



Universität Hamburg

DER FORSCHUNG | DER LEHRE | DER BILDUNG

# Open Day of Technology Platforms

Technology Platform – Clean Room @ CHyN

31.01.2024 **Michael Rübhausen**

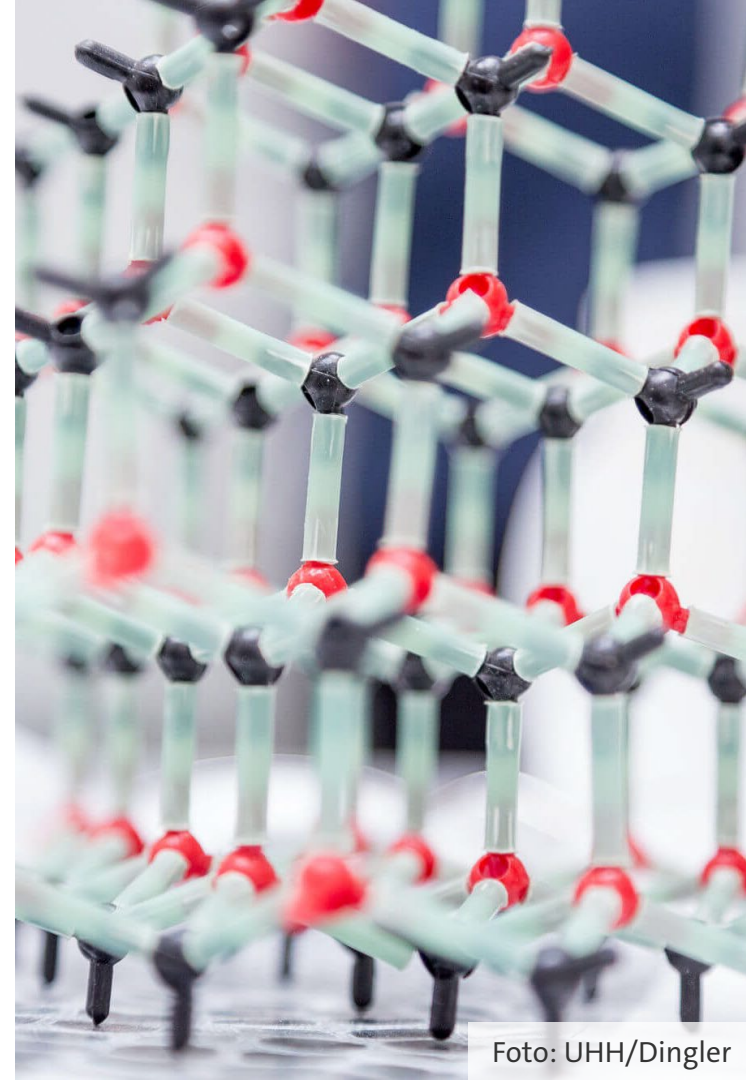
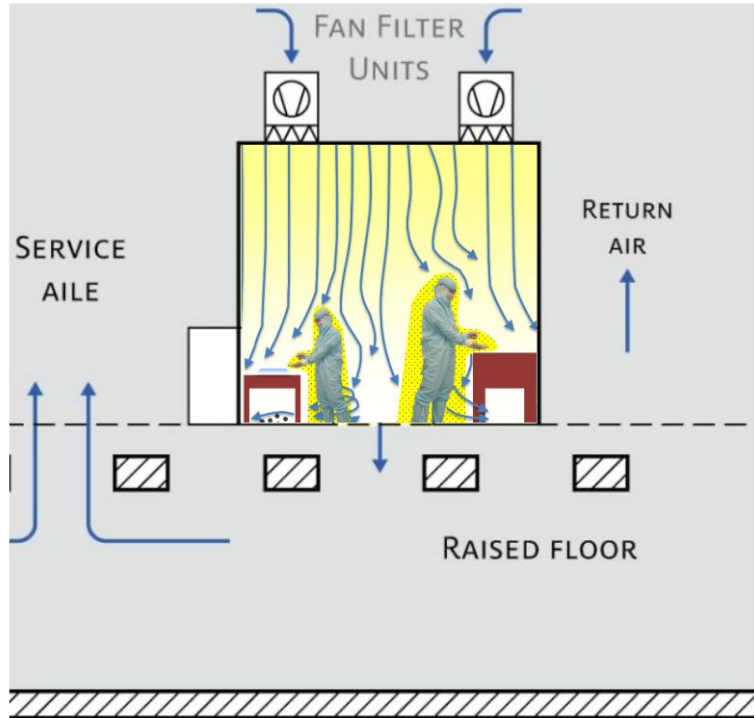


Foto: UHH/Dingler

# Concept of the platform

- Cutting edge technologies for modern hybrid nanostructures
- Focussed Ion Beam, E-Beam Lithography, Optical Lithography, Reactive Ion Etching, Nanoimprinting, PVD techniques and many more
- More than 18 different devices are combined in typically 3-10 different process steps to make and characterize nano- and micro structures leading to diverse opportunities for research

# What is a clean room ?



Concentration max allowed of particles (particles/m<sup>3</sup> of air)  
 Particles sizes equal or superior to that given below

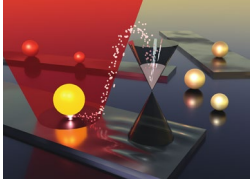
(0.5µm particles/ft<sup>3</sup> of air)

Class ISO	0.1 µm	0.2 µm	0.3 µm	0.5 µm	1 µm	5 µm	Class US FS209
ISO 1	10	2	0	0	0	0	
ISO 2	100	24	10	4	0	0	
ISO 3	1 000	237	102	35	8	0	1
ISO 4	10 000	2 370	1 020	352	83	0	10
ISO 5	100 000	23 700	10 200	3 520	832	29	100
ISO 6	1 000 000	237 000	102 000	35 200	8 320	293	1 000
ISO 7	□	□	□	352 000	83 200	2 930	10 000
ISO 8	□	□	□	3 520 000	832 000	29 300	100 000
ISO 9	□	□	□	35 200 000	8 320 000	293 000	

Standard ISO 14644-1

We are aiming at ISO class 4 !

# Applications – Some Examples



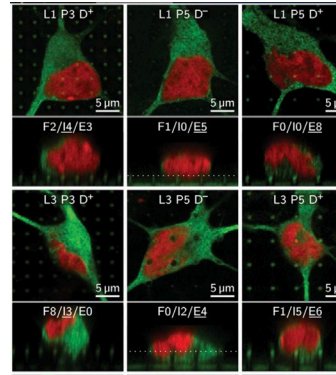
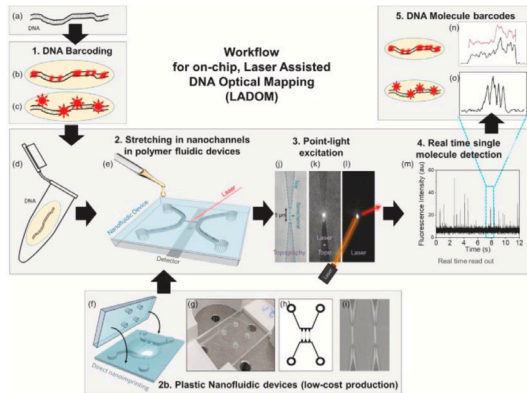
Presented research from Prof. Dr. Barbara Demler at the Center for Nanostructured Layer Systems, University of Applied Sciences, Hamburg, Germany.



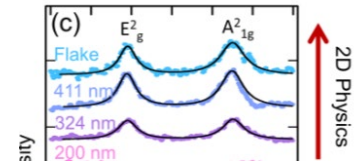
ROYAL SOCIETY OF CHEMISTRY

rsc.li/nanoscale

- Quantum Nano Materials
- Bio-Hybrid Nano Materials
- Semiconductor Devices, Science, and Technology
- X-Ray Optics and X-Ray Devices
- Nanofluidic Devices and Detection
- Quantum Information



Confined in Space



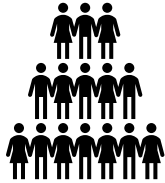
# You need training before you can enter !

- General:
  - Risks and hazards of a **Chemistry Lab**
  - Risks and hazards of a **Laser Lab**
  - Risks and hazards of a **Vacuum Lab**

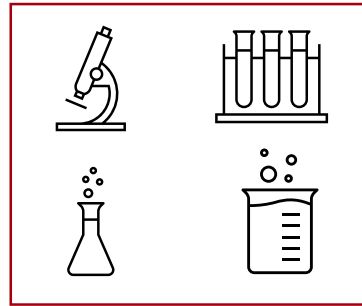


# Using the platform – A guide

User General Safety Training



General Access to Booking Tool and CRR  
(However – no booking yet possible)



- CRR provides information on the available tools SOP's and standards
- User is now visible for the instructors
- User can contact responsible persons
- User receives information on the process flow applications process
- Users submit their process flow applications. The include MSDS risk assessments.
- Instructors review the application and provide feedback.
- Modifications of tools might be also initiated.

Process Flow Application



Submits Process Steps / MSDS etc.



Approves / Modifies / Updates



# Using the platform – The Booking Tool

The image displays three overlapping screenshots of the clustermarket platform interface, illustrating its core management functions:

- Manages Time:** A calendar view for the week of 23-29 Jan 2023, showing equipment availability for various lab activities.
- Manages Equipment:** An 'Equipment Overview' table listing various lab equipment with details on room, manufacturer, and status.
- Manages Users:** A 'Users overview' table listing lab users with their roles, access groups, and status.

**Equipment Overview Table:**

Name	Room	Manuf	Access groups	Projects	Announcements	Reports	Integrations	Reviews	Refer a Lab
<input type="checkbox"/> Focused Ion Beam	FIB Room - Groundfloor Chyn	Carl Zeiss							
<input type="checkbox"/> Hood 1	Yellow Light	null							
<input type="checkbox"/> Hood 2	Yellow Light	null							
<input type="checkbox"/> Nanoprint Lithography	EVO								
<input type="checkbox"/> Physical Vapour Deposition System	CREAF								
<input type="checkbox"/> Raith Voyager	Raith								
<input type="checkbox"/> Reactive Ion Etcher	Sentec								
<input type="checkbox"/> Slane Oven	Thermo Fisher Scientific	Vacuum 10646142	No contract	Not scheduled	Unavailable				
<input type="checkbox"/> SUSS Maskaligner	SUSS MicroTec	MB4	No contract	Not scheduled	Available				
<input type="checkbox"/> UV-O Cleaner	Jelight Company Inc.	144AX	No contract	Not scheduled	Unavailable				
<input type="checkbox"/> Wetbench 1	Yellow Light	null	No contract	Not scheduled	Available				
<input type="checkbox"/> Wetbench 2	Yellow Light	null	No contract	Not scheduled	Available				
<input type="checkbox"/> Wetbench 3	Yellow Light	null	No contract	Not scheduled	Available				
<input type="checkbox"/> Wet Bench 4	Yellow Light	null	No contract	Not scheduled	Available				

**Users Overview Table:**

Name	Role	Individual Rules	Access groups	Status	Actions
<input type="checkbox"/> Ari Dangwal Pandey	Researcher	No	General	Active	
<input type="checkbox"/> Ari Dangwal Pandey	Instructor	Not required	Not required	Active	
<input type="checkbox"/> Carina Hedrich	Guest	No	General	Active	
<input type="checkbox"/> Carsten Putzke	Admin	Not required	Not required	Active	
<input type="checkbox"/> Chhitra Hanthara Sharma	Guest	No	General	Active	
<input type="checkbox"/> Frantiska Esmek	Guest	No	General	Active	
<input type="checkbox"/> Hessa Hosseinkazemi	Guest	No	General	Active	
<input type="checkbox"/> Irene Fernandez-Cuesta	Instructor	Not required	Not required	Active	
<input type="checkbox"/> Jeremy Teuber	Guest	No	General	Active	
<input type="checkbox"/> Lewis Olaniyi Akinsinde	Admin	Not required	Not required	Active	
<input type="checkbox"/> Malte Siegmund	Guest	No	General	Active	
<input type="checkbox"/> Melike Gumus Arcaalan	Guest	No	General	Active	

# Using the platform – The Process Flow Application

**CRR Process Flow Application**

**Applicant** Surname Name Application Number

**Expected Run time**

**Collaborators** Surname Name

1.  
2.  
3.

**General Project Description**

**Project Steps** Label Safety Sheet Expected Booking time Approved

1. Step  
2. Step  
3. Step  
4. Step

- CRR provides information on the available tools SOP's and standards
- User is visible for the instructors
- User can contact responsible persons
- User receives information on the process flow applications process
- The process flow applications detects incompatible process steps and can correct them
- This is not a scientific evaluation – just a technical one



# Contact



**Dr. Ing. Lewis Akinsinde (from 01.04.2024)**

Coordinator Technology Platform Clean Room  
Universität Hamburg

+49 40 8998-6607

[lakinsin@physik.uni-hamburg.de](mailto:lakinsin@physik.uni-hamburg.de)

**Prof. Dr. Michael Rübhausen**

Speaker of the Clean Room Board  
Fachbereich Physik - Universität Hamburg

+49 40 8998-6600

[ruebhausen@physnet.uni-hamburg.de](mailto:ruebhausen@physnet.uni-hamburg.de)