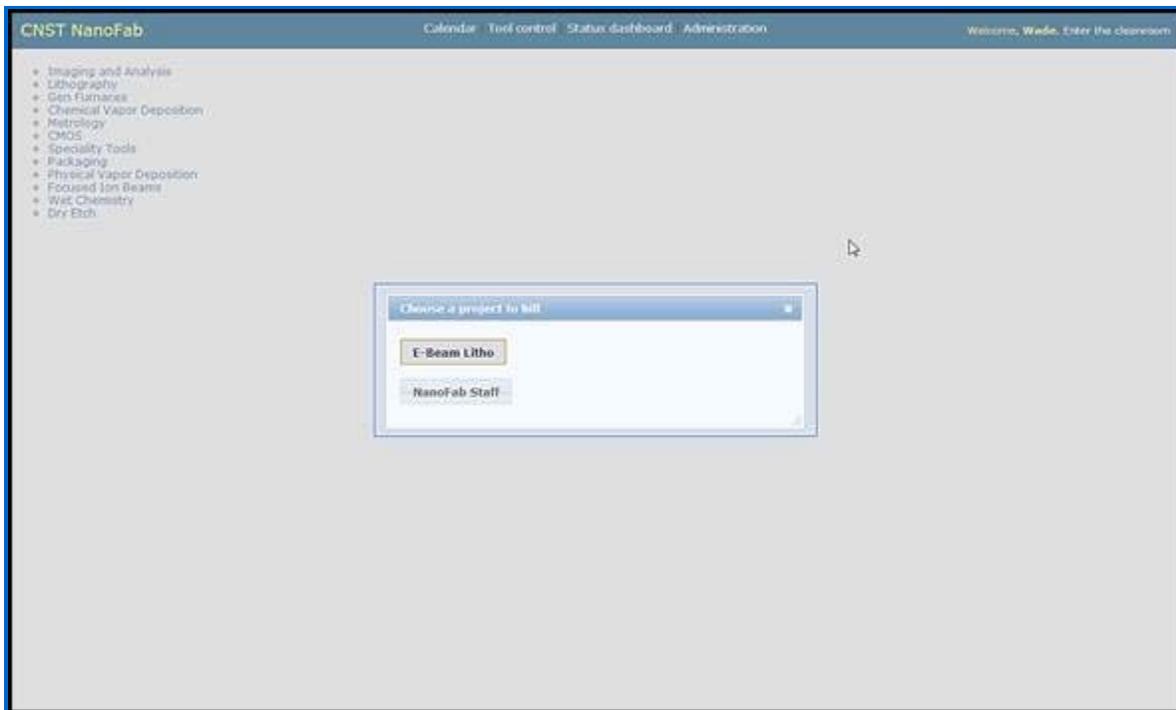


Figure 21: Choosing a NanoFab project to charge cleanroom access time to.

You are now logged in as a cleanroom user and your NanoFab project will be charged your cleanroom access time. When you leave the cleanroom you will need to logout to stop your cleanroom access time charge. Click on **Exit the cleanroom**. (Figure 22)

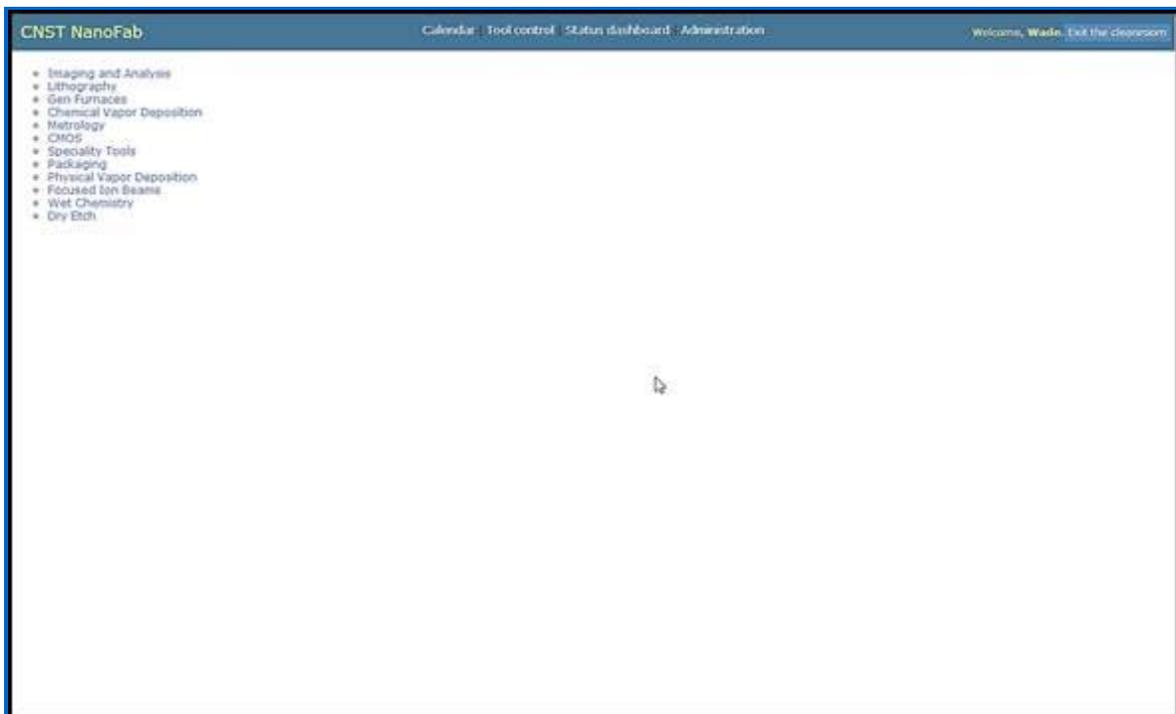


Figure 22: Logging out of the cleanroom.

You are now logged out as a cleanroom user and your NanoFab project is no longer charged your cleanroom access time. (Figure 23)



Figure 23: Confirming that you are logged out of the cleanroom.

VII. Posting a Comment

To **post a comment** first locate the tool that you would like to post a comment on. For this example we will post a comment on the **Gen. Dry Ox.** From the **Tool control** screen, click on the **Gen Furnaces** tool category tree to list the tools under that category. (*Figure 24*)

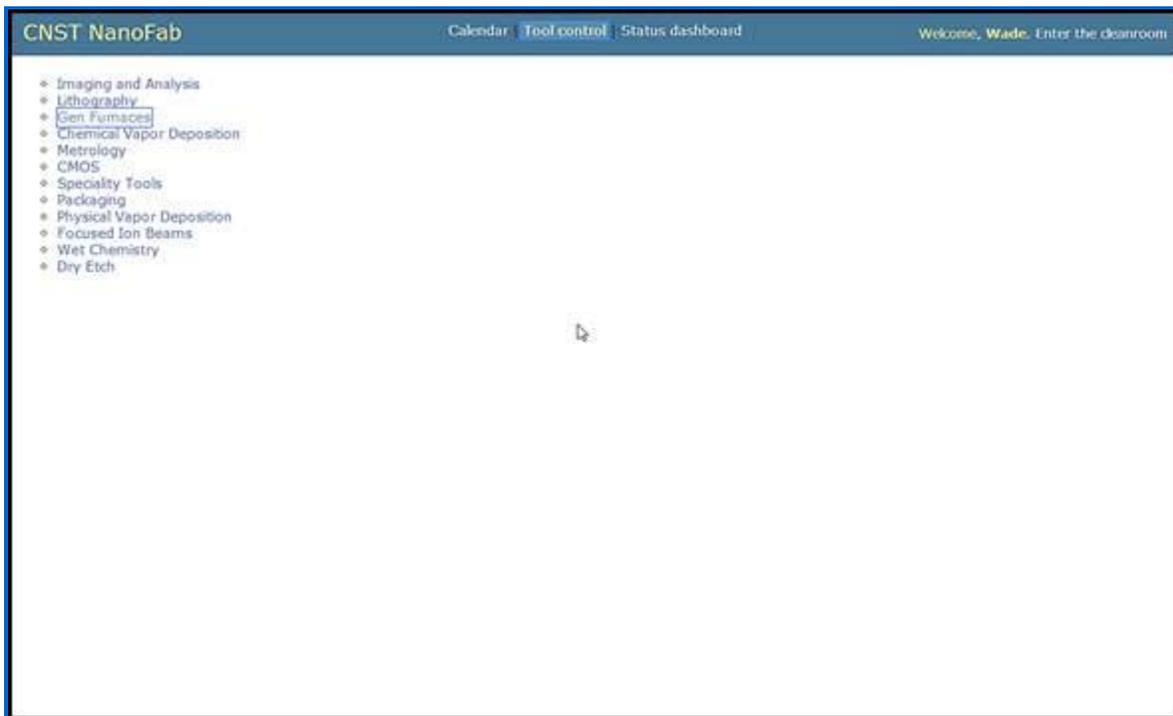


Figure 24: Accessing tools listed in tool category tree

Click on **Gen. Dry Ox.** (*Figure 25*)

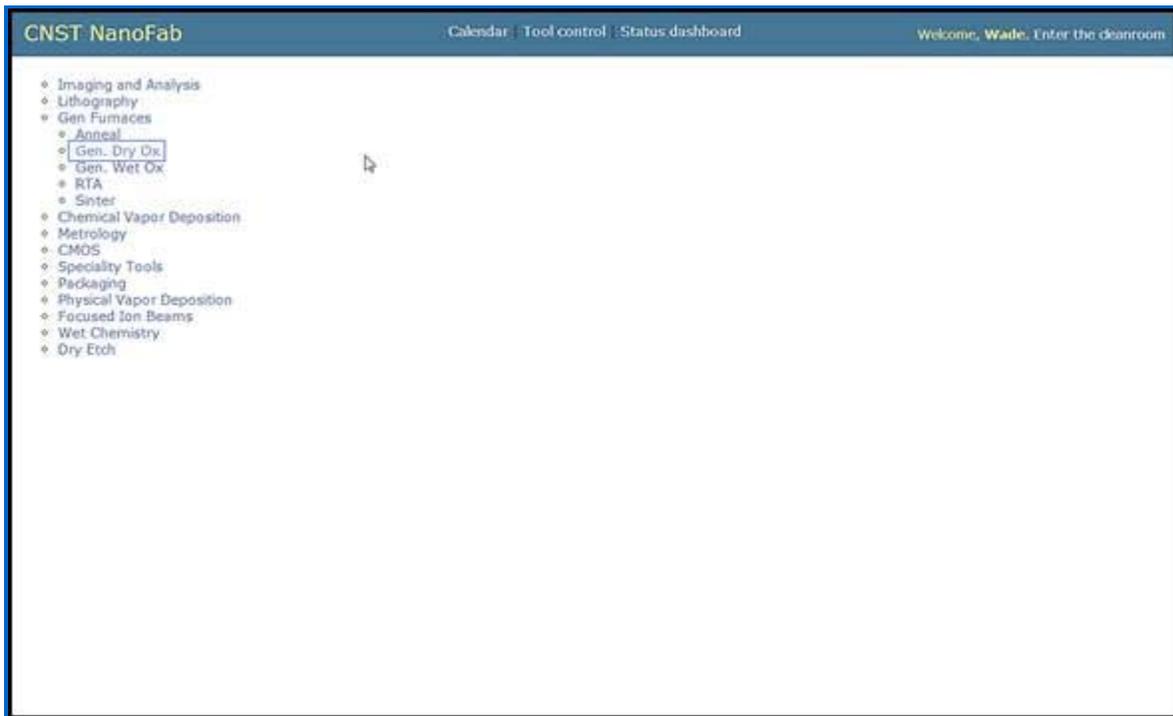


Figure 25: Accessing tool operation screen.

Click on **post a comment**. (Figure 26)

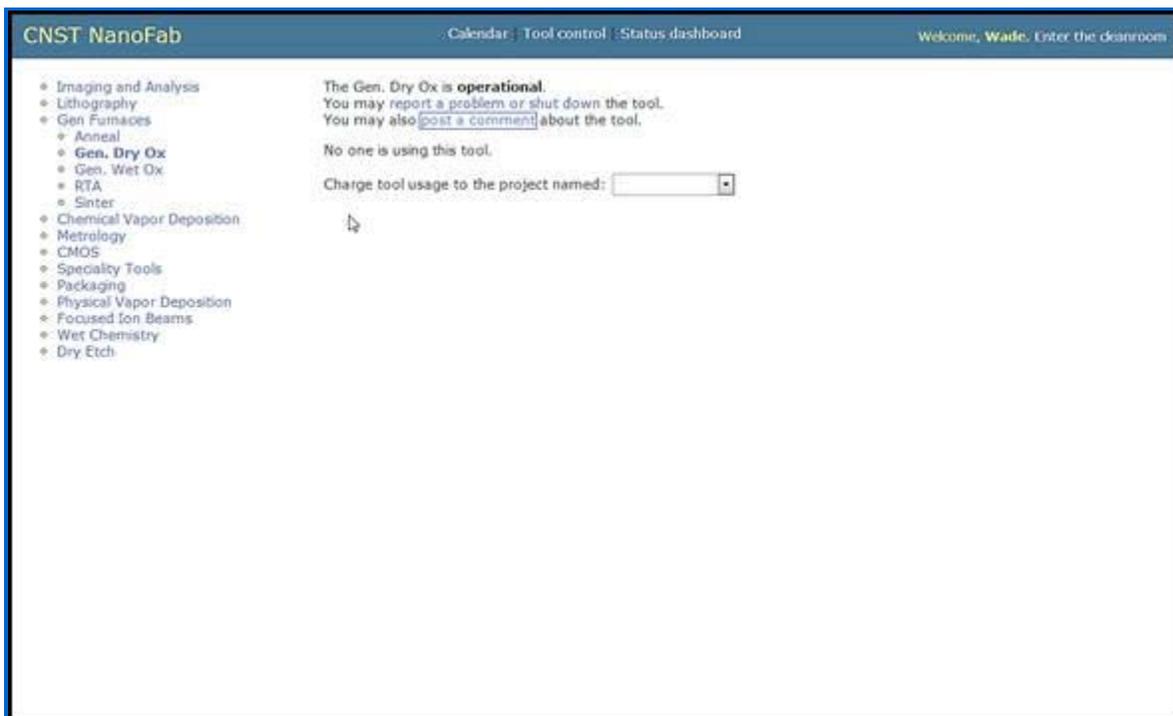


Figure 26: Accessing posting a comment information box.

This information text box will allow you to **post a comment** for the **Gen. Dry Ox**. You can determine how many days you want the comment to be displayed. Make sure you leave a detailed comment for informative purposes pertaining to the use of the tool. (Figure 27)

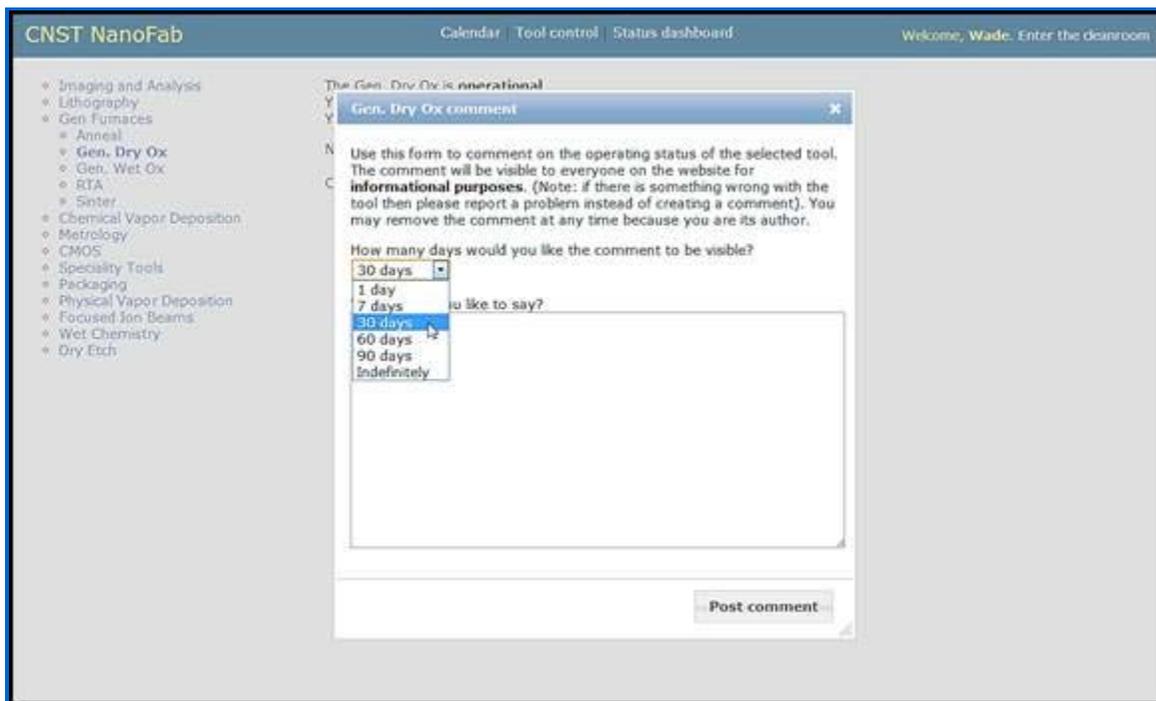


Figure 27: Selecting days comment is displayed.

Once you have completed entering the information for the comment click on **Post comment**. (Figure 28)

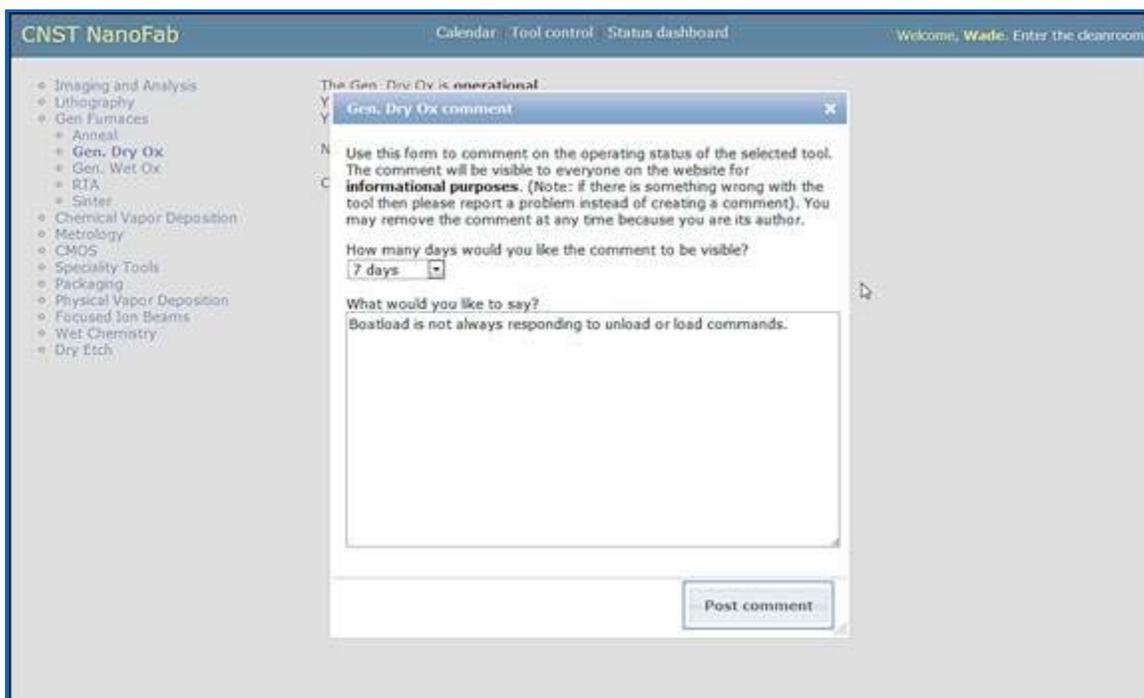


Figure 28: Posting a comment.

Your comment has been added. You can hide a comment that you added at any time if the comment is no longer appropriate for the usage of the tool and you are the author of the comment. Click on **Hide**. (Figure 29)

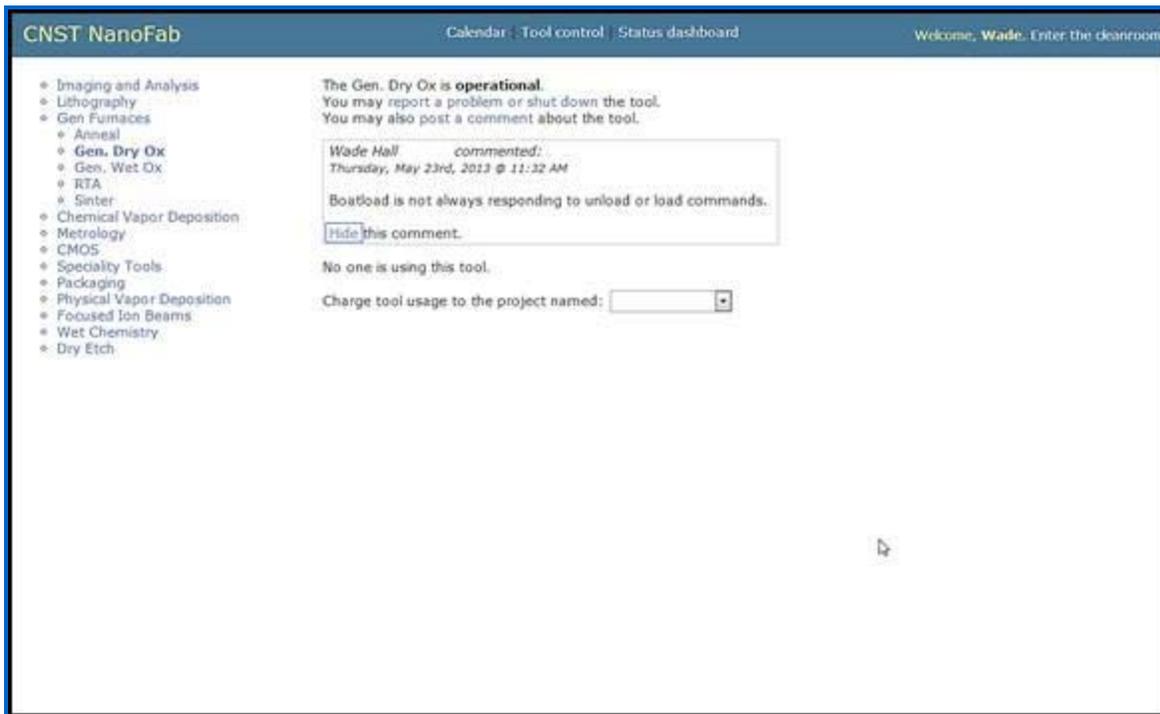


Figure 29: Hiding a comment.

The comment is now hidden from other users since it is no longer valid for usage of the tool. (Figure 30)

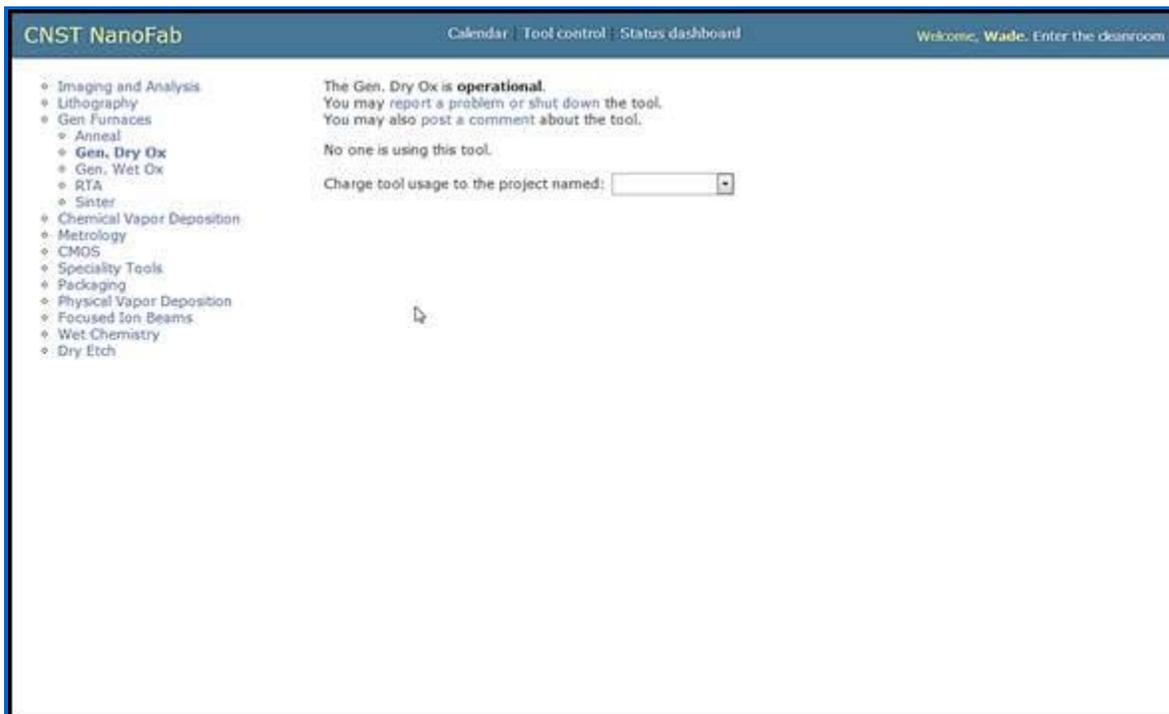


Figure 30: Confirming comment is hidden.

VIII. Reporting Tool Problems

To **report a problem** first locate the tool that you would like to report a problem on. For this example we will report a problem on the **Wet Etch 1** Tool. From the **Tool Control** screen, click on the **Wet Chemistry** tool category tree to list the tools under that

category. (Figure 31)

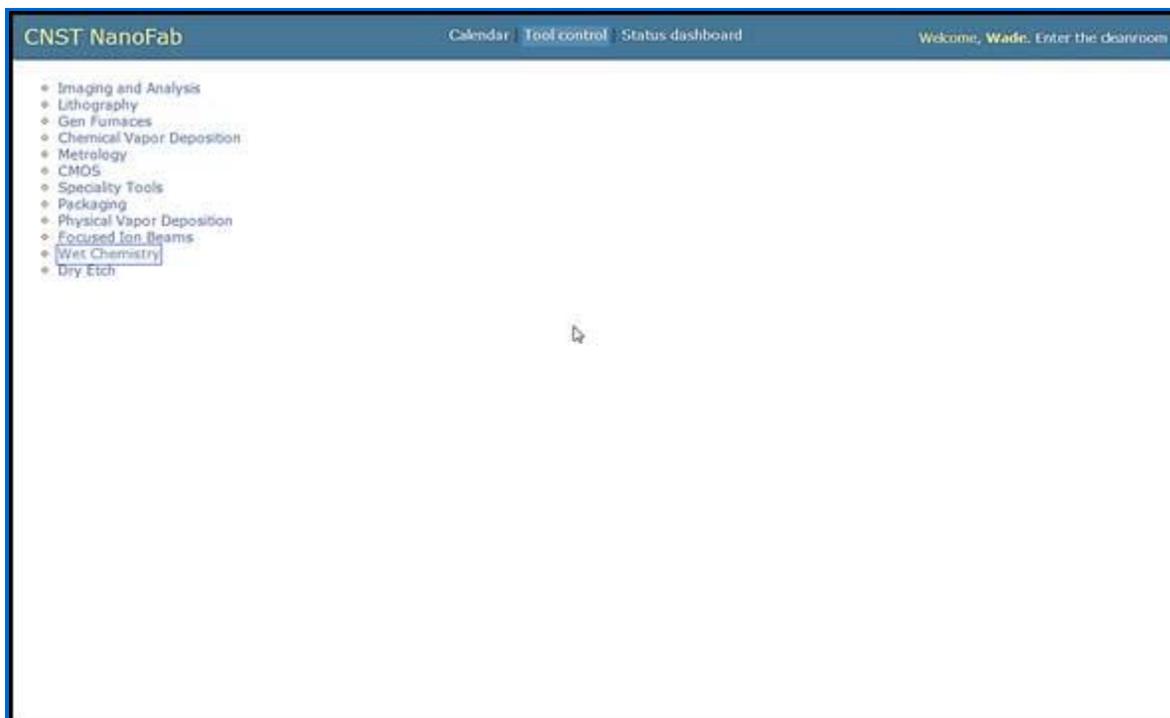


Figure 31: Accessing tools listed in tool category tree.

Click on **Wet Etch1**. (Figure 32)

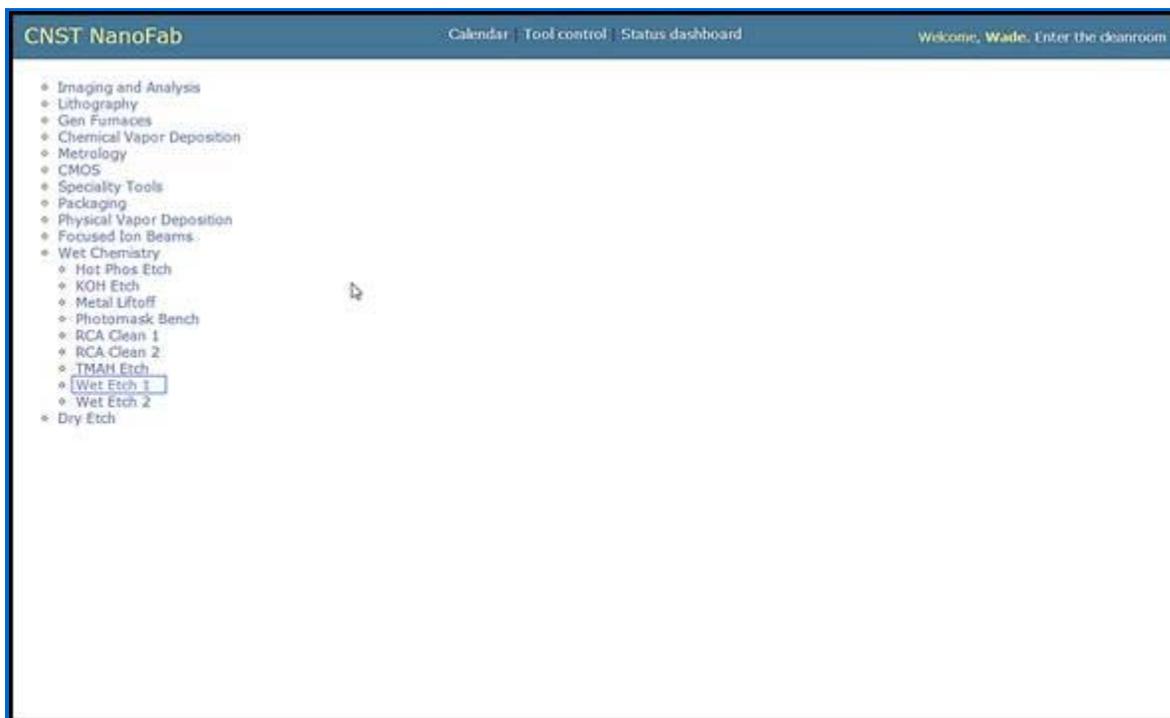


Figure 32: Accessing tool operation screen.

Click on **report a problem or shut down**. (Figure 33)

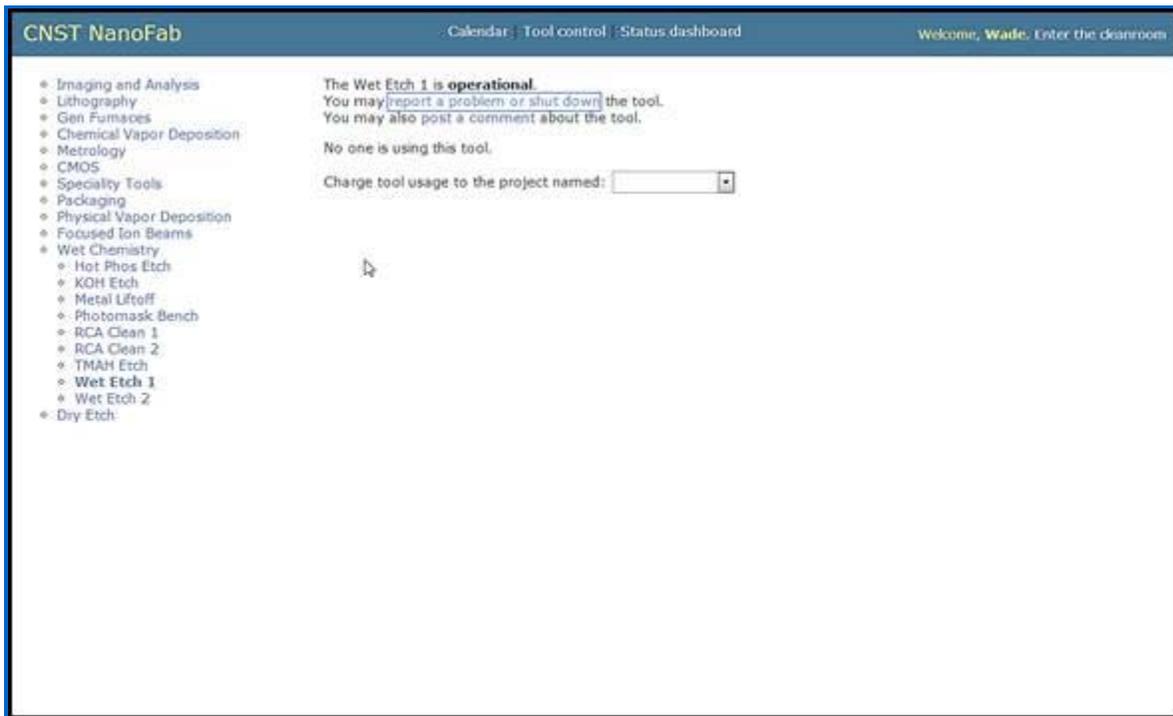


Figure 33: Accessing report a problem or shut down information box.

The problem report information text box will allow you to report a problem for the **Wet Etch 1**. Make sure that you provide a detailed description of the problem in the text box so NanoFab staff can address the problem accordingly. You can choose a problem category that best describes the problem if appropriate. (Figure 34)

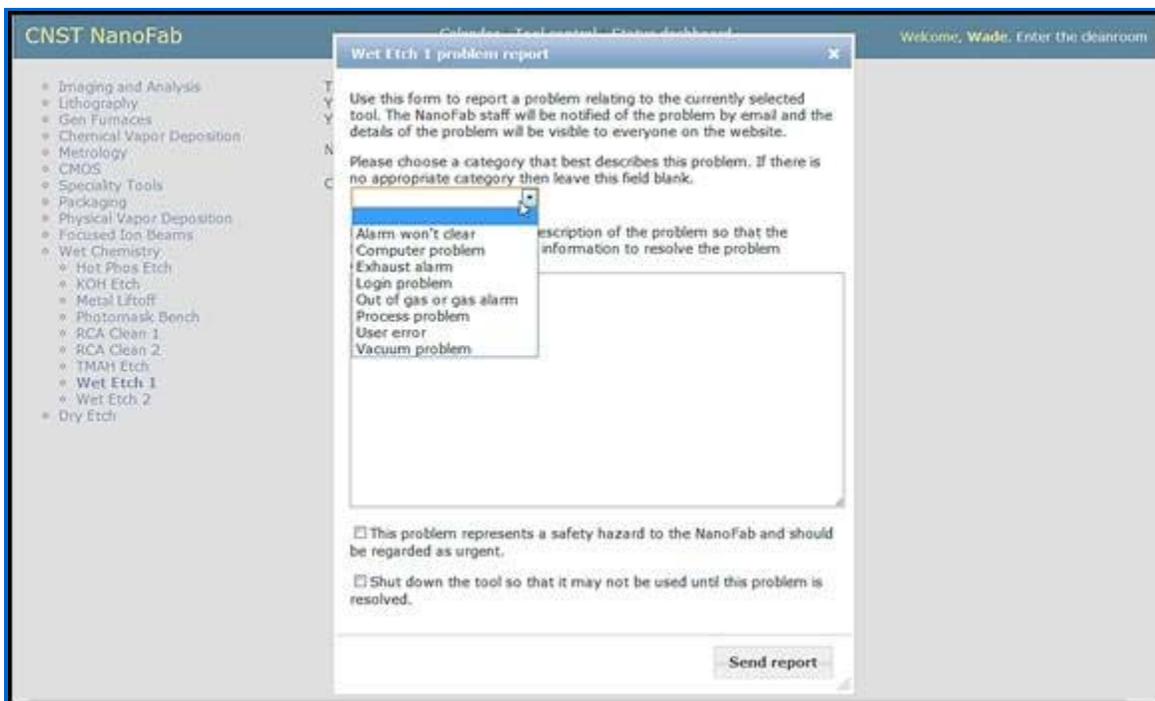


Figure 34: Choosing problem category if appropriate.

The problem report information box includes check boxes allowing you to either flag this tool problem as a **Safety Hazard** or **Tool Shutdown** or both if applicable to the problem report. Once you complete entering in all the appropriate information for the report click on **Send report**. (Figure 35)

CNST NanoFab | Calendar | Tool control | Status dashboard | Welcome, Wade. Enter the cleanroom

Wet Etch 1 problem report

Use this form to report a problem relating to the currently selected tool. The NanoFab staff will be notified of the problem by email and the details of the problem will be visible to everyone on the website.

Please choose a category that best describes this problem. If there is no appropriate category then leave this field blank.

Login problem

Please provide a **detailed** description of the problem so that the NanoFab staff have enough information to resolve the problem efficiently:

The computer would not accept my user log in credentials.

This problem represents a safety hazard to the NanoFab and should be regarded as urgent.

Shut down the tool so that it may not be used until this problem is resolved.

Send report

Figure 35: Filling out problem report and submitting report.

Your tool problem report has been logged and the appropriate NanoFab staff has been alerted about the tool problem. If you make a mistake in reporting a tool problem you can cancel the tool problem report by clicking on **cancel**. Doing this will delete the tool problem report for the tool. (Figure 36)

CNST NanoFab | Calendar | Tool control | Status dashboard | Welcome, Wade. Enter the cleanroom

The Wet Etch 1 is **operational**.
You may report a problem or shut down the tool.
You may also post a comment about the tool.

This tool requires maintenance.

The following task is unresolved for this tool:

Category: Login problem
Problem description: The computer would not accept my user log in credentials.
Status: Requires attention
Urgency: Normal
Created by: Wade Hall (whall)
Created on: Wednesday, May 22nd, 2013 @ 12:52 PM
You may [cancel](#) this task if it was mistakenly created.

No one is using this tool.

Charge tool usage to the project named: [dropdown]

Figure 36: Canceling a problem report.

Your tool problem report has been deleted. (Figure 37)

The screenshot displays the CNST NanoFab tool control interface. The top navigation bar includes "Calendar", "Tool control", and "Status dashboard". A user greeting "Welcome, Wade. Enter the cleanroom" is visible in the top right. On the left, a tree view lists various tool categories, with "Wet Etch 1" selected. The main content area shows the status of "The Wet Etch 1" as "operational". It includes instructions: "You may report a problem or shut down the tool. You may also post a comment about the tool." Below this, it states "No one is using this tool." and provides a dropdown menu for "Charge tool usage to the project named:".

Figure 37: Confirming problem report deleted.

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