

National Institute of Science Education & Research Bhubaneswar

Annual Report

and

Audited Statement of Accounts



2022-2023

Outreach Activities

NISER Outreach Brief Report 2022-23

The Outreach Program at NISER aims to communicate the importance and ideologies of science with the community. These programs are instrumental in promoting scientific literacy, inspiring future scientists, and bridging the gap between the scientific community and the public. These programs serve as a vital bridge, ensuring that the benefits of scientific knowledge are accessible to all, ultimately contributing to a more informed, innovative, and interconnected society.

Faculty members representing various schools at NISER have played an instrumental role in the NISER Outreach program. These dedicated individuals include:

- Dr. Debasmita P. Alone, Associate Professor, SBS
- Dr. U. Lourderaj, Associate Professor, SCS
- Dr. Pankaj V. Alone, Associate Professor, SBS
- Dr. Subhankar Mishra, Reader-F, SCPS
- Dr. Anupam Pal Choudhury, Assistant Professor, SMS
- Dr. Jayesh Goyal, Assistant Professor, SEPS; and
- Dr. Satyaprasad P. Senanayak, Assistant Professor, SPS

As a part of NISER's Outreach program, we conduct various science outreach activities throughout the year which are mentioned below:

Science Outreach Activities	No. of Events
Educational Visits to NISER	20
Outreach Talk Series	4
Popular Talks	5
Student Internship	1
Other events	5
Total Number of Outreach Events in the year 2022-23	35

Educational Visits 2022-23

Total Educational Visits for the year 2022-23: 20

About the Event: Educational Visits to a research laboratory are considered to be fundamentally enriching educational experiences. There are year-round visits of students and faculty from various institutions nationwide who get first-hand experience of a state-of-the-art Scientific Institution. The students are inspired through interactions with the NISER faculty, Scientific Officers, and its students. During their visits on any Friday (with a prior appointment), the school/college students are exposed to a few experiments and get to observe people's work-life balance at NISER. This helps in a better understanding of what is expected of oneself if the students undertake science as a career and enhance the scientific, social, and emotional development of all the participants. The students are left with a sense of imagination and a newfound interest in science.



Upon their arrival at the NISER campus, students undergo an initial orientation session by Dr. Debasmita P. Alone. During this session, they are familiarized with NISER's offerings, including its diverse range of courses, state-of-the-art facilities, and exciting array of extracurricular activities. Subsequently, they are guided to specific

laboratories within their respective academic buildings. The school students are exposed to the following schools at NISER: School of Biological Sciences, School of Chemical Sciences, School of Physical Sciences, School of Earth and Planetary Sciences, School of Mathematical Sciences, School of Computer Sciences, and the Centre for Interdisciplinary Sciences. These visits are coordinated by the Scientific Officers at various schools namely:

- Dr. Arun Kumar, SCS
- Dr. Shyamashree Ghosh, SBS
- Dr. Sudakshina Prusty, SPS
- Dr. Priyanka Pandey, SCS
- Dr. Chandramohan Bathrachalam, SBS
- Dr. Saralasrita Mohanty, SPS
- Dr. Santosh Babu Gunda, SPS; and
- Dr. Ajay Kumar Dash, SEPS



Other faculty members have demonstrated their unwavering commitment to the program and helped with motivating the students during the visits on various occasions. These members are: Prof. A. Srinivasan, Professor, SCS; Prof. Bedangadas Mohanty, Professor, SPS; Dr. Debasmita P. Alone, Associate Professor, SBS; Dr. Anupam Pal Choudhury, Assistant Professor, SMS; Dr. Subhankar Bedanta, Professor, SPS; Dr. Kartikeswar Senapati, Associate Professor, SPS; Dr. Tirumala Kumar Chowdhary, Associate Professor, SBS; Dr. Kishore Chandra Panigrahi, Associate Professor, SBS; Dr. Ajaya Nayak, Associate Professor, SPS; Dr. Sutanu Roy, Reader-F, SMS; Dr. Kaushik Majumder, Reader-F, SMS; Dr. Krishanu Dan, Assistant Professor, SMS; and Dr. Chitrabhanu Chaudhuri, Assistant Professor, SMS. Their contributions have significantly enriched the program's outreach efforts.



In the year 2022-23, the Outreach cell has conducted a total of 20 such educational visits. These visits were from various schools and colleges in Odisha, where approximately 1200 students and 250 teachers participated. These educational institutes include GHVM School, Jupiter College, JNV Khurda School, School of Forensic Science, Centurion University, Jatni, Rajdhani College, Carmel School, KV Khurda Road, Sailabala Women's Autonomous College, Carmel School, GIET University, DPS Paradip Refinery, JNV Mundali, Cuttack, Mahamayee Mahila Mahavidyalaya, BJB High School, Odisha Adarsh Vidyalaya Sangathan, Saraswati Sishu Vidya Mandir, Cuttack, Odisha Adarsh Vidyalaya Sangathan, DPS Dhenkanal, Freedom International School, Cuttack, Rajdhani College, Pranath College (Autonomous), Khordha, NIIS Group of Institutions, BBSR, KV No. 3, BBSR.

Outreach Talk Series 2022-23

Total Outreach Talks for the year 2022-23: 4

About the Events: To celebrate the 75th year of Independence, a monthly NISER Outreach Talk Series was initiated at NISER for school students from Class IX to XII and First-year College students. The talks are based on relatable concepts and are structured to be interactive, emphasizing question-answer sessions. These talks are usually given by NISER faculty members from various schools and are online and offline or both.

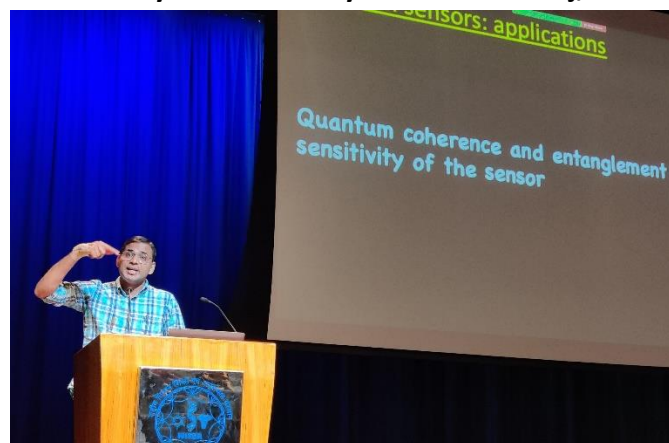
There were four talks conducted in the year 2023-24 in which approximately 600 students had participated.

Browning Reactions

Enzyme-catalyzed browning - browning of apples/vegetables

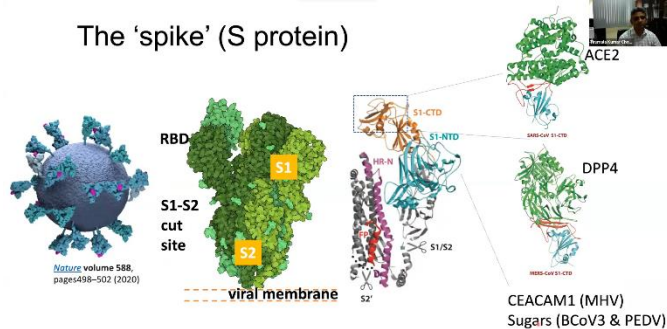
Phenol $\xrightarrow{\text{Polyphenol oxidase, O}_2}$ Diphenol $\xrightarrow{\text{Polyphenol oxidase, O}_2}$ Quinone $\rightarrow$ Brown pigments (Melanin)

"Culinary Reactions" by Dr. U. Lourderaj, SCS



"Quantum Sensors" by Dr. Ashok Mohapatra, SPS

The 'spike' (S protein)



“Where the COVID-19 pandemic virus, SARS-CoV-2, come from? - A difficult question to answer” by Dr. Tirumala Chowdary, SBS



“Exoplanets and the Search for Habitable Worlds” by Dr. Jayesh M Goyal

Outreach Popular Talks 2022-23

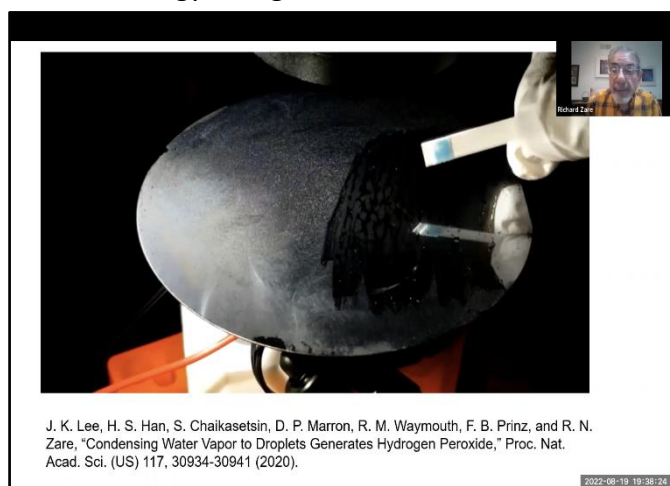
Total Popular Talks for the year 2022-23: 5

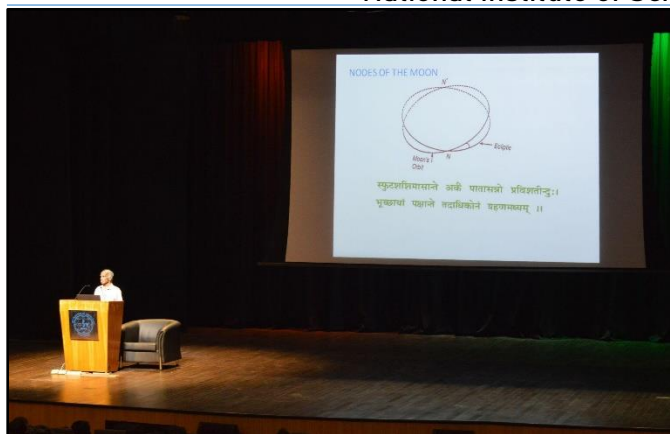
About the Events: A part of NISER's Outreach activity, where eminent scientists from the country and abroad are invited to deliver a talk at NISER. These talks are aimed at the students of NISER, school students from Class IX to XII, and College students. These talks are usually based on topics related to modern science and technology to which the participants can relate to.

In the year 2022-23, a total of five popular talks were organized by the Outreach cell in which approximately 2200 people had participated. The participants included students from schools like Carmel English Medium School, Khordha and KV Khurda Road, NISER students, faculty and staff and students from other educational institutions. These talks were given by esteemed scientists such as

- Prof. Richard Zare, Department of Chemistry, Stanford University, USA (Online)
- Prof. N. Sathyamurthy, Honorary Professor, IISER Mohali
- Prof. S. Ghaskadbi, Developmental Biology Group, MACS-Agharkar Research Institute, Pune
- Prof. S. Balachandra Rao, Former Director, Gandhi Centre of Science and Human Values, Bengaluru; and

- Prof. Venugopal Padmaja, Professor and Head, Department of Mathematics, SJB Institute of Technology, Bengaluru.





- Dr. Harapriya Mohapatra, Associate Professor, SBS
- Dr. Joe V. Yeldho, Reader-F, SHSS
- Dr. Pankaj V. Alone, Associate Professor, SBS
- Dr. Pratap K. Sahoo, Associate Professor, SPS
- Dr. R. Srinivasan, Associate Professor, SBS
- Prof. Subhankar Bedanta, Professor, SPS
- Dr. U. Lourderaj, Associate Professor, SCS



Students' Internship 2022-23

About the event: NISER Outreach Cell has taken the initiative to conduct a 15-day long internship for school students ranging from standard IX to XII. In this internship, the students were assigned a laboratory of their choice to learn about various activities and experiments conducted in a research lab. They got an idea of what research is and how researchers work in a scientific atmosphere which was very well appreciated by the students in their feedback.

In the AY 2022-23, eleven students from Sai International School and four students from Krypton Higher Secondary got the opportunity to participate in this internship program. The program was successful with the dedicated efforts of NISER's faculty members namely:

- Dr. Anupam Pal Chowdary, Assistant Professor, SMS
- Prof. Chandan Goswami, Professor, SBS
- Dr. Debasmita P. Alone, Associate Professor, SBS



IGNITE 2022

IGNITE 2022 was an online science event consisting of science talks (previously mentioned), an art competition, a story-writing competition, subject-specific quizzes and video-making competition. This event was aimed especially towards high school and undergraduate students. The main objective of this event was to stimulate creativity and inculcate scientific temperament among the students and to bring out their abilities of problem-solving and critical thinking.

It took place in the month of April 2022 as a part of the "Azaadi ka Amrit Mahotsav" celebration. More than 1,500 schools and colleges were invited to participate. The event was organized by the student-led Science Activities Club at NISER under the guidance of Dr. Debasmita P. Alone. Various faculty and staff members namely from NISER were invited to be the judges for the competitions, namely, Dr. Pankaj V. Alone, SBS; Dr. U. Lourderaj, SCS; Dr. Satyaprasad P. Senanayak, SPS; Dr. Shyamashree Ghosh, SBS. In the end, around 66 participants were selected as winners.

Other Outreach-Related Events 2022-23

Apart from the above mentioned activities, the NISER Outreach Cell had also conducted other Science Outreach events in collaboration with various educational and government organizations,

in which approximately 500 people had participated. The events were as follows:

NISER, in collaboration with the Odisha Bigyan Academy, observed World Thalassaemia Day on May 8, 2022, at the Pathani Samanta Auditorium, NISER. The event featured a highly informative lecture on thalassaemia by Dr. Dipika Mohanty, Senior Consultant in the Hematology Department at Apollo Hospital, Bhubaneswar. Distinguished guests included Prof. Bibhuti Bhusan Mishra, President of Odisha Bigyan Academy; Prof. Sudhakar Panda, Director, NISER; and Er. Narendra Kumar Panda, Secretary of Odisha Bigyan Academy.



The Rotary Club of Bhubaneswar generously contributed a portable telescope to NISER, enhancing our capacity to engage in a wide range of Astronomy-related Outreach activities. This valuable addition allows students to directly observe and study various celestial bodies and astronomical phenomena, further enriching their learning experience.



NISER Outreach Cell successfully organized a panel discussion where distinguished speakers from the Department of Economic and Policy Research at the Reserve Bank of India took center stage to delve into the contents of RBI's Annual Report for the year 2021-22. This engaging session prompted an enthusiastic exchange of ideas, as participants posed numerous queries spanning the realm of finance, encompassing topics like Cryptocurrency, Stocks, and more. The event was coordinated by Dr. Amarendra Das, SHSS.



To celebrate the essence of the 75th Year of Independence, "Azadi ka Amrit Mahotsav," NISER Outreach Cell celebrated Outreach Week at NISER which included a week full of Science Outreach activities.



The Outreach week commenced with the announcement of the IGNITE 2022 results, accompanied by a brief presentation of the event by a SAC Coordinator, Anshuman Padhi. Subsequently, the winners were recognized and awarded prizes and certificates, with the esteemed presence of Prof. Sudhakar Panda, Director, NISER who graciously felicitated the achievers. Next on the agenda was an insightful session on Waste Water Management, skillfully demonstrated by the Institute Works Department at NISER. This informative demonstration was followed by an engaging site visit, graced by the enthusiastic participation of invitees from Jatni Municipal Corporation, led by Mr. Dilip Kumar Mohanty, Executive Officer of Jatni Municipality coordinated by Shri. Ashank Vishwakarma, Scientific Officer, Institute Works Department, NISER. During the Outreach week, an enriching educational visit unfolded, attracting 58 students from the School of Forensic Science at Centurion University, Jatni. Following this educational excursion, a Science Outreach Talk on Cancer Awareness was delivered by Dr. Prashant Kumar Parida, an Associate Professor in Medical Oncology at Acharya Harihar Regional Cancer Research Centre, Cuttack. The talk's focal point was "Lifestyle and Cancer." A pivotal moment in the Outreach Week celebration was the official launch of the NISER Outreach website. As an

additional highlight, an online photography competition was conducted to commemorate World Photography Day, along with the student-led Photography Club, Sapsara featuring the theme "Day-to-day Science through your lens." This event garnered widespread interest, with invitations extended to over 2000 schools and colleges, resulting in more than 200 entries. The esteemed panel of judges comprised Dr. Debasmita P. Alone, SBS and Dr. Subhankar Mishra, SCPS.



In conclusion, our outreach activities have been marked by dedication, collaboration, and a commitment to sharing knowledge and fostering engagement with our community. These outreach activities have significantly heightened the demand for science education and exposure among various educational institutions. We have witnessed a growing interest, with an increasing number of institutions eager to participate in these outreach activities. As we move forward, we remain steadfast in our mission to inspire curiosity, promote learning, and contribute positively to society. We look forward to continuing these outreach efforts, forging new partnerships, and making a lasting impact in the years to come.



Vigyan Pratibha Brief Report 2022-23

About the Vigyan Pratibha Project at NISER:

Vigyan Pratibha, a pioneering initiative of the central government, is dedicated to crafting a distinctive learning ecosystem. Our primary objective is to integrate various pedagogical tools grounded in constructivism and collaborative learning methodologies. Presently, our dedicated team at the National Institute of Science Education and Research (NISER) in collaboration with Institute of Physics (IOP) are working closely with students and educators from the 8th, 9th, and 10th grades of Kendriya Vidyalaya (KV), Jawahar Navodaya Vidyalaya (JNV), and Atomic Energy Central Schools throughout the states of Odisha and Chhattisgarh. This is achieved by bringing scientists, teachers, and educators together to develop activity modules by Homi Bhabha Centre for Science Education (HBCSE), named 'learning units'. These meticulously designed units seamlessly align with the curriculum of the National Council of Educational Research and Training (NCERT). They are strategically structured to empower students with a profound and critical comprehension of specific scientific concepts.

Vigyan Pratibha is not just an initiative; it's a transformative journey toward enhancing science education that actively engages young minds and equips them with the knowledge and skills necessary for a promising future.

The Vigyan Pratibha team at NISER remains actively engaged in a myriad of events throughout the year. This dedicated team comprises of faculty members and associated project staff,

The following activities have been conducted in the year 2022-23 under the VP project:

Sl. No.	Date of the Event	Title of the Activities	Participating Educational Institutes	Number of participants
1	30.08.2022 - 03.09.2022	First Vigyan Pratibha Teachers' Training Workshop	KVs and JNVs, Odisha, and Chhattisgarh	43 teachers

- Dr. Debasmita P. Alone, Associate Professor, SBS
- Dr. Pankaj V. Alone, Associate Professor, SBS
- Dr. Upakarasamy Lourderaj, Associate Professor, SCS
- Dr. Subhankar Mishra, Reader-F, SCPS



The Vigyan Pratibha project extends its influential reach across the Odisha and Chhattisgarh region, under the able leadership Dr. Debasmita P. Alone at NISER. Her visionary guidance has been instrumental in advancing the project's objectives and impact.



2	26.10.2022 - 27.10.2022	VP School Visit (Components of Wood Ash)	KV 2, Bhubaneswar	24 students (Class 9)
3	29.10.2022	VP School Visit (Osmosis in Raisins)	JNV Konark, Puri	39 students (Class 9)
4	12.12.2022 - 15.12.2022	Second Vigyan Pratibha Teachers' Training Workshop	KVs and JNVs. Odisha, and Chattisgarh	40 teachers
5	2022-23	Learning Units conducted in schools	KVs and JNVs, Odisha, and Chattisgarh	557 students

Vigyan Pratibha Teachers'-Training Workshops

The essence of the Vigyan Pratibha project lies in its vision to conduct biannual teachers' training workshops hosted at the prestigious NISER campus. These workshops, meticulously designed, are geared towards equipping educators from diverse schools, with a particular focus on TGTs from Kendriya Vidyalayas (KVs), Jawahar Navodaya Vidyalayas (JNVs), and Atomic Energy Central Schools (AECs).

Teachers participating in these workshops undergo intensive and systematic training through the learning units. After the initial workshop, teachers return to their respective schools, armed with specific learning units, and conduct these modules within their classrooms, offering students a dynamic learning experience. The uniqueness of Vigyan Pratibha shines through in the second workshop, where participating teachers engage with an entirely new set of learning units. Here, they share their invaluable experiences, reflecting upon the triumphs and challenges they faced while conducting these modules with their students. This cyclic process enriches the teachers with fresh perspectives and infuses their teaching methodologies with novel ideas and approaches. The ripple effect is felt in classrooms across the nation as these enthusiastic teachers return to nurture their students' scientific curiosity and excellence, thus advancing the cause of scientific education and literacy in our society.



**Vigyan Pratibha 1st Teachers'-Training Workshop
2022-23**



**Vigyan Pratibha 2nd Teachers'-Training Workshop
2022-23**



School Visit for VP: JNV Konark



School Visit for VP: KV BBSR CRPF

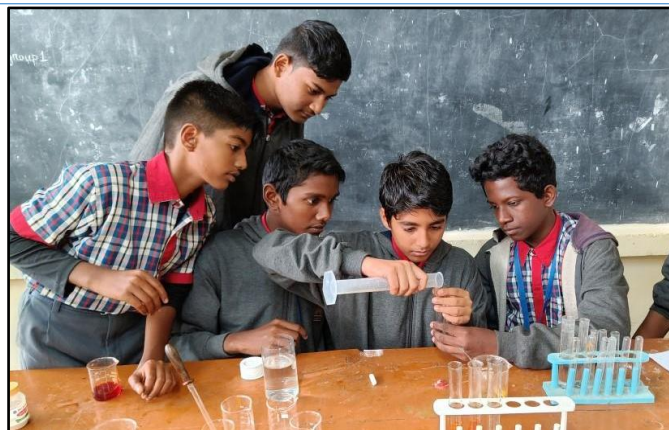
Vigyan Pratibha School Visits

The VP team at NISER helps the teachers conduct the said learning modules in their school and observe the same. These sessions allow us to understand the students' mindset and their relationship with their teachers.



Learning Units Conducted in Schools

The teachers once trained with the learning units in the teachers' training workshop conduct them with their students. The following teachers conducted such learning units and submitted the details about the same on the Vigyan Pratibha official website: Amlawati Lakra from JNV Jashpur; Bhabani Sankar Mohanty from KV Puri; Lambodar Rout from JNV Belpada; Manisha Kumari from KV Gopalpur; V.V. Narsamma from KV Kirandul; Swarupa Nanda Das from JNV Mayurbhanj; Anil Ekka from KV Bilaspur; Bomnath Mazumdar from KV Sukma; and Swati Singh from KV Raigarh. A total of 557 students have been trained by the teachers under the Vigyan Pratibha project in 2022-23.



In conclusion, the Vigyan Pratibha Initiative have successfully empowered our teachers with valuable tools, resources, and strategies to enhance our country's education quality. The knowledge sharing, collaborative discussions, and skill-building exercises have equipped them with the means to create more engaging and effective learning environments. As we move forward, we must continue to support and nurture our educators, as they play a pivotal role in shaping the future of our youth.



Students Activities

Various Club Events

Tree Trail: Seasonwatch August tree festival

Oorna and Seasonwatch organized Tree Trail: a tree walks during the August Tree Festival. The August Tree Festival is a nationwide monsoon fest which has multiple interesting challenges for everyone to compete for. This was a 2-day long event, held on 20th and 21st August, 2022. The tree walk was led by Dr. Geetha Ramaswami (Project Head, Seasonwatch). During this walk, students learned about plants, seasons and how the two are linked.



Birdwatching Session

This will be a great opportunity for everyone to explore and know the winged neighbors of our campus. With around 100 species of birds identified on campus, It is a really enjoyable experience to go around the campus looking for birds. Apps like ebird and merlin were used to observe and identify the birds respectively. This event was held for 2 days, evening of 2nd September, 2022 and early morning of 3rd September, 2022. No. of participants= 75

World Wildlife Week 2022

Oorna organized the World Wildlife Week 2022 celebration in the NISER campus for the very first

time! Every year, World Wildlife Week is celebrated globally to celebrate the many beautiful and varied forms of wild fauna and flora and to raise awareness of the multitude of benefits that their conservation provides to people. At the same time, the celebration reminds us of the urgent need to step up the fight against wildlife crime and human-induced reduction of species, which have wide-ranging economic, environmental and social impact.



Timeline of the weeklong events

21st October: Tree Crickets use Tools to Amplify their Mating Calls - HOW and WHY? **Talk by Dr. Rittik Deb, SBS, NISER & Let's Go Herping! Herping Session for Beginners**

22nd October: Commencement of "Nature on Canvas": Art event organized in collaboration with Arts Club

23rd October: Pitch Perfect: **Talk by Ashlesh Pattnaik, Dr. Aniruddha Datta Roy's Lab, SBS, NISER & Katydid or Katy-did'nt: Bioacoustic session**

24th October: Hike with Nature: Morning **Hike to Barunei Hills**

Nature Walk

Oorna's events in 2023 started off with the nature walks which were held 20th January and 21st January, 2023. We were glad to see the enthusiastic crowd. We spotted interesting creatures like the Black crowned Night heron and the Eurasian Hoopoe.

Prerana 2022 - World Children's Day

On 19th November, Oorna in collaboration with Zaariya, TFR (The Free Radicals), NAC (NISER Astronomy Club), RoboTech Club, MathematiX (Maths Club) and Vikiran (Physics club) is organizing



ପ୍ରୂର୍ଣ୍ଣା ୨୦୨୨ (Prerana 2022) which aims at introducing the children of NISER's general workforce to the vibrant world of science that we inculcate here at NISER. All the

aforementioned Clubs showcased their respective fields through interactive activities and sessions.

Campus Bird Count

Oorna organized a Campus Bird Count from February 11-12, 2023. Held as part of the Great Backyard Bird Count, it is a bird watching event held every year in February. During the event, we spotted many species like common myna, alexandrine parakeet, yellow wattled lapwing, and red whiskered bulbul. No. of participants – 20.

Treasure Hunt

As a part of Tvisha '23, NISER's cultural cum sports fest, Oorna conducted a Treasure Hunt which involved the participants being tested on their knowledge of the marine creatures, trees and birds in three different rounds. This was held on 19 March, 2023. No. of participants – 160.

Campus Phenology Network

Oorna is a part of the Campus Phenology Network, a nationwide network of campuses who monitor trees. Oorna has been monitoring 60 trees in campus since April 2022. No. of participants – 12.

NISER Open Day 2023

On April 7, Oorna conducted a series of events which included a documentary screening, a tree walks and an insect exhibit. No. of participants – 40.

Drama and Music Club

The Dance and Music Club (DMC) organized several events and initiatives:

Independence Day Celebration: DMC arranged an annual cultural program for India's 76th Independence Day, featuring a National anthem choir and cultural performances attended by dignitaries and NISER members.

Weekly Musical Sessions: DMC introduced a "weekend jamming session" series where students gathered every Saturday in the music room for discussions and music-related activities. The aim was to nurture music enthusiasts at NISER and enhance their technical knowledge and appreciation of music.

Koffee with Kishore: An event named "Koffee with Kishore" was held to honor the multifaceted artist Kishore Kumar Ji. It served as a platform to celebrate his contributions and legacy.

Inter-IISER Cultural Meet: DMC represented NISER at the Inter-IISER Cultural Meet hosted by IISER Pune. NISER participants excelled in music and drama events, with their drama piece "FALAK" receiving acclaim for its storytelling. NISER also performed well in events like Battle of Bands, Mehfil, and Solo/Duet singing.

NISER's Inter-College Fest "TVISHA":

DMC organized music and drama events as part of NISER's first inter-college fest. The events included Rangamanch (stage play competition), Dristi (nukkad-natak event), Battle of Bands, and



Solo/Duet singing, drawing participation from neighboring institutes like IIT BBSR, Silicon Institute

of Technology, IIIT, CV Raman Global University, and ITER.

Participation in Other College Fests: NISER's music and drama teams took part in external college fests including Alma Fiesta by IIT Bhubaneswar and KAIRAAN by NLU Odisha, showcasing their talents beyond the campus.

Quizone

In August 2022, NISER's Quizone club teamed up with IIT Bhubaneswar's quiz club to organize a dynamic General quiz. Over a hundred students participated in teams of two from both institutions. Eight teams excelled in the written prelims, progressing to the intense finals, featuring captivating rounds of quizzing and cleverly designed questions. In October, Quizone hosted an Insta quiz on their Instagram page, running for 15 days with rapid-fire questions and daily winners. March brought two more quizzes - Cognizzia, a general quiz hosted by Mr. Somnath Chanda, and Pop goes the culture, the MELA quiz, drawing significant engagement from college students in both intra and inter college categories.

The Free Radicals (TFR) Club

The Free Radicals (TFR), the chemistry club of NISER was formally inaugurated by the Director, Prof. Sudhakar Panda at the School of Chemical Sciences (SCS) Meet, 19th April, 2022. After its inception, the club has held a series of alumni talks, student talks, and chemistry-themed activities to invigorate the passion for the subject beyond the classroom. Along with that, outreach activities were held to popularize science among school students and the general public.

Student Talks:

1. Kinetic Investigations of the Catalytic Hydration of Nitriles to Amides by Mr. Shivam Mahapatra, 5th Year Integrated M.Sc., SCS. (29th April, 2022)

Alumni Talks:

1. Local Excitations in Crystalline Point Defects with Multireference Density Matrix Embedding

Theory by Mr. Abhishek Mitra (Batch of 2014), University of Chicago, USA (10th June, 2022).

2. Competing reaction dynamics with second-order saddles by Ms. Richa Rashmi (Batch of 2016), University of California, San Diego, USA (29th August, 2022).
3. Tackling Multireference Quantum Chemistry by Incorporating Selected Configuration Interaction in Moment Energy Expansions by Ms. Swati Snigdha Priyadarsini (Batch of 2016), Michigan State University, USA (4th January, 2023).
4. Hybrid QM: QM methods for adsorption of ethanol in H-MFI by Mr. Dipansu Kumar (Batch of 2016), Radboud University, Netherlands (6th January, 2023).
5. Structure, Assembly, and Properties of Cephalopod Protein-Based Materials by Dr. Preeta Pratakshya (Batch of 2012), University of California, Berkeley (6 February, 2023).

Outreach Activities:

1. Prerana 2022 (19th November, 2022)

Prerana 2022 was an expository outreach program for the children of NISER's general workforce. TFR participated in the event with an exhibitional chemistry session. Several fun chemistry experiments like elephant toothpaste, baking soda rocket, liquid nitrogen freezing, fluorescence demonstrations, and flame tests, were performed in front of the children. After each experiment, the science was explained to the children in a lucid manner. The exhilarating event was enjoyed and well appreciated by the children of different age-groups in the audience.

2. Science Camp 2023 (6th - 7th April, 2023)

TFR was involved in teaching high-school students about real-life applications of chemistry. Forensic chemistry was chosen to be the matter of exposition and students were given a case study of a murder case. The theory behind the chemical tests they would perform to solve the case was explained. The students were grouped to attempt the problem,

after performing the analytical tests, they explained the cause and culprit of murder.

3. Open Day 2023 (8th April, 2023)

TFR was involved in coordinating the exhibitional chemistry session for the School of Chemical Sciences. Many eye-catching experiments were performed for high school students. The science behind the experiments was explained following which the students expressed their satisfaction in learning new concepts in chemistry.

Departmental Events:

1. SCS Meet 2022 (19th April, 2022)

The club was formally inaugurated at this event. Prof. K.V.R. Chary (Director, IISER Berhampur) and Prof. Swapan K. Ghosh (Distinguished Professor, HBNI) was the Chief Guest and Guest of Honour, respectively. Cultural events were also a part of the proceedings, which were arranged and coordinated by TFR.

2. Aromatte 2022 (22nd October, 2022)

Aromatte 2022 was a Mini-Symposium cum Fresher's Program for M.Sc. Batch '21, Int. Ph.D. '22, and Ph.D. '22 of the School of Chemical Sciences. The morning was devoted to research talks showcasing the work being pursued by the various groups at SCS. The evening was filled with cultural activities, games, and ice-breaking sessions, organized by TFR, for the newly-admitted members of the department.

Other:

1. Khojo to Jaane!!! (18th March, 2023)

Khojo to Jaane!!! was a chemistry-themed treasure hunt organized by TFR during NISER's intercollege fest Tvisha. The event involved locating various interconnected clues littered around the campus by application of the knowledge of chemistry.

NISER Astronomy Club

1. The NISER Astronomy Club (NAC) is devoted to fostering enthusiasm towards astronomy. NAC

conducted telescope training sessions for the new joiners of the club in September-October 2022. Students were oriented about the 6-inch



equatorial mount telescope and directed to set it up by themselves.

- Mr. Chandan Kumar Sahu and Ms. Dibya Bharati Pradhan were elected as the club representatives of the NISER Astronomy Club for the session 2022-23. They functioned as the contact point of NAC for the club activities and events. Dr. Tuhin Ghosh (SPS), Dr. Luke Chamandy (SPS), Dr. Liton Majumdar (SEPS), and Dr. Jayesh Goyal (SEPS) took the responsibility of being the faculties-in-charge of NAC. They provided support and guidance for the functioning of the club.
- An observation session for the partial solar eclipse on October 25, 2022, and lunar eclipse on November 8 was organized for all members of NISER by NAC, where students, faculties and their family members witnessed the events with binoculars and telescopes while breaking the myths associated with eclipses.



Abhinav Roy (3rd year Int. MSc.) and Aheesh Hegde (4th year Int. MSc.). Members from different institutes participated in the events. Trophies and cash prizes worth 12K were awarded to the winners of the events.

4. NAC trained junior members to handle the 8-inch equatorial mount telescope and take photographs of Jupiter and its moons using a CMOS camera. This was a three-week observation run conducted in November 2022, led by Vasanth Kashyap (4th year Int. MSc.) to study the revolution period of Jupiter and its moons, calculate the mass of Jupiter and their orbital synchronization using Kepler's laws of planetary motion.
5. On the occasion of Children's Day, NAC conducted an interactive session with school children followed by a demonstration of telescopes, led by Srusti Sampanna (2nd year Int. MSc.).
6. In association with the NISER Outreach Committee, NAC hosted a session for visiting teachers and professors from various institutes in November 2022.
7. NAC launched the 4th edition of its in-house magazine 'Kshitij' in December 2022, which is the first and longest student-led magazine of NISER. In this edition, content calls were also made to students of other national science institutes, and entries from IISER Pune and IISER Thiruvananthapuram were published.
8. NAC organized two events in the inter-college fest TVISHA organized in March 2023, namely ANTARIKSH Astronomy Quiz and GAGAN Astrophotography Contest supervised by

9. NAC organized interaction sessions with students of various schools and motivated them towards astronomy, astrophysics and space science on the occasion of Open day in April 2022. NAC demonstrated the appearance of a black hole in space and explained the physics behind the phenomena.
10. The club frequently conducts observation sessions and talks on astrophysics and cosmology for all residents of NISER, expanding their knowledge and motivating people towards astronomy and astrophysics. NAC has organized a total of 12 weekend talks between August 2022 and April 2023.

Brain Matters Club

The BRAIN MATTERS club hosted 2 talks during the 2022-2023 academic year. These are:

1. Student talk on "Flies, Stains and Individuality Neurons: My experience as an intern at Paris Brain Institute" by Shubham Kumar (B18, Int. MSc, SBS) on September 16, 2022. Around 100-120 students attended.
2. Faculty talk on "Excitatory/Inhibitory (E/I) Imbalance in Neurological Disorders" by Dr. Swagata Ghatak (Assistant Professor, SBS) on February 3, 2022. Around 100-120 students attended.

Film Club

This section outlines Film Club's activities from April 1, 2022, to March 31, 2023. The club maintained a steady Friday schedule, showcasing diverse movie genres and hosting special events like a Halloween horror movie marathon. Notably, they continued their tradition of organizing Oscar movie marathons, exposing students to acclaimed films. Student talks on topics such as "Colours in Film as a Storytelling

Device" and "Maternity and Monstrosity in Horror Cinema" were held on September 2 and October 31, 2022, respectively. The club actively engaged in filmmaking, creating two short films and participating in the IICM short film competition. A documentary project titled "Life in a Day - NISER" captured daily life experiences, and an interview with departing faculty Dr. Ritwick Das was conducted. Additionally, Film Club played a role in NISER's intercollege fest, Tvisha 2023, which offered a rich tapestry of cultural and sports events from March 15 to 19.

Robotics Lab

The Line Follower team of RTC bagged top positions in inter-college robotics competitions held at Silicon Institute, Bhubaneswar and IIT Bhubaneswar.

Software Development Group

Throughout the year, the club organized diverse events fostering collaboration, teamwork, and problem-solving. The highlights included a Code Golf challenge in June 2022, where participants aimed to write the shortest code for a given problem. In September 2022, the Bug Bomber event had students competing to identify and x errors in NISER's intranet ecosystem. November 2022 brought the Webpage Design Competition, testing participants' creativity and design skills in creating attractive and functional websites. The grandest event of all was the January 2023 Blitz Byte.

Tvisha- Intercollege Fest of NISER

The fest embraced arts, sciences, and entertainment. Noteworthy were events like Short Film and Captivating Covers for film enthusiasts, Gagan for astrophotography lovers, and Terpsichore, Battle of Bands, and more for music and drama enthusiasts. Integrating science, events like Astro Quiz, Blitz Byte, and Integration +C combined learning with fun.

Starnight was a highlight, with captivating performances by Gamak band, DJ Zyphertone, and Italian DJ Olly Esse creating an electric atmosphere. The fest's sports competitions fostered healthy competition and sportsmanship.

Tvisha facilitated intercollegiate bonding and networking, connecting students with experts in their fields. The fest's success was evident in enthusiastic participation and campus-wide energy, symbolizing unity and talent.

In essence, Tvisha's diverse events, intercollegiate camaraderie, and memorable experiences exemplify its significance as a platform for talent, fostering unity, and celebrating creativity. It stands as a cherished memory in NISER's history, inspiring future generations.

