



ANANTA

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# YEAR AT A GLANCE

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2020-21

# ORIENTATION 2020-21

*"Science means constantly walking a tightrope between blind faith and curiosity; between expertise and creativity; between bias and openness; between experience and epiphany; between ambition and passion; and between arrogance and conviction – in short, between an old today and a new tomorrow."*

The annual orientation programme of Ananta for the academic year 2020-21 was held on 20 January 2021. Sonali Shakya, the president of Ananta welcomed everyone. The host for the day was Simran Tuteja, Editor-in-Chief of Ananta.

In the era of rapidly advancing frontiers of Science and Technology, ANANTA- the Science Society of Indraprastha College for Women was launched by Principal Prof. Babli Moitra Saraf on 11th October 2018. It has been launched as an academic society that acts as a torch of discovery for the young budding scientists to quench their thirst for knowledge. It was formed as a result of the collective efforts of Computer Science, Environmental Studies, Geography, Economics, Mathematics and Psychology, as pillars under the auspices of society.

Members of Ananta undertake the responsibility for the cultivation of awareness, the encouragement of critical thinking and the involvement of students in numerous activities under the supervision and guidance of Ms Ritu Singhal as the coordinator of the society with the departmental advisors.

Nishchal Gaur, the Vice President explained the team structure. Our coordinator, Ms Ritu Singhal and society advisors were introduced.

Ananta members believe in teamwork and proper division of work. Each one of us has a different set of qualities but when we all come together, we make a perfect team.

Our core team works day and night planning everything and coordinating with every member to execute things systematically. The technical heads work with the graphics team, the Vice President and the General Secretary work with the content team, the editor in chief works with the research team and the president coordinates with the core team and ensures smooth functioning of the society. The department representatives coordinate with each other and work in harmony, bringing out the best from each department and getting the work done properly. There are two department heads from each department.

The research team is very observant and hence knows where and how to look for the right piece of information. The content team uses information and presents it in such a manner that you can easily read and understand. The graphics team knows its way around various editing tools, hence providing our audience with eye-pleasing videos and pictures. The research, content and graphics team together form the creative team of our society. Also, note that Ananta is open to all. Any of the students from the college can be a part. Society gives a platform to the students to showcase their skills and work on their ideas in the form of different projects and researches.

An overview of all the activities in previous

sessions was given by Ishika Singh, Technical Head of Ananta. Ananta organised numerous activities and events throughout the session. We organised interactive workshops to provide students with the knowledge and hands-on experience on topics including Arduino, Solar Panel Usage, Python programming and “Rubaroo” – An Exercise on Self-Reflection. In addition, to enhance students' understanding, presentations on topics of Safety Measures, Consumption Expenditure of Students, Earthquake Alarm System, Solar Panel for IPCW, Climate Change Cognizance were conducted. The National Science Day event was celebrated with great zeal by Ananta and it was a huge success among all students. Society members exhibited exciting projects and presented interesting papers on topics such as Kandor and Water Resources and Management in Delhi. Psychology tests and learning experiments were conducted and a documentary prepared by our society members on the theme “Women in Science” was presented. On the occasion, the society also initiated a monthly quiz series named Inquizitors which is being conducted successfully on the 14th of each month. Projects prepared by students for the session include Smart Assistance Glove, Air Quality Index, LED Matrix, Solar Mobile Charger, Earthquake Alarm System, Solar Panel from E-Waste, Automatic Street Lights, Distance Measuring Device using Arduino and Air Purifier.

Chinmay briefed the audience about the past events. In 2020, even though physical interactions were not possible, the team made sure to continue our journey of learning. SciVerse: an Online fun & interactive workshop series was initiated covering in-demand topics such as Google Analytics & Psychological First Aid.

Social media campaigns- under which we covered topics such as Financial Literacy- a 7 day video awareness series explaining the basic concepts of economic and financial terms to peers was also started. Also on the occasion of World Science Day, a 3 day Social Media Campaign on Biodegradable Packaging was held. The impact of Covid-19 on our Environment through our social media handles was analysed.

Monthly quiz series- Inquizitors by various departments covering a dynamic range of topics such as quiz on Man v/s Nature by Geography dept, Myths v/s fact by the psychology department and Artificial Intelligence by the Computer Science Department were organised.

Lastly, Ananta also initiated a comic strip: MAYA and EDGAR on our Instagram handles which serves as a fun myth-busting guide to numerous common scientific myths.

Simran concluded the event by thanking the presenters. The registration form was circulated and later, interviews were held.

This event was held under the supervision of the coordinator and the advisors of Ananta.

# INQUIZITORS

## INQUIZITORS-1

The Inquizitors monthly quiz was held on 19th July at 6 pm on the Instagram page of Ananta. The topic was 'Cyber Security'. Top 10 scorers were declared as winners.



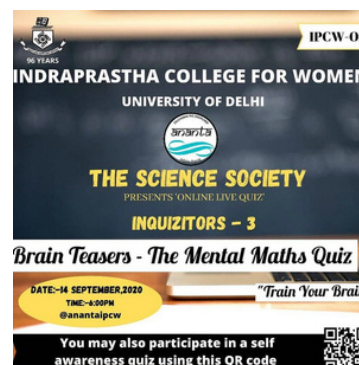
## INQUIZITORS-2

The Inquizitors monthly quiz was held on 14th August at 6 pm on the Instagram page of Ananta. The topic was 'Dynamic Growth: Unlocking India's Economic Potential'. Top 10 scorers were declared as winners.



## INQUIZITORS-3

The Inquizitors monthly quiz was held on 14th September at 6 pm on the Instagram page of Ananta. The topic was 'Brain Teasers: The Mental Maths Quiz'. Top 10 scorers were declared as winners.





# INQUIZITORS

## INQUIZITORS-4

The Inquizitors monthly quiz was held on 28th September at 6 pm on the Instagram page of Ananta. The topic was 'River day and green consumer day'. Top 10 scorers were declared as winners.



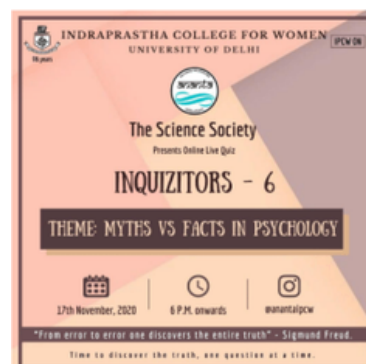
## INQUIZITORS-5

The Inquizitors monthly quiz was held on 15th October at 6 pm on the Instagram page of Ananta. The topic was 'Man V/S Nature: The Dynamics of Panchatatva quiz'. Top 9 scorers were declared as winners.



## INQUIZITORS-6

The Inquizitors monthly quiz was held on 17th November at 6 pm on the Instagram page of Ananta on the topic, 'Myths vs Facts in Psychology'. 101 people participated through Instagram. The quiz was hosted by the Psychology department of IPCW. The top 12 scorers were declared as winners.



# INQUIZITORS

## INQUIZITORS-7

The Inquizitors monthly quiz was held on 14th January 2021 at 6 pm on the Instagram page of Ananta. The topic was 'Artificial Intelligence- Creating the Future.' 72 people participated out of which Top 8 scorers were declared as winners.



## INQUIZITORS-8

The Inquizitors monthly quiz was held on 14th March at 6 pm on the Instagram page of Ananta. The topic was 'Geographical facts- knowing the Earth'. Top 10 scorers were declared as winners.



## INQUIZITORS-9

The Inquizitors monthly quiz was held on 17th April at 6 pm on the Instagram page of Ananta. The topic was 'Astronomy, the Mathematical Aspect'. Top 10 scorers were declared as winners.



## Prof. Saji Varghese

Professor Saji Varghese has designed a revolutionary straw made from coconut leaves. The coconut leaves undergo a three-step cleaning process which we follow with scraping and rolling. All this is done by in-house machinery so that the straw is hygienic. Besides this, they use a food-grade adhesive for glue, making it free of chemicals. Simple cleaning and steaming process bring out the natural healthy wax of the leaf itself onto the surface making the leaf anti-fungal and hydrophobic which makes it efficient as a straw. It has a shelf life of nine months and stays steady in beverages for more than six hours.

Prof. Saji Varghese an English professor at CHRIST (Deemed to be University), is from Kerala. His keen interest to find out ways to increase and augment the income of poorer communities made him think of great innovation from merely dried coconut leaves. According to him when you automate the process of making straw building machines several people are getting employed, the majority being women from rural India. The straws are an attempt to create an earth a better place to live, one sip at a time! The straws have been able to prevent the burning of coconut leaves that have played a part in reducing the usage of plastic straws and have empowered women in rural communities through employment. The straws are being exported to 25 countries, including the US, Australia and EU nations.

The coconut straws have received several accolades including the Shreshta Udyami Guru Puraskar 2020 from the Entrepreneurship Development Institute of India (EDII) and the First Position at Start-Up Launch pad by the ASSOCHAM, New Delhi.

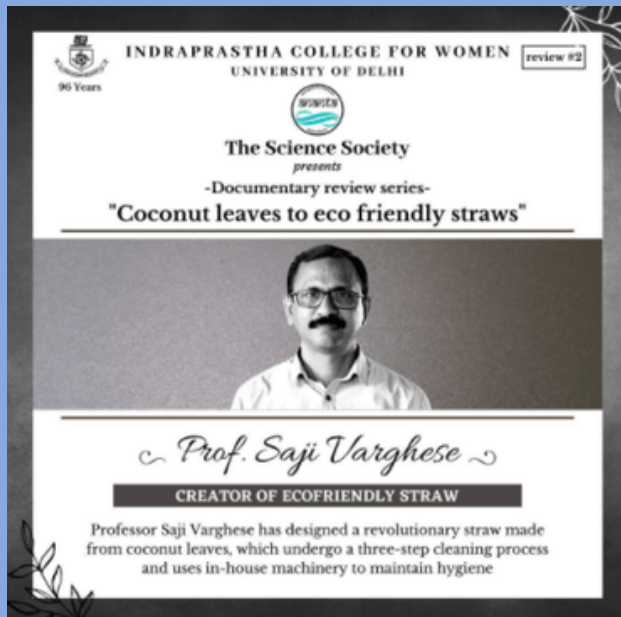
Facebook pages: 1. Saathi Ventures 2. Saji Varghese

Youtube: Interview with CNEWS:

<https://youtu.be/-aekajSYe-0>

Articles:

- <https://www.thebetterindia.com/232281/bengaluru-innovation-earns-crores-coconut-leaf-straw-plastic-alternative-sustainable-buy-online-inspiring-India-ser106/amp/>
- <https://www.themachinemaker.com/innovation/professor-turns-inventor-with-ecofriendly-coconut-leaves-straw>



# World Science Day for Peace & Development A Documentary Review Series

## Paul Tasner

He is an Industrial Engineering graduate of the New Jersey Institute of Technology and holds a PhD in Mathematics from Boston University. PulpWorks and Paul have been the recipients of 20 awards and the subject of more than 40 articles in the media. Paul was selected as a TED Resident in 2017.

Paul Tasner being a passionate man was having a strong passion to make a difference for people and the planet. The amount of increasing plastic pollution day by day made him much tensed about the environment. By this, he founded PulpWorks in 2011 and set out to create safe, eco-friendly packaging for consumer products. The development of the Karta-Pack™ – a compostable replacement for the toxic plastic blister pack – followed immediately with a great positive impact on the environment.

The company was placed 3rd in the 2012 Silicon Valley Innovation & Entrepreneurship Forum start-up competition. There were more than 300 entrants in this U.S./China event. PulpWorks was placed first among all U.S. entrants. They won Grand Prize winners of the 2013 'Think Beyond Plastic' competition sponsored by the Plastic Pollution Coalition and placed 3rd among 650 Ventures from 40 countries in the 2013 Global Social Venture Competition and also the Grand Prize at the 2014 North Bay Innovation Forum.

In December 2016, the company was awarded a patent for a package that enabled the customers to replace the toxic and ubiquitous plastic blister pack with our compostable alternative, the Karta-Pack™.

By this company, one by one started moving forward with speed towards the door of success receiving 20+ awards till 2018.

<http://www.pulpworksinc.com/>

<https://www.crunchbase.com/organization/pulpworks-inc> <https://money.com/pulpworks-eco-friendly-packaging/>

<https://i3connect.com/company/pulpworks-inc>

<https://money.com/pulpworks-eco-friendly-packaging/?amp=true>

<https://angel.co/company/pulpworks>



Paul Tasner developed an environment-friendly alternative to the toxic plastic blister pack. He designed consumer packaging made from moulded paper waste or agricultural waste such as bagasse, bamboo, switchgrass, and wheat straw.

With this aim, he founded a packaging company –PulpWorks that designs and manufactures sustainable packaging for the consumer products industries. PulpWorks offers compostable products (in industrial compost), moulded from 100% post-consumer paper waste and agricultural waste. They use environmentally friendly packaging by creating and utilizing the same technology that's been used for decades to create egg cartons. They have added a wide variety of colours, textures, and complexity to the original technology. Their engineers and designers create custom packaging for consumer product companies to suit aesthetic needs without sacrificing functionality. PulpWorks custom designs moulded pulp products most efficiently and economically possible through the various disciplines of geometry and architecture. Configurations effectively nest and stack, reducing shipping costs and storage space and easy for consumers to use.

Paul Tasner, co-founder and CEO of PulpWorks has held leadership positions in procurement, manufacturing, and logistics in ventures ranging from start-up to Fortune 100, including The Clorox Company, California Closet Company, Method Products, Hepagen, OM2 (supply chain consultancy), and the Eclipse Group. In 2008, Paul founded and continues to lead the San Francisco Bay Area Green Supply Chain Forum.



## Jeff Kirschner

Founder & CEO of Litterati, a global community working to create a litter-free planet. It is taking a data-driven approach to understand one of humanity's most complex and challenging problems. Jeff Kirschner, the founder is a public speaker. Over the last several years, he has been a keynote speaker for Fortune 500 corporations, universities, government organizations, and conferences. Examples include Google, Facebook, eBay, Keep America Beautiful, the US Environmental Protection Agency, the University of Michigan, the University of California, the Berkeley Haas School of Business, and 100+ others. Previously, he was the Co-Founder and Creative Director of two other startups. Intro, an SMS-based platform designed to help conference speakers meet, engage, and follow up with their audiences. (Acquired by Bizzingo, Inc.), and Razz, a mobile entertainment company, backed by Mayfield Fund, Cardinal Venture Capital, Siemens Acceleration in Communications, and Guy Kawasaki's Garage Technology Ventures.

Litterati may have started as a series of Instagram posts on Kirschner's account, but it didn't stay that way for long. He launched a dedicated Litterati account, and then an iOS app on Earth Day in 2016 and an Android app in 2017. Today Litterati app has 150,000 downloads and a decidedly outsized impact. Getting there, however, took both online and offline work.

They aim to eradicate litter and they believe strategically the way to do that is you need three Ps. You need a policy, packaging with sustainable materials, and personal responsibility.

Fitbit users can count their steps, Kirschner wants Litterati users to be able to "quantify the positive impact they're having on the planet."

Playstore:

[https://play.google.com/store/apps/details?id=org.litterati.android&hl=en\\_IN&gl=US](https://play.google.com/store/apps/details?id=org.litterati.android&hl=en_IN&gl=US)

Twitter:

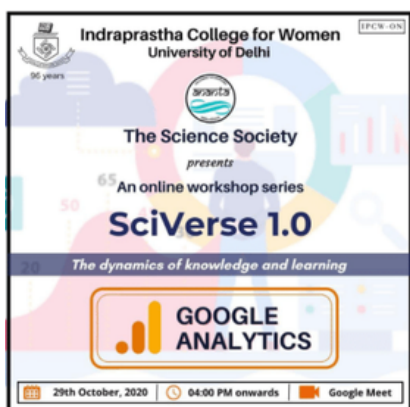
[https://twitter.com/litterati?](https://twitter.com/litterati?ref_src=twsrc%5Egoogle%7Ctwcamp%5Eserp%7Ctwgr%5Eauthor)  
<https://mashable.com/article/litterati-app-instagram-for-trash/>



Litterati is a free app that encourages users to pick up litter and to share their efforts with like-minded individuals. But the app does more than just provide a nudge to tidy up. Behind the profile pics, photo galleries, and cheery campaigns announcing participants' intention to clean up their neighbourhoods lies a secret weapon: crowdsourced data. By aggregating massive amounts of information detailing what type of litter people pick up, and where and when they do so, Litterati paints a holistic picture of how trash exists in and permeates throughout our cities. This, in turn, allows for a compelling case to be made to fast-food chains, individual businesses, and even elementary schools that became environmentally focused, a change that is both desirable and beneficial. Litterati is a global community that's crowdsource-cleaning the planet, from students in South Africa to activists in Italy and neighbours across the US. And collecting a ton of data in the process, helping businesses and communities identify the root of the problem and drive change. It's the power of what happens when individuals join forces for the greater good. It is a mobile app that identifies, maps, and collects the litter we pick up as a community. Litterati's technology is used to develop behavioural insight, map problem areas, and mitigate future harm.

## GOOGLE ANALYTICS REPORT

01



An interactive workshop on Google Analytics was held on 29th October 2020. The workshop was conducted by Kushagri Sharma and Nisha Samant of the Maths department under the guidance of Mrs Ritika Gulati. Around 40 people attended this interactive workshop and did the activity in the end. Kushagri and Nisha thoroughly explained Google Analytics, its origin, and usage. They also guided the participants to set up their websites in Google Analytics.

Google Analytics can do wonders for your business in more advanced ways. It provides you with valuable insights that can be used to improve the performance of your website and increase conversions.

Even though there are so many other analytics management platforms, Google Analytics remains a free highly relevant solution for managing the analytics of your website.

Google Analytics is a web analytics service offered by Google that tracks and reports website traffic, currently as a platform inside the Google Marketing Platform brand. Google launched the service in November 2005. As of 2019, Google Analytics is the most widely used web analytics service on the web. Google Analytics works by the inclusion of a block of JavaScript code also known as TRACKING CODE on pages in your website. The tracking operation retrieves data about the page request through various means and sends this information to the Analytics server via a list of parameters attached to a single-pixel image request. In a Google Analytics report, metrics are quantitative measurements of data and show how a website is performing about a specific dimension.

With the help of a demo account, Kushagri and Nisha explained Real-Time, Audience, Acquisition, Behaviour, and Conversions Tabs. They later helped the audience export/share their analytics report. In the end, the participants were asked to do an activity, which was to make a website on Google Analytics.

## PSYCHOLOGICAL FIRST AID WORKSHOP REPORT

02



Ananta- The Science Society organized an online workshop on “Psychological First Aid- Self Care and Care for Others” on the 21st of November, 2020 with Nisha Gupta and Prakriti, 3rd-year students of the Department of Psychology under the guidance of Dr Swati Jain, as part of their Workshop Series on SciVerse- The Dynamics of Knowledge and Learning. In times of challenging situations and disasters such as the COVID-19 pandemic, people experience intense emotions and seek supportive & practical assistance to cope with the emergent stressors. Psychological First Aid (PFA) can help responders promote an environment of safety, calm, connectedness, self-efficacy, empowerment, and hope for themselves and others, in the immediate aftermath of an emergency. The event was attended by more than 100 participants belonging to Indraprastha College for Women, as well as other colleges and schools.

The workshop began with a brief overview of PFA and demystifying misconceptions associated with it along with an introduction to Disaster Mental Health and Crisis Management. Potential causes of stress, signs and symptoms to look for and methods of coping were explained in the context of Self-Care. To understand how to offer effective help to people in traumatic situations, the Johns Hopkins RAPID model: rapport and reflective listening, assessment of needs, prioritization, intervention, and disposition was elucidated to help responders develop the ability to provide compassionate and supportive presence designed to mitigate acute distress and assess the need for the continued care of others. In light of this contextualization, experiential exercises guided by vignettes demonstrating the provision of psychological first aid were used to help facilitate better assimilation of the concept. Covering the basics of which, additional resources available online for students to read and learn more from, were shared. Finally, the session concluded with a Guided Imagery Meditation Exercise and a Q & A session to provide the attendees with an opportunity to seek any clarifications, engage in discussions and stimulate conversations around the concept of Psychological First Aid.

## STOCK MARKET

03



An interactive workshop on STOCK MARKET was held on 13th February 2021 to acquaint students with the basics of Stock Market. The workshop was conducted by Muskan Garg and Diya, 2nd year students of the Economics department under the guidance of Ms. Ritu Singhal and Ms. Manavi Jain. The event was attended by more than 50 students and faculty members. Presenters commenced the workshop with the basic definition of the Stock Market. Some of the other topics included were Indexes, Exchanges, Investments, Speculation, Index Funds, Technical Analysis, Fundamental Analysis, and Margin of Safety. The workshop proved to be academically enriching for the students as it also involved practical representation of technical and fundamental information on platforms like moneycontrol and screener. After the end of the presentation, there was a quick Q&A session and book recommendation. The workshop was appreciated by both the students and faculty members.

An efficiently functioning stock market is considered critical to economic development, as it gives companies the ability to quickly access capital from the public.

The stock market serves two very important purposes:

- The first is to provide capital to companies that they can use to fund and expand their businesses.
- The second purpose is that the stock market gives investors- those who purchase stocks- the opportunity to share in the profits of publicly-traded companies.

*“Stock market bubbles don’t grow out of air. They have a solid basis in reality, but reality as distorted by a misconception.”*

How will it help you if you know about the stocks?

- If you’re not well-versed in the basics of the stock market, the stock trading information spewing from CNBC or the section of the market of your favourite newspaper can border on gibberish.
- If on the other hand, you want to learn how to trade stocks, you need to understand the stock market and at least some basic information about how stock trading works.



## FIGMA REPORT

04



An interactive workshop on PERFORMING DESIGN SPRINT- FIGMA was held on 20th February 2021 which was conducted by Sabhya Saini. 75 attendees were provided with an insight on how to design their solutions as digital apps using the Figma platform. Figma is a vector graphics editor and primarily web-based prototyping tool, with additional offline features enabled by desktop applications for macOS and Windows. The Figma Mirror companion apps for Android and iOS allow viewing Figma prototypes on mobile devices.

The workshop aimed to understand and apply:

- The User Experience and User Interface laws while designing any digital application.
- The psychology of the human vision and behaviour while surfing through digital content.
- The colour theory for enhanced impact and navigation across any digital or analogue information.
- The material design libraries available in one's design.

- The documentation and communication skills among a designer and a developer for creating a digital solution such as mobile or web apps.

The usage of Figma was also discussed by the hosts. The usages are as follow:

- Design an app easily by using the skills that you already have
- Prototype the wireframes which translates the actual app under consideration
- Share your apps instantly and design simultaneously with co-workers on a single design
- Test your designs by using the Figma Mirror companion app on your mobile
- Automatically generate CSS code and share it with the developers

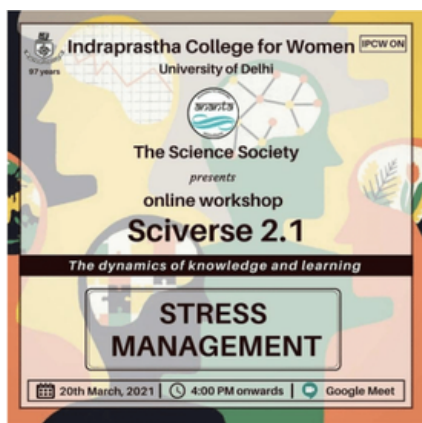
Colour Theory, UX laws, and Human Behaviour for consuming content were also discussed in depth.

Step by step Application creation using Figma involves the following process:

1. Finding the problem and the key entities that are in the direct impact of the problem and its solution
2. Defining the key entities' operation in the solution
3. Designing the integrated system which involves all the key entities
4. Prototyping the designed solution
5. Testing the designed solution with the key entities

## STRESS MANAGEMENT REPORT

05



An interactive workshop on Stress Management was held on 20th March 2021 which was hosted by Bharavi Yadav, Anaya Srinivasan and Ishika Jain. Around 40-45 participants attended this workshop. The host discussed the term 'Stress', types of Stress, its causes, stress overload, stress response, effects of stress, and stress management. The workshop was conducted under the guidance of Ms Swati Jain.

The event aimed to help students learn how to adjust and manage to cope with stress more effectively.

*Stress is a word that is usually used to describe experiences that are challenging emotionally and physiologically.*

Types of stress:

1. Acute Stress: Sometimes you can feel stressed for a short period.
2. Chronic Stress: When stress spirals on for too long, it can have damaging effects on your physical, mental, and emotional health.
3. Eustress: Positive stress
4. Distress: Negative stress

Signs of stress overload:

1. **Cognitive symptoms:** Memory problems, inability to concentrate, etc.
2. **Emotional symptoms:** Depression or general unhappiness, Anxiety, etc
3. Loneliness and isolation, Other mental or emotional health problems.
4. **Physical symptoms:** Aches and pains, Diarrhea, etc
5. **Behavioural symptoms:** Eating more or less, sleeping too much or too little, etc

Causes of Stress:

- Being under lots of pressure
- Facing big changes
- Worrying about something
- Not having much or any control over the outcome of a situation
- Having responsibilities that you're finding overwhelming
- Not having enough work, activities or change in your life
- Times of uncertainty

## Stress response: Fight or Flight

The carefully orchestrated yet near-instantaneous sequence of hormonal changes and physiological responses helps someone to fight the threat off or flee to safety. Unfortunately, the body can also overreact to stressors that are not life-threatening, such as traffic jams, work pressure, and family difficulties.

Effects of stress: The 'Fight or Flight' response was designed to protect your body in an emergency by preparing you to react quickly. But when the stress response keeps firing, day after day, it could put your health at serious risk.

## Stress Management

### 1. Reducing Stress

- Relaxation Technique
- Meditation Procedure
- Biofeedback
- Creative Visualization
- Exercise
- Yoga, Tai chi, & Qigong

### 2. Preventing Stress

- Get active
- Take control
- Talk to someone
- Help other people
- Get enough sleep

### 3. Cope with stress



## How to maintain a stress journal?

A stress journal can help you identify the regular stressors in your life and the way you deal with them. Each time you feel stressed, keep track of it in your journal or use a stress tracker on your phone. Keeping a daily log will enable you to see patterns and common themes.

Write down:

- What caused your stress (guess if you're unsure).
- How you felt, both physically and emotionally.
- How you acted in response.
- What you did to make yourself feel better.







illustrator: Mahika Jain



## R PROGRAMMING REPORT

06



An interactive workshop on R Programming was held on 12th April 2021 which was hosted by Deepti Dalakoti, Disha Chaudhary and Nikita Yadav under the supervision of Ms Nikita Jain. The hosts talked about R, its installation, usage, importance, and Data structures used in R. A total of 40-42 participants attended this workshop.

The overarching goal of the workshop was to provide an introduction to the R programming language functions and to provide some instruction in data visualization.

*Which is the better language to learn for data analysis and visualization? Whether one should use R or Python? The answer is R.*

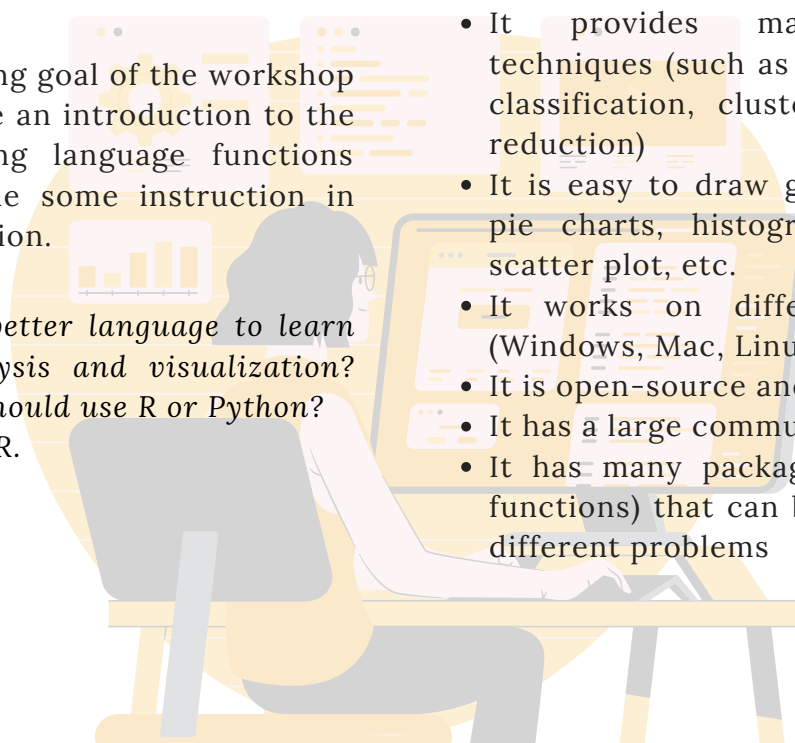
“ R is a Free/Libre and Open Source Software (FLOSS) - a well-organized and sophisticated package – that facilitates data analysis, modelling, inferential testing, and forecasting.

### How to Install R?

To install R, go to <https://cloud.r-project.org/> and download the latest version of R for Windows, Mac or Linux.

### Why Use R?

- It is a great resource for data analysis, data visualization, data science and machine learning
- It provides many statistical techniques (such as statistical tests, classification, clustering, and data reduction)
- It is easy to draw graphs in R, like pie charts, histograms, box plot, scatter plot, etc.
- It works on different platforms (Windows, Mac, Linux)
- It is open-source and free
- It has a large community support
- It has many packages (libraries of functions) that can be used to solve different problems



# SciVerse

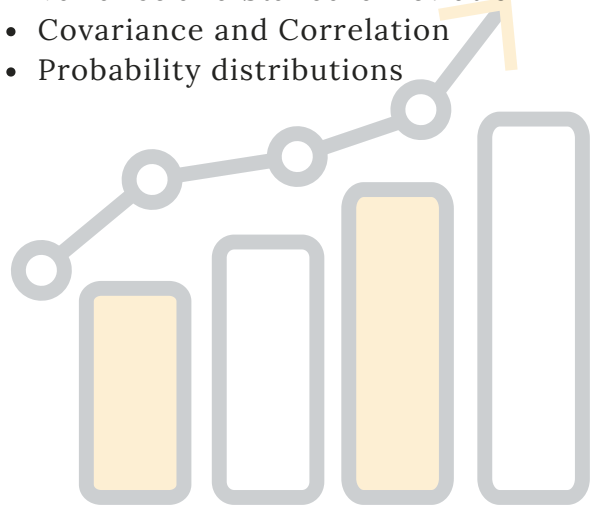
Terminologies discussed in-depth with examples:

1. Syntax
2. Comments
3. Variables in R
4. R Data Types
  - Basic Data Types
5. Type Conversion
6. Math
7. Strings
8. If ... Else
9. While Loop
10. For Loop
  - Break
  - Next
  - If .. Else Combined with a For Loop
11. Nested Loops
12. Functions
  - Default Parameter Value
13. Nested Functions
14. Recursion
15. Global Variables

## R Statistics

Statistics is the science of analyzing, reviewing, and concluding data. Some basic statistical numbers include:

- Mean, median, and mode
- Minimum and maximum value
- Percentiles
- Variance and Standard Deviation
- Covariance and Correlation
- Probability distributions



## Data Structures in R

1. Vectors: A vector is simply a list of items that are of the same type.
2. Lists in R: A list in R can contain many different data types inside it. A list is a collection of data that is ordered and changeable.
3. Matrices in R: A matrix is two-dimensional data set with columns and rows. A column is a vertical representation of data, while a row is a horizontal representation of data.
4. Arrays in R: Compared to matrices, arrays can have more than two dimensions.
5. Data Frames in R: Data Frames are data displayed in a format as a table.
6. Data Frames can have different types of data inside them. While the first column can be a character, the second and third can be numeric or logical. However, each column should have the same type of data.

7. Factors in R: Factors are used to categorize data. Examples of factors are: Demography: Male/Female; Music: Rock, Pop, Classical, Jazz; Training: Strength, Stamina

8. Plot: The plot() function is used to draw points (markers) in a diagram. The function takes parameters for specifying points in the diagram.

9. Line Graphs

10. Scatter Plots: A "scatter plot" is a type of plot used to display the relationship between two numerical variables, and plots one dot for each observation.

11. Pie charts: A pie chart is a circular graphical view of data.

12. Bar charts: A bar chart uses rectangular bars to visualize data. Bar charts can be displayed horizontally or vertically. The height or length of the bars is proportional to the values they represent.



# Financial Literacy Report

1st November to 7th November was 'Financial Literacy' week and Ananta took Instagram to spread awareness.

Financial Literacy is “the ability to use knowledge and skills to manage financial resources effectively for a lifetime of financial wellbeing.”

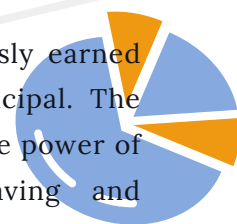
Our future financial position is dependent on the financial decisions we take today. Knowing the finances, becoming more aware of the financial risk and opportunities available, makes a person more confident, independent, and relaxed. The event aimed at educating people about financial literacy and making people acquainted with key financial concepts. It will motivate people to study more about the subject and achieve independence in taking financial decisions.

## Day 1- Financial Literacy

Money is one of the most important commodities in every person's life but money management has never been easy. Financial literacy plays a crucial role in everyone's life. Financial Literacy is the ability to understand basic financial concepts and skills required to make informed and effective financial planning and decisions using the available financial resources. It helps you in generating, managing, saving, spending, and investing money. Ever thought why should I invest money? What will happen after that? Will the money I invested now grow in the future? Is the investment I am planning now will able to fulfil my needs in the future? Through this series, we mainly focus that you should be able to answer all these questions. We want you to be financially independent, financially confident, and never face any financial problems in life.

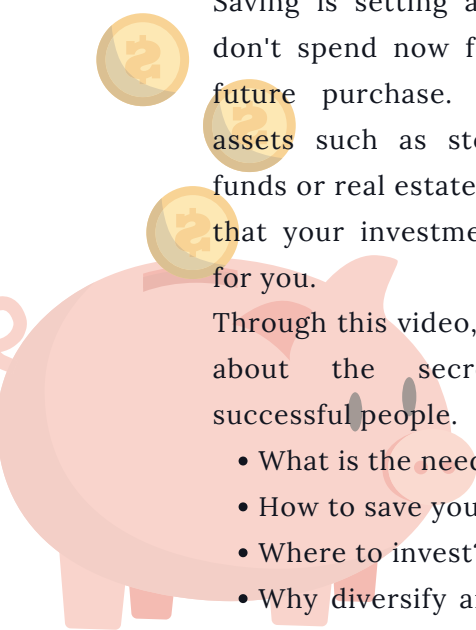
## Day 2- Compound interest

The Interest is paid on previously earned interest as well as on the principal. The best way to take advantage of the power of compounding is to start saving and investing wisely as early as possible. Even if your income is low but you have understood the power of compounding, you will become rich and more financially independent with time. The earlier you start investing, the greater will be the benefit of compounding.



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### Day 3- Savings



Saving is setting aside the money you don't spend now for emergencies or a future purchase. Investing is buying assets such as stocks, bonds, mutual funds or real estate with the expectation that your investment will make money for you.

Through this video, you will get to know about the secrets of financially successful people.

- What is the need of making a budget?
- How to save your money?
- Where to invest?
- Why diversify and follow dollar-cost averaging?

### Day 4- Taxes

A tax is a mandatory fee or financial charge levied by any government on an individual or an organization to collect revenue for public works providing the best facilities and infrastructure.

Tax-exempt refers to income or transactions that are free from tax at the federal, state, or local level.

Through this video, you would be able to understand the following concepts-

- 1.Components of consumer income
- 2.Some of the taxes levied by the government
- 3.Tax exemptions available for the taxpayers

### Day 5- Financial fraud

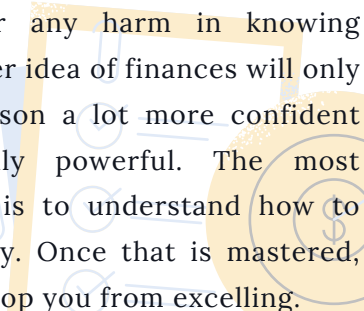
Financial fraud happens when someone deprives you of your money, capital, or

otherwise harms your financial health through deceptive, misleading, or other illegal practices. This can be done through a variety of methods such as identity theft or investment fraud.

For all types of financial fraud, it is important to report the crimes to the appropriate agencies and law enforcement as soon as possible. Fraudulent charges should also be disputed or cancelled as soon as they are discovered as well. Furthermore, victims should gather all documentation related to the crime (e.g. bank statements, credit reports, tax forms from current and previous years) and continue to file important information throughout the reporting process.

### Day 6- Conclusion

The event was aimed at spreading awareness and motivating people to learn more. We hope that we helped you add to your knowledge assets.

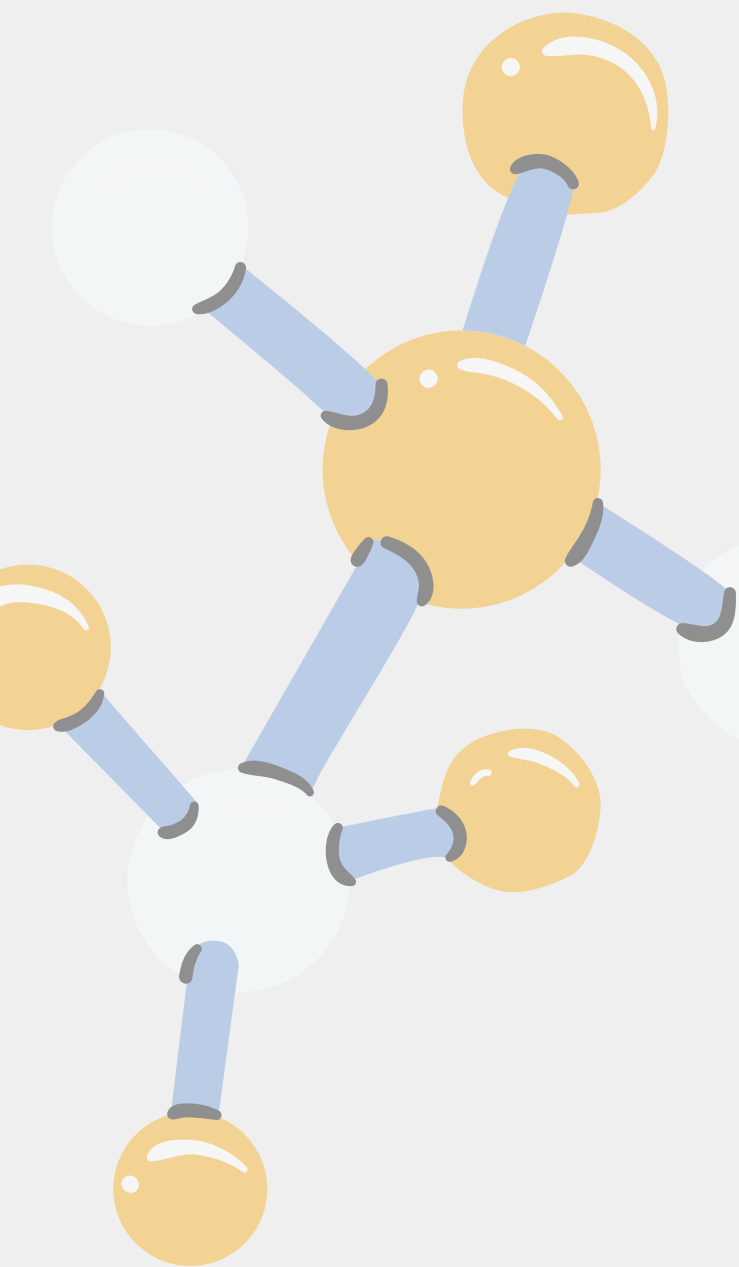


There's never any harm in knowing things. A better idea of finances will only make the person a lot more confident and financially powerful. The most difficult task is to understand how to manage money. Once that is mastered, nothing can stop you from excelling.

This event was hosted by the economics department under the guidance of Ms. Manavi Jain.



# SCIENCE EVENTS TO LOOK OUT FOR 2021



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2021 has exclaimed to be a year full of developments and various advancements. While, 2021 has swerved to peek the matters of grave concern, such as the fight against Climate change, discovering the origins of the virus- COVID detectives and determining the effectiveness of several new COVID Vaccines. 2021 also has in-store events, such as the discovery of stem cell revamp to allow scientists to better understand why so many early pregnancies end in miscarriage; discovery of a Drug to slow the progression of Alzheimer's; the long-awaited launch of the James Webb Space Telescope and radio astronomers being on the verge of detecting long-wavelength ripples produced by pairs of supermassive black holes as they orbit each other at the centres of distant galaxies. Amid threats to human health, 2021 looks set to be a pivotal year for several themes to shape research and development. This was carried out by the society members of the psychology department under the guidance of Dr Swati Jain.

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# Global Food Crisis

Food Crisis is a wake-up call.



Lack of food and its poor quality harm people's health, labour force quality, and productivity, i.e. it prevents economic growth. This also causes social and political tension and conflicts both in the regions suffering from food problems and the global world.

The global food problem has the following contradictions:

- Food production in terms of output, quality and efficiency is unevenly spread over different world regions;
- On the whole, in terms of scale, food production worldwide formally meets the current world's requirements;
- Food production is lacking in places where food shortages are felt the most;
- There is no shortage of land worldwide theoretically suitable for food production to feed even between 14 and 33 billion people; at the same time, fertile soil is being destroyed in cultivated land and industrial areas;
- Over 1 billion people suffer from starvation and undernourishment worldwide and approximately 1,6 billion people from overeating and obesity.

# GLOBAL FOOD CRISIS

“We know that a peaceful world cannot long exist, one-third rich and two-thirds hungry.”

– Jimmy Carter

The global food problem consists of the lack of food provision for the Earth's population. It manifests itself primarily in the poorest countries of the Third World and is currently aggravating as their populations grow. The total number of people suffering from a lack of food is over one billion people worldwide. The fact is that population growth outpaces agricultural production and the development of agricultural technologies.

COVID-19 impacts have led to severe and widespread increases in global food insecurity, affecting vulnerable households in almost every country, with impacts expected to continue through 2021 and into 2022.

The primary risks to food security are at the country level: Higher retail prices, combined with reduced incomes, mean more and more households have to cut down on the quantity and quality of their food consumption.

Numerous countries are experiencing high food price inflation at the retail level, reflecting lingering supply disruptions due to COVID-19 social distancing measures, currency devaluations, and other factors. Rising food prices have a greater impact on people in low- and middle-income countries since they spend a larger share of their income on food than people in high-income countries.



The many years of experience of the UN, the Red Cross and other international charitable institutions, and substantial food aid do not solve the food problems of poor countries, because they address symptoms rather than the cause. Special food and charitable programmes, however numerous they may be, have a one-off character. It is not correct either to rely on the resources of industrialized nations. We must: address the poorer countries' scientific-technical and industrial-economic backwardness factors; uproot the barbarically unjust system of benefit distribution; and stimulate the abandoning of archaic forms of agriculture in favour of scientifically sound and technologically modern methods.

It would be incorrect to approach the food problem without taking into account other global problems i.e. political, economic, energy, environmental, social and demographic.

This was a social media campaign organised by the geography department under the guidance of Dr Anindita Sarkar.

# COMIC STRIP ON: BRAIN SCIENCE AND PSYCHOLOGY RESEARCH

The comic strips on memorable brain science and psychology research and developments include new reveals about sleep, its influence on memory and decision making, and what happens in our brains when we don't get enough. Other studies include seeking genetic links to mood such as happiness and depression which have found convincing evidence of how we psychologically experience the world has roots in the genome and understanding how not unlike drug addiction, sugar dependency changes how the brain controls electrical signals linked to either pursuing a reward or putting the brakes on the pursuit, making sugar a hard habit to break.

Three-day comic strips and research were organized by the psychology department under the supervision of Dr Swati Jain on the topic of brain science and psychology research.

While recent years have seen their share of chaos, they have also produced some outstanding research.





# WORK AND RESEARCH OF FAMOUS SCIENTISTS

Three-day comic strips and research were organized by the mathematics department on the topic of work and research of famous scientists under the guidance of Mrs Ritika Gulati.

**Day 1: Roger Penrose- formation of black holes:** Sir Roger Penrose, an English mathematical physicist, philosopher of science and Nobel Laureate in Physics showed how stars collapse to form black holes. A prominent theorist whose name will be forever linked with such eminent scientists as Hawking and Einstein shared the Wolf Prize for physics with Stephen Hawking for this work on the Penrose-Hawking singularity theorems and one half of the 2020 Nobel Prize in Physics for the discovery that black hole formation is a robust prediction of the general theory of relativity. He is also known as the founding father of quantum gravity through his work on twistor theory and is an emeritus professor of mathematics at the University of Oxford.

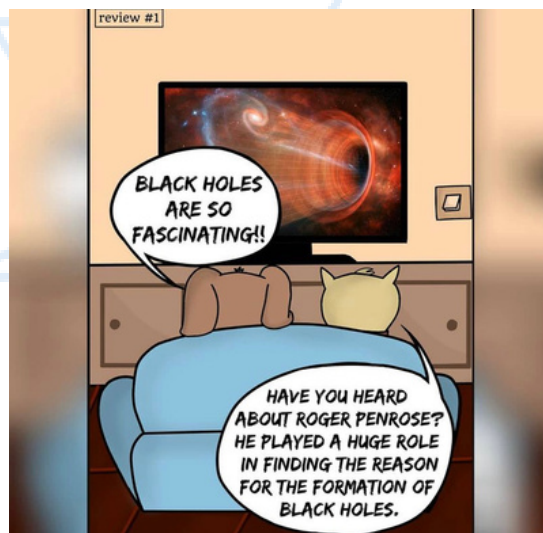
**Day 2: Dr Kary Mullis- Polymerase Chain reaction:** Dr. Mullis invented the process for analysing DNA that is called polymerase chain reaction, or PCR. It replicates a single strand of DNA millions of times, enabling scientists to pinpoint a segment of the strand and amplify it for identification. Polymerase, an enzyme that synthesizes polymers and nucleic acids, is essential in creating DNA and RNA, the molecules that are responsible for coding DNA.

Before PCR, amplifying DNA took weeks, because it had to be generated in bacteria. Once Dr. Mullis's process was perfected, it took only hours, opening up a world of possibilities.

Today, his method is used to detect genetic mutations that can lead to diagnosis of diseases, like sickle cell anaemia; analyse ancient sources of DNA, like bones; assist

in obtaining crime scene evidence;  
and determine paternity.

Day 3: Allen J Bard- Modern Electrochemistry : He is renowned as the 'father of modern electrochemistry'. His discoveries have made many revelations for the betterment of mankind. Right from discovering electrogenerated chemiluminescence, a process that harnesses the energetic transfer of electrons between molecules to creating light in a way similar to how firefly's tail glows to scanning electrochemical microscopy which scientists used to study electrochemical behaviour, including detecting cancer cell. These are just a few examples of his hard work and dedication to the field of science. His contribution to the world of electrochemistry is immeasurable.



# ARTICLE REVIEWS

Article reviews were written by students of the Economics department on Pink Tax, India's new farm laws and impact of Kenyan producers taking over global tea markets under the supervision of Ms Manavi Jain. The reviews were posted on the Instagram page of Ananta from February 7th 2020 to February 9th 2020. In addition to the articles, topics were also depicted by comic strips, Edgar and Maya.

The article on Pink Tax highlighted the cost of being a female consumer, reviewed how higher taxes and tariffs are imposed on goods designed for women as compared to men.

The article on India's farm laws have potential to raise farm income, reviews the major issue faced in India about the farm bills and farm laws. The article also gives background on the farmers' protest that took place recently.

The article Kenyan producers taking over global tea markets highlights Indian tea producers looking inward for price recovery reviews. Kenyan tea production at much cheaper prices is hurting Indian tea producers in the world market as Kenya is flooding the global black tea markets due to higher production in the country. Indian tea producers are relying more on the domestic market this year for better price recovery.





# FIELD PRIZES IN MATHEMATICS



**The Math Department organized a social media campaign,** under the guidance of Mrs Ritika Gulati focusing on providing information on the Fields Prize. It is considered to be the mathematician's Nobel Prize.

It was a social media campaign with three posts. The first post of the Strip discussed this prestigious prize, the eligibility, the frequency and other details. The depiction of the gold medal was also explained. The second post was based on the works of different scientists. Some notable Fields Prize Honorees were mentioned along with their work who contributed immensely in their field of research.

The work done by them has inspired the younger generation to continue to strive for their goals. Some of them were Maryam Mirzakhani, Manjul Bhargava and Alessio Figalli. In the last post of the strip, other renowned awards in the field of mathematics were discussed. From pure math to applied mathematics, there have been initiatives to encourage women to study and have active careers in mathematics. Thus, more mathematical prizes for women were discussed.





# MASK: A NEW WASTE

A three-day social media campaign was held by the **Geography Department** under the supervision of Dr Anindita Sarkar from 25th April 2021 to 27th April 2021 on Mask: a new waste.

With the outbreak of the Corona Virus, precaution was the first and last step to be taken up. People were guided to use sanitisers, face mask and maintain a social distance.



With the hike in cases, the wearing of face masks was made mandatory for everyone to use. The market for face masks suddenly widened resulting in the settling up of large manufacturing firms for face masks. The increase in production leads to an increase in the disposal of face mask waste becoming a major concern in our environment to look up. Therefore, the major focus should be on the production and use of biodegradable masks which are:

- 1 Sustainable
- 2 Less Polluting
- 3 Independent of Plastic Constituents
- 4 Easily Reused by Washing

Thus, it focused on the problem and its solution to save our planet as well as aware our people.



# RESEARCH AND PROJECT REVIEWS

## **The tricky terrain of gender, sexuality and mental health by Bharavi Yadav**

**(II Year, Psychology)**

**Mentor: Dr Swati Jain**

Gender and Sexuality have been taboo topics for a long period. Earlier models of Psychology viewed them as a disorder that can be treated using therapies. But with the advent of a new and complex social world, gender and sexuality also changed the perspective on an individual's choice also. Sex has taken up a non-procreative lens and counselling and therapy have become more inclusive. The following project was an extensive suggestion on why therapy and counselling should be more inclusive especially when it comes to the LGBTQIA+ Community. The main purpose of this project was to highlight what gender and sexuality are and why the need of the hour is to focus on this community. The project was an extensive suggestion on why therapy and counselling should be more inclusive especially for the LGBTQIA+ Community. For this Instagram and it's modelling of gender and sexuality were also looked at. This project is in no manner a replacement for clinical or therapeutic setup. The focus is to make people aware of the existing trends and the problems faced by people who identify with the LGBTQIA+ communities.

## **Digital Hearing Aid Device for Impaired People using MATLAB by Sonamsi**

**(II Year, Computer Science)**

**Mentor: Ms Ritu Singhal**

Hearing loss is caused by different reasons. It can be a part of the aging process or can be hereditary. It can be caused by loud noise, injuries, infections or by side effects of any medicines. But on a good note, these can be corrected and in the past many cases have been worked upon. Traditional analog hearing aids can adjust bass, treble and volume. Hence, they are like simple radios but it is not just a technical loss of sound. Rather, hearing deficiency can increase sensitivity towards different sounds and can tolerate a certain level or type of sounds while in other cases can make sounds well heard by all, difficult to hear for the ones having hearing loss. For instance, digital technology can recognize and show the difference between noise and simple speech, so it allows speech in, while it filters out noise. Around 10% of the total population endures from some kind of hearing misfortune, yet just a minuscule level of them utilize hearing to address it. In the research paper, a basic computerized hearing aid was created utilizing MATLAB programming language. The commotion decrease channel, recurrence shaper capacity, and amplitude capacity was executed in the listening device. This digital hearing aid system was designed to target people having mild or moderate hearing loss as different mappings are done for different levels of hearing loss.

## **Impact of Augmented Reality on Science and Education by Mahak Garg, Rishija Shrivastava, Suleka Bansal, Saloni Rai**

**(II Year; II Year; I Year; I Year, Computer Science)**

**Mentor: Ms Nikita Jain**

This research focuses on the impact of augmented reality (AR) on science and education, the use of AR in teaching people with disabilities, challenges in implementing AR, and future scope.

Augmented reality is a technology that transforms the view of the physical real-world environment with superimposed computer-generated images, thus changing the perception of reality. The main objective of AR is to make users interact with 3-D objects in the form of canvas captured and highlight the physical world, this increases its capability to derive accessible perception that can be applied to real-world applications and make the understanding more flexible.

AR can be used in many fields like Physics, Computer Science, Medical, Psychology, Mathematics, Geography, Economics. Given the pandemic that is going on, AR can also be used in online classes, it enables sharing information and knowledge creatively and effectively. It also has to customize the learning path in web-based courses. AR can be used in teaching people with disabilities. The outer world can be unfolded to the people who can not walk or go outside their homes.

## **Artificial Intelligence for Mankind: Threat or Better Opportunity by Drishti Sharma and Khyati Yadav**

**(I Year, Geography ; I Year, Computer Science)**

Today, Human life revolves around Humanoid robots from Alexa to Siri, and all these are the result of Artificial intelligence. The official idea of Artificial Intelligence was first Coined back in 1955 by John McCarthy. It is a machine with the ability to solve problems done by humans with our analytical intelligence. A computer would demonstrate a form of intelligence when it learns how to improve itself by solving problems. They mimic humans and perform human-like actions but have no emotions. In today's era where every sector has digitized and it has become a new trend to lead a digital life offering previously unimagined opportunities and unprecedented threats. According to the World Economic Forum, 'Automation will displace 75 million jobs', indicating that we are moving towards a jobless future. Humans may be displaced by Human avatars and the beginning of a new era of the unemployed underclass. As Stephen Hawking said, "The rise of Robotics may be disastrous for mankind". Some scholars argue that it can do the reverse, generating new employment opportunities if we invest in reskilling and upskilling. Data scientists, Mobile operators, robotics operators, etc are new job trends produced by AI. This research analyses how AI destroys human life by becoming smarter than humans and the ways through which we can manage the AI threat making our generation prepared for the newly emerging concept of Job. Ultimately, determining whether AI will be a 'Job creator' or 'Job displacement'. The paper focuses on world preparedness to tackle the boom of technology with special emphasis on India and the ways through which technology will remain a tool of innovation and a better future for the next generations.

## **Water Level Indicator by Sonamsi**

**(II Year, Computer Science)**

**Mentor: Ms Ritu Singhal**

Living in an age where we need to be more conscious of the energy that we use, a water level indicator is ideal for saving water, power and money. We should focus more on sustainable living and therefore saving should be our practice, but smart saving is also to be considered. Therefore, monitoring things which need attention and alertness can be carried out smoothly with the help of a combination of simple circuits. Water is stored at every working place in order to fulfill the basic requirements as no life is possible without water, so installation of water level indicators at these places can help the people to monitor the storage and reduce water wastage. So, the project initiates help to reduce water wastage by monitoring the amount of water filled in a tank and alerting the responsible to close the taps before the water overflows.

## **Vertical Axis Wind Turbine for Highways by Ankita Sahu**

**(II Year, Mathematics)**

In a time of increasing energy consumption and diminishing natural resources, it is necessary to generate energy in a way that is renewable and Eco-Friendly. The concept of the production of electricity using the non-conventional form of energy i.e. wind energy came into work. In continuation of this concept, windmills with horizontal axis turbines were established to start the production of electricity. Over the years, several disadvantages of this concept popped up. To improve the old technology, VAWT (Vertical axis wind turbine) came into play replacing HAWT (Horizontal axis wind turbine) at big farms with great advantages. Now, we can get energy from wind turbines placed on the side of a roadway or in the centre of a divided highway.

This system of electrical power generation utilizes wind draft force from vehicles travelling on roadways. By installing wind turbines on the side of a road or in the centre of a road, energy can be captured and utilized. This can be done with the help of a vertical axis wind turbine, a rotating machine that converts the kinetic energy of wind into mechanical energy which in turn can be converted into electricity.

Using on-highway vehicles moving on both sides of the road, the wind-generated can be used to move the turbines and that can maximise the wind energy to generate electricity. Naturally, wind speed normally does not exceed several miles an hour. It is a natural phenomenon related to the movement of air masses caused primarily by the differential solar heating of the Earth's surface.



The wind is a classical example of a stochastic variable; due to this stochastic nature, wind energy cannot be controlled but can be managed. This is because wind power is available only when the wind speed is above a certain threshold. To commercially get a wind-powered electricity generator, requires a large-scale wind impeller.

By placing wind turbines on the side of a road or in the centre of a road, energy can be captured. There are more than 2.5 billion cars, which generate wind turbulence. The same wind turbines that are responsible for huge windmill rotation can be replaced by small efficient traffic wind turbines, which rotate with the help of moving air from passing cars on the highway. The turbine that will be used should be designed in such a manner that can fulfil all the criteria of expenses and it should give the maximum output.

### **Pandemic and E-commerce by Prachi Saxena (II Year, Computer Science)**

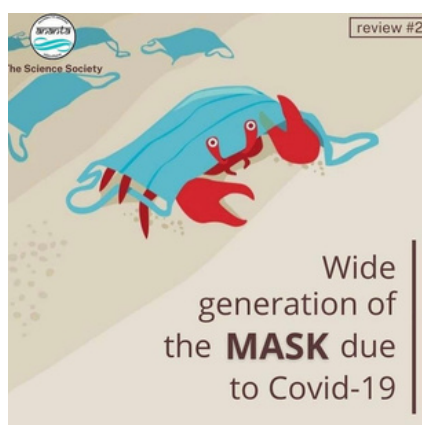
The coronavirus pandemic or the COVID 19 pandemic has led to many lifestyle changes for everyone around the globe. It has completely altered our lives and has led to grand changes in global trends. This research focuses on “the paradigm boost of e-commerce”.

There is no doubt that the e-commerce businesses have grown and expanded during this pandemic where everything else has met a halt and here is the reason why: Since standing in queues at a motor and brick shop became next to impossible the e-commerce websites have bloomed, flourished, and have become a substitute source for ordering essentials, entertainment, and luxury at your doorsteps.

This research discusses the details of the trends of e-commerce sites during the pandemic, their working amidst the pandemic, challenges faced and monitors their growth as well as uncovers their hand behind the spread of the virus. In the end, it predicts the behaviour of consumers towards e-commerce in the future.

# HOW THE TEAM STAYED CONNECTED DURING THE PANDEMIC

By Diya  
Year 2  
Economics



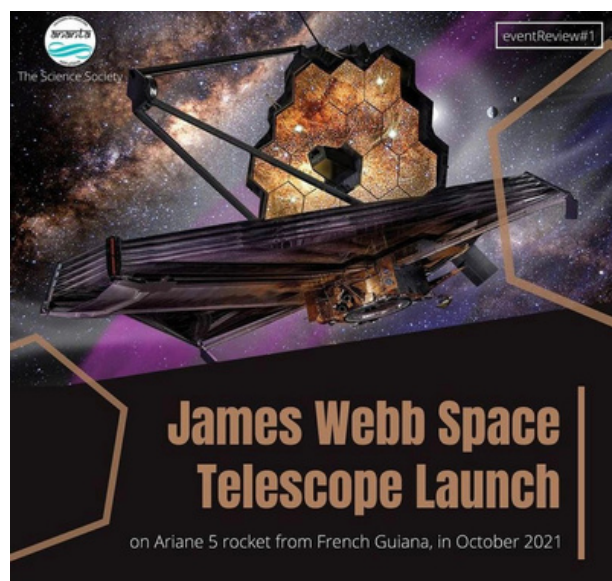
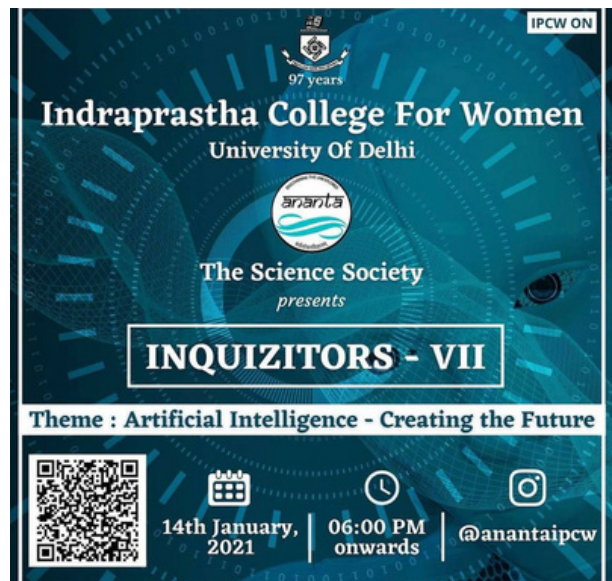
Our lives have been changed forever by the coronavirus pandemic and of course, many of us feel a wave of nostalgia down our spine every time we think about our lives before the pandemic. We never envisioned our college years without any physical interaction with our professors and fellow students. It never crossed our minds that our classes would be synonymous with screens and our day spent doing assignments. Similarly, the workings of college societies have changed significantly and engaging with Ananta before and during the pandemic was an entirely different experience.

The days when we used to reserve auditoriums for events, budding teammates undertaking event decoration, making posters, smiling and giggling as we moved around the college campus, setting up stalls, calling out for students to partake in organised competitions, professors and students coordinating to make events a success, is just a sample of what we used to accomplish. This is the reality of today's world. As everything was online, students couldn't get to know each other much. All we saw were students in small boxes, some of

which were simply icons, listening to the meeting organisers and individuals who were either outgoing or had a valid argument to make. Social media handles of students were the only means of personal engagement available. Even though there was a tonne of negativity in the air, the team had a clear vision and managed to bring out the best in each other. Working together in online mode was difficult, but the team and the professors persevered and organised several amazing events such as SciVerse-online workshop series, Inquizitors-a quiz series, comic strip series-Maya and Edgar, review article series, various scientific facts on Ananta's Instagram page, and much more.

Everything was prepared ahead of time, including team meetings and the semester's schedule of activities and workshops. Though everything was different from how it used to be, one of Ananta's most important events, National Science Day, was a huge success. Previously, students used to set up stalls and describe their projects to the principal ma'am, professors, and other students. But this time, it was a three-day

event, all organised via Google Meet. Day 1 was pre-recorded films of students describing their projects and others showcasing their work live. Day-2 was a discussion session organised on discord themed “Science and Space Oddities” and Day-3 was a paper presentation session. Overall, it was a unique and enlightening experience and also people were far more involved than they had been previously. We all were grateful for the opportunity to work together amid difficult circumstances and we would cherish these memories for the rest of our lives.





# Achievements

The Physics and Nanotechnology department of SRMIST organized a biennial International Conference on Nanoscience and Nanotechnology with several foreign universities and academic societies.

Our college students, **Chinmay Chahar and Sonamsi** got the opportunity to talk with the in-house expert committee formulated by the ICONN organizers in this prestigious event and won the 'Best Students Award' along with prize money.

