



Miranda House
UNIVERSITY OF DELHI

Department of Physics
Departmental Annual Report – 3B
2022-2023

Departmental Activities: Curriculum and Beyond

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Miranda House

UNIVERSITY OF DELHI

Academic Year: 2022 – 2023 (from 1.7.2022 to 30.6.2023)

B.1

Department Society, Vidyut and its Office Bearers

President	Vice President	General Secretary	Joint Secretary	Treasurer
Priya Kalakoti	Niveditha R Nair	Anagha Ajith	Megha Atri	Avni Jain

Staff Advisors:

Dr. Abha Dev Habib

Dr. Bilasini Devi Naorem

Professor Monika Tomar

Dr. Divakar Pathak

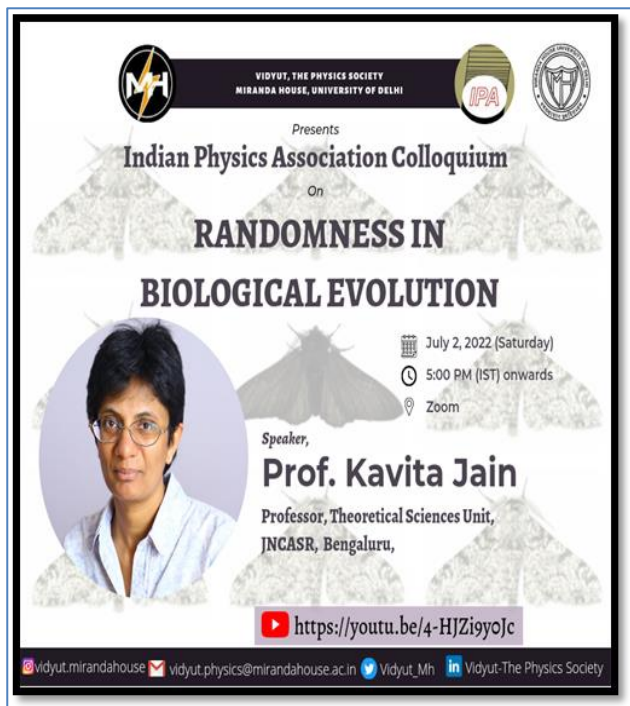
Dr. Nisha Rani



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PART B.2

Seminars/Conferences/Workshops conducted by the department



On July 2, 2022, VIDYUT, the Physics Society of Miranda House, organized a webinar on "**Randomness in Biological Evolution**" featuring **Professor Kavita Jain** as the resource person. Professor Jain, a renowned professor at JNCASR in Bengaluru, shared her expertise on the topic.

The webinar explored the role of randomness in biological evolution and its implications for the diversity of life on Earth.

Professor Jain discussed the mechanisms of genetic variation, mutations, and natural selection, shedding light on how randomness contributes to the evolutionary process. The event provided valuable insights into the fascinating interplay between chance and adaptation in shaping the biological world.

Number of participants: 80

VIDYUT, the Physics Society of Miranda House, organized a hybrid webinar under the series *Journeys* on "**Single Atom Based Quantum Memories for Quantum Network**" on September 29th, 2022. The resource person, **Ms Pooja Malik**, an alumna of Miranda House and a Research Scholar in Quantum Physics, discussed her research journey and her master's thesis on Rubidium atoms.

Miss Malik explained the energy levels, selection rules, and trapping methods involved in capturing a single Rubidium atom. The webinar highlighted the establishment of quantum networks using fiber optic cables and the applications of this technology. Student questions were addressed, and Miss Malik provided her email for further inquiries.

Number of participants: 35





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RADIO FREQUENCY IDENTIFICATION

HEY EVERYONE !!

This is Amanjot kaur
In the first session of discussion series I am going to speak on radio waves transmission used to identify, track any object. I will cover the working of RFID system and it's uses in morden technology.

DETAILS

- BATCH: 2H1
- CONTACT NO. : +91 83027 97325
- DATE : THURSDAY, OCT 13
- VENUE: LAPTOP LAB
- TIMINGS: 3 PM(15 TO 20 MIN DISCUSSION)

Chapter 1, under the series *Colloquy*, took place on Thursday, 13.10.2022. The speaker for this session was **Amanjot Kaur**, a **2nd year student** from the physics department. She spoke on the topic “**Radio Frequency Identification.**”

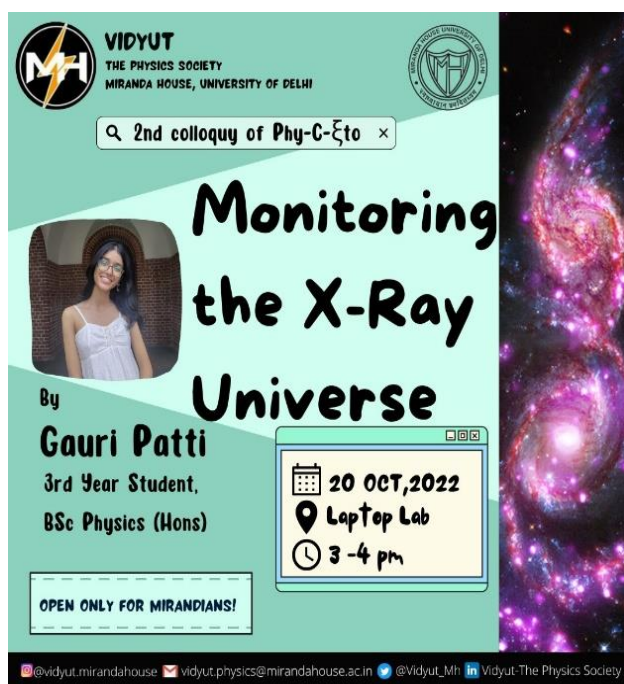
The speaker gave a very illustrative and easily comprehensible talk on RFID system with appropriate circuit diagrams, flowcharts, and pictorial representation of the applications of this system, how it is widely used in Fastag, equipment tracking, in shopping malls etc. highlighting its advantages. The talk was finally concluded with a questioning session.

Number of participants: 50

Chapter 2, under the series *Colloquy*, took place on 20th October 2022. The talk was given by **Gauri Patti**, physics major, **3rd year undergraduate** on ‘**Monitoring the X-Ray Universe**’.

Gauri and her team did a project at Caltech, California, about how to tell, with less data, if a luminous body is a ULX and discussed the same. They observed 3 galaxies and all 3 of them had different behavior in their ULX population. The conclusion was that they obtained the same result from the spectral fitting and by using the BEHR method. The session was concluded by sharing her research experience at Caltech and how students can apply for the similar internships abroad and in the country.

Number of participants: 50



VIDYUT THE PHYSICS SOCIETY
MIRANDA HOUSE, UNIVERSITY OF DELHI

2nd colloquy of Phy-C- ξ to

Monitoring the X-Ray Universe

By **Gauri Patti**
3rd Year Student,
BSc Physics (Hons)

20 OCT, 2022
Laptop Lab
3-4 pm

OPEN ONLY FOR MIRANDIANS!

@vidyut_mirandahouse vidyut.physics@mirandahouse.ac.in @Vidyut_Mh Vidyut-The Physics Society



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Vidyut, The Physics Society
Miranda House, University of Delhi
on the occasion of

INTERNATIONAL SCIENCE DAY

10 November, 2022
Presents

Questions of sustainability



Dr. Darshana Joshi
Founder and CEO,
VigyanShala International



D. Raghunandan
Founder-Director, Centre for
Technology & development

2:30 PM, onwards
Auditorium
Open to all mirandians

@vidyut.mirandahouse | vidyut.physics@mirandahouse.ac.in | @Vidyut_Mh

International Science Day serves as a reminder of the power of science to improve our understanding of the world. On behalf of this VIDYUT, the physics department of Miranda House organized a seminar on “**Questioning of sustainability**”. **Dr. Darshana Joshi**, Founder and CEO Vigyan Sabha International and **Dr. D Raghunandan**, Founder-Director of Centre for Technology and Development were the speakers of the session.


Dr. Darshana Joshi delivered a talk on “**Finding your tribe***” and Dr. D Raghunandan delivered an insightful talk on the topic “**India, Self-reliance and the 4th Industrial Revolution**”. Students got a great opportunity to interact with these graceful speakers. The questions of the attendees were also addressed.

Number of participants: 70

On 20th January 2023, Vidyut, the Physics Society of Miranda House, conducted an online webinar on “**Fluid mixing to study climate variability**.” The webinar featured **Dr. Nairita Pal**, an assistant professor at IIT Kharagpur, Center of Oceans, Rivers, Atmosphere, and Land Science (CORAL), as the resource person.

Dr. Nairita discussed the importance of fluid mixing in both man-made technologies and natural phenomena, such as atmospheric cloud mixing and oceanic temperature variations. She shared her research on the impact of oil spills on the ocean ecosystem and demonstrated the observations through engaging videos. The webinar ended with an inspiring Q&A session, leaving participants with valuable insights into the application of fluid mixing in understanding climate variability.

Number of participants: 70



Vidyut, Physics Society
Miranda House
Presents a webinar on

FLUID MIXING TO STUDY CLIMATE VARIABILITY



Dr. Nairita Pal
Assistant Professor,
Center for Oceans,
Rivers, Atmosphere and Land
Science (CORAL)
IIT-Kharagpur

20th January, 2023
3:00 pm
Room No. 260

OPEN TO ALL MIRANDIANS!!

@vidyut.mirandahouse | vidyut.physics@mirandahouse.ac.in | Vidyut_Mh | Vidyut-Physics Society



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ON INTERNATIONAL COSMIC DAY

Vidut presents

Seminar On:
**LARGE HADRON COLLIDER:
UNRAVELING THE ENIGMA OF THE
UNIVERSE**

22 November, 22 Room No.: 308C

2:30 PM

Open to all Mirandians

PROF. KIRTI RANJAN
Director,
Centre for Detector and
Related Software
Technology (CDRST)
Department of Physics
and Astrophysics
University of Delhi

International Cosmic Day (ICD) is dedicated to cosmic particles, which constantly surround us but always go unnoticed.

As a part of the ICD celebration, VIDYUT, the Physics society of Miranda House organized a seminar on the topic “**Large Hadron Collider: Unraveling the Enigma of the Universe**”. **Prof. Kirti Ranjan**, Director, Centre for Detector and Related Software Technology (CDRST), Department of Physics and Astrophysics, University of Delhi, was the speaker of the occasion. Queries of the attendees were addressed. It was a great opportunity for the students to understand the cosmic universe.

Number of participants: 60

Under the series *Journeys* on 23 January, 2023. The speaker for this session was **Ms. Rajnandini Mukherjee**, a former student of Miranda House (Batch of 2019), who has completed her masters in Applied Mathematics from University of Cambridge and is currently a third year PhD research scholar in Theoretical Physics at University of Southampton. She initiated her talk by giving a brief yet a very informative description of her research work on “**Lattice field theory.**”

At the end of this session Ms. Rajnandini addressed the queries of students and discussed about various research Internships, Scholarships, and scopes of pursuing higher studies abroad. Overall, it was very informative session.

Number of participants: 80

VIDYUT
The Physics Society of Miranda House
Presents

A Seminar under the series "Journeys"

23rd January, 2023

12 P.M. Onwards

Room No. 308 C

Open to all mirandians

Ms. Rajnandini Mukherjee
Former student of MH (batch of 2019),
Currently a third year student of PhD in
theoretical physics at the University
Southampton,
Masters in Applied Mathematics,
University of Cambridge

@vidyut.mirandahouse M vidyut.physics@mirandahouse.ac.in in Vidyut-Physics Society




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Vidyut, The Physics Society, Miranda House

How do I make my summer productive?

your guide to emailing researchers, preparing your C.V./resume and forming cover letters!



16-02-2023 | Robotics Lab | 3 P.M.

Workshop Coordinators:
Manidipa Banerjee;
Gauri Patti

Open to all Mirandians
(Particularly from
Science background);
Bring your laptops for on the
spot assistance!

A workshop on "Guide to emailing researchers, preparing your C.V / resume and forming cover letters" was conducted on 16th February 2023 by **Gauri Patti and Manidipa Banerjee** (former students of MH).

The workshop was valuable for students who are interested in emailing researchers, preparing a CV/resume, or writing cover letters. The facilitators provided helpful tips and advice that will help students to write effective emails to researchers, CVs/resumes, and cover letters.

Number of participants: 30

Chapter 1, Session three of the Career Counseling Series "**What Next?**" was held on 24th February 2023, Friday, from 2:00 pm to 3:00 pm. The session focused on guiding students on transitioning from a physics background to the corporate sector, with a particular emphasis on exams like CAT. The guest speaker for this insightful session was **Ujjwal Batham**, a distinguished alumnus of MH with a BSc (Hons) in Physics. Currently pursuing her MBA at FMS, speaker shared her valuable experiences and insights on how to navigate a successful career transition. She emphasized the importance of preparation and shared her personal journey of transitioning from a science background to the corporate world.

The interactive session saw students actively participating and raising pertinent questions about the duration of studies. The event concluded on a positive note, with students expressing their gratitude for the valuable guidance received.

Number of participants: 80


VIDYUT, THE PHYSICS SOCIETY
MIRANDA HOUSE, UNIVERSITY OF DELHI
Presents

WHAT NEXT?

A CAREER COUNSELLING SERIES

CHAPTER 2, SESSION 3
24 FEB (FRIDAY)
2PM ONWARDS
VENUE : 308 C

With



UJJWAL BATHAM
Former student of MH, currently an MBA student at FMS

Open only for students of Miranda House!

@vidyut.mirandahouse | vidyut.physics@mirandahouse.ac.in | @vidyut_MH | Vidyut-The Physics Society



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On **National Science Day**, a lecture by **Dr. Poornendu Chaturvedi** (Scientist F, Solid State Physics Laboratory, DRDO) was conducted on 28th February 2023. The topic of the talk was **“Securing Secrets with Photons”**. The session was informative and thought-provoking. Dr. Poornendu used many creative videos and graphics which made the session more interesting and easier to grasp.

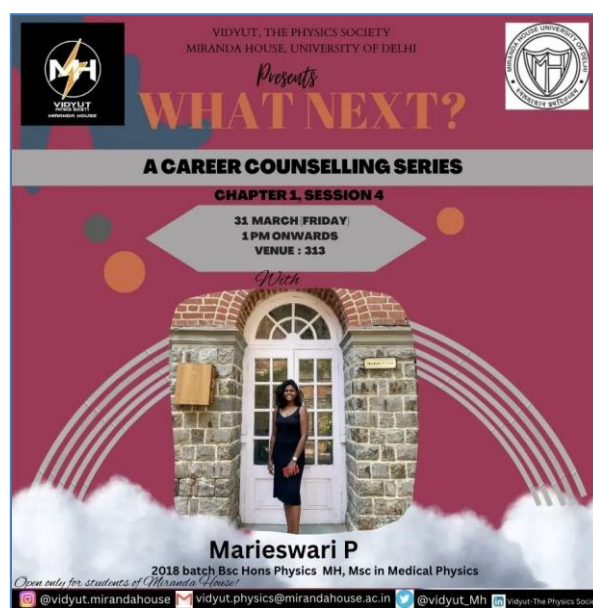
This was followed by a Science Exhibition named **“Sci-Fair”** where students from Miranda and other participating colleges demonstrated various projects. The prominent DU college such as Hindu College and Rajdhani College also participated in the exhibition. After the session, the honorable speaker and our respected professors took a round of all the projects discussing their pros and cons and suggesting some improvements. Overall, the day was totally devoted towards science and it was a successful event.

Number of participants: 12

Chapter 2, Session four of the Career Counseling Series **“What Next?”** took place on 31st March 2023, from 1:00 pm. The guest speaker for this session was **Marieswari P**, an accomplished individual from the 2018 batch of BSc (Hons) in Physics and currently pursuing her MSc in Medical Physics.

Ms. Marieswari shared her inspiring journey and experiences, motivating the students to pursue their dreams with determination and the duration of studies, recommended books for preparation, and other related doubts. Ms. Marieswari's expertise and engaging presentation style made the event a success, leaving the attendees feeling inspired and well-informed about their future career paths.

Number of participants: 70





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VIDYUT
The Physics Society of Miranda House

Presents a 'webinar' on
**Crystal Structure Prediction for
Transition Metal Dichalcogenides:
Addressing an Old
Problem using MACHINE LEARNING**



Dr. Pratibha Dev
ASSOCIATE PROFESSOR,
DEPARTMENT OF PHYSICS AND ASTRONOMY,
HOWARD UNIVERSITY, WASHINGTON

 : ROOM NO. 308C
 : 9:30 AM (ONWARDS)
 : 5TH APRIL (WEDNESDAY)

Vidyut had organized a webinar by **Dr. Pratibha Dev**, Associate Professor, Department of Physics and Astronomy, Howard University, Washington on the topic - **Crystal Structure Prediction for Transition Metal Dichalcogenides: Addressing an Old Problem Using Machine Learning**. The webinar was held on April 5th, 2023, in room no: 308c from 9:30 am onwards. The event was open to all Mirandians.

The professors along with the students found this topic very interesting and were seemed to develop their curiosity towards the session. The talk ended with a Q/A session which gave an opportunity to the students to have one on one conversation with Dr. Dev. The webinar was indeed interesting and helpful for all the attendees who attended.

Number of participants: 50



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RESEARCH BOARD
VIDYUT, THE PHYSICS SOCIETY
MIRANDA HOUSE
PRESENTS

OPEN FOR ALL MIRANDIANS!

DATE - FEB 3, 2023
TIME - 3 PM
Venue - LT2
(SCIENCE BLOCK)

An interactive session on
"Reading a research paper"

We will take up 2 research papers of 2022 physics nobel prize winner french physicist **Alain Aspect**

- 1 The birth of wave mechanics
- 2 From Huygens' waves to Einstein's photons: Weird light

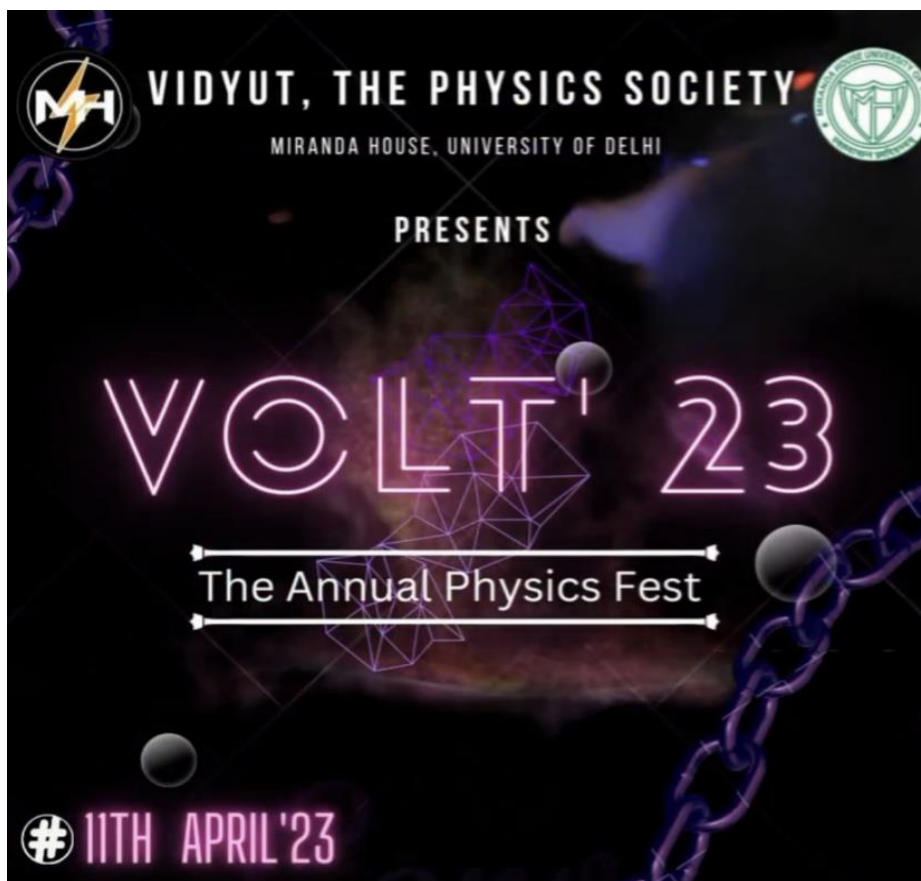
An interactive session on **"Reading a Research Paper"** was conducted on 3rd February 2023, where they took **two research papers** of 2022 physics Nobel prize winner French physicist Alain Aspect, **"The birth of wave mechanics"** and **"From Huygen's waves to Einstein's photons: weird light"**. The interactive session gave a valuable opportunity for participants to learn about the process of reading any research paper. The participants were able to gain a deeper understanding of the two research papers that were discussed, and they were also able to share their own insights and perspectives on the papers.

Number of participants: 60



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The Annual Physics Fest: VOLT



Volt'23, the annual fest of Physics Department, Miranda House was organized by Vidyut, The Physics Society on the **11th of April, 2023**. It was a much-anticipated event for the entire department be it the students or the faculty members or the laboratory staff, everyone actively volunteered and coordinated with the Student Convenors and office bearers of the society, throughout the month-long preparation process so that the fest comes up to be a successful one.

Finally, it was the fest day and each of us were geared up to make most out of it. A brief of the various events that were conducted in the fest is given as below:



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Seminar and interactive session with Prof. Ajoy Ghatak.

VIDYUT
The Physics Society, Miranda House
PRESENTS
VOLT'23
THE ANNUAL PHYSICS FEST

Seminar and Interactive Session With
Prof. Ajoy Ghatak
Optics and Photonics Centre, IIT Delhi

**Evolution Of Quantum
Theory, and a Simple
Derivation of Bell's
Inequality**

11 April, 23
12 PM

Room no. (145)

Open to
Mirandians
only

A seminar presentation on the topic, "**Evolution of Quantum Theory and a simple derivative of Bell's inequality**" by renowned Indian Physicist and Author, **Prof. Ajoy Ghatak**, who is currently serving as Honorary Professor at the Department of Optics and Photonics, IIT Delhi.

The seminar was attended by our esteemed **Guest of Honor, Prof. Bijayalaxmi Nanda, Principal, Miranda House**, the respected faculty members of the department and students. It was a very interactive and demonstrative session where both the resource person as well as the attendees took part with keen interest. Professor Ghatak captivated the students with his in-depth knowledge on Quantum Theory and explained the concepts in the most lucid and comprehensive way. The presentation concluded in an hour and was followed by distribution of refreshments.

Number of participants: 80



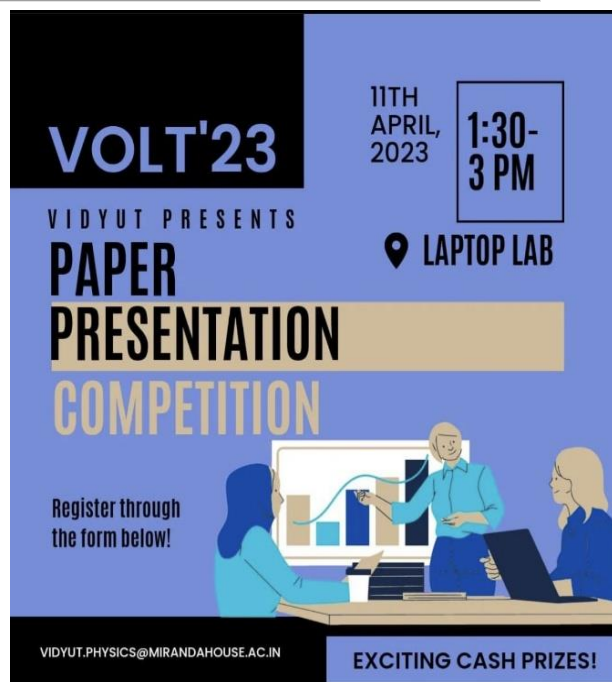
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1. Paper Presentation competition:

In the session, the undergraduate researchers were welcomed to present their research papers. The session was open to both team as well as individual participants. Students across DU participated with great ardor which gave us a clear picture of the growing interest towards research among young scientists. Each of the participants were given a definite time limit within which they had to finish the presentation and face the questions of the judges and audience and marked accordingly.

At the end of the presentations, we got our three winners who were awarded with E-certificates and exciting cash prizes.

Number of participants: 50



2. Quiz-o-Trivia:

An **inter College Science Quiz** was organised as a part of Volt'23. It witnessed massive participation from students from various colleges of University of Delhi. Questions were not only based on Physics but also other prospects of science and technology like current affairs, science fiction, mathematical and logical ability etc. The Quiz was conducted in two rounds (written SAQ round and a Buzzer round) and participants were instructed to join in groups of two. Three winners were declared at the end of the second round and were awarded E-certificates and exciting cash prizes.

Number of participants: 120





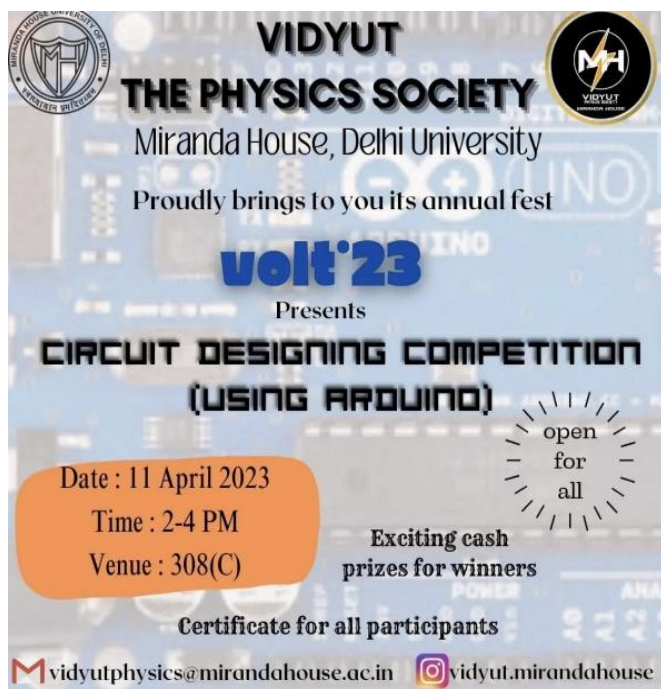
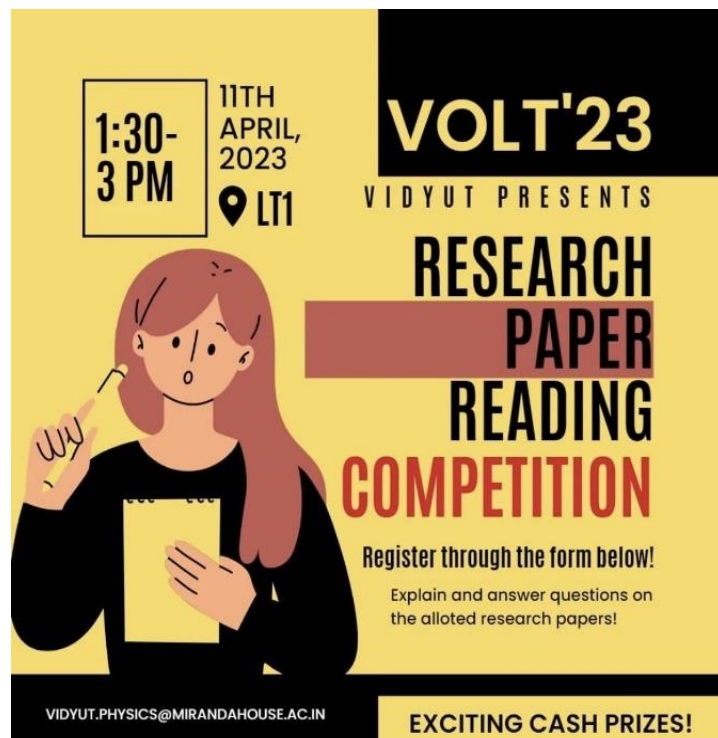
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3. Research Paper reading Competition:

It was something new that Vidyut came up with and the response from participants was immense. The competition was designed in three rounds and with each passing round the difficulty level increased.

The participants were **provided with research papers in each round which they had to read using certain methodology and then answer questions** pertaining to the content in the paper. It came up to be a very interesting competition. At the end, the judges selected three winners and were awarded E-certificates and exciting cash prizes.

Number of participants: 70



4. Circuit designing competition (using Arduino UNO):

An exciting and quintessential physics competition, which could tickle the technical skills of an aspiring physicist, was something we were planning to hold and what could be more fascinating than a Circuit designing competition! Entries were allowed in groups of two or individually. **They were given circuits that they were needed to design, but the plot twist was that they had to use Arduino while doing so, with all the other requirements and a time limit.** The top two individuals which could accomplish the task and satisfied pre specified requirements within the time frame were declared winners and awarded according with E-certificates and exciting cash prizes.

Number of participants: 80



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Extension Activities Organized

Summer Workshop for Undergraduate Science Students, Flavor of Research: Investigative Projects in Multidisciplinary Contexts held at the D. S. Kothari Centre for Research and Innovation in Science Education, Miranda House, University of Delhi from **09 June to 21 July 2022**.

Participation: 15 faculty members of the Physics Department mentored 23 Summer Projects. Out of 91 undergraduate students who successfully worked on projects, 35 students were from other institutions.



DSKC, MIRANDA HOUSE

University of Delhi



Flavour of Research
Investigative Projects in Multidisciplinary Contexts

Summer Workshop for UG students
(09 June 2022 - 21 July 2022)

**Botany, Chemistry, Geography, Mathematics, Physics
and Zoology**

Chief Guest
Professor Maharaj K. Pandit
CEO, Institute of Eminence and Chairperson, Research Council
University of Delhi

Orientation Program
9 June 2022 | 10:30 am | College Auditorium
Website: <https://www.mirandahouse.ac.in/centres/dskc.php>

For further details see:

<https://www.mirandahouse.ac.in/uploads/dskc/summerworkshop/2022%20DSKC%20Summer%20Workshop%20Report.pdf>



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PART B.4

Other events organised by Vidyut as part of students' activities (not listed above)



Farewell 2022

The farewell was conducted on **June 4, 2022 in the college auditorium** by the students for the graduating seniors. The function was vibrant and full of energy. Interesting games were played among the students which continued with some sweet notes of good bye by the teachers and the seniors. They shared their experiences and vision about their future. At last, it ended up with the give away of some sweet and memorable gifts to the seniors. The overall atmosphere was filled with mixed emotions of joy, happiness, nostalgia and the hope to meet everyone soon in the future.



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Teachers' Day 2022



Teachers' Day in India is an annual celebration observed on **5th of September**. This is a day to honour our teachers for their valuable work. The students of BSC (Hons) Physics celebrated Teacher's Day with great enthusiasm. There were several dancing and singing performances for the entertainment. The students also picked out some games for teachers and students to play together. This was a kind gesture from the students to thank teachers for their huge support and motivation.



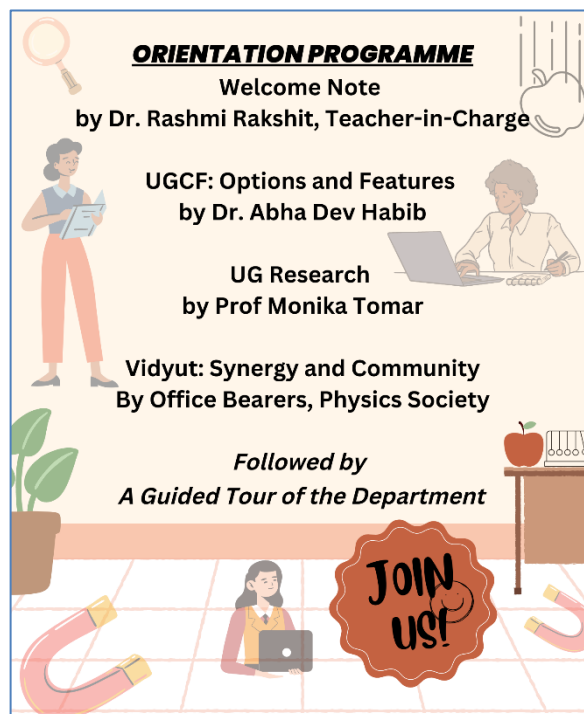
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Orientation 2023

The Physics Department Orientation was held on **2nd Nov, 2022**. The goals of the orientation program were to create student's familiarity with the institution's regulations and academic standards, acquaint the students with their classmates and to learn about the other institutional members that would help them succeed.

The orientation was started by addressing the students by our professors, further informing them about the new academic layout. It was followed by a college tour by the panel members. It gave a chance for incoming students to explore the campus, meet faculty, and become familiar with the environment.





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Freshers 2023

On **13th January 2023**, the Department of Physics organised the event of freshmen social for the batch of 2022-26 under the banner **WELKOM FIESTA**. The Teacher and Student moderators of Vidyut, the Physics Society took charge of planning and smooth execution of the entire program. Also, the theme for the celebration was “**Modern Bollywood**”.

The event started with the welcome address delivered by Dr. Vandana Verma. It was followed by the various colorful performances by the students of 2nd year and 3rd year like singing, dancing, poetry recitation etc. In between the performances refreshments were also served and many competitions as well as games and fun activities were also organized for the freshers and they thoroughly enjoyed participating in them. The major attraction of the entire event was the title competition. All in all, it was an engaging and successful event.





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