

R.S.S.P. Mandal's

**Nanasaheb Yashvantrao Narayanrao Chavan
Arts, Science & Commerce College
Chalisgaon. Dist – Jalgaon**

Department of chemistry

Industrial Visit Report



National Center for Nanoscience and Nanotechnology, University of Mumbai.

2023-24



Visit Location:- National Center for Nanoscience and Nanotechnology,
University of Mumbai.


Date of Visit:- 15/03/2024

Timing of Visit:- 11.30 am onwards

Name of the Director:- Prof. Vishwanath R. Patil

Name of student:- Patil Harshada Bapu

Class:- T. Y. B. Sc. (Chemistry)

Signature:- 

Objective:

The industrial visit was organized for us to learn Nanoscience and Nanotechnology and Machine Learning applications. R&D in Nano-sciences and Nanotechnology, with thrust area of Materials Science leading to industry-ready technology and Development of human resources to implement the technology. Nanosciences and Nanotechnology being an interdisciplinary subject offers knowledge, understanding and output that is integrated and Interdisciplinary in nature.

Activities Conducted:

On 15th March 2024, 20 students of third year of chemistry along with 5 faculty members visited National Center for Nanoscience and Nanotechnology, University of Mumbai. We left from college on 14th march 2024 at 10:30 pm and reached University of Mumbai by 11:30 am on 15th March 2024. We travelled in a travel train with students and faculty to guide us. As we reached the University of Mumbai, we were greeted in friendly manner by them. Initially they talked about the history of National Center for Nanoscience and Nanotechnology, University of Mumbai and there working style.

About Visited Industry (NCNNUM):

The National Centre for Nanoscience's and Nanotechnology, University of Mumbai (NCNNUM) has undertaken R&D and Training Programmes to meet some of the challenges of nanotechnology development. University of Mumbai will focus on R&D in Nanoscience's



and Nanotechnology leading to industry-ready technology and Development of human resources to implement the technology.

The total cost of the project for the Centre for Nano-science and Nanotechnology was estimated at Rs.100.00 crores. The Centre will house sophisticated equipment worth Rs. 70 crores for Nano-synthesis and Nano-characterization. Non-recurring expenditure for building, infrastructure, etc. is estimated at Rs. 15 crores. Recurring expenditure for faculty, staff, fellows, consumables, etc shall be Rs.15 crores for 3 years. It is thought that Nanotechnology will impact significantly the industries related to Energy, Health-care, Chemical & Materials (Materials Science) and Electronics. UoM has decided to focus on Materials Science for industrial applications as its thrust area. In the next Five Years, UoM will focus on

1. R&D in Nano-sciences and Nanotechnology, with thrust area of Materials Science leading to industry-ready technology and
2. Development of human resources to implement the technology

The Programmes planned are:

1. Catalyzing University for increased R&D output
2. Innovation Park for industries,
3. Nanotechnology Education initiative
4. Green Nanotechnology

There will be strong links with industry through Innovation Park programme where faculty members would partner with industries for innovations. In the next five years the Centre has targeted to produce 100 PhDs, 120 MSc students, 60 M Tech students in the field of Nanotechnology, in next five years. We also have targeted to get about 50 projects from industry in the next five years. The Programme also includes development of Social Sciences and other departments. The estimated cost of Rs.100.00 crores for the next five years, have been budgeted for the proposed programmes

Infrastructure of NCNNUM

Nano-science and Nanotechnology was estimated at Rs.100.00 crores. The Centre will house sophisticated equipment worth Rs. 70 crores for Nano-synthesis and Nano-characterization. Non-recurring expenditure for building, infrastructure, etc. is estimated at Rs. 15 crores. Recurring expenditure for faculty, staff, fellows, consumables, etc shall be Rs.15 crores for 3 years.

LIST OF NANOFABRICATION TOOLS

LIST OF NANOFABRICATION SYSTEMS

- Molecular Beam Epitaxy (MBE)
- Combined Pulsed Laser Deposition (PLD) and Pulsed Electron Deposition (PED) System
- Customized Pulsed Laser Deposition System (PLD)
- Focused Ion Beam Lithography (FIB)
- Plasma Enhanced Chemical Vapor Deposition System (PECVD)
- Electron Beam Lithography (EBL)
- Optical Lithography
- Mask Aligner



LIST OF NANOMATERIAL SYNTHESIS SETUP

- Ball Mill
- Electro-Spinning Spray Unit
- Supercritical CO2 Extractor
- Ultra Centrifuge System

LIST OF NANO-CHARACTERIZATION TOOLS

SPECTROMETRY

- Fluorescence Spectrometer
- Fourier Transform InfraRed (FT-IR) Spectroscopy
- UV-Vis-NIR Spectrophotometer
- Mass Spectrometer LC-MS
- Micro-Raman Spectroscopy
- Photoluminescence Spectroscopy
- Nano-IR Spectroscopy
- Circular Dichroism spectrometer
- Inductively Coupled Plasma Mass Spectrometer (ICP-MS)
- Inductively Coupled Plasma Optical Spectrometer (ICP-OS)

MICROSCOPY

- Scanning Electron Microscopy (SEM)
- Field Emission Scanning Electron Microscopy (FESEM)
- Ultra-High Resolution Transmission Electron Microscopy (HRTEM)
- Scanning XPS Microprobe
- Atomic Force Microscopy (AFM)
- Scanning Probe Microscopy (SPM)
- Bio-Atomic Force Microscopy (Bio-AFM)

CRYSTALLOGRAPHY

- X-Ray Diffraction (XRD)
- Particle Size & Zeta Potential Analyzer Instrument

TEM/SEM SAMPLE PREPERATION KIT

- Plasma Cleaner
- Ion Beam Milling

LIST OF PHYSICAL MEASUREMENT EQUIPMENTS

ELECTRICAL MEASUREMENTS

- Semiconductor Characterization System (Keithley 4200)
- LCR Meter
- Solar Simulator (AM 1.5G)
- Agilent Network Analyser
- Electrochemical System (Autolab)
- AC Susceptibility

MECHANICAL ANALYSIS

- Stylus Surface Profilometer
- Nano Indentation
- Nano Rheometer
- High Temperature Tribometer



- Contact Angle Measurements
- Differential Scanning Calorimetry

OPTICAL PROPERTIES

- Dual Core 3D Profiler Imaging & Interferometer System
- Nano Photometer
- Fluorescence DIC Biological Microscope
- Inverted Metallurgical Microscope

MAGNETIC MEASUREMENTS

- Magnetic Hysteresis Loop Tracer
- Physical Property Measurement Systems (PPMS)

OTHER FACILITIES

CHEMICAL ANALYSIS TECHNIQUES

- High Performance Liquid Chromatography (HPLC)
- Liquid Chromatography Mass Spectroscopy (LCMS)
- Gas Chromatography (GC)

ADDITIONAL FACILITIES

- Servers for Computational Nanotechnology
- Security System : IP Camera and Facial Recognition System
- Liquid Nitrogen Plant
- Solar Powered Electrical System
- Laminar Fume Hoods

TEACHING KITS

- Fuel Cell teaching kit
- Nanotechnology Education Software
- Electrochemistry teaching kit
- Atomistix toolkit and virtual nanolab
- Raman teaching kit
- STM teaching kit

Outcome from visit:

- Awareness of research ongoing in the field of Nanosciences and nanotechnology,
- We observed Nanosciences and nanotechnology laboratory work
- We realized practical applications Nanosciences and nanotechnology.
- We learn Nanosciences and Nanotechnology being an interdisciplinary subject which offers knowledge, understanding and output that is integrated and Interdisciplinary in nature.





Visit Location:- National Center for Nanoscience and Nanotechnology, University of Mumbai.



Visit Location:- Nanoscience and Nanotechnology laboratory, University of Mumbai.

Nhorun

Mr. N. U. Chavan
Trip coordinator

Dr. S. J. Wagh

Head, Dept. of Chemistry

HEAD
DEPT. OF CHEMISTRY
NANASAHEB Y. N. CHAVAN

Arts, Science & Commerce College
Chalisgaon Dist. Jalgaon



दि. 93/3/2024

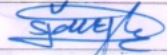
प्रति,
प्राचार्य,

गोलासाहेब म. ना. चव्हाण
कला, विज्ञान आणि वाणिज्य
महाविद्यालय, चानेसगाव

विषय- शैक्षणिक सूटकीस जाध्यास परवानगी
मिळणेबाबत
महोदय.

वरील विषयास अनुसकून आपणास विनंती करतो की, आपल्या महाविद्यालयातील रसायनशास्त्रा विभागाची शैक्षणिक सुट National Centre for Nanoscience and Nanotechnology, University of Mumbai (NCTNUT), मुंबई येथे दि. 93/3/2024 रोजी आयोजित करण्यात आले असून त्यासंबंधीच्या परवानगीच्या Email सदर Institute कडेन प्राप्त झालेला आहे. तसेच रसायनशास्त्र विभागातील T.P.S.C. येथे 20 विद्यार्थ्यां हे सूटकीस से इच्छुक असून त्यांचे व त्यांच्या पालकांचे संगतीपत्र देखील प्राप्त झालेले आहे. तरी विद्यार्थ्यांसोबत विभागातील प्राध्यापक यांना जाध्यास परवानगी मिळावी ही विनंती. सर्व विद्यार्थ्यांची सूटकीस सर्व सुवतीपत्रा काळजी काढी घेवु ही आपणास उवाकी देतो. तरी शैक्षणिक सूटकीस जाध्यास आम्हाला पक्षातगी मिळावी ही विनंती.

आपले विश्वासु


Ramesh

डॉ. राम. जे. वाघ
ग. म. चव्हाण



Dr.swapnil wagh <dr.swapnilwagh11@gmail.com>

Regarding visit to NCNNUM

3 messages

Dr.swapnil wagh <dr.swapnilwagh11@gmail.com>

Tue, Mar 12, 2024 at 9:21 AM

To: director@nano.mu.ac.in

Respected sir,

With reference to said subject, we are willing to visit your esteemed institute National Centre for Nanoscience and nanotechnology University of Mumbai. Our college's 20 students of TYBSC Chemistry and faculty members wish to visit NCNNUM as part of our curriculum. Kindly find the attachment of the college request letter for permission. My humble request to you to give us permission for the visit. I assure you that our students will maintain discipline and obey the rules during the visit. So, kindly give us visit permission and convey us the date and schedule of visit. We are eagerly waiting for your positive response and permission.

Thank you.

Regards,

Dr. Swapnil J. Wagh,**Head and Assistant Professor,****Department of Chemistry,****Nanasaheb Y. N. Chavan Arts, Science and Commerce College,****Chalisingaon, Dist.- Jalgaon. (M.S.)****(+91) 08830115086** **Request for NCNNUM visit letter.pdf**

435K

Director Nano . <director@nano.mu.ac.in>

Tue, Mar 12, 2024 at 9:35 AM

To: "Dr.swapnil wagh" <dr.swapnilwagh11@gmail.com>

Dear Dr. Swapnil,

Thank you for your email, you are most welcome with your students and faculty members at NCNNUM.

Plz convey my namaskar to my guru Prof. S. R. Jadhav sir.

Regards,

Prof. Vishwanath R. Patil

Director, NCNNUM

[Quoted text hidden]

Dr.swapnil wagh <dr.swapnilwagh11@gmail.com>

Wed, Mar 13, 2024 at 11:01 AM

To: "Director Nano ." <director@nano.mu.ac.in>

Thanks sir for your permission for visit to NCNNUM.

As per our telephonic communication we will visit on Friday, 15/3/2024.

Thanks again.

Regards,

Dr. Swapnil J. Wagh,**Head and Assistant Professor,****Department of Chemistry,****Nanasaheb Y. N. Chavan Arts, Science and Commerce College,****Chalisingaon, Dist.- Jalgaon. (M.S.)****(+91) 08830115086**

[Quoted text hidden]



NAAC Re-accredited (Third Cycle) - 'B++' Grade

Dr. S. R. JADHAV

M.Sc., M.Phil., Ph.D.

Principal

फोन ०२५८९-२२२६०१ (कार्यालय), २२५२८२ (निवास) मो. ९४२२७८९५०९

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डॉ. एस. आर. जाधव

एम. एस्सी., एम. फिल., पीएच. डी.

प्राचार्य

Outward No. / जावक क्र. ६६९/२०२३-२४

Date / दिनांक - 14/03/2024

To,

The Director,

National Centre for Nanoscience and Nanotechnology,

University of Mumbai,

Kalina, Santacruz (E), Mumbai.

Subject: Regarding visit to NCNNUM.

Respected Sir,

With reference to your email received on dated 12/3/2024 regarding permission for industrial visit to your esteemed institute National Centre for Nano science and Nanotechnology (NCNNUM). Our chemistry department TYBSC chemistry students have Industrial Visit as part of curriculum according to Kavayitri Bahinabai Chaudhari North Maharashtra University, Jalgaon. In that concern our 20 students of T.Y.B.Sc. Chemistry along with 5 teachers would like to visit on 15th March 2024.

I request you to grant the permission for the same and support them to enrich the knowledge among the students.

Thanking you.



Visited to *Nanobio Science*
Yours faithfully,
S. R. Jadhav
15/3/2024
(Dr. S. R. Jadhav)

PRINCIPAL

NANASAHEB Y. N. CHAVAN
Arts, Science & Commerce College
Chalisgaon Dist. Jalgaon

**List of students & Teachers visited to National Center for
Nanoscience and Nanotechnology University of Mumbai
(NCNNUM)**

Date:-15/03/2024

ATTENDANCE REPORT

Sr. No.	Name of Student/Teacher	Signature
1.	Kapadne Jayesh Ashok	<u>Kapadne</u>
2.	Patil Gayatri Vijay	<u>Patil</u>
3.	Mali Pooja Pundalik	<u>Malati</u>
4.	Mahajan Sunita Lotan	<u>Mahajan</u>
5.	Shirsath Pranali Dadaji	<u>Shirsath</u>
6.	Deore Urmila Dhanraj	<u>Deore</u>
7.	Khatik Muskan Jakir shaikh	<u>Khatik</u>
8.	Pardeshi Mamta Vinod	<u>Mamta</u>
9.	Patil Harshada Babu	<u>Patil</u>
10.	Mahajan Yogita Jagan	<u>Yogita</u>
11.	Kulkarni Meghana Dilip	<u>Kulkarni</u>
12.	Sonawane Krishna Suresh	<u>Sonawane</u>
13.	Kumavat Abhay Somnath	<u>Kumavat</u>
14.	Pardeshi Aashutosh Bhagvat	<u>Pardeshi</u>
15.	Nikam Ganesh Rajendra	<u>Nikam</u>
16.	Hire Divya Ashok	<u>Hire</u>
17.	Patil Darshana Gopal	<u>Patil</u>
18.	Pagare Mayuri Sunil	<u>Pagare</u>
19.	Songire Harshada Raghunath	<u>Songire</u>
20.	Patil Prachi Macchindra	<u>Prachi</u>
21.	Dr. Swapnil J. Wagh	<u>Wagh</u>
22.	Prof. Narendra U. Chavan	<u>Chavan</u>
23.	Mr. Dhananjay P. Gosavi	<u>Gosavi</u>
24.	Mr. Narendra P. Surse	<u>Surse</u>
25.	Mr. Eknath H. Gaikwad	<u>Gaikwad</u>



मुंबई विद्यापीठ
UNIVERSITY OF MUMBAI

राष्ट्रीय नॅनोविज्ञान आणि नॅनोतंत्रज्ञान केंद्र
National Centre for Nanoscience
& Nanotechnology



