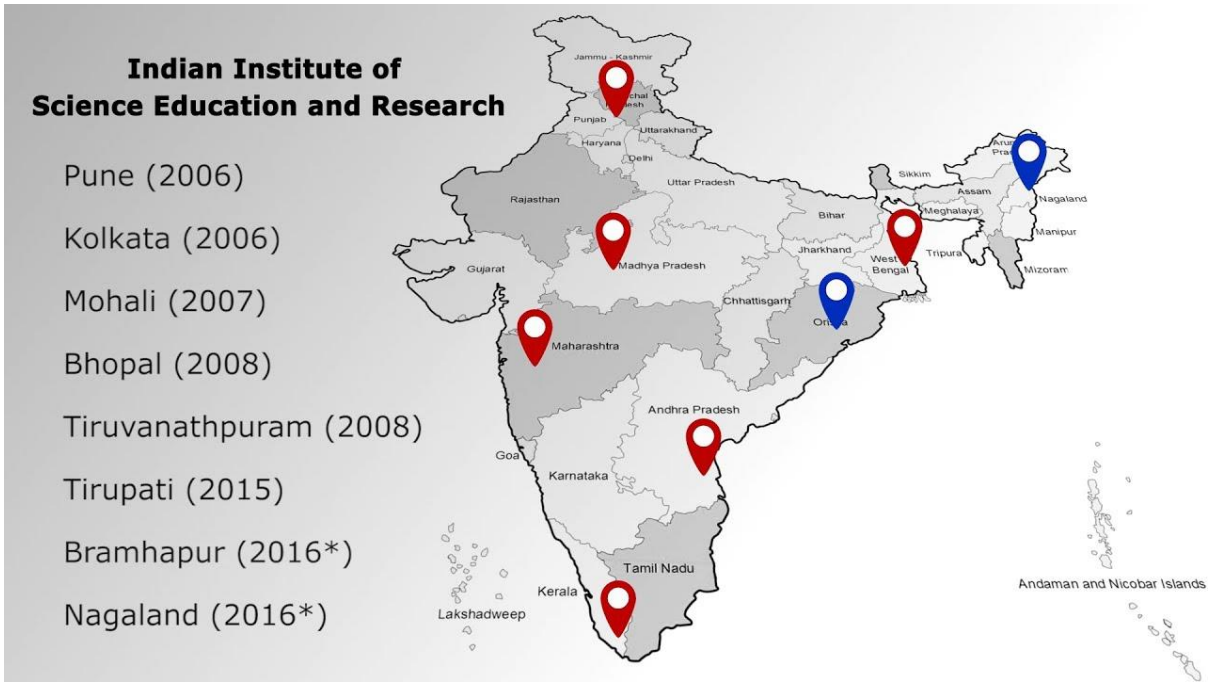
On the 29th of January 2021 the students of MAHSS got an opportunity to interact with one of the top personalities in the field of research-Dr Anindita Bhadra. Dr Bhadra did her Bachelorsand Masters of Science from the Calcutta University, Kolkata, India. She did her PhD from the Indian Institute of Science, Bangalore, India. Her thesis for her PhD was "Queens and their successors: The story of power in the primitively eusocial wasp RopalidiaMarginata." She has won several awards.She was awarded the INSA medal for young scientists in Animal Sciences in 2009. She featured among 10 Indian scientists of the decade selected by The Telegraph, India in 2010. She was selected as IAP Young Scientist 2015. Her current area of research is Behavioural ecology and evolution of free-ranging dogs in India and her achievements continue...

They say science is simply the word we use to describe a method of organising our curiosity. For all the science enthusiasts this lecture was a real feast!Some people have a wrong notion that science is difficult, but the various inputs that we received during this lecture have indeed broadened our views on what science is and how interesting it could be.The lecture began witha very creative title that read **'Curiosity, Questions and Fun'**and ma'am made sure that she convinced everyone present there that these were the perfect adjectives to describe the amazing subject-Science.

Ma'am started her presentation by sharing with us
The qualities that one must have to become a successful scientist.
1)Love for the subject: One must be interested in science, one must be passionate about the subject.
2)Habit of reading: Reading is a quality that every person aspiring to be a scientist must inculcate within himself/herself! And not just reading our textbooks at school but much beyond that. Reading exposes us to new ideas, new concepts and helps us to enhance our creativity.
3)The habit of asking questions!Just a small question and the want for an answer to that question has led to, people performing simple experiments that have led to great discoveries and conclusions.

Further, ma'am introduced us to the Origin of the **IISERs** (**Indian Institutes of Science Education and Research**)established by the Government of India through the **Ministry of Human Resource Development (MHRD)** to provide quality collegiate education in basic sciences coupled with cutting-edge research at the undergraduate level. Seven IISERs have been established across the country, namely **IISER Kolkata** in West Bengal, **IISER Pune** in Maharashtra, **IISER Mohali** in Punjab, **IISER Bhopal** in Madhya Pradesh, **IISER Thiruvananthapuram** in Kerala**, IISER Tirupati** in Andhra Pradesh, and **IISER Berhampur** in Odisha, IISER Pune and IISER Kolkata being the first ones to be established. Ma'am told us that the idea behind IISERs was to construct an equivalent of IITs bufor the Basic Sciences.



We were also shown pictures of the wonderful campus of IISER Kolkata, the library, the auditorium, the labs, etc.

Then ma'am introduced us to the **5 year programme at IISER Kolkata that we could join after our 12th standard.**
There are various departments at IISER Kolkata including, Biology, Chemistry, Earth Science, Mathematics& Statistics and Physics.
1st year: The students must do a course from each of the above-mentioned departments.
2nd year: The students must choose 3 pre-major subjects.
3rd year:The students must pick a major subject.
5th year: Is the MS project

Following this, in response to one of the questions, ma'am explained us **the entry process to IISERs**.
1)KVPY Examination
2)JEE MAINS
3)A common entrance test
{Ma'am also specified that the rank of the candidate in case of the JEE MAINS and the Common Entrance Test plays a crucial role in selecting the IISER of the candidate's choice but as far as KVPY is concerned clearing the examination would suffice.}

Ma'am also told us about the welcoming environment and hostel life at IISER Kolkata, where the new students are introduced to the rules and ways by their seniors.
The institute allows the students to carry forward their talents during the course by means of different clubs. The list of clubs is long, including: Theatre club, Music club, Art club, Photography club, Nature club, Science club etc.

IISER Kolkata also organises **Inquivesta,** a science fest under which different competitions are organised like The treasure hunt, Solving Murder mystery, Thrust etc, which are not just enjoyable but also test the student's knowledge of science and reasoning skills.**Thrust** is an event where teams compete to build and launch a pressurized water rocket with maximum efficiency. Another tech event is **Botprix**, in which participants construct a manually controlled wireless/wired robot capable of manoeuvring through various terrains.The fest also holds an event called **Biomimetics**, based on the biotechnology field of the same name.


Then ma'am gave us some information about the Global footprint of IISER Kolkata. IISER Kolkata has a Nature **index rank of 8 among Indian institutes.**

IISER Kolkata also organises several activities for the betterment of society like the '**EkPehal Programme'**, where the students of the institute teach the local children Science, Maths and English.

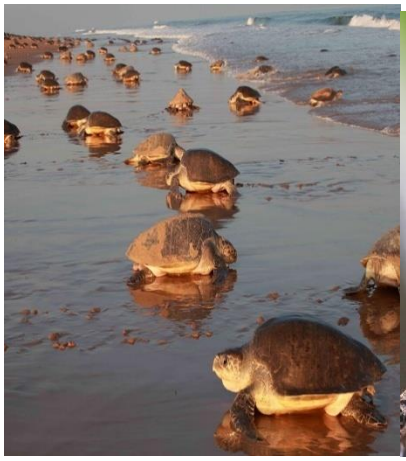
The discussions got even more interesting when ma'am began to explain to us her work as a behavioural biologist!

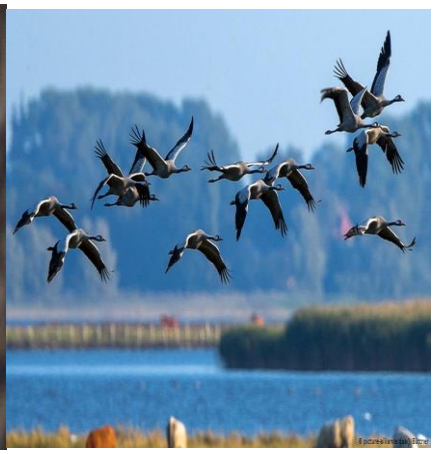
A behavioural Biologist is one who studies how animals live and why they live the way they do! The topic began with ma'am explaining how the food chain works and its significance in the environment, which definitely made us realise that nature is a tangled bank! How one organism depends on the other for survival.

Then was the most interesting part of the session when ma'am gave us a beautiful contrast between the navigation skills in humans and other living organisms. What would a human kid do if he were lost? Maybe he would start crying so that people would gather around him and ask him if he needed any help. Or maybe he would remember certain landmarks and follow them to return home. But what would birds or insects do to find the way to their destination?

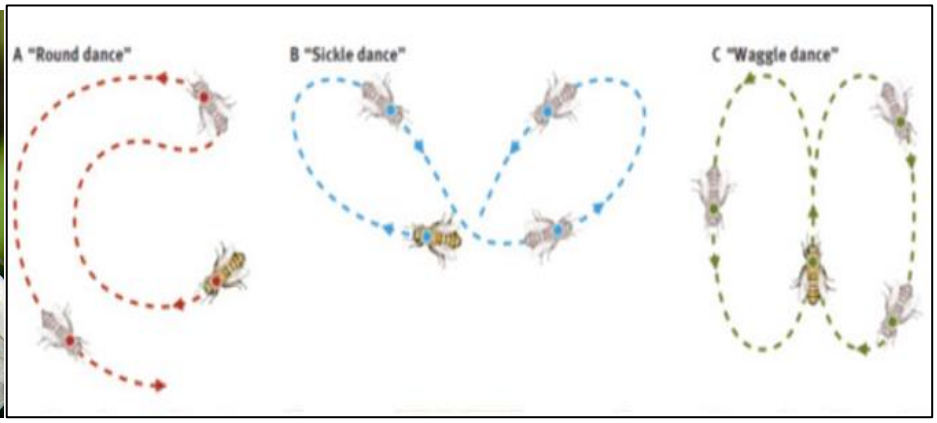
Well birds are known to detect the temperature gradients and the earth's magnetic field in order to navigate! That's how migratory birds are able to complete their long journeys successfully.

All of us have seen trails of ants may it be in the kitchen, on walls etc and we always tend to think, how come these ants always travel in a straight line? Well this question was indeed answered during the discussions. When ants travel they leave a pheromone and the ants follow the scent of this one after another to reach their destination.



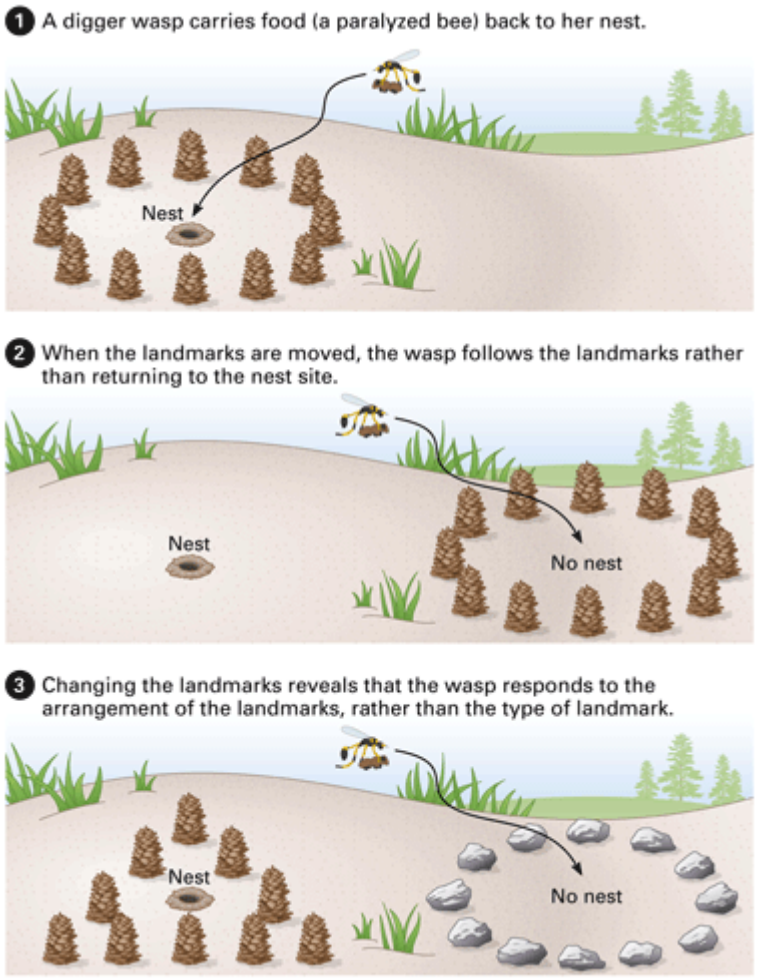


Another amazing thing that we learnt was about the discovery that honey bee dances were actually of different types and each had a significance of its own. The dances were performed in order to convey a certain message to the other bees. One of the dances was performed by the worker bees to tell the others where the food was kept.

Then came the experiment conducted to learn the navigating behaviour of the Digger Wasp or Beewolf. Initially a ring of acorns was made around the nest of the Digger wasp. The next time before the wasp returned the ring of acorns was shifted to a different location. It was seen that the wasp first came towards the ring of acorns and then realised that the nest wasn't there! This showed that it indeed recognised the ring as a landmark for

its nest. But as soon as it discovered that the nest wasn't within the ring it flew higher up and then found its nest. This shows that they can reroute their path in such cases. The next time a triangle of acorns was made around the nest and a ring of stones was made at a location nearby. When the wasp came, it flew towards the ring of stones. This tells us that they don't identify the objects that make up the landmark but they recognise the shape of the landmark!



Following this amazing discussion we were shown a video cliprecorded by ma'am at her own residence. It showed the entire process of a Potter wasp making a nest on a basket kept near a window. Each time it came to the nest it brought with it a blob of clay/mud to build further. The nest had several dome like structures. Ma'am told us that the wasp laid eggs in each of those dome like structures, dropped a food source (ex. A caterpillar) for the young ones when they would hatch and then

sealed it off. The clip included a situation when ma'am lifted the basket and kept it at a slightly higher level. When the wasp returned initially she couldn't find the nest, following which she increased her altitude at which she was flying, and successfully located the nest!

All the experiments that ma'am shared with us were really interesting and the pictures and videoclips in the presentation made it even more enjoyable. At the end of the presentation Ma'am highlighted the fact that the experiments that she discussed with us didn't involve any superb technology or rocket science but it all started with a simple question and the ability of the person who asked the question to try and find an answer to that.

'How could the wasp locate the correct hole containing its nest when any person wouldn't be able to differentiate between the many holes present there?', this was the question. And apparatus was nothing but a bunch of acorns and stones and most importantly, a creative mind.

The lecture was very informative and gave us a clear idea about IISERS, the courses there, the entry process etc and the various pictures, the videoclip of the Potter Wasp, all the experiments and stories that ma'am shared with us have indeed made us realise how mesmerising and wonderful nature and science is! And yes, we all will indeed drive home an important message after this lecture. **Never stop asking questions! For there is no good science without good questions!**

Written By Saumya Hede

Class XI