Mercury System

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1.0 System Purpose

Mercury is the NanoLab management system that provides an efficient way to operate and monitor the laboratory resources, and support safety and stability of the cleanroom.

NanoLab staff use *Mercury System* mainly to control and manage the laboratory resources, to monitor equipment status and its usage, to monitor equipment utilities status (i.e. water, gases and power), and to prepare charges for NanoLab members in accordance with their usage of the laboratory resources.

Students and associated researches use *Mercury System* mostly to have access to the laboratory and its resources, to take qualifications tests, to interact with other NanoLab members and staff, and to file job requests or suggestions to the laboratory staff.

2.0 System Overview

Mercury System is a complex of control systems, software applications, and Windows®, UNIX™ terminals. Its applications designed for NanoLab members are *Mercury Client* and *MercuryWeb*.

Mercury Client starts the laboratory session and gives members an ability to enable/disable equipment. It shows who is in the cleanroom at the current moment and warns if there is nobody or less than three people in the lab when a member tries to log in/out the laboratory. Also in *Mercury Client,* members may view the laboratory equipment and its status, view equipment reservations, find manuals and members who are qualified to work on the equipment, find the appropriate equipment engineers, track or file equipment problems, view the laboratory fees on materials, chemicals and equipment usage, view general laboratory fees, and review the current laboratory charges. Members have access to *Mercury Client* only from the cleanroom and only from the cleanroom Windows® terminals.

MercuryWeb provides online access to the laboratory resources via Internet browser from any place. It provides members with abilities to make equipment reservations, to view the current reservation schedule, to find and communicate with other NanoLab members, to file Mask job requests, Machine Shop job requests or ASML job requests, and to file suggestions to the laboratory staff. Like *Mercury Client*, *MercuryWeb* also allows one to view the current laboratory charges, to view equipment status and the laboratory supplies (i.e. materials and chemicals), to find equipment manuals, qualified members or appropriate equipment engineers, and to track problem reports for laboratory resources. Members may find the link to *MercuryWeb* at the NanoLab web site or at *Mercury Client*.

After a new member submits their NanoLab Membership form, their NanoLab member account will be created. This account provides members with an e-mail address <*login@silicon.eecs.berkeley.edu*> and with access to Windows®, UNIX™ terminals, and to *Mercury Client* and *MercuryWeb*.

Common and Personal Environment (CAPE) is a NanoLab member's Windows® terminal from where they can login to the *Mercury Client* application. Access to *CAPE* terminals is possible only from the cleanroom computers. UNIX™ accounts are created for access to servers: *silicon2.eecs.berkeley.edu* and *mercury4.banatao.berkeley.edu*. NanoLab members may access UNIX™ terminals from any place via Secure-Shell connection protocol.

3.0 Applicable Documents

- *Mercury System* Report: http://www.eecs.berkeley.edu/Pubs/TechRpts/2014/EECS-2014-149.pdf
- Equipment Qualification: https://nanolab.berkeley.edu/member/qualification/eqqual.shtml
- Equipment Reservation Policy: https://nanolab.berkeley.edu/member/reservation/policies.shtml

- Tanner L-Edit: https://nanolab.berkeley.edu/member/computers/computeruse/apphelp/tanner.shtml
- CAD Conversion: https://nanolab.berkeley.edu/member/computers/computeruse/apphelp/cad.shtml

4.0 System Procedures

4.1 Laboratory Qualifications

NanoLab members must pass the safety test to gain access to the cleanroom and must qualify for each piece of equipment they use. To take a test online, members have to come in the NanoLab office, 520 Sutardja Dai Hall, and login to *MercuryWeb*. Usage of any external resources during a test is prohibited.

4.1.1 Laboratory Safety Test

Before a member passes the NanoLab safety test, their account stays in **pending** status and they will be unable to use *Mercury Client* or *MercuryWeb.*

To take the NanoLab safety test, a member needs to login to *MercuryWeb* using their login and password pair (chosen by the member on their New Member Form), and choose a facility.

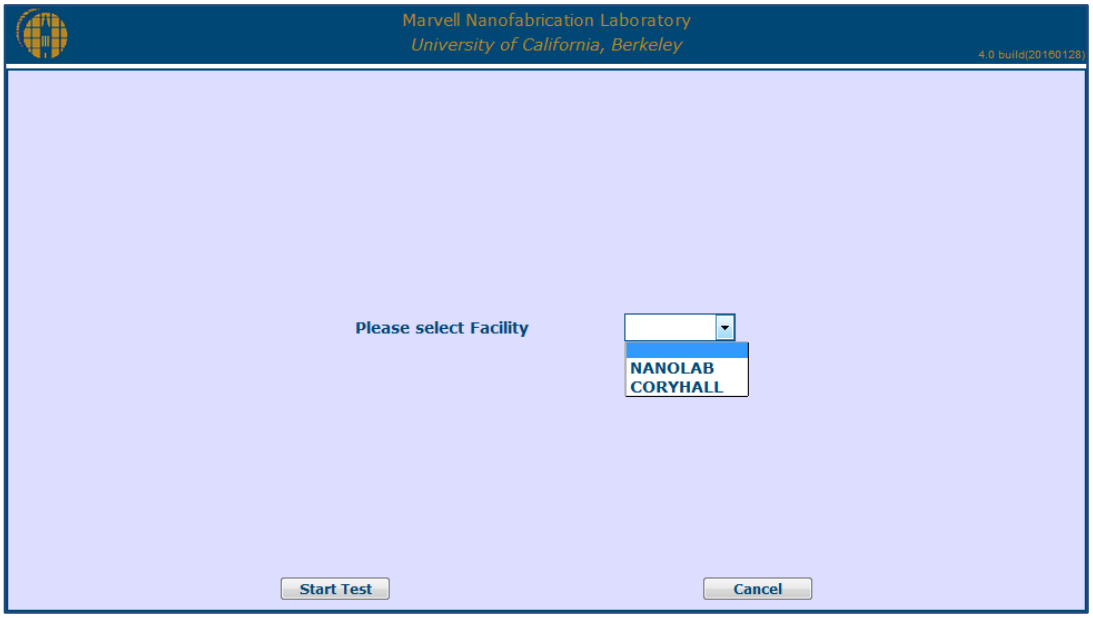


Figure 1. The laboratory safety test page

If a member tries to take a test from any other location except the NanoLab office, they will see the following error message:

If a member fails the safety test, they may retake it in 2 hours. If the member fails the safety test a second time, they must review the test with the NanoLab Director or a super user.

After a member passes the safety test, their account will be **activated**. This qualification lasts 1 year, and after it expires a member will be required to pass the safety quiz. Members will be notified about the qualification expiration in 30 days prior to expiration by a message from *MercuryWeb*.

Active members may use M*ercury Client* and *MercuryWeb* resources, but to be able to use and enable/disable equipment, members will need to take and pass the equipment qualification test.

4.1.2 Laboratory Equipment Qualification

Before use the laboratory equipment, members need to pass the equipment qualification.

To find a person who will provide a training, a member may send a Training Request to all qualified members, to members with current reservations, or to super users. This option is available at *MercuryWeb.*

To send a Training Request, a member needs to enter an equipment name in <Request Qualify> field at the Equipment section on the Member page.

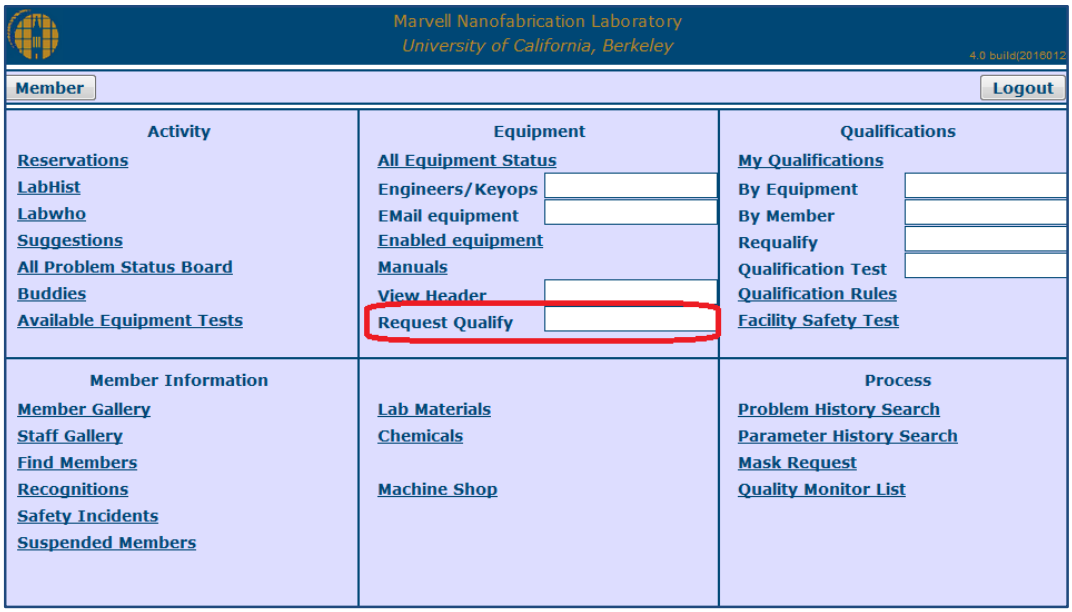


Figure 2. Request Qualify option

Training Request form will be open in the new window. A member needs to type a message and select the group of members whom they want to send this request.

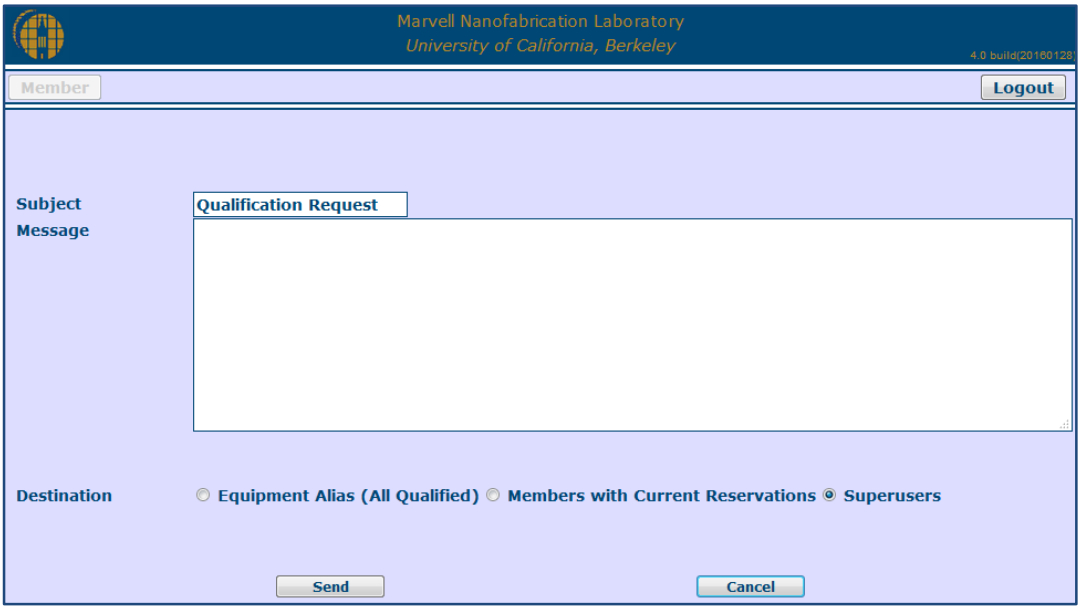


Figure 3. Training Request

The list of equipment qualification online tests can be found at *MercuryWeb* on the Member page, by clicking on Available Equipment Tests link in the Activity section.

Note: Not all equipment tests are online. There are some tools that require a written qualification test, to take these tests members need to go to the NanoLab office and ask the front desk for the test they need.

By clicking on My Qualifications link, members may view the list of already passed qualifications and its details. Qualifications have expiration dates, and by clicking on Qualification Rules members may review the qualification expiration rules.

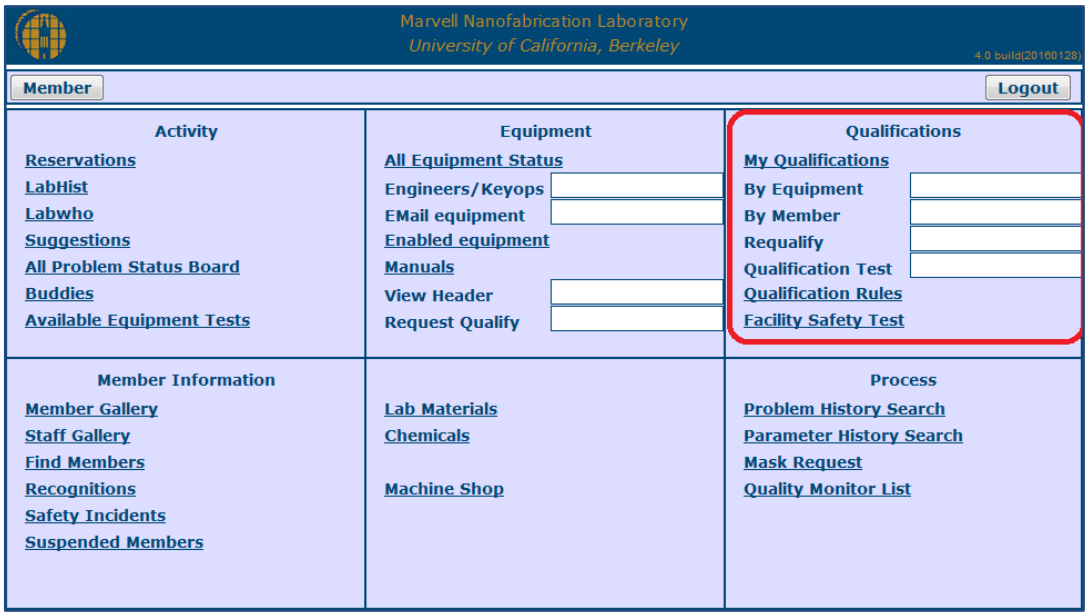


Figure 3. The Qualifications section on the Member page

To find the laboratory members who are already qualified to work on a piece of equipment, a member may enter the equipment name in <By Equipment> field.

> *MercuryWeb* tips
>
> All equipment and members names are present in lowercase and input is case sensitive.
> Start typing a name and the list of 16 first possible entries will show up in the pop up window; select the required name, or finish typing it and hit Enter to get results.

To find what qualifications a laboratory member has, a member may enter the login name of that person in the <By Member> field. Members and staff login names can be found at Member Gallery and Staff Gallery links at the Member Information section on the Member page.

To find and take equipment qualification test, a member needs to enter the name of that equipment in <Qualification Test> field. As with all qualification tests, a test can be taken only from the NanoLab office computers, otherwise a member will see the following error message:

If a member fails a test, they may retake it. The time that the member must wait to retake a test depends on the test, and can be 1, 2, 4, 12 or 24 hours. This information is shown when a member tries to take the test again. If the member fails the equipment qualification test second time, they must review the test with the test grader.

If the equipment qualification expires, a member will need to take the qualification test again. For some equipment, there are equipment re-qualification quizzes. To find and take a requalification quiz, a member may enter the equipment name in <Requalify> field. If a quiz for this equipment is present, it will show up in the pop up window.

> *MercuryWeb* tips
>
> Enter the question mark '?' in a text field to see 16 first available entries.

4.2 Access to the Laboratory

Every NanoLab member must **login to *Mercury Client*** before entering the NanoLab**.**

Step 1

From computers located in the laboratory gowning room, a member needs to login to a personal Windows® terminal, *CAPE,* by clicking on the *CAPE3* icon and entering their login and password.

Figure 4. Computers at the laboratory gowning room

Step 2

From the *CAPE* terminal, the member needs to login to *Mercury Client* by clicking on the *Mercury* icon, entering their login and password, and specifying a Project they are working on.

If a member has more than one project then they may switch projects after login into *Mercury Client* by clicking on the 'Set Project' button on the top of the main window.

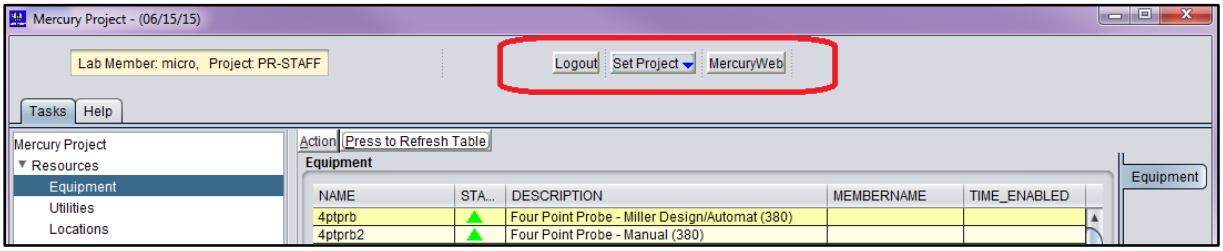


Figure 5. Set Project option at Mercury Client

> Keep it in mind
>
> If a member has more than one project and they are going to work on several projects simultaneously, they will need to switch projects at *Mercury Client* each time before using the laboratory equipment to avoid mistakes in his/her monthly charges.

Step 3

After login, the member needs to click on the *HIDECAPE* icon to leave the computer terminal available for other members.

HIDECAPE leaves a session active and members always can login back into to their *CAPE* terminal from any computer located in the laboratory by clicking on the *CAPE3* icon.

Any *CAPE* terminal will be auto-hidden after 10 minutes of inactivity to make the laboratory computer terminals available for other members.

Laboratory rules

I. If there is nobody in the NanoLab then a member will see the following warning message during an attempt to login to *Mercury Client*:

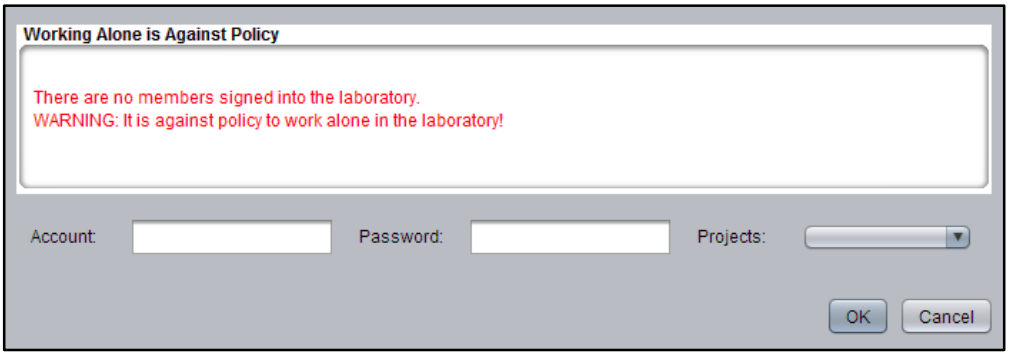


Figure 6. Warning message at Mercury Client login

Members may proceed with login but only if they are going to login together with somebody else because it is against NanoLab policy to work alone in the lab

> Keep it in mind
>
> Members need to plan their work ahead to be sure that they will not work alone in the laboratory.

Members may use the Buddies feature on *MercuryWeb* to find people who will work in the laboratory together with them. Buddies is described in the paragraph 4.5.3.

II. After a member is finished with work in the cleanroom, they need to disable all equipment that was used and logout from *Mercury Client*.

Leaving equipment in enabled state is dangerous and makes the cleanroom unsafe. It also leads to overcharging a member for the equipment usage. Leaving the *Mercury Client* session on leads to overcharging a member for the laboratory time.

Note: In case of long time process that runs on the equipment, a member may leave the cleanroom and leave this equipment on, and only logout from *Mercury Client*.

III. During logout from *Mercury Client*, if there are 3 or less people left in the cleanroom, a member who just logged out will be notified about it with the warning message. If a member sees such notification, they need to inform members who are working in the cleanroom that they are only researchers still in the laboratory and remind them that it is against the laboratory rules to work alone.

4.3 Laboratory Resource Usage

The laboratory resources may be divided on the following groups:

- Equipment – a piece of equipment in the laboratory
- Utilities – resources like power, water or different gases that are connected to the equipment
- Supplies – the laboratory materials and chemicals
- Locations – rooms with one or more pieces of equipment.

4.3.1 Equipment Reservation

For NanoLab members' convenience, *MercuryWeb* provides the ability to make equipment reservations so members may plan their work ahead.

Due to some equipment being more popular than others, there is a list of equipment reservation rules. Members may find these rules at *MercuryWeb* on the Reservations page.

To open this page, a member needs to click on Reservations link at the Activity section on the Member page.

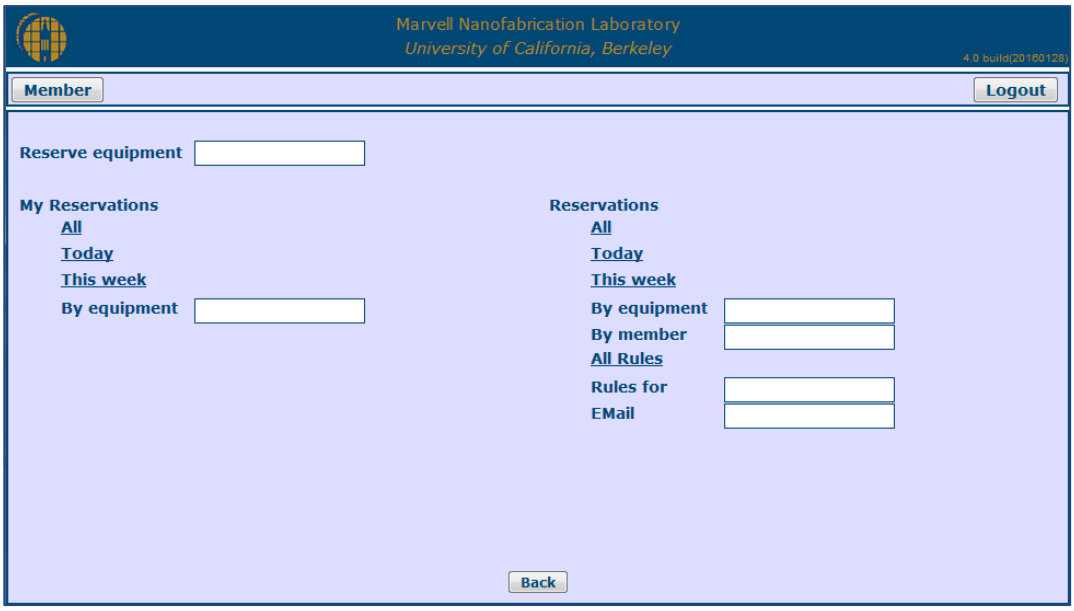


Figure 7. The Reservations page

By clicking on All Rules link, a member may view the list of all equipment reservation rules.

To find a reservation rule for the specific equipment, a member may enter the equipment name in <Rules for> field.

To make an equipment reservation, a member needs to proceed with the following steps:

1. Enter the equipment name in <Reserve equipment> field, and the equipment reservation calendar will be shown in the new window.

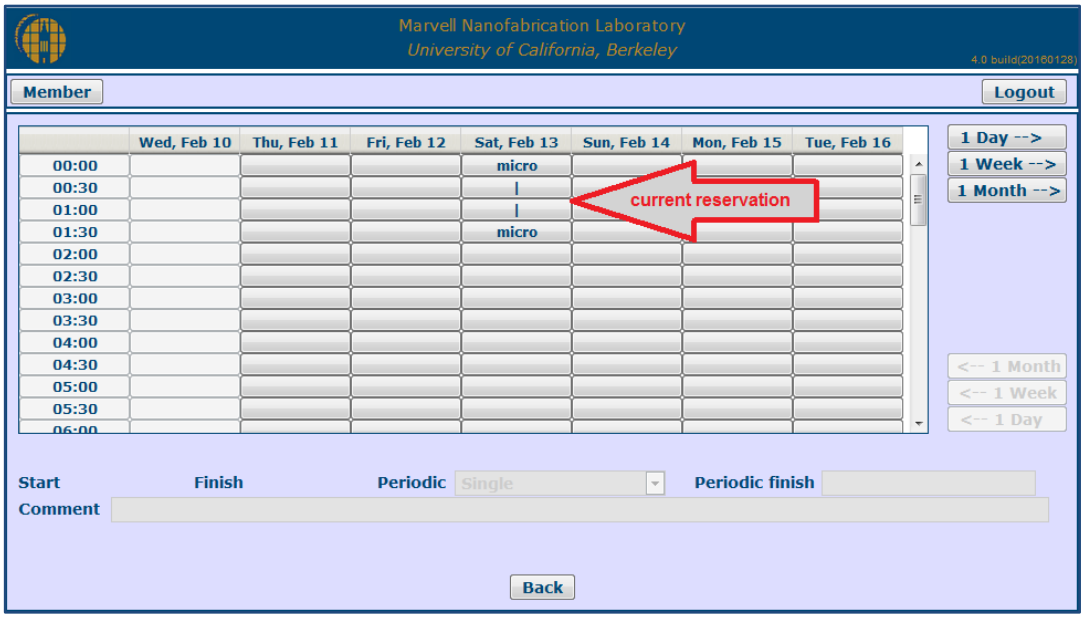


Figure 8. Equipment reservation calendar

All already scheduled reservations for this equipment will be shown on the calendar.

2. Select a time when they are going to start working on this equipment

3. Select a time when they will finish the work, plus an extra 30 minutes. For example: to set a reservation timeframe between 00:00 and 02:00 select a finish time of 02:30. By saving the reservation, the timeframe will be set between 00:00 and 02:00. If somebody else's reservation starts at 02:30, select the start time of that reservation, example is shown on the picture below:

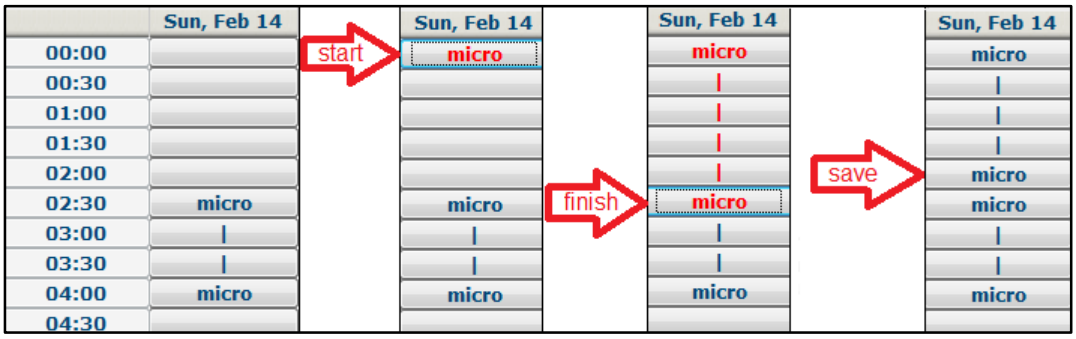


Figure 9. Example of how to set an equipment reservation timeframe

4. Add a comment (optional)

5. Click on the Reserve button. Or click on the Cancel button to change the reservation.

Members cannot override somebody else's reservations, but can edit or delete their own reservations.

To edit a reservation, a member may click on the reservation at the calendar, press the Edit button, select a new start and finish time and confirm changes by pressing the Reserve button.

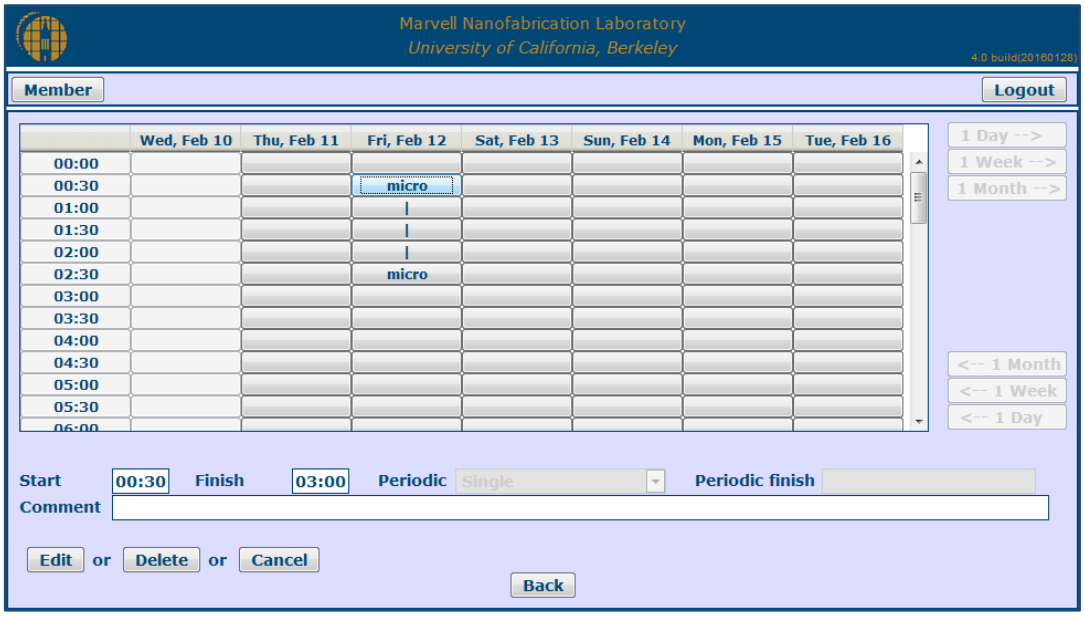


Figure 10. Edit and delete a reservation options

To delete a reservation, a member needs to click on the reservation at the calendar, press the Delete button, and confirm changes.

At the Reservations page on *MercuryWeb,* members may also view their equipment reservations, all equipment reservations, equipment reservations for the specific equipment or equipment reservations

that were made by a specific member. These options are available at the My Reservations and Reservations sections that are shown on the figure below.

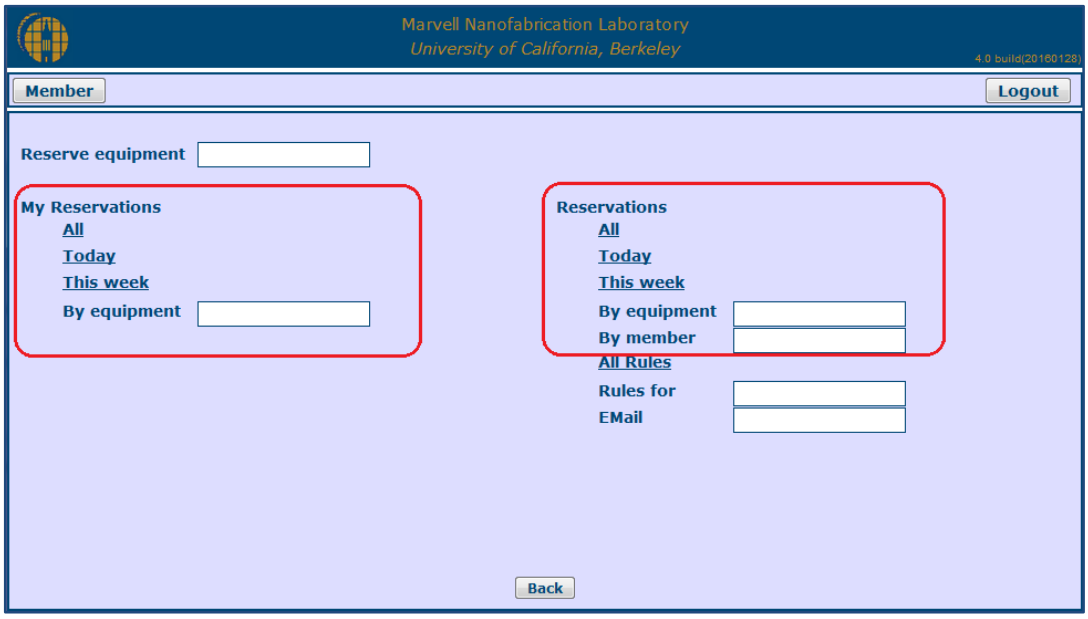


Figure 11. My Reservations and Reservations sections on the Reservations page

At the Equipment page on *Mercury Client*, members may view equipment reservations for the specific equipment, but cannot delete or edit current reservations.

To view equipment reservations at *Mercury Client*, a member needs to open the Equipment page, choose an equipment, open its context menu and click on View Reservations option.

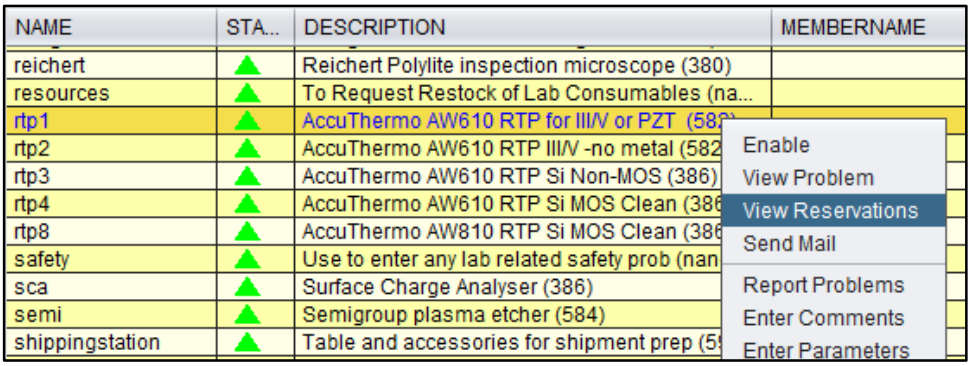


Figure 12. View Reservations option

The table with a list of all reservations for that equipment will be shown in a new window.

4.3.2 Find Equipment Manuals

All major laboratory equipment has a lab manual prepared by process engineers. Before starting to use a tool or piece of equipment, a member must read the equipment manual and take the equipment qualification test.

Equipment manuals can be found on *Mercury Client* and *MercuryWeb.*

At *Mercury Client*:

To find an equipment manual, a member needs to open the Equipment page, select the equipment, open its context menu and click on Manual option.

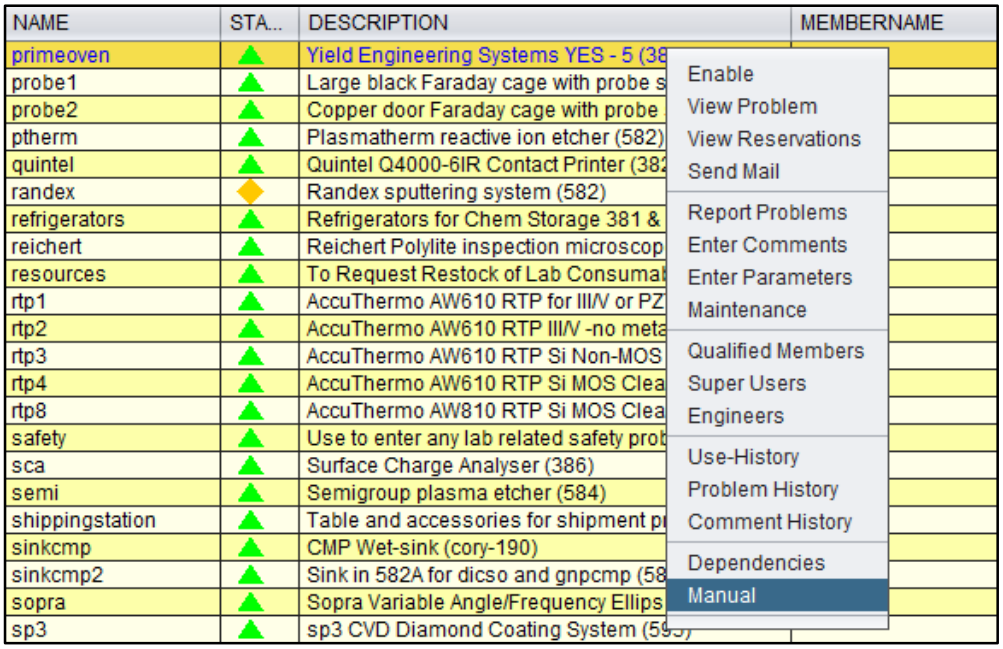


Figure 13. Equipment manual option

The Manual will be open in a new Internet browser window.

At *MercuryWeb*:

To find an equipment manual, a member needs to click on Manuals link at the Equipment section and select their needed manual from the list of all equipment manuals.

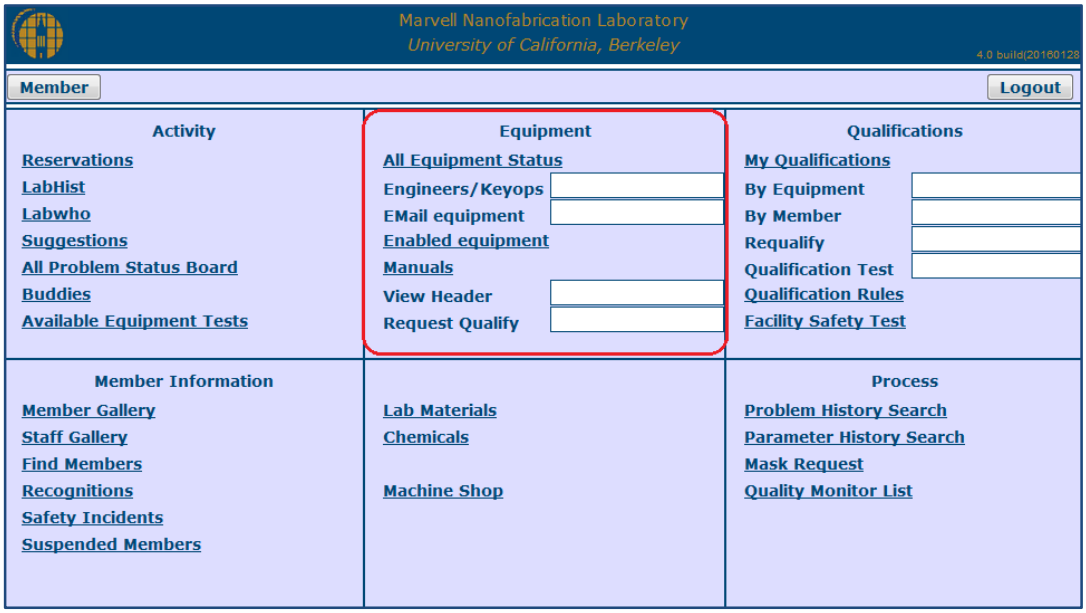


Figure 14. The Equipment section on the Member page

4.3.3 Review Resource Status

Each laboratory resource, like equipment, utility or location, has a status. Resource status depends on current problems reported to that resource. The list of possible resource statuses is described below:

- ▲ - normal, means that a resource has no issues, and if it is a piece of equipment then members can enable it
- ◆ - warning, means that a resource has some issues and it may affect members' work, before a member will enable an equipment with warning status, they need to read about current issues to determine if it may affect their work
- ▼ - fatal, means that a resource has major issues, and members cannot use it
- **X –** black cross, means that an equipment is locked due to one or more of its depended utilities in a fatal state

Members may see the laboratory resource status at *Mercury Client* and *MercuryWeb.*

At *Mercury Client:*

Members may see resource status in the second column of the resource table.

NAME	STA...	DESCRIPTION	MEMBERNAME	TIME_ENABLED
4ptprb	▲	Four Point Probe - Miller Design/Automat (380)		
4ptprb2	▲	Four Point Probe - Manual (380)		
accounting	◆	Use to request accounting adjustments (520)		
afm2	▲	Digital Instruments AFM (cory-151)		
aln2	▲	Tegal Endeavor AT sputter deposition sy(584)		
amatepi	▼	epitaxial silicon / germanium deposition (586)		

Figure 15. Example of the equipment table

At *MercuryWeb*:

Members may review equipment status by clicking on the All Equipment Status link at the Equipment section on the Member page.

Resource↑	Status	Description	Enabled By
cpd	◆	Tousimis 915B 6" Critical Point Dryer	
cpd2	▲	Tousimis 815A 1.5" Critical Point Dryer	
cpdsink	▲	CPD Sink - Bay 382	
crestec	▲	Crestec EBEAM Lithography	
dcl	▲	For Problem Reports - No Enable Require	
dektak	▲	Dektak Model 3030 Surface Profilometer	
diebonder	▲	MEI 779 Die Bonder	
disco	▲	Disco DAD3240 Automated Dicing Saw	
drystation1	▲	Drying Station - Bay 382	
edwards	▲	Edwards Sputter System	
edwardseb3	▲	Edwards 306 E-Beam System	
edx	▼	Energy-dispersive X-ray Spectroscopy	

Figure 16. Example of the equipment status table

MercuryWeb tips

By clicking on the column header, the table maybe sorted by values in this column in ascending or descending order.

To review all current laboratory resource problems, a member may click on All Problem Status Board link at the Activity section on the Member page.

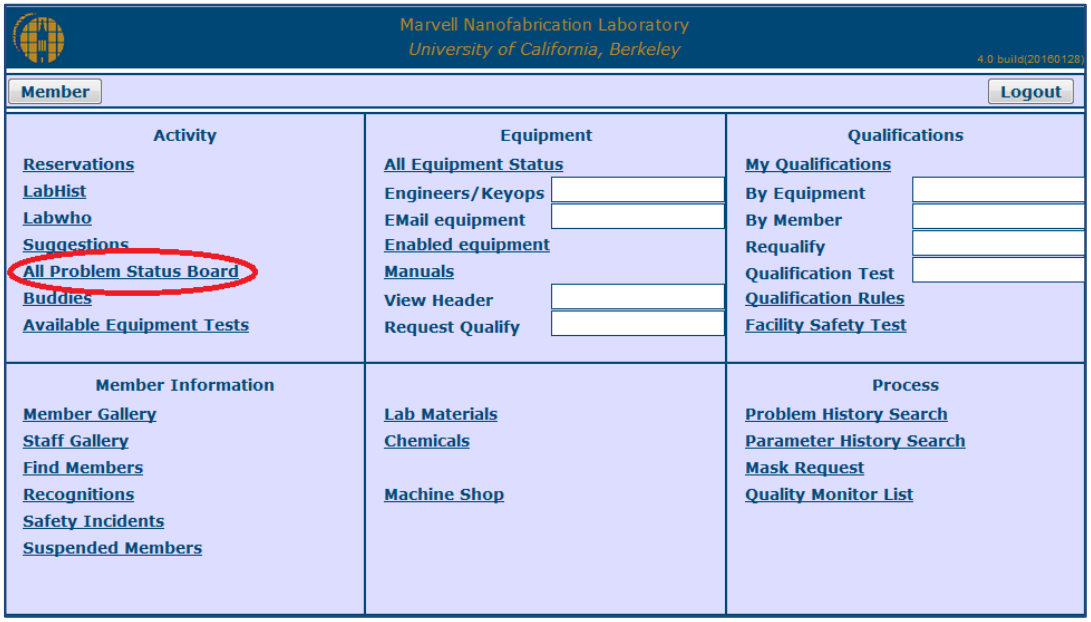


Figure 17. All Problem Status Board link

The list of resources and their reported problems will be shown in a new window.

4.3.4 Enable Equipment

The laboratory equipment can be enabled or disabled only at *Mercury Client*.

A member can enable a piece of equipment if:

- the member has been qualified for this equipment
- this equipment is in disabled state
- and status of this equipment is normal or warning (not fatal)

To enable equipment, a member needs to open the Equipment page at *Mercury Client*, select the required equipment, open its context menu and click on Enable option.

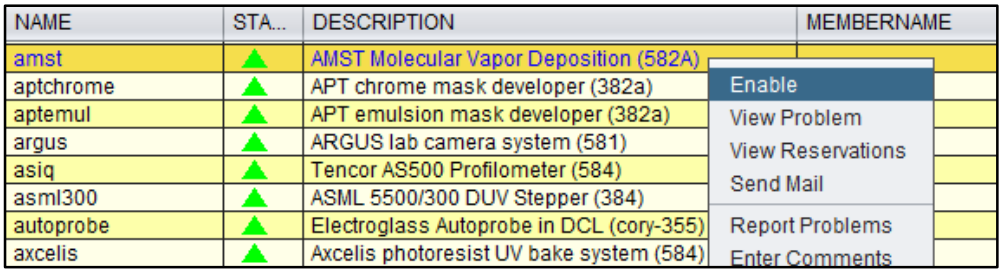


Figure 18. Enable equipment option

If an equipment is in the warning state before it is enabled, members will see the pop up window with Reported Problems. If there are upcoming reservations then a member will be notified about it in the same popup window.

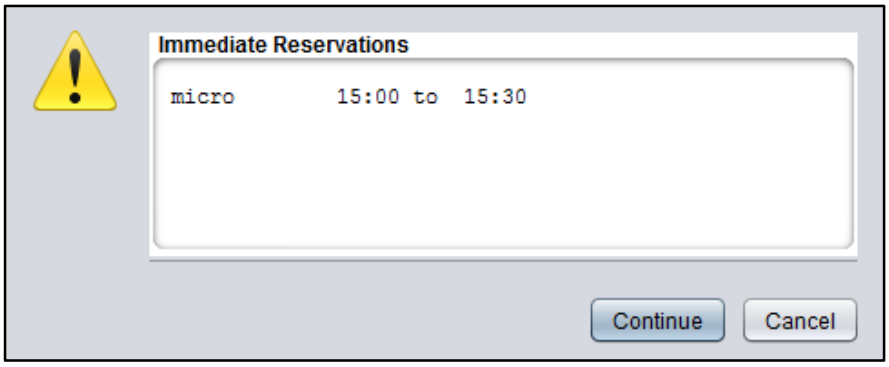


Figure 19. Example of a notification window at the enable equipment procedure

To continue with the enable equipment procedure, a member needs to press Continue button.

4.3.5 Disable Equipment

To disable equipment, a member needs to open the Equipment page at *Mercury Client*, select the required equipment, open its context menu and click on Disable option.

After the disable equipment procedure, a member will see the following pop up window where he/she will be asked if there are any equipment problems to report.

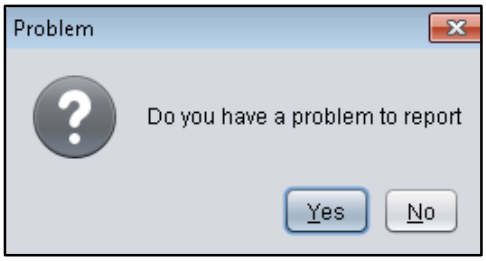


Figure 20. Pop up window at the disable equipment procedure

By answering “Yes”, a member will be asked to file an equipment Problem Report, shown on the picture below.

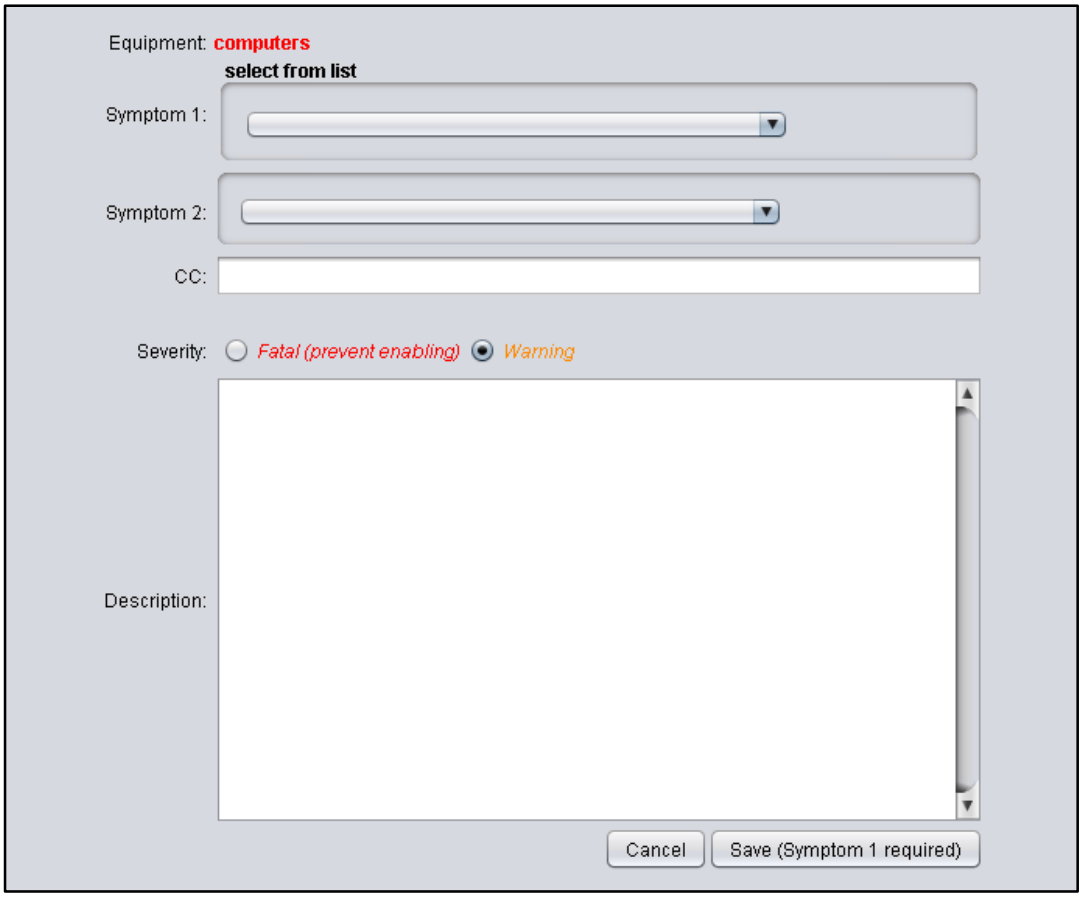


Figure 21. Problem Report form

To file a problem report, a member needs to:

1. Select a Symptom
2. Add CC recipients (optionally)
3. Choose an appropriate severity
4. Describe the problem. Problem description should be detailed and include an explanation of the problem, actions performed before the problem occurred, and what steps were done to correct it.
5. Press the Save button to send the Problem Report, or press the Cancel button to discard it.

The problem report will send an e-mail to the process engineers and equipment engineers assigned to this equipment, and to all members with current reservations. The problem report will also be stored in the equipment problem reports history.

4.3.6 Report Problems

Members may file a problem report at any time. To do that, a member needs to login *Mercury Client,* open the appropriate resource page like Equipment, Utilities or Locations, select an equipment, utility or location that has a problem, open its context menu and click on Report Problems option.

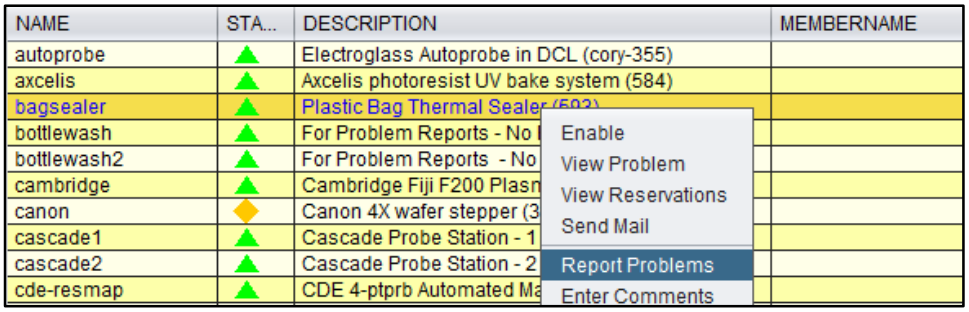


Figure 22. Report Problems option

A Problem Report will be open in the new window, and a member will need to fill it as it's described above in the paragraph 4.3.5.

You may find Equipment Problem Reporting e-mail notifications rules in the Appendix 1.

4.3.7 Review Problem History

Members may review the history of problem reports for any equipment, utility or location.

This option is available at *Mercury Client* and *MercuryWeb*.

At *Mercury Client*:

To review the history of problem reports for an equipment, a member needs to open the Equipment page, select an equipment, open its context menu and click on Problem History option.

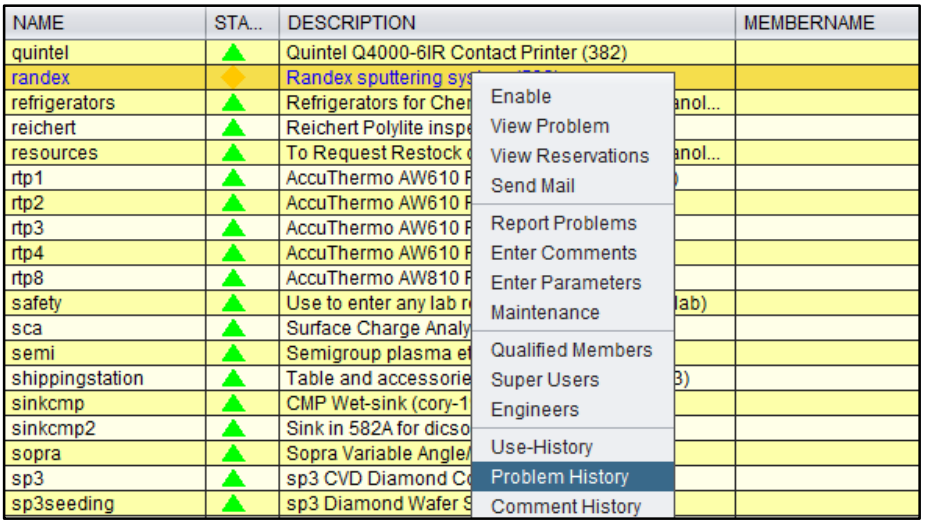


Figure 23. Problem History option

The table of all problem reports for that equipment will be shown in the new window. To view reports, a member needs to select a report, open its context menu and click on Read Details option.

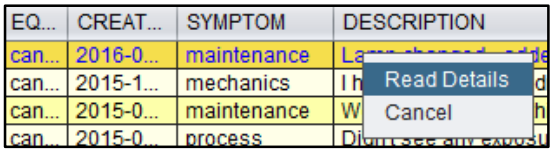


Figure 24. Read Details option

The problem description will be shown in the new window.

In the same way, a member may review the history of problem reports for utilities or locations, at the Utilities or Locations page accordingly.

At *MercuryWeb*:

To find and review the history of problem reports for an equipment, utility or location, a member needs to open the Search Problem History page by clicking on Problem History Search link at the Process section on the Member page.

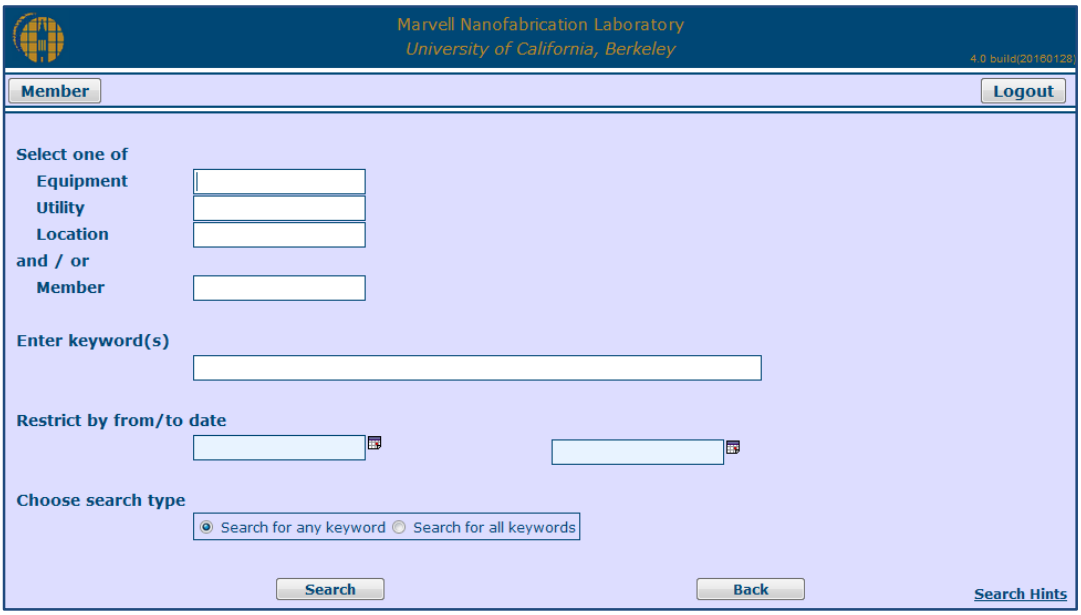


Figure 25. The Search Problem History page

To find the history of problem reports, a member needs to:

1. Specify an equipment, utility or location name; OR specify a member's name. If a member specifies an equipment, utility or location name together with a member's name then the history of problem reports for this equipment, utility or location will be filtered by the member's name, i.e. the results of the search of problem reports will include only reports where the specified member was involved (for example, the specified member filed a problem report or responded to the problem)
2. Specify keywords to filter the results; OR specify a time frame of the history of problem reports
3. Select a search type
4. Press Search button to get the results

The results will be shown in the new window. A member may use navigation buttons Next, Previous, First, and Last to go through the list of results.

4.3.8 Find Process and Equipment Engineers

All laboratory equipment has assigned process and equipment engineers. Process/equipment engineer 1 is in charge of that equipment. Process engineer 1 approves a special process on an equipment.

Members may find engineers assigned to an equipment at *Mercury Client* or *MercuryWeb*.

At *Mercury Client:*

To find process and equipment engineers, a member needs to open the Equipment page, select an equipment, open its context menu and click on Engineers option.

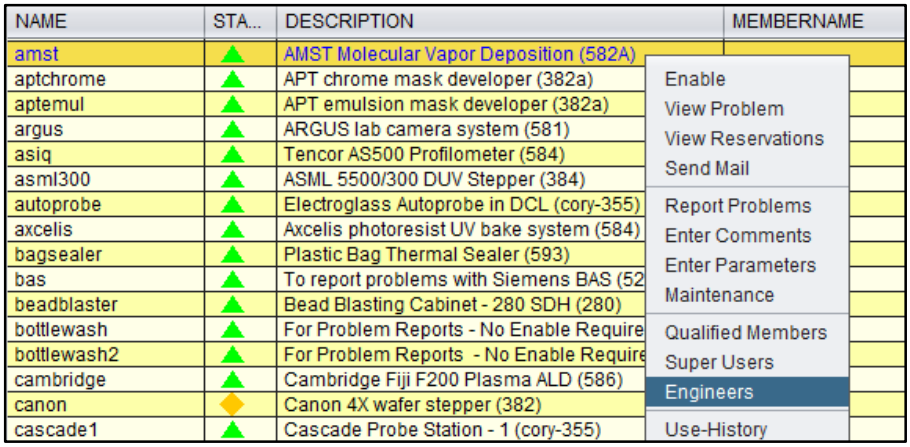


Figure 26. Equipment engineers option

The list of assigned process and equipment engineers will be shown in the new window. At this table members may find engineers' membername, full name, office and phone information.

At *MercuryWeb*:

To find process and equipment engineers assigned to an equipment, a member needs to enter the equipment name in the <Engineers/Keyops> field at the Equipment section (Figure 15).

The list of engineers will be shown in the new window. There is only engineers' membername information. To get full name and contact information, members may find staff engineers in the Staff Gallery and click on the full name link.

4.3.9 Find Laboratory Supplies

Members may view the list of the laboratory supplies (i.e. materials and chemicals), its amount in stock, and price.

This option is available at *MercuryWeb*.

To view available materials like wafers or beakers, a member needs to click on Lab Materials link.

To view available chemicals, a member needs to click on Chemicals link.

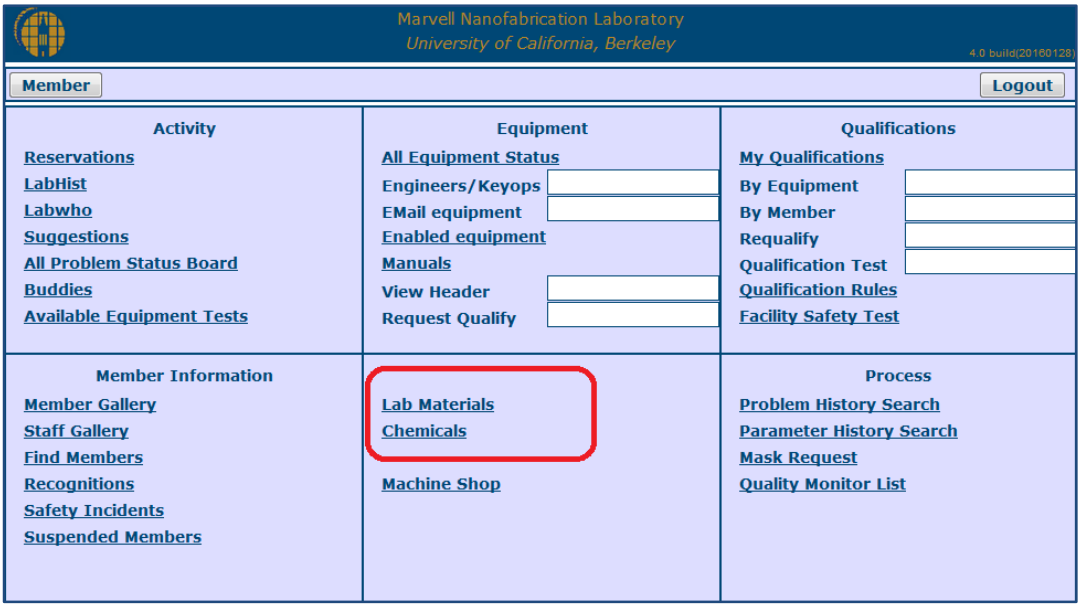


Figure 27. Lab Materials and Chemicals links

Both links will be open a new window with a table of available supplies. At this table members may find information about supplies' SKU (stock keeping unit) number, location, its current amount in the stock and fee for using it.

4.4 Laboratory Fees and Charges

4.4.1 Review Laboratory Fees

Members may review the laboratory fees for resource usage at any time.

This option is available at *Mercury Client*. At *MercuryWeb*, members may review fees only on the laboratory materials and chemicals usage (Find Laboratory Supplies, the paragraph 4.3.9).

To review the laboratory prices for chemicals use, a member needs to open the Chemicals page.

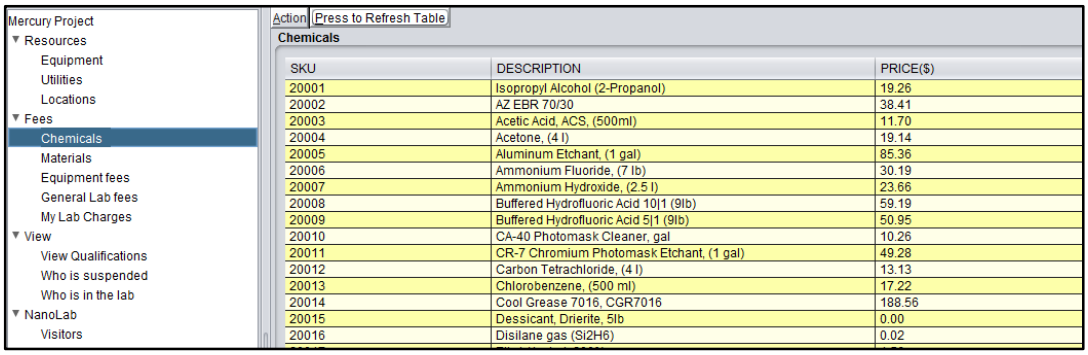
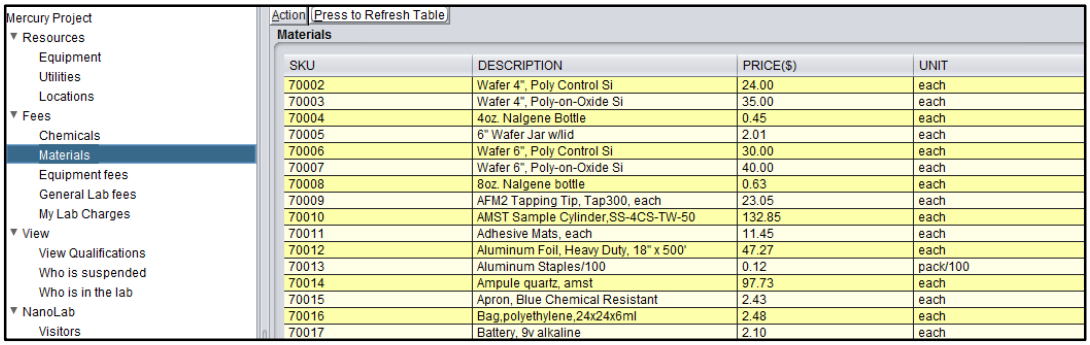


Figure 28. The Chemicals fees page

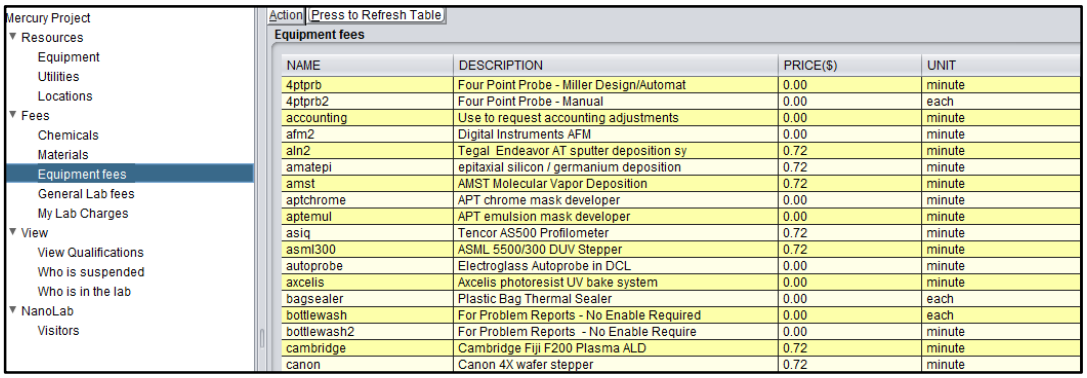
To review the laboratory fees for materials, a member needs to open the Materials page. Price for materials usage are shown in dollars per each unit.



SKU	DESCRIPTION	PRICE($)	UNIT
70002	Wafer 4", Poly Control Si	24.00	each
70003	Wafer 4", Poly-on-Oxide Si	35.00	each
70004	4oz. Nalgene Bottle	0.45	each
70005	6" Wafer Jar w/lid	2.01	each
70006	Wafer 6", Poly Control Si	30.00	each
70007	Wafer 6", Poly-on-Oxide Si	40.00	each
70008	8oz. Nalgene bottle	0.63	each
70009	AFM2 Tapping Tip, Tap300, each	23.05	each
70010	AMST Sample Cylinder,SS-4CS-TW-50	132.85	each
70011	Adhesive Mats, each	11.45	each
70012	Aluminum Foil, Heavy Duty, 18" x 500'	47.27	each
70013	Aluminum Staples/100	0.12	pack/100
70014	Ampule quartz, amst	97.73	each
70015	Apron, Blue Chemical Resistant	2.43	each
70016	Bag,polyethylene,24x24x6ml	2.48	each
70017	Battery, 9v alkaline	2.10	each

Figure 29. The Materials fees page

To review the laboratory fees for equipment usage, a member needs to open the Equipment fees page. Fees for equipment usage are shown in dollars per 1 minute of usage.



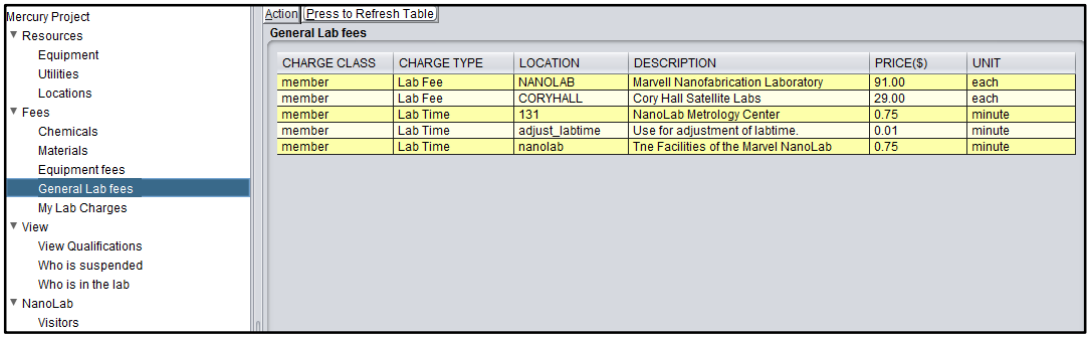
NAME	DESCRIPTION	PRICE($)	UNIT
4ptprb	Four Point Probe - Miller Design/Automat	0.00	minute
4ptprb2	Four Point Probe - Manual	0.00	each
accounting	Use to request accounting adjustments	0.00	minute
afm2	Digital Instruments AFM	0.00	minute
aln2	Tegal Endeavor AT sputter deposition sy	0.72	minute
amatepi	epitaxial silicon / germanium deposition	0.72	minute
amst	AMST Molecular Vapor Deposition	0.72	minute
aptchrome	APT chrome mask developer	0.00	minute
aptemul	APT emulsion mask developer	0.00	minute
asiq	Tencor AS500 Profilometer	0.72	minute
asml300	ASML 5500/300 DUV Stepper	0.72	minute
autoprobe	Electroglass Autoprobe in DCL	0.00	minute
axcelis	Axcelis photoresist UV bake system	0.00	minute
bagsealer	Plastic Bag Thermal Sealer	0.00	each
bottlewash	For Problem Reports - No Enable Required	0.00	each
bottlewash2	For Problem Reports - No Enable Require	0.00	minute
cambridge	Cambridge Fiji F200 Plasma ALD	0.72	minute
canon	Canon 4X wafer stepper	0.72	minute

Figure 30. The Equipment fees page

To review the general cleanroom access fees, a member needs to open the General Lab fees page.

This group of charges includes:

- A fee for the cleanroom access (NANOLAB, CORYHALL) that is charged one time per month;
- A fee for the time spent in the cleanroom (nanolab and 131), this charge applies per minute.



CHARGE CLASS	CHARGE TYPE	LOCATION	DESCRIPTION	PRICE($)	UNIT
member	Lab Fee	NANOLAB	Marvell Nanofabrication Laboratory	91.00	each
member	Lab Fee	CORYHALL	Cory Hall Satellite Labs	29.00	each
member	Lab Time	131	NanoLab Metrology Center	0.75	minute
member	Lab Time	adjust_labtime	Use for adjustment of labtime.	0.01	minute
member	Lab Time	nanolab	Tne Facilities of the Marvel NanoLab	0.75	minute

Figure 31. The General Lab fees page

4.4.2 Review Laboratory Charges

Members may review their current laboratory charges at any time.

This option is available at *Mercury Client* and *MercuryWeb*.

At *Mercury Client*:

To review the current laboratory charges, a member needs to open the My Lab Charges pages. The table with all charges for the current month will be shown in the new window.

At *MercuryWeb*:

To review the current laboratory charges, a member needs to open the Lab History page by clicking on the LabHist link at the Activity section on the Member page.

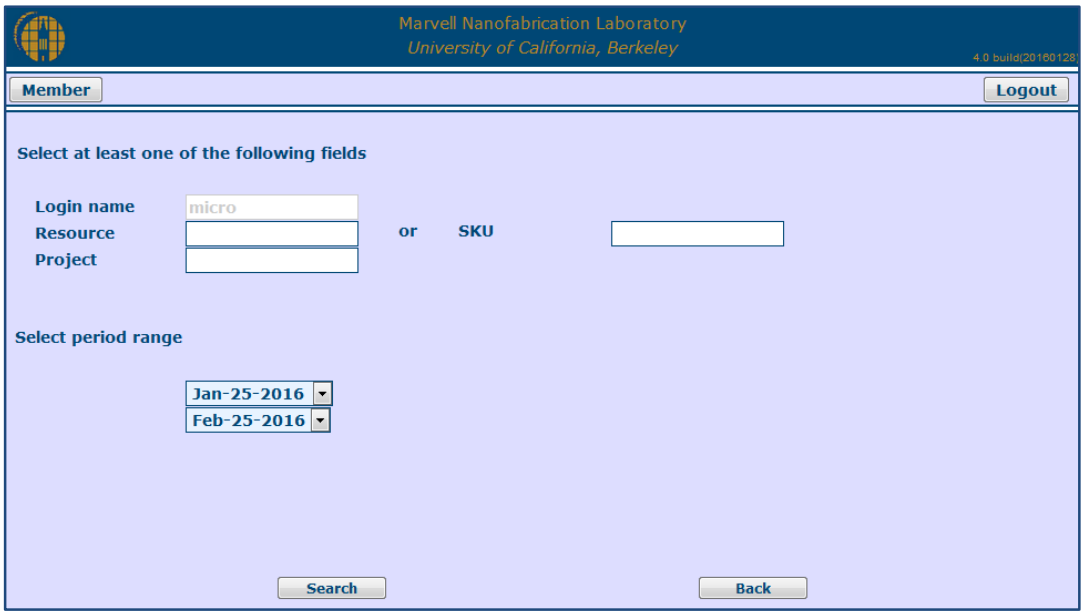


Figure 32. The Lab History page

At the Lab History page, a member needs to select a period for which he/she wants to get a lab charges report and press on Search button. Period range is limited by the current month and last two historical months. By default the period is set to the current month.

In addition, a member may filter the lab charges report by the specific project and resource (i.e. equipment, location, material or chemical).

To filter by an equipment or location, a member needs to enter the equipment or location name in the <Resource> field, and press Search button. Possible locations are “nanolab” - NanoLab cleanroom; and “131” - NanoLab Metrology Center.

To filter by a chemical or material, a member needs to enter SKU (stock keeping unit) number of the chemical or material in <SKU> field, and press Search button.

To filter by a project, a member needs to enter the project name in <Project> field, and press Search button.

4.5 Sending E-mails

4.5.1 E-mail Forward

Every NanoLab member has an e-mail address like <membername>@silicon.eecs.berkeley.edu.

Every e-mail that are sent to a member's NanoLab e-mail address will be forwarded to e-mail that they provided during the registration at the New Member form.

4.5.2 Contact with Members

Members may e-mail any member by using <membername>@silicon.eecs.berkeley.edu e-mail address.

Members may send e-mails from the system to the group of members. Possible groups are listed below:

- Equipment - all engineers assigned to the equipment and all members who qualified to work on the equipment
- Superusers - all equipment super users
- Members with Current Reservations - all members who has reservations for the equipment.

This option is available at *MercuryWeb*. At *Mercury Client*, members may send e-mails only to Equipment group.

At *Mercury Client*:

To send an e-mail, a member needs to open the Equipment page, select an equipment, open its context menu and click on Send Mail option.

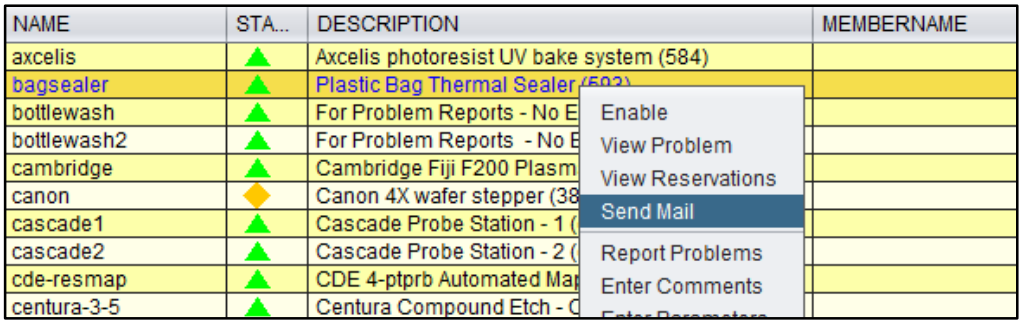


Figure 33. Send Mail option

The equipment e-mail form will be open in the new window. A member needs to write a subject and a message, add CC recipients (optional), and press the Send button. This message will be sent to Equipment group.

Send Mail option is also available for utilities and locations. In this case, an e-mail will be sent to all engineers and keyops assigned to this utility or location.

At *MercuryWeb*:

To send an e-mail, a member needs to enter an equipment name in <EMail equipment> field at the Equipment section (Figure 15) or in <EMail> field on the Reservations page (Figure 8).

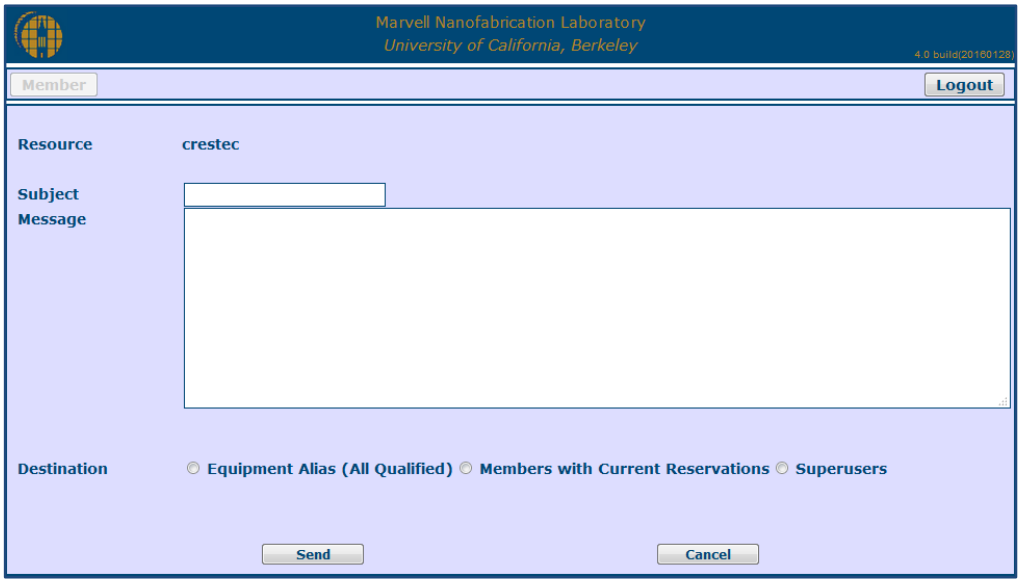


Figure 34. Equipment e-mail form

The equipment e-mail form will be open in the new window. A member needs to write a subject and a message, choose the group of members whom this message will be addressed, and press Send button.

4.5.3 Buddies

To find a buddy to work together in the laboratory, a member may send a broadcast message to other members using the Buddies option.

This option is available at *MercuryWeb*.

To send a broadcast message, a member needs to click on Buddies link at the Activity section on the Member page.

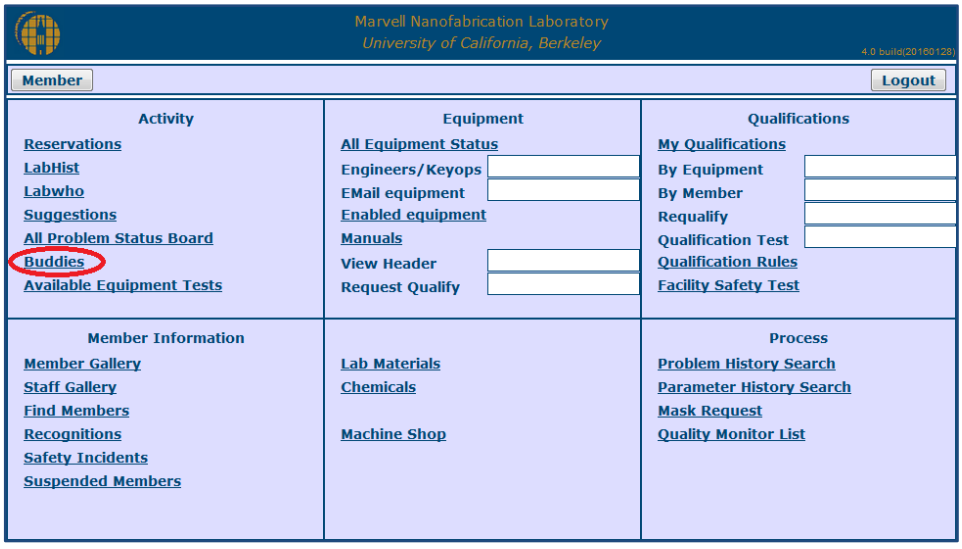


Figure 35. Buddies link

Buddies will be open in the new window.

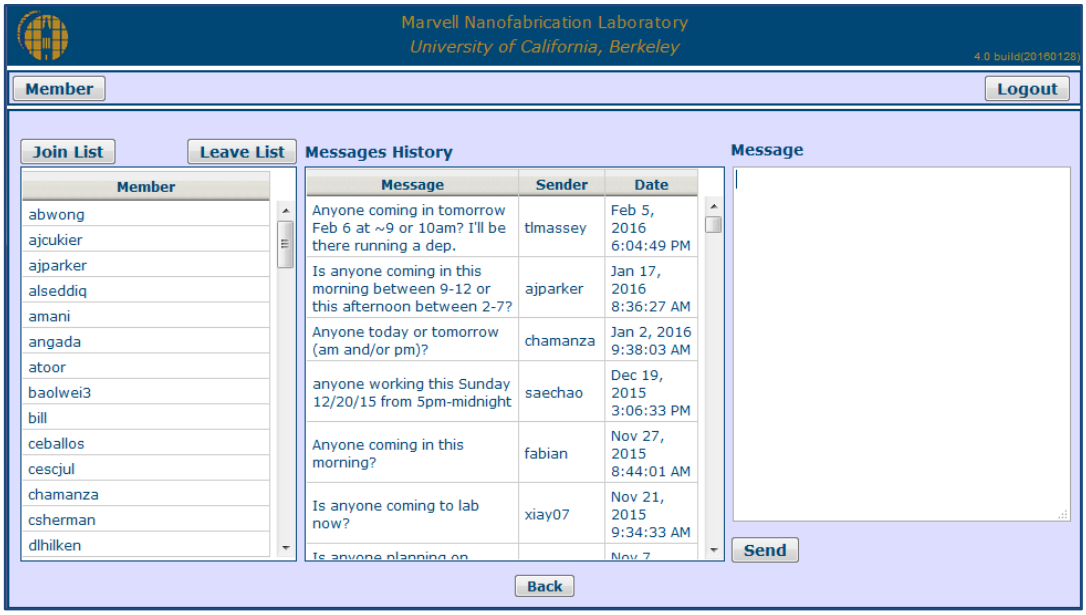


Figure 36. Buddies option

A member needs to text a message at Message text field and press on Send button. The message will be sent to all members listed in the Member window and will appear in the Message History window.

To get e-mails from Buddies, a member needs to join Buddies listing by clicking on Join List button.

To stop receiving e-mails from Buddies, a member needs to press on Leave List button.

4.6 Equipment Override

To perform *Mercury System* updates and maintenance with as little effect on members that are working in the cleanroom as possible, there is Equipment Override procedure.

Equipment Override doesn't affect member's work if an equipment is already enabled or it is reserved for that time frame.

During Equipment Override procedure all equipment will be automatically enabled.

After Equipment Override is turned off, **all equipment will be automatically turned off except of**:

1. Equipment that was enabled **before** Equipment Override was turned on,
2. Equipment that was **enabled at *Mercury Client* during** Equipment Override, and
3. Equipment that had **reservations** for that time frame.

> Keep in mind
>
> If a member wants to keep an equipment on after Equipment Override will be turned off then they need to enable the equipment at *Mercury Client* before Equipment Override will be turned off.

When the laboratory staff members plan to turn on/off Equipment Override they send a broadcast notification about it to everybody who is in the cleanroom. This notification is displayed on the TV screens located in the cleanroom and in the NanoLab office. Also all members will be notified about it by e-mail and by phone via broadcast pager system, so members will hear this message from all NanoLab phones and speaker in the cleanroom.

5.0 Appendices

1. Equipment Problems Reporting

Action	**Recipients**
New Report, Update or Maintenance	Keyops, Process and Equipment Engineers, and Members with reservations
Fix	Keyops, Process and Equipment Engineers 1 and 2, and Active Members with current or expired qualifications
Delete	No Emails

2. Reservation Rules

Action	**Restrictions**
Reserve	At least half an hour (up to one hour) in the future.
Delete reservation by member	Not allowed to delete past and in progress reservations
Delete reservation by staff	No restrictions

3. Suggestion Email

Action	**Recipients**
New Update	bill, bob, marylin, member

4. Safety Incident Email

Action	**Recipients**
New	nanolab (all members)

5. Recognition Email

Action	Recipients
New	bill, bob, marilyn, member, nominee
Update	member

6. Equipment Enable/Disable Rules

Action	Equipment Status	Restrictions
Enable	Green	No restrictions
	Yellow	No restrictions
	Red	Staff only
	Cross	Staff only
Disable	Green	No restrictions
	Yellow	No restrictions
	Red (enabled by member)	No restrictions
	Red (enabled by staff)	Staff only
	Cross (enabled by member)	No restrictions
	Cross (enabled by staff)	Staff only

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