

From

Dr. M. Parandamaiah
Lecturer Incharge
Dept. of Physics
S.V.A. Govt. College
Srikalahasti

Date: 15-12-2023

Srikalahasti

To

The Principal
S.V.A. Govt. College
Srikalahasti

Madam,

Sub: Educational tour to National Atmospheric Research Laboratory (NARL),
Gadanki- Permission to apply for visit - Request - Regd.

I submit that the staff members of department of Physics resolved to organize an educational tour to National Atmospheric Research Laboratory (NARL), Gadanki in January 2024. This educational tour helps the III and II B.Sc. Physics students to get practical exposure of various aspects atmospheric research. Hence, I request you to kindly permit us to communicate with NARL outreach officials and apply for visiting NARL research facilities. The list of students and staff participating in the Educational tour are attached herewith for your reference.

Thanking you Madam,

Yours faithfully

Encl:

1. List of Students and Staff

Copy to File

(Dr. M. Parandamaiah)
LECTURER IN-CHARGE
DEPARTMENT OF PHYSICS
S. V. A. GOVT COLLEGE
SRIKALAHASTI Chittoor Dist.



S.V.A. Govt. College (M), Srikalahasti
Accredited by NAAC with B+ grade
Affiliated to S.V. University, Tirupati



**Educational Tour to National Atmospheric Research Laboratory (NARL),
Gadanki**

List of Students

S.No.	Class / Group	Identity No.	Name of the Student	Gender
1	III MPCS	OAM202101432717	BANDI UDAY	M
2	III MPCS	OAM202101375825	BELLAMKONDA BHARATH	M
3	III MPCS	OAM202101375187	BILLU DINESH	M
4	III MPCS	OAM202101324045	CHEMBETI VINODH KUMAR	M
5	III MPCS	OAM202101606973	CHITTATHURU VENKATADRI	M
6	III MPCS	OAM202101571785	ELACHERI MOHANKRISHNA	M
7	III MPCS	OAM202101401511	GEDDAM PALLAVI	F
8	III MPCS	OAM202101310705	KOGILI PURNACHANDRA	M
9	III MPCS	OAM202101308843	KORRA BALA RAJU NAIK	M
10	III MPCS	OAM202101592111	PETA PAVAN KUMAR	M
11	III MPCS	OAM202101282071	POODI SURESH REDDY	M
12	III MPCS	OAM202101409804	POOJARI UDAYA KUMAR	M
13	III MPCS	OAM202101276338	REDDIVARI LEELA PRASAD	M
14	III MPCS	OAM202101393973	THENNEMBEDU ABELU	M
15	III MPCS	OAM202101481349	THIRUMELLA PRAVALIKA	F
16	III MPCS	OAM202101408561	THIRUVEEDI SURENDRABABU	M
17	III MPCS	OAM202101374152	VEDAM HARSHAVARDHAN	M
18	III MPCS	OAM202101470313	VYASAPOGU PRABHAS	M
19	III MPC	OAM202101264456	UPPARI VENKATESH	M
20	III MPC	OAM202101211822	KOORA UDAY KIRAN	M
21	III MPC	OAM202101229524	BATTEPATI VENKATESH	M
22	III MPC	OAM202101321022	CHERIVI SIDDULU	M
23	III MPC	OAM202101321788	GADHI SHANMUGA REDDY	M
24	III MPC	OAM202101322303	KANDATI MUNI CHARAN	M
25	III MPC	OAM202101571327	KOGILA SUSMITHA	F
26	III MPC	OAM202101568066	KOTA SYAMKUMAR	M
27	III MPC	OAM202101454907	NALLANI VAMSI KRISHNA	M
28	III MPC	OAM202101228275	PIDUGU SUBBU	M
29	III MPC	OAM202101492110	SHAIK AHAMAD HUSSAIN	M
30	III MPC	OAM202101493192	SHAIK MAHAMAD HUSSAIN	M
31	III MPC	OAM202101521860	THUPAKULA SURESH	M
32	III MPC	OAM202101507736	UPPU SURENDRA	M
33	II MPCS	202211290442	KUTLURU BHANU PRAKASH	M
34	II MPCS	202211917269	TALARI SURYA	M
35	II MPCS	202212257344	THIRUTHANI MOHAN	M



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15/11/2023

36	II MPC	202212352025	TANDYAM LEELA KRISHNA	M
37	II MPC	202212386336	KANKANALA RAKESH	M
38	II MPC	202212443823	YANADI KARTHIK	M
39	II MPC	202212451626	NALLAPATI DILEEP	M
40	II MPC	202212456263	KOTA VENKATESH	M
41	II MPC	202212562725	THALARI GILCHRIST	M
42	II MPC	202212579176	NEDAMBARAM MUNI PRAKASH	M
43	II MPC	202213984138	MARELLA VAMSI	M

List of Staff Members

S. No.	Name of the Staff Member	Designation	Gender
1	Dr. M. Parandamaiah	Lecturer in Physics	M
2	Dr. C. Bapanayya	Lecturer in Physics	M
3	Sri T. Rama Sunkanna	Lecturer in Physics	M
4	Smt. B. R. Padma Priya	Store Keeper	F
5	Sri SP. Masthan Valli	Record Assistant	M

15/12/23
LECTURER IN-CHARGE
DEPARTMENT OF PHYSICS
S. V. A. GOVT COLLEGE
SRIKALAHASTI, Chittoor Dist.



S.V.A. Govt. College (M), Srikalahasti
Pichatur Road, Srikalahasti-517644, Tirupati Dist., Andhra Pradesh
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Dr. M. Sreelatha
Principal

Mobile No.: 9989305638
Email ID: svagovtc@gmail.com

To
The Director,
National Atmospheric Research Laboratory (NARL),
Department of Space,
Government of India,
Gadanki – 517 112.
Andhra Pradesh

Date: 02-01-2024
Srikalahasti

Sub: Educational tour to NARL, Gadanki – Permission to visit Atmospheric Research Laboratory facilities – Request – Regd.

Ref: Email from NARL Outreach dated: 22-12-2023

Dear Sir,

With reference to the cited, I here with forward the list the students and staff who are going to visit the NARL, Gadanki.

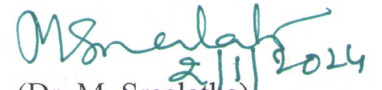
I shall be grateful for extending the co-operation by according permission to our B.Sc. Physics students along with staff members to visit your esteemed research laboratory NARL. I request you to kindly arrange an interaction session with executives of your esteemed organization to enable our students to acquaint themselves with different aspects of your organization. I assure that the students will not cause any inconvenience to you during the visit.

Name of Institution	S.V.A. Govt. College (M), Srikalahasti
Number of students	43
Number of accompanying faculty	5
Expected date of visit	09-02-2024
Session	Forenoon

I look forward for your favorable reply from you.

Thanking you sir,

With Regards


(Dr. M. Sreelatha)
PRINCIPAL
S. V. A. GOVT. COLLEGE
SRIKALAHASTI Chittoor Dist.



Bapanayya Chitikela <bapustf@gmail.com>

Fwd: SVA GOVT COLLEGE (M), SRIKALAHASTI, ANDHRA PRADESH Students Visit to NARL... on 22-03-2024

1 message

Govtcollege Srikalahasti <svagovtc@gmail.com>
To: Bapanayya Ch <bapustf@gmail.com>

Fri, Jan 19, 2024 at 11:19 AM

Dr. M.Sreelatha, M.A.,M.Phil, Ph.D.
Principal
S.V.A. Govt. College (M)
SRIKALAHASTI - 517 644
Chittoor District

Mobile No : 9989305638.

----- Forwarded message -----

From: <stvisits@narl.gov.in>
Date: Fri, Jan 19, 2024 at 11:14 AM
Subject: SVA GOVT COLLEGE (M), SRIKALAHASTI, ANDHRA PRADESH Students Visit to NARL... on 22-03-2024
To: <drmparandamaiah@svagovtcm.ac.in>, <adminoffice@narl.gov.in>, <svagovtc@gmail.com>

Dear Sir/Madam,

Received a letter from SVA GOVT COLLEGE (M), SRIKALAHASTI, ANDHRA PRADESH, Addressed to The Director NARL.

As per the consent of the Director NARL, We earmarked Friday, March 22, 2024 for 43 Students(max) and 5 faculty members' visit to NARL.

Administrative Officer, NARL is requested to kindly provide NARL entry pass for the staff and students of SVA GOVT COLLEGE (M), SRIKALAHASTI, ANDHRA PRADESH on the name of DR.C. BAPANAYYA, DR. M. PARANDAMAIAH, SRI T. RAMA SUNKANNA, SMT. B. R. PADMA PRIYA, SRI SP. MASTHAN VALLI , faculty member, along with 43 students and 5 faculty members as per the attached list for entry into NARL on, Friday, March 22, 2024, 10:30 hrs

You may be aware that, NARL is on Tirupati-Chittoor high way 35 km from both Tirupati and Chittoor.

As soon as the students bus reaches NARL main gate, The visitors will be asked to show identity cards and they have to deposit their electronic items at main gate. Kindly show our e-mail communications to collect the entry pass at NARL main gate at the time of visit.

The tentative agenda of the students visit program is as follows.

10:30 - 11:00: Power point presentation - NARL introduction. Overview of NARL activities & video

11:00 - 12:30: Visit of Automatic Weather station & Balloon launch facility, Lower Atmospheric Wind Profiler, Data Center, High Performance Computing, VHF (MST) Radar, 50 mtr Instrumented Tower. (10 min at each lab.)

12:30 hrs: Departure.

Students may come with lab shoes without laces, as footwear to be removed at each lab.

All the members are expected to come to NARL with identity card.

Electronic gadgets are not allowed in to NARL.

For security reasons, NARL has CCTV monitoring coverage for all the campus.

All the visitors should wear mask without fail, sanitise their hands and undergo thermal screening.

From

Dr. M. Parandamaiah
Lecturer Incharge
Dept. of Physics
S.V.A. Govt. College (M)
Srikalahasti

Date: 20-03-2024

Srikalahasti

To

The Principal
S.V.A. Govt. College (M)
Srikalahasti

Madam,

Sub: Educational tour to National Atmospheric Research Laboratory (NARL), Gadanki
– Permission granted by NARL – Request to permit us to visit – Regd.

I submit that the staff members of department of Physics resolved to organize an educational tour to National Atmospheric Research Laboratory (NARL), Gadanki in January 2024. NARL has accorded permission for 43 students along with 5 staff members to visit NARL research facilities on 22-03-2024 and the communication has been done to college email. This educational tour helps the III and II B.Sc. Physics students to get practical exposure of various aspects atmospheric research. Hence, I request you to kindly permit us to visit NARL, Gadanki and treat the absence of staff listed in the attachment as On Duty. The list of students and staff participating in the educational tour are attached herewith for your reference.

Thanking you Madam,

Yours faithfully

Encl:

1. List of Students and Staff
2. Copy to File

M. Parandamaiah
(Dr. M. Parandamaiah)
LECTURER-IN-CHARGE
Department of Physics
S.V.A. Govt. Degree College (M)
SRIKALAHASTI, Chittoor D.



**Educational Tour to National Atmospheric Research Laboratory (NARL),
Gadanki on 22-03-2024**

List of Students

S.No.	Class / Group	Identity No.	Name of the Student	Gender
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S. No.	Name of the Staff Member	Designation	Gender
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3	Sri T. Rama Sunkanna	Lecturer in Physics	M
4	Smt. B. R. Padma Priya	Store Keeper	F
5	Sri SP. Masthan Valli	Record Assistant	M

M. S. S.
20/8/24
LECTURER-IN-CHARGE
Department of Physics
S.V.A. Govt. Degree College (M)
SRIKALAHASTI, Chittoor D.



S.V.A. Govt. College (M), Srikalahasti

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Circular

Educational Tour to National Atmospheric Research Laboratory (NARL), Gadanki on 22.03.2024

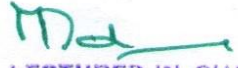
Date: 20.03.2024

This is to inform students of II, III MPC and MPCS that the department of Physics is Organizing Educational Tour to National Atmospheric Research Laboratory (NARL), Gadanki on 22.03.2024

In this Educational Tour, students will get,

1. A practical insight into the principles and operations of Balloon launch facility, Lower Atmospheric Wind Profiler, Data Center, High Performance Computing, VHF (MST) Radar, 50 mtr Instrumented Tower, complementing their theoretical knowledge gained in classrooms.
2. A deeper understanding of physics principles in the context of Weather and wind Speed changes between different layers of the atmosphere i.e Troposphere, stratosphere and ionosphere.

Hence, all students are hereby instructed to attend the Educational Tour on 22.03.2024 without fail.


LECTURER IN-CHARGE
DEPARTMENT OF PHYSICS
S. V. A. GOVT. COLLEGE
SRIKALAHASTI, Chittoor Dist.

Signature of In charge
Dept. of Physics



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Educational Tour to National Atmospheric Research Laboratory
(NARL), Gadanki on 22.03.2024

List of Students

S. No.	Name of the candidate	Class	Signature
1	B Venkatesh	III MPC	B. Venkatesh.
2	C. Siddulu	III MPC	C. Siddulu,
3	E. Mohana Krishna	III MPCS	E. Mohan Krishna
4	R. Leela Prasad	III MPCS	R. Leela Prasad
5	P. Suresh Reddy	III MPCS	P. Suresh Reddy
6	P. Udaya Kumar	III MPCS	P. Uday Kumar
7	B. Dinesh	III MPCS	B. Dinesh
8	C Vinod Kumar	III MPCS	C. Vinod Kumar
9	K Bala Raju Naik	III MPCS	K. Bala Raju Naik
10	B Bharath	III MPCS	B. Bharath
11	T. Gilchrist	II MPCS	T. Gilchrist
12	N. Muni Prakash	II MPCS	N. Muni Prakash
13	K. Venkatesh	II MPCS	K. Venkatesh



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**Educational Tour to National Atmospheric Research Laboratory
(NARL), Gadanki on 22.03.2024**

List of Staff Members

S. No.	Name of the Staff Member	Designation	Signature
1	Dr. M. Parandamaiah	Lecturer in Physics	
2	Dr. C. Bapanayya	Lecturer in Physics	
3	Sri T. Rama Sunkanna	Lecturer in Physics	
4	Smt. B. R. Padma Priya	Store Keeper	
5	Sri SP. Masthan Vali	Record Assistant	



S.V.A. Govt. College (M), Srikalahasti

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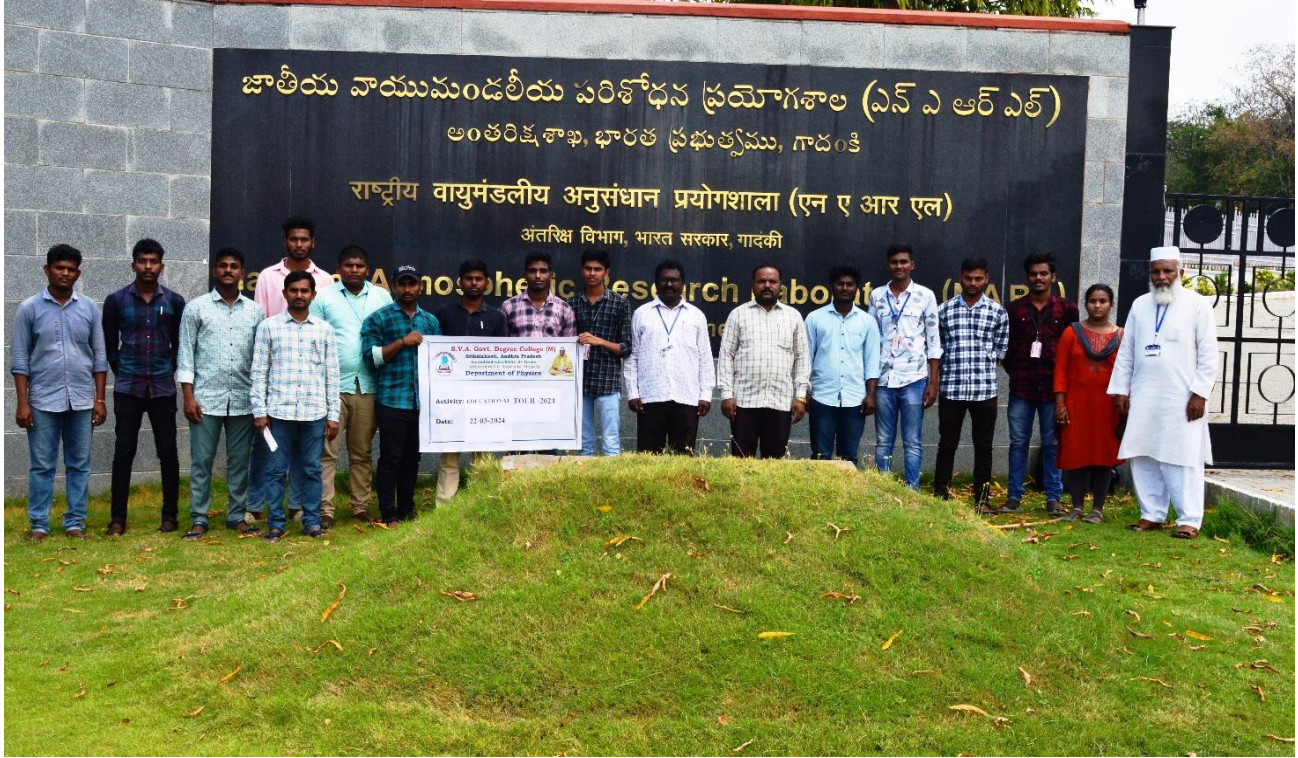
Affiliated to S.V. University, Tirupati



**Educational Tour to National Atmospheric Research Laboratory
(NARL), Gadanki on 22.03.2024**

Photographs

Group Photo Students and Staff at NARL Main gate on 22.03.2024

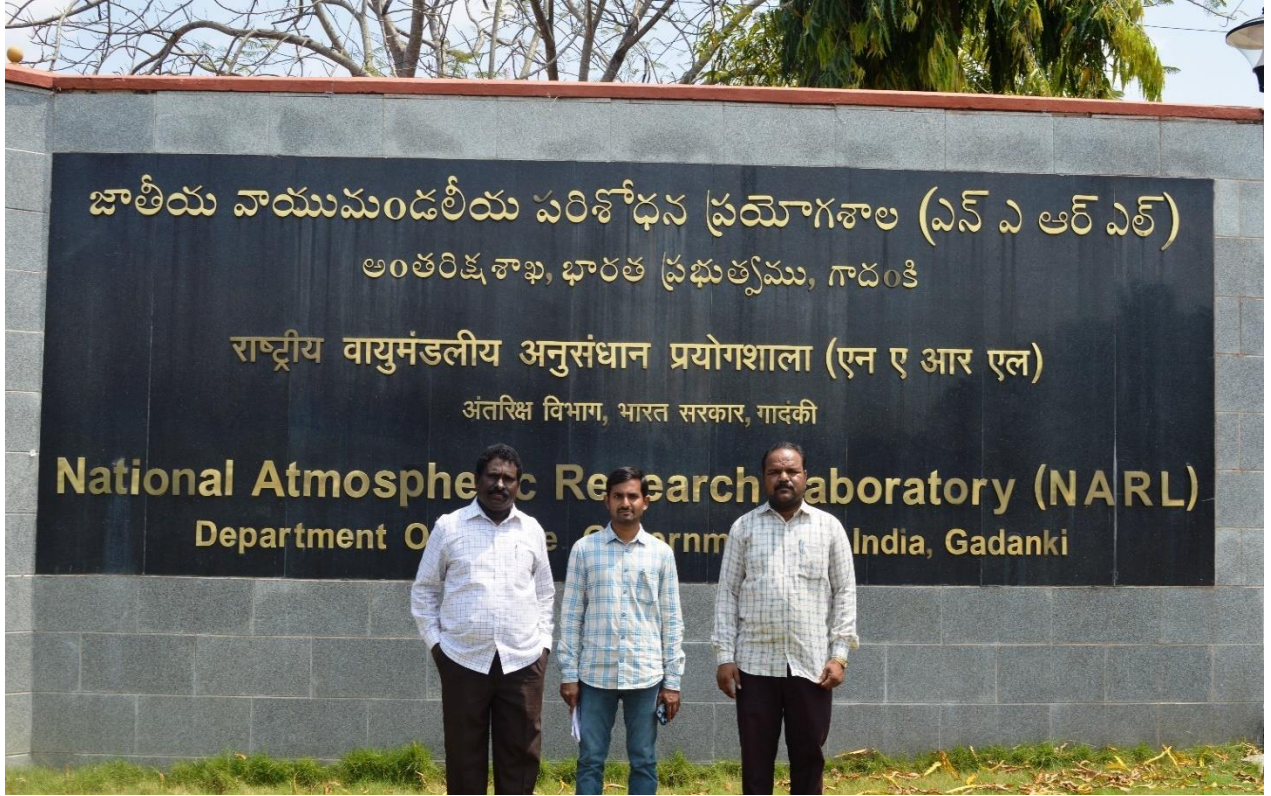




S.V.A. Govt. College (M), Srikalahasti

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Dept of Physics Staff members (from the right Dr M Parandhamaiah, Dr C Bapanayya, Sri Tholla Rama Sunkanna)



S.V.A. Govt. College (M), Srikalahasti

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Report on Educational Tour

To

National Atmospheric Research Laboratory (NARL), Gadanki on 22.03.2024

Date: 22-03.2024

The undergraduate B.Sc MPC and MPCS students of SVA Govt. College(M) embarked on an enlightening journey during their recent Educational Tour to the National Atmospheric Research Laboratory (NARL), Gadanki Tirupati District . The purpose of the visit was to provide students with a practical insight into the principles and operations of Balloon launch facility, Lower Atmospheric Wind Profiler, Data Center, High Performance Computing, VHF (MST) Radar, 50 mtr Instrumented Tower, complementing their theoretical knowledge gained in classrooms.

Background:

NARL (National Atmospheric Research Laboratory) is an autonomous research institution funded entirely by the Department of Space, Government of India. Since its inception in 1992 as the National Mesosphere-Stratosphere-Troposphere (MST) Radar Facility, NARL has been dedicated to both fundamental and applied research in Atmospheric and Space Sciences. Over the years, NARL has expanded its capabilities by incorporating various complementary techniques such as Rayleigh/Mie lidars and wind profilers. Today, it stands as a prominent center for atmospheric research within the country. Its state-of-the-art facilities include an MST radar, Rayleigh/Mie Lidar, Boundary Layer Lidar, Sodium Lidar, Lower Atmospheric Wind Profiler, Sodar, Disdrometer, Optical Rain Gauge, GNSS-NavIC receiver, and an Automatic Weather Station. Additionally, NARL conducts regular launches of GPS Radiosondes to further enhance its observational capabilities. Despite its relatively young age, NARL's research endeavors are led by a team of dynamic and



enthusiastic full-time research scientists and students. This youthful vigor drives NARL towards innovative discoveries and advancements in the field of atmospheric and space sciences.

Observations:

Automatic Weather Station: Dr. V. Yesubabu, Sci. Engr Explained about the National Atmospheric Research Laboratory (NARL), we've set up an automatic weather station equipped with five sensors and a tipping bucket rain gauge to monitor the weather conditions accurately. Let me break down the components and their functionalities for you,

Pressure Sensor: We employ a temperature-compensated piezo-resistive pressure sensor to measure atmospheric pressure. This sensor has a high resolution of 0.1 millibars, ensuring precise pressure readings.

Temperature Sensor: For temperature measurement, we utilize an RTD (Resistance Temperature Detector) type sensor. This sensor boasts a resolution of 0.1 degrees Celsius, allowing us to capture even minor temperature fluctuations.

Humidity Sensor: To monitor humidity levels, we utilize a thin film capacitance sensor. This sensor offers an accuracy of within $\pm 3\%$, enabling us to track changes in humidity with reliability.

Wind Speed Sensor: Our station is equipped with a 3-cup rotor type sensor to measure wind speed. This sensor provides us with wind speed data with an accuracy of $\pm 1\%$, ensuring precise measurement even during varying wind conditions.

Wind Direction Sensor: We employ a potentiometer type sensor to determine wind direction. This sensor offers a high resolution of less than 1 degree, allowing us to precisely ascertain the direction from which the wind is blowing.



Tipping Bucket Rain Gauge: Lastly, we have a tipping bucket rain gauge installed to provide us with information on rainfall intensity. This gauge has a resolution of 0.5 millimeters, allowing us to accurately measure rainfall rates.

Lower Atmospheric Wind Profiler: Dr. T.K. Ramkumar, Sci. Engr Explained about the NARL has engineered a cutting-edge 1280 MHz wind profiler tailored for lower atmospheric research applications. Allow me to delve into its intricacies

Technical Specifications:

Power-Aperture Product: The system boasts a formidable power-aperture product of approximately $1.7 \times 10^4 \text{ W/m}^2$, ensuring robust performance in data collection.

Antenna Array: Comprising 256 microstrip patch antenna elements arranged in a 16x16 square matrix, the antenna array forms the backbone of the profiler's functionality.

Transmit-Receive Modules (TRMs): Each antenna element is individually powered by a dedicated 12-watt TRM, contributing to the system's impressive transmission capabilities.

Beam-Forming Network: A passive two-dimensional 16x16 Butler beam-forming network facilitates the formation of multiple beams across the two-dimensional angular space.

Beam Characteristics: The profiler's beams exhibit a width of approximately 4.6 degrees, with a side lobe level (SLL) of about 16.5 dB, ensuring precision in directional sensitivity.

Operating Technique: Employing the Doppler beam-swinging technique, the radar scans the atmosphere to gather comprehensive wind data.

Operational Modes:



1. Lower Range Wind Profiling: Designed to capture wind data at lower altitude levels, providing insights into boundary layer dynamics.

2. Higher Range Wind Profiling: Extends its capabilities to capture wind profiles at higher altitudes, offering a holistic view of atmospheric dynamics.

3. Low-Level Precipitation Mode: Tailored to detect and analyze precipitation events occurring at lower atmospheric levels.

4. High-Level Precipitation Mode: Equipped to monitor and study precipitation phenomena transpiring at higher altitudes within the atmosphere.

5. Three-Dimensional Atmospheric Turbulence Profiling Mode: Facilitates detailed investigations into atmospheric turbulence dynamics across three-dimensional space.

Observational Range and Resolution: The profiler supports observations ranging from 450 meters to 8 kilometers in clear air conditions. It offers a remarkable range resolution of 150 meters, ensuring fine-grained data collection.

Potential Applications: With its versatility and precision, the LAWP serves as a potent tool for exploring various aspects of atmospheric dynamics, including boundary layer dynamics, precipitation patterns, and convection phenomena.

Technology Transfer: NARL's groundbreaking LAWP has garnered recognition and is now listed on the Antrix-ISRO portal for potential technology transfer, signifying its readiness for broader utilization and commercialization.

HPC Facilities: The High-Performance Computing (HPC) Lab Facility at NARL represents a cutting-edge infrastructure designed to accelerate the analysis of genomics and transcriptomics data. With its impressive configurations including parallel processing, massive RAM and data storage capacity, high-speed connectivity, and GPU capabilities, the facility is poised to handle large-scale computational tasks efficiently. Central to its operation is the Primary Domain Controller (PDC), which



orchestrates data flow and management across various domains within the facility. From the User Domain, where individual users access data securely, to the Application Domain, responsible for data analysis and dissemination policies, and to the Internet Domain facilitating external access, each component is meticulously organized for optimal functionality. Moreover, the Space-net Domain ensures seamless connectivity with external servers, while sophisticated modules cater to data pre-processing, analysis, and visualization needs. With its robust database design and performance optimization strategies, the HPC Facility exemplifies NARL's commitment to advancing scientific research and facilitating collaborative endeavors. Through both intranet and internet access portals, users can seamlessly interact with the data center, retrieving valuable information and contributing to scientific progress. NARL's HPC Facility stands as a beacon of technological prowess, empowering researchers to delve deeper into the complexities of atmospheric and genomic sciences.

This facility comprises with the following Configurations

- 96 Parallel processing
- 200TB of RAM
- 200GBPS Connectivity
- 2 petabytes of Data Storage
- 32GPU's

MST RADAR Dr. P. Kamaraj, Sci. Engr Explained about "The MST radar stationed at Gadanki serves as a highly advanced system for atmospheric probing across the Mesosphere, Stratosphere, and Troposphere (MST), with capabilities extending up to 100 kilometers in altitude. Additionally, it facilitates coherent backscatter studies of ionospheric irregularities beyond the 90-kilometer mark.



Key features and capabilities of the MST radar include:

Frequency and Power: Operating at 53 MHz, the radar boasts a peak power of 2.5 MW, enabling robust atmospheric exploration.

Phased Antenna Array: The radar's phased antenna array comprises two orthogonal sets, each accommodating 1024 three-element Yagi-Uda antennas arranged in a 32 x 32 matrix over a 130 m x 130 m area.



Beam Alignment: Aligned along geomagnetic axes, the radar beam can be oriented perpendicular to the Earth's magnetic field, facilitating ionospheric backscatter applications.

Transmitter Configuration: The array is powered by 32 transmitters of varying power, with each transmitter feeding a linear sub-array of 32 antennas. Power distribution across the array follows a modified Taylor weighting approximation.

Beam Positioning: Electronically adjustable, the radar beam can be positioned within ± 200 off-zenith in both East-West and North-South planes.

Pulse Characteristics: Capable of transmitting both coded and un-coded pulses, with pulse repetition frequency ranging from 62.5 Hz to 8 kHz and a maximum duty cycle of 2.5%. Pulse duration can be adjusted from 1 to 32 microseconds, providing a range resolution of 150 meters.

Control and Data Processing: The radar is controlled by a PC-based radar controller, executing experiments as specified by scientists. It can record both time-series and power spectrum data online, which can subsequently be processed offline to derive various atmospheric parameters.

50mtr Instrumented Tower: Dr. S. Satheesh Kumar, Sci.Engr Explained that, Since 2009, the National Atmospheric Research Laboratory (NARL) has been operating a 50-meter instrumented tower, serving as a pivotal platform for atmospheric research. Here's an overview of its key features and functionalities:

Tower Configuration:

Sensor Placement: The tower accommodates both fast sensors, including a Sonic anemometer (RM Young 81000) and an IR hygrometer (Li-COR), positioned at 4 meters and 8 meters above ground level respectively.



Meteorological Parameters: Slow sensors for meteorological parameters such as temperature, relative humidity, wind speed, and direction are distributed across six levels, situated at 2, 4, 8, 16, 32, and 50 meters above ground level.

Radiation and Rain Measurement: Measurements of pressure, incoming shortwave and longwave radiation are conducted at a height of 1.2 meters. Additionally, radiation sensors, soil temperature and moisture profile probes, and a tipping bucket rain gauge are installed 20 meters away from the tower, towards the south, to minimize shadow effects.

Data Collection and Analysis:

Eddy Covariance Technique: The tower facilitates the estimation of sensible and latent heat fluxes using the eddy covariance technique, leveraging high-resolution measurements (20 Hz) from the Sonic anemometer and IR hygrometer.

Energy Balance Studies: The calculated fluxes, in conjunction with radiation and sub-surface measurements, offer researchers a comprehensive dataset to study the energy balance across various atmospheric conditions.

Research Opportunities: The tower's setup provides researchers with a unique opportunity to investigate atmospheric dynamics and energy exchanges in different environmental contexts. By analyzing the collected data, scientists can gain insights into processes such as heat transfer, moisture dynamics, and their impacts on weather patterns and climate.

Learnings:

Practical Application of Theory: The field visit provided students with a bridge between theoretical knowledge and practical application. Concepts learned in classrooms were brought to life, fostering a deeper understanding of physics principles in the context of generation, transportation, operation, and distribution of electric power.



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Interdisciplinary Connections: Students realized the interdisciplinary nature of power systems, recognizing the intersection of physics principles with engineering and technology. This holistic perspective broadened their appreciation for the interconnectedness of scientific disciplines.

Operational Challenges: The visit exposed students to the operational challenges faced by electrical substations. They gained insights into how professionals troubleshoot issues and ensure the continuous and reliable supply of electricity to end-users.

Teamwork and Coordination: Witnessing the coordination in the control room highlighted the importance of teamwork in managing a complex electrical grid. Students learned how professionals collaborate to respond swiftly to changes and challenges in the system.

Critical Thinking and Problem-Solving: The dynamic nature of the electrical grid necessitates quick thinking and effective problem-solving. Students were encouraged to analyze scenarios and propose solutions, enhancing their critical thinking skills.

Conclusion:

In conclusion, the development of NARL's newly implemented LAWP, equipped with its cutting-edge MST radar and 50-meter instrumented tower, marks a significant milestone in atmospheric research technology. By strategically placing sensors on the tower and incorporating advanced instruments like the MST radar, we ensure optimal data collection for precise analysis. This comprehensive setup not only supports our research and forecasting efforts but also promises to unlock new insights into atmospheric complexities. In essence, NARL's infrastructure represents a pinnacle of innovation, facilitating in-depth studies on energy balance, atmospheric dynamics, and meteorological processes. With its state-of-the-art capabilities, it stands as a beacon for advancing our understanding of the atmosphere and driving scientific endeavors forward.

Date: 14-11-2023

The staff members of physics met in the department of physics staff room and made the following Resolutions.

1. Write a letter to E.E. Electricity department Srikalahasti Sub division for permission to field trip to 33/11 KV power station
2. write a letter to Director-ISRO from the department of physics for ~~can~~ organising field visit in January/February months of 2024
3. write a letter to Director-NARL Gadanki from the department of physics for organising Educational Tour for the Academic year 2023-24 ~~for~~ in the month of February-2024

1. ~~Mr. H. H. H.~~

2. ~~Mr. H. H. H.~~

3. ~~Mr. H. H. H.~~



Feedback Questionnaire

1. **Overall Experience:** How would you rate your overall experience at the National Atmospheric Research Laboratory (NARL), Gadanki?
 - 1: Very Poor
 - 2: Poor
 - 3: Average
 - 4: Good
 - 5: Excellent
2. **Learning and Engagement:** Did the tour meet your expectations in terms of learning about atmospheric research and related technologies?
 - 1: Not at all
 - 2: Slightly
 - 3: Moderately
 - 4: Very much
 - 5: Extremely
3. **Facilities and Organization:** How would you rate the facilities and organization of the tour at NARL, Gadanki?
 - 1: Very Poor
 - 2: Poor
 - 3: Average
 - 4: Good
 - 5: Excellent
4. **Educational Impact:** In what ways has this tour contributed to your understanding of atmospheric science and its applications?
 - 1: Not at all
 - 2: Slightly
 - 3: Moderately
 - 4: Very much
 - 5: Extremely
5. **Recommendations:** Based on your experience, would you recommend future educational tours to NARL, Gadanki to other students?
 - 1: Not at all
 - 2: Unlikely
 - 3: Neutral
 - 4: Likely
 - 5: Definitely



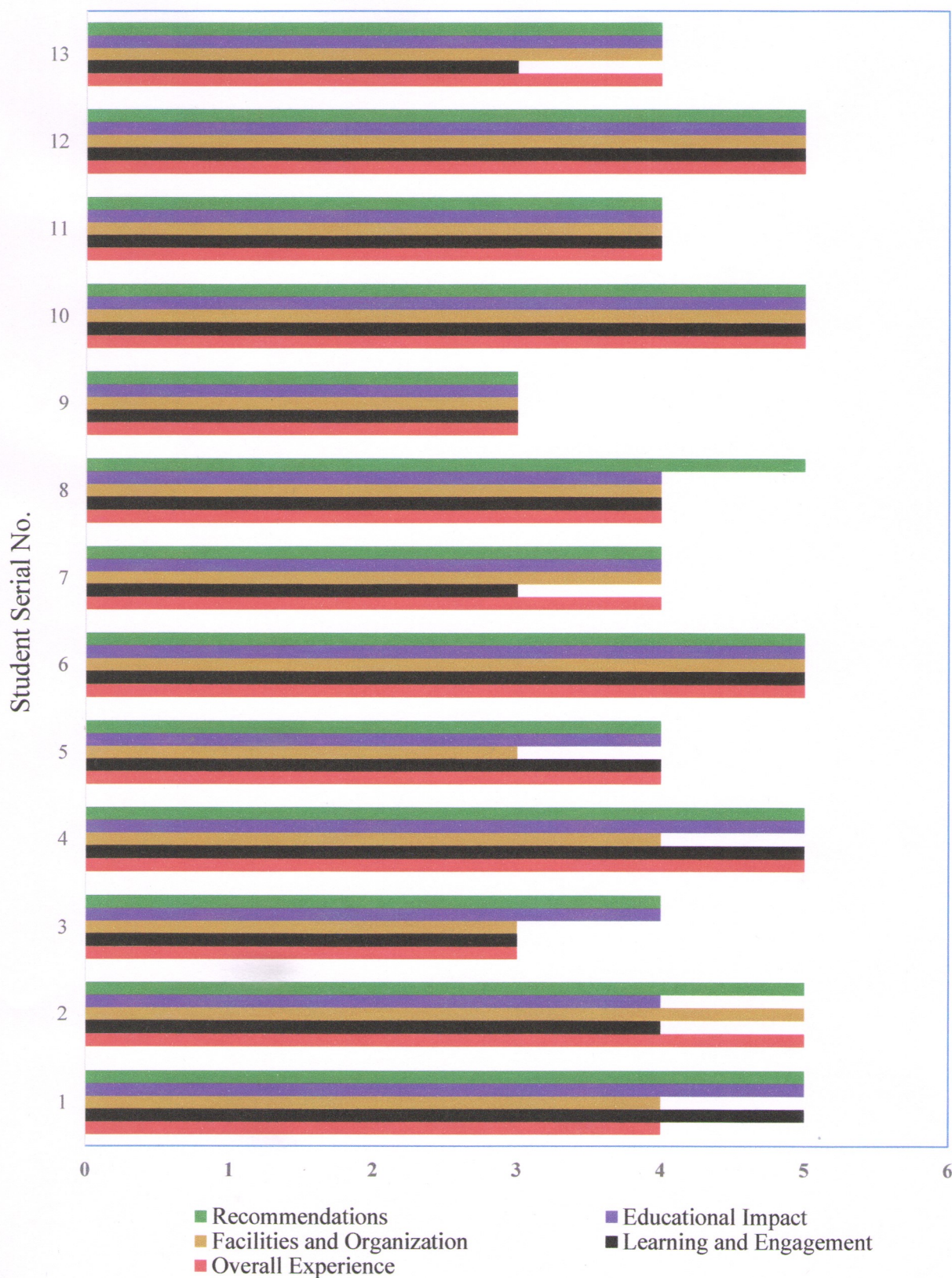
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Feedback from Students on 5 point Scale





Feedback Analysis and Key Insights

Based on the responses provided by the 13 students who attended the educational tour to NARL, Gadanki, here are some key insights:

1. Overall Experience:

- The majority of students rated their overall experience highly, with ratings of 4 or 5 out of 5.
- This indicates that most students found the tour to be very good to excellent in terms of their overall experience at NARL, Gadanki.

2. Learning and Engagement:

- Ratings for learning and engagement were generally positive, with most students giving scores of 4 or 5.
- This suggests that the tour met or exceeded expectations in terms of educational content and engagement with atmospheric research and related technologies.

3. Facilities and Organization:

- Ratings for facilities and organization were predominantly positive, with scores of 4 or 5.
- Students generally felt that the facilities at NARL, Gadanki were good to excellent and that the tour was well-organized.

4. Educational Impact:

- Feedback on educational impact was consistently high, with ratings of 4 or 5 from almost all students.
- This indicates that the tour significantly contributed to students' understanding of atmospheric science and its applications.

5. Recommendations:

- The majority of students indicated they would recommend future educational tours to NARL, Gadanki to other students, with ratings of 4 or 5.
- This reflects a high level of satisfaction and enthusiasm among the students regarding their experience, suggesting they believe it would be beneficial for others to participate in similar tours.

Overall Insights:

- The educational tour to NARL, Gadanki was well-received by students, who appreciated the learning opportunities and the quality of the facilities.
- The tour had a significant positive impact on students' understanding and knowledge of atmospheric research.
- Students are likely to promote and encourage future participation in similar educational tours to NARL, Gadanki based on their positive experiences.

These insights indicate that the tour was successful in achieving its educational goals and left a strong positive impression on the students who participated.