

# NFF

Nanosystem Fabrication Facility

Facilities in NFF

NFF Phase II

NFF Enterprise Center

Ion Implantation and  
Electroplating Laboratory

Photo Gallery

## Part D – NFF (CWB) Equipment Reservation System Training

Mr. Wilson Yip





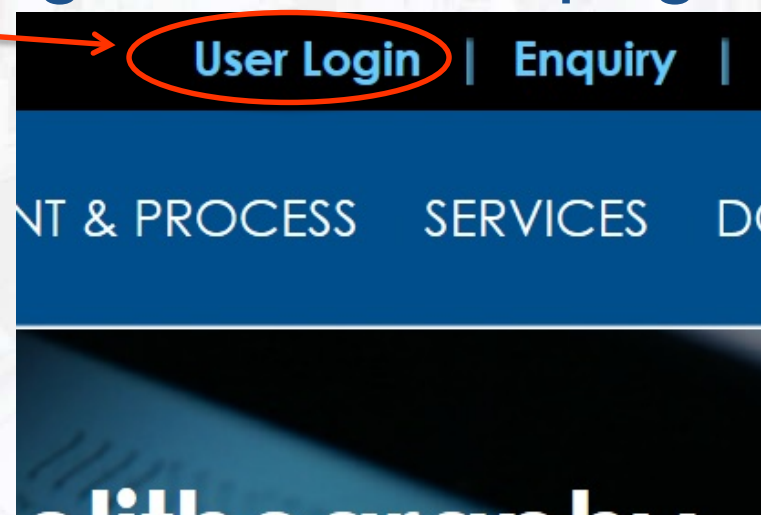
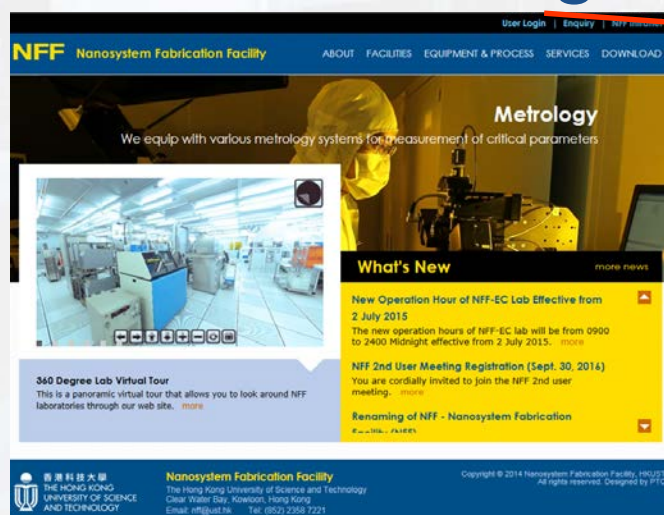
# Purpose of Training

- To know how to reserve the equipment through equipment reservation system
- To know how to check in and check out the reserved equipment
- To know the rules and guidelines to reserve the equipment
- To know other features in the system
  - eg. Equipment training, lab material purchase, etc.....



# Introduction of Equipment Reservation System

- NFF Equipment Reservation System direct URL
  - <https://nanolab.ust.hk/booking/navmain.asp>
  - Connect to [HKUST VPN](#) on or off campus first
- OR click “User Login” through NFF homepage







# Introduction of Equipment Reservation System

- Log in the system
  - User name
  - Password
  - Project no.
- You can get the above information after applying a NFF account

**Lab User Login**

Please login to NFF Equipment Reservation System to make reservation or check your bookings. Or just [click here](#) to check the equipment reservation status.

To apply an account, please contact our staff in Room 421B.

login as a NFF Staff

Username :

Password :

Project No. :

Any queries, please email to [binoman@ust.hk](mailto:binoman@ust.hk) or call Norman LAW at Ex.8021

[to Main Page](#)

last October 14, 2019

Username :

Password :

Project No. :

Any query, please email to [binoman@ust.hk](mailto:binoman@ust.hk) or call Norman LAW at Ex.8021





# Introduction of Equipment Reservation System

- Log out: To log out your NFF account
- Reservation: To book equipment of NFF
- Check In/Out: To check in and check out equipment before and after operation
- User Info: Include lab material purchase, equipment operation training, etc.....
- View Lab Notice: To notify equipment or lab shutdown
- View Eq Reservation: To show reservation status in NFF
- Available Reservation Hours: Hours that you remain for reservation.
  - Each NFF account has maximum of 20 hours to make reservation

Logout MFF000	Reservation	Check In/Out	User Info Logged on as: Ho LI	View Lab Notice	View Eq Reservation Available Reservation Hour(s): 22.0
Your Project's Reservation					
Project No: MFF000					
Name	Equipment Name	Reservation Date	Reservation Time		
Ho LI	ALD -Non-Standard	Wednesday, January 14, 2015	09:00 - 12:00		
Ho LI	ALD -Non-Standard	Wednesday, January 14, 2015	12:00 - 15:00		
Ho LI	ALD -Non-Standard	Thursday, January 15, 2015	09:00 - 12:00		
Ho LI	ALD -Non-Standard	Thursday, January 15, 2015	12:00 - 15:00		
Ho LI	ALD -Non-Standard	Friday, January 16, 2015	12:00 - 15:00		
Ho LI	ALD -Non-Standard	Friday, January 16, 2015	15:00 - 18:00		





# Introduction of Equipment Reservation System

- More about “View Eq Reservation”.....
  - It is to show the reservation status of each equipment
    - Separate into four modules
    - Show who reserve the equipment with time slot
    - Purple color: User has checked in the equipment and is operating the equipment now.
    - Black color: User has reserved the equipment with corresponding time slot

## ARC-12M - Available

Name	Project No.	Date	Time	Job
Zhenhuan TIAN	NFF1125	8/21/2015	09:00 - 18:00	500A TiW/1um Cu / Copper (Cu), Tungsten-Ti. (W/Ti)
Zhen SUN	MFF919	8/24/2015	09:00 - 18:00	Cr 500A Au 1500A / Chromium (Cr), Gold (Au)
Daniel Josephus VILLAROMAN	MFF991	8/25/2015	09:00 - 18:00	50/500 / Chromium (Cr), Platinum (Pt)
Jian Biao LU	MFF911	8/26/2015	09:00 - 18:00	gold / Chromium (Cr), Gold (Au)
Daniel Josephus VILLAROMAN	MFF991	8/27/2015	09:00 - 18:00	50/500 / Chromium (Cr), Platinum (Pt)





# Introduction of Equipment Reservation System

## ■ More about “View Lab Notice” .....

- A notice for you to know the equipment status, mainly for notification of equipment shut down

<b>Notice ID</b>	: 2719
<b>Submitted By</b>	: Chun Fai YEUNG
<b>Submitted Date</b>	: Wednesday, January 07, 2015
<b>Machine(s) Affected</b>	: ASML Stepper 5000
<b>Shutdown Period</b>	: From Friday, January 16, 2015 09:00 To Friday, January 16, 2015 14:00
<b>Reason</b>	: CDA plant maintenance

- For example

Equipment	Type of shut down	Shut down period	When can you reserve?
Oxford ALD	Scheduled shut down (eg. Routine maintenance)	2/15/2021 – 2/17/2021	CAN reserve any time slots EXCEPT the time slots during shutdown period
DRIE Etcher #1	Non-scheduled shut down (eg. Pump failure)	From 2/15/2021 until further notice	CANNOT reserve any time slots starting from 2/15/2021 until further notice

- System will not allow you to book the equipment during shutdown







# Introduction of Equipment Reservation System

- More about “View Lab Notice”.....
  - How about if you have already reserved an equipment but a shut down notice is issued afterward ?
    - Delete your affected reservations automatically by the system
    - Return the reservation hours
    - Send a notification email to you to inform you that your reservations have been cancelled
  - Always keep checking NFF lab notice to know the equipment status and to well prepare for your process.





# Introduction of Equipment Reservation System

## ■ More about “User Info” .....

- You can change your account password anytime
- You can purchase some NFF materials (eg. Wafers, tweezer, etc.....) through the system
- You can check your account's monthly charging record (for HKUST members only)
- You can join the equipment operating training in order to learn how to operate the equipment by yourself
- You can find the equipment operating manual or training video
- You can apply for using software tools
  - LinkCAD and DeScribe
- Other information related to NFF (eg. NFF user meeting notice, handbook)

### Change Password

Username: nfpkyip  
Old Password:   
New Password:   
Re-Enter New Password:

### Lab Material Request

How to..

### Charging Information

### Equipment Related

- [Equipment Operation Training](#)
- [Equipment Operation Manual](#)
- [Qualification of Equipment Operation](#)

### Process Related

- [Wet and Dry Etching Table](#)
- [NFF Process Database](#)
- [Application for Software](#)

### Safety Related

- [NFF User HandBook](#)
- [MSDS](#)
- [Chemical Control](#)





# Equipment Reservation

- Types of equipment that need to be reserved (Only show part of them below. For a full list, please click [HERE](#)):

Thermal Diffusion and Implantation Module	Photolithography Module	Dry Etching and Sputtering Module
CF-3000 Implanter (1 hr/session)	ASML Stepper (1 hr/session)	DRIE Etcher #1 (1 hr/session) And (3hrs/session)
Oxford ALD (3 hrs/session)	Karl Suss MA6 #1 and #2 (1 hr/session)	Lam 490 Etcher (1 hr/session)
TEOS PECVD (3 hrs/session)	AB-M Aligner #1 and #2 (1 hr/session)	Cooke Evaporator #1 and #2 (3 hrs/session)
AG610 RTP (1 hr/session)	Karl Suss Bonder SB6 (1 hr/session)	CVC-601 Sputter (6 hrs/session)

- Each equipment has its own “hours per session”
- Equipment that do not need to be reserved (First-come, first-served):
  - Ovens, hot plates, spin coaters, wet stations
  - Microscopes
  - Surface profiler, probe station, resistivity measurement system





# Equipment Reservation

- Equipment can be reserved 2 weeks in advance
- How to reserve an equipment?
  - Step 1
    - Log in the system, go to “Reservation” and click “Make/Delete Reservation”
  - Step 2
    - Select the module and equipment that you want to reserve in the module
    - Eg. Trion RIE Etcher in Dry Etching and Sputtering Module
    - Click “OK” if there is a pop-up message which reminds you some information before reserving the equipment



# Equipment Reservation

Equipment Name: Trion Etcher

## How to reserve an equipment?

### Step 3

- Put a tick in the box. Each box represents a time slot. The box without a user name on it means this time slot is available. **Don't put a tick in the box that has a name on it. It means that time slot has been reserved already!**

### Step 4

- Select "Make Reservation" and fill in the information. Click "Submit Form".

Last Month Next Month

January

Weekday	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Weekend
09:00 - 10:00					1	2	3	
10:00 - 11:00						dlae		
11:00 - 12:00						dlae		
12:00 - 13:00								
13:00 - 14:00								
14:00 - 15:00								
15:00 - 16:00								
16:00 - 17:00								
17:00 - 18:00								
09:00 - 10:00	4	5	6	7	8	9	10	
10:00 - 11:00		jliaz		eelulei		djavaa		
11:00 - 12:00		jliaz		eelulei		djavaa		
12:00 - 13:00		jliaz	hluac		eelulei	djavaa		
13:00 - 14:00					lujb93	djavaa		
14:00 - 15:00		jliaz	hluac		lujb93	djavaa		
15:00 - 16:00					lujb93	djavaa		
16:00 - 17:00				eegfln	lujb93	djavaa		
17:00 - 18:00								
09:00 - 10:00	11	12	13	14	15	16	17	
10:00 - 11:00		eelulei	zwxab	<input type="checkbox"/> djavaa	<input type="checkbox"/> zwxab	<input checked="" type="checkbox"/> djavaa		
11:00 - 12:00		eelulei	zwxab	<input type="checkbox"/> djavaa	<input type="checkbox"/> zwxab	<input checked="" type="checkbox"/> djavaa		
12:00 - 13:00		eelulei	zwxab	<input type="checkbox"/> djavaa	<input type="checkbox"/> zwxab	<input checked="" type="checkbox"/> djavaa		
13:00 - 14:00		jliaz	zwxab	<input type="checkbox"/> djavaa	<input type="checkbox"/> zwxab	<input checked="" type="checkbox"/> djavaa		
14:00 - 15:00		eelulei	zwxab	<input type="checkbox"/> djavaa	<input type="checkbox"/> zwxab	<input checked="" type="checkbox"/> djavaa		
15:00 - 16:00		eelulei	zwxab	<input type="checkbox"/> djavaa	<input type="checkbox"/> zwxab	<input checked="" type="checkbox"/> djavaa		
16:00 - 17:00		eelulei	zwxab	<input type="checkbox"/> djavaa	<input type="checkbox"/> zwxab	<input checked="" type="checkbox"/> djavaa		
17:00 - 18:00		eelulei	zwxab	<input type="checkbox"/> djavaa	<input type="checkbox"/> zwxab	<input checked="" type="checkbox"/> djavaa		
09:00 - 10:00	18	19	20	21	22	23	24	
10:00 - 11:00								
11:00 - 12:00								
12:00 - 13:00								
13:00 - 14:00								
14:00 - 15:00								

"Tick" on the box

DO NOT put Tick on the box that has name

Project Number : MFF000  
 User Name : Pui Keung YIP  
 Email Account : nfpkyip@ust.hk  
 Contact Phone : 23587896  
 Make/Delete Reservation : ☒ Make Reservation ☐ Delete Reservation  
 Job Description : SiO2 etch  
 No. of Wafers : 1

Submit Form Clear Form

Fill in the information.  
For deposition process,  
You need to select what  
Materials you deposit.







# Equipment Reservation

## ■ How to reserve an equipment?

### ○ Step 5

- If you can reserve the equipment successfully, you will receive an email to confirm your reservation. Otherwise, you have to go back and reserve again.
- Delete reservation
  - You can delete reservation through the system **at least one day in advance**
  - Put a tick in the box that you have selected, choose” Delete Reservation” and then click “Submit Form”
  - You will receive an email to confirm your deletion of reservation
  - If you reserve a time slot but you do not come over or delete the reservation, **HK\$400 will be charged as penalty**
  - For urgent case, you can contact IT staff for help of deleting reservation

Project Number	: MFF000
User Name	: Pui Keung YIP
Email Account	: ntpkyp@ust.hk
Contact Phone	: 23587896
Make/Delete Reservation	: <input checked="" type="radio"/> Make Reservation <input type="radio"/> Delete Reservation
Job Description	: SiO2 etch
No. of Wafers	: 1

Submit Form Clear Form



# Equipment Reservation

## ■ Things you need to know.....

- Each NFF account has maximum of **20 hours** for equipment reservation
- The deduction of hours is based on “hours per session” of the equipment you reserved
  - For example, after you reserved three equipment, you only have 14 hours left

Reserved Equipment	Time Slot	Hours per session	Remaining hours (20hrs as start)
Oxford ALD	9am-12pm	3	$20-3 = 17$
AST Metal Etcher	11am-1pm	2	$17-2 = 15$
AG610 RTP	3pm-4pm	1	$15-1 = 14$

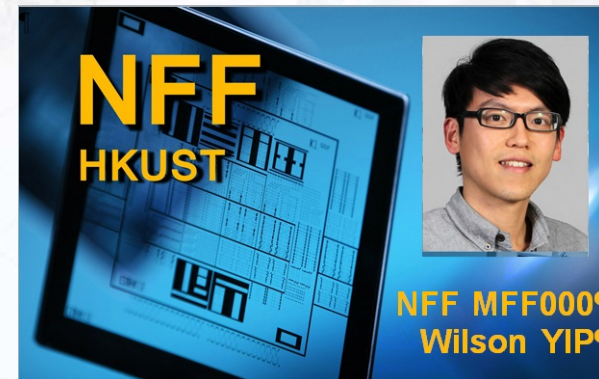
- Hours will be returned when you check out the equipment after operation
- Special case for CVC-601 Sputterer and ARC-12M Sputterer
  - CVC-601: 6 hours per session but only deduct 3 hours due to long time of chamber pump down
  - ARC-12M: 5 hours per session but only deduct 1 hour due to long time of chamber pump down





# Equipment Check-In / Check-Out

- Equipment check-in – Do it **BEFORE** operating the equipment
- Equipment check-out – Do it **AFTER** operating the equipment
- Two ways to check in and check out the equipment
  - Through NFF reservation system on website
    - Only computers in labs can do check-in and check-out
  - Through NFF access card
    - Each user needs to get a NFF access card for lab access and equipment check-in and check-out





# Equipment Check-In / Check-Out

To check in and check out through the website

## Step 1

- Log in the system, go to “Check In/Out” and click “Check In” or “Check Out”

## Step 2

- Put a tick in the box that you want to check in or check out. Then click “Submit Form”.

Machine(s) to be Checked In

Eq read : 107,

	Machine Name	Date	Time
<input checked="" type="checkbox"/>	Cello GaN Etching	Wednesday, January 14, 2015	16:00 - 17:00
<input checked="" type="checkbox"/>	Cello GaN Etching	Wednesday, January 14, 2015	17:00 - 18:00

Submit Form

Clear Form

- If you check in successfully, the reservation status will be changed to purple and the equipment will be unlocked for operation

Cello GaN Etching - Available



Name	Project No.	Date	Time	Job
Pui Keung YIP	MFF000	1/14/2015	16:00 - 17:00	test
Pui Keung YIP	MFF000	1/14/2015	17:00 - 18:00	test







# Equipment Check-In / Check-Out

To check in and check out through NFF access card (For reserved equipment)

- Within your reserved time slots, put your card on card reader that is mounted on the equipment
- If you can check in or check out successfully, A LED will be turned on or turned off accordingly. Otherwise, 3 times of “beep” sound will come out as a failure sound.
- Check in: LED turns on and equipment will be unlocked for operation
- Check out: LED turns off and equipment will be locked



The 1<sup>st</sup> generation card reader



The 2<sup>nd</sup> generation card reader (LED is embedded)



# Equipment Check-In / Check-Out

To check in and check out through NFF access card

(For “non-reserved” equipment)

- There are equipment that do not need reservation but they are mounted with card readers
  - Surface profiler , PR spin coater, wet stations, etc.....
- They are “first come first serve basis”
- Use your NFF access card to check in and unlock the equipment to operate
- Remember to check out after use (except the 3<sup>rd</sup> generation card reader)



The 1<sup>st</sup> generation card reader



The 2<sup>nd</sup> generation card reader  
(LED is embedded)



The 3<sup>rd</sup> generation card reader with timer and display embedded. Once check in, timer will start to count down and equipment will be unlocked for operation





# Equipment Check-In / Check-Out

## Rules of Check-In

- If you don't use your OWN NFF access card to enter NFF labs, you will fail to go into the check-in website or you will fail to check in through the card

### Check In / Check Out

#### Notes:

- We do not have your IN door lock record.
- You can not access the check-In/Check-Out page.

- If you come late (i.e. **late more than half of your reversed time slot**), you cannot check in the equipment on website. It means there is time limitation.
  - Example:

Equipment	Reserved Time slots	The time you come to check in	Check in successfully ?
Oxford ALD	12pm – 3pm	2pm	No
Trion RIE Etcher	9am – 10am	9:35am	No

- In this case, other NFF users can reserve your time slot.





# Equipment Check-In / Check-Out

## Rules of Check-In

- If you reserve a consecutive time slot, you can check in all of them at the same time by NFF access card or website

### Machine(s) to be Checked In

Eq read : 120,

	Machine Name	Date	Time
<input checked="" type="checkbox"/>	Trion Etcher	Thursday, January 15, 2015	10:00 - 11:00
<input checked="" type="checkbox"/>	Trion Etcher	Thursday, January 15, 2015	11:00 - 12:00
<input checked="" type="checkbox"/>	Trion Etcher	Thursday, January 15, 2015	12:00 - 13:00

3 consecutive time slots

[Submit Form](#) [Clear Form](#)

- System will not check in the equipment for you. You have to do it by yourself whenever you have a new reservation
- If you reserve an equipment but do not come into lab to check in, you will be charged **HK\$400** as penalty
  - You will receive an email for the notification of penalty in the second day







# Equipment Check-In / Check-Out

## Rules of Check-Out

- If you have checked in a consecutive time slot, you can check out all of them at the same time by NFF access card or website
- What if you forget to check out the equipment ?

- For photolithography equipment

- If you forget to check out, the system will calculate the usage time from your check in time to next user's check in time. If you are the last user of that equipment in that day, the system will charge you from your check-in time to 11:59pm.

- Example

	Reserved time slot	Check-in time	Check-out time
User A	10am-11am	10:05am	11:15am
User B	11am-12pm	11:15am	

- You will receive an email to notify you in the second day

Red color: check out by system

- For other equipment

- The system will automatically check out your equipment at the end of your reserved time slot
- For example, your reserved time slot is 9am-12pm and the system will count 12pm as your check-out time





# Lab Material Purchase

## ■ How to purchase NFF materials?

### ○ Step 1

- Log in the system, go to “User Info” and click “Material Request”

### ○ Step 2

- Click “Lab Material”
- Check what materials you want to purchase and input a quantity on it

36. Tweezer	1	pcs	187	187
37. 2" Single Wafer Carrier with spring	0	pcs	22	0
38. Wafer Storage Box for 25 pcs wafers	1	pcs	584	584
39. 1" Single Wafer Carrier with spring	0	pcs	14	0
40. 4" Single Wafer Carrier with spring	0	pcs	30	0
41. 6" Single Wafer Carrier with spring	0	pcs	56	0
42. Other wafer	0	pcs	119	0
<b>Total:</b>				<b>771</b>

Budget Controller: Prof. Ricky S. W. LEE

Submit

Reset

- Click “Submit”





# Lab Material Purchase

## ■ How to purchase NFF materials?

### ○ Step 3

- After submission, print the Request Form and let your budget controller to sign on it
- Submit the signed form to NFF staff to get the materials

The Hong Kong University of Science and Technology  
Nanosystem Fabrication Facility  
**Laboratory Material Request**

The Request is Sent Successfully  
Request Ref No. 7444 with 1 Items

Request Form for Printing

Please print the Request Form and return it to the NFF staff with the budget controller's signature  
If you ONLY request for NFF access card, please print the Request Form and pass it to Miss Terry Lam for signature

Back

- You can review your material submission by clicking “View Request”





# Training For Equipment Operation

- Let you know how to operate equipment by yourself
  - Karl Suss MA6 #1 and #2, AST 600EI Evaporator, etc.....
- It is **NOT ALLOWED** to operate the listed equipment without joining our training
- You don't have to join training of all equipment, just choose which you need to learn and operate (refer to your process flow)
- Go to “Equipment Operation Training” in “User Info” to register for training
  - Go through equipment's operation manual and training video (if provided)
  - Register for training of the equipment that you want to operate
  - After training and ability confirmation test, you can get the right to operate the equipment by yourself
- If you don't operate the equipment for more than 6 months, you need to be re-qualified







# Training For Equipment Operation

- You can check what equipment you have been qualified to operate

Click to know the qualified list

## Equipment Operation Training

The following equipment (in the table shown below) have been released for hand-on operation training. If users do not find his/her name on the qualified list, (Or click here for knowing what equipment you have been qualified) and plan to operate these equipment by themselves for their projects frequently (more than 1 time per month) in the near future, please follow these procedures:

1. Go through equipment's operation manual on NFF web-site.
2. When getting familiar with such operation steps, please apply the hand-on training by sending request to NFF.
3. After attending the training and passing the ability confirmation test, user can get the right to operate those equipment by themselves.

### Available Equipment For Training:

Thermal Process and Implantation Module	Registration of Training	Photolithography Module	Registration of Training	Wet Etching and CMP Module	Registration of Training	Dry Etching and Sputtering Module	Registration of Training
1. STS Multiplex PECVD, PECVD2	<a href="#">Registration</a>	1. Karl Suss MA6 Aligner, both #1 and #2	<a href="#">Registration</a>	1. PEL Wet Station M (Phase III)	<a href="#">Registration</a>	1. AST C200 Al Metal Etcher	<a href="#">Registration</a>
2. Allwin21 AW610 RTP (Phase III)	<a href="#">Registration</a>	2. Solitec 5110-C/DP Manual Photoresist Coater (Phase III)	<a href="#">Registration</a>			2. AST 600EI E-beam Evaporator (Phase III)	<a href="#">Registration</a>
		3. EVG 101 Spray Coater	<a href="#">Registration</a>			3. Oxford Plasmalab 80 Plus RIE (Phase III)	<a href="#">Registration</a>
						4. AST 450I E-beam Evaporator (Phase III)	<a href="#">Registration</a>
						5. Branson IPC 3000 O <sub>2</sub> Asher (Phase III)	<a href="#">Registration</a>

Remark: The exact date and venue of training will be informed to you by E-mail after registration.





# Lab Operating Hours

## ■ NFF (CWB)-Phase II

- Room 2230 (near lift no.23)
- 9am-midnight (Monday – Friday, closed on Saturday, Sunday and public holiday)

## ■ NFF (CWB)-Enterprise Center

- Room 4162 (near lift no.33)
- 24hours (Monday – Friday, closed on Saturday, Sunday and public holiday)

## ■ NFF (CWB)-TSV Process Laboratory

- Room 2227 (near lift no.23)
- 9am-midnight (Monday – Friday, closed on Saturday, Sunday and public holiday)

## ■ NFF (CWB)-Deep RIE Process Center

- Room 2223 (near lift no.23)
- 9am-5pm (Monday – Friday, closed on Saturday, Sunday and public holiday)



NFF (CWB)-Enterprise Center



NFF (CWB)- Phase II



NFF (CWB)-Deep RIE Process Center



NFF(CWB)-TSV Process Laboratory





# Lab Operating Hours

- Office hour of NFF (CWB)
  - 8:45am – 5:33pm (Monday – Friday)
  - For non-office hour, please follow **buddy system** to work in NFF lab
  - **DON'T stay and work ALONE** in NFF lab





# Green User Policy

- Objectives
  - Encourage more practices for “green” users
  - Avoid serious operational mistakes
- Who are “green” users ?
  - Without experiences in working in the NFF cleanrooms
  - Have not beening using the NFF cleanrooms for 1 year or more
  - UG students (“green” user throughout the whole period working in the NFF)







# Green User Policy

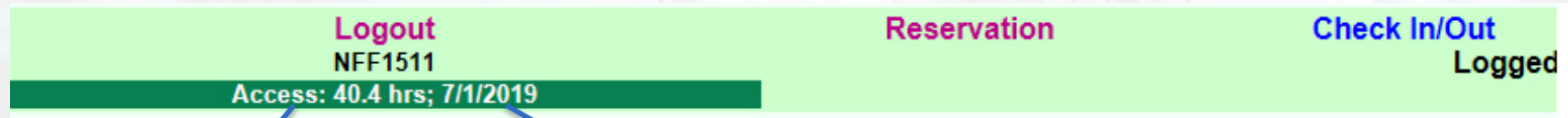
- Dos and Don'ts for “green” users
  - Lab access time: 9:00am-5:00pm
  - Must consult the NFF staff before starting a process
  - “Green” users are not allowed to start any wet processes, prepare or dispose any chemicals without monitoring by the NFF staff (*or by another regular NFF user within the same research group who has been a regular user for at least 6 months, if the regular user is willing to take the responsibility*).





# Green User Policy

- Criteria for promotion to become the regular user
  - 3-month probation since the project start date
  - Accumulated total working hours of at least 50 hours in the NFF labs
  - No warning letters
  - No recommendations by NFF staff to extend the probation period



Accumulated working hours  
(update once per day)

Project start date





~ END ~

Thanks for your coming !

(Part D will not be included in the exam)

Link for registration of orientation exam (with HKUST VPN connected)

<https://nanolab.ust.hk/SafetyCourseReg/monthlycourseregExam.asp>

(For external users, please contact Eddie CHEUNG ([nfeddiec@ust.hk](mailto:nfeddiec@ust.hk)) for registration.)

