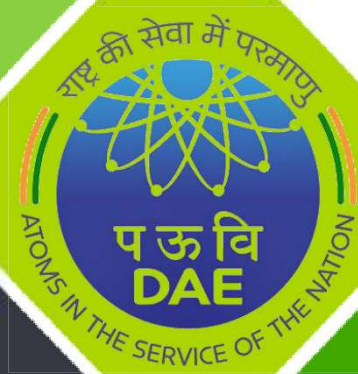


# National Institute of Science Education & Research Bhubaneswar

## Annual Report

and

Audited Statement of Accounts



# 2022-2023



**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.

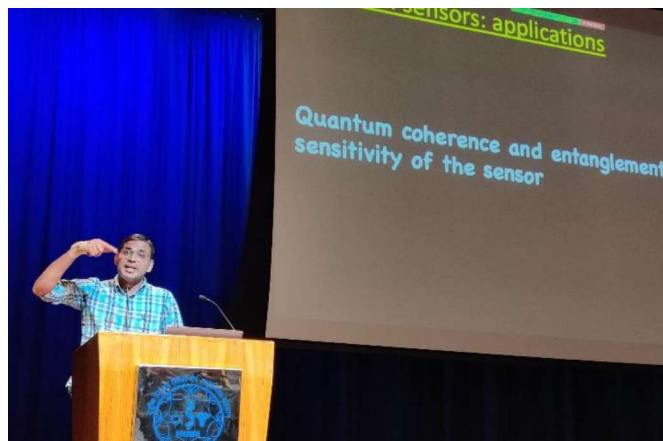
There were four talks conducted in the year 2023-24 in which approximately 600 students had participated.

**Browning Reactions**

Enzyme-catalyzed browning - browning of apples/vegetables

The diagram illustrates the chemical pathway of enzyme-catalyzed browning. It starts with Phenol (a benzene ring with one hydroxyl group). Polyphenol oxidase, using O<sub>2</sub>, converts Phenol to Diphenol (a benzene ring with two hydroxyl groups). Further action of Polyphenol oxidase with O<sub>2</sub> converts Diphenol to Quinone (a six-membered ring with two carbonyl groups). This process leads to the formation of Brown pigments (Melanin). An image of a sliced apple is shown to the left of the reaction scheme.

**“Culinary Reactions” by Dr. U. Lourderaj, SCS**



**“Quantum Sensors” by Dr. Ashok Mohapatra, SPS**

The ‘spike’ (S protein)

The diagram shows the structure of the S protein spike. It consists of a viral membrane, a Receptor Binding Domain (RBD), and two subunits, S1 and S2. The S1-S2 cut site is also indicated. The S1 subunit is shown interacting with ACE2 and DPP4. The S2 subunit is shown interacting with CEACAM1 (MHV) and Sugars (BCoV3 & PEDV). A reference to Nature volume 588, pages 498-502 (2020) is provided.

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**