

JAIPUR [/] IISU Campus, Gurukul Marg, SFS, Mansarovar, Jaipur-302020 **T:** +91-141-2400160-161, **W:** www.iisuniv.ac.in, **E:** iisuniversity@iisuniv.ac.in



CHEMICAL ASSOCIATION

Submitted By:

Dr. Deepak Singh Rajawat

IIS (deemed to be University), JAIPUR Chemical Association Committee (2022-2023)

The committee formed to organize and coordinate the activities of the **Chemical Association** is as follows:

S.No.	Name	Position
1	Dr. Deepak Singh Rajawat	Coordinator
2	Dr. Ruchi Singh	Co-Coordinator
3	Dr. Lav Varma	Member

About Chemical Association

The IISU Chemical Association was set up in 1999 for the enrichment of science faculty students. The association emphasized the need to promote excellence and quality in higher education by breaking the barrier of the traditional methods of imparting education. The association has implemented several beneficial practices in the university to enrich the student's experience.

The main objectives of the association are-

- To develop research aptitude among students, scientific thinking, and passion for scientific inquiry.
- To develop a combination of knowledge, skills and competence to encourage scientific activity and creative expressions by providing resources and opportunities.
- > To adopt healthy practices for furthering the cause of higher education
- To increase awareness and develop an interest among the students in applied aspects of chemistry along with training in various analytical tools and techniques of study
- > To provide a high standard of teaching and training through knowledge sharing

Furthermore, the Chemical Association publishes an in-house magazine called Science Spectrum to increase awareness and creative expression. The association also provides training in various analytical tools and techniques. Over the years, the IISU Chemical Association has conducted a variety of webinars, guest lectures, competitions, and industrial visits.

Number of meetings held in the year-04

Agenda for the Meeting of the Chemical Association to be held on 10th July 2022

- To consider and approve the minutes of the last meeting held on 23 March 2022.
- To discuss the events to be organized in the current academic year and their tentative schedules.
- To finalize the faculty and student coordinators of various activities for the upcoming events.

Minutes of the Meeting of Chemical Association held on 10th July 2022 at 3.15 pm at IISU Campus, Jaipur

The following members were present:

S.No.	Name	Designation
1	Dr. Deepak Singh Rajawat	Coordinator
2	Dr. Ruchi Singh	Member
3	Dr. Lav Varma	Member

At the outset, of the meeting held on 10th July, coordinator, Dr. Deepak Singh Rajawat welcomed all the members of the Chemical Association Committee. The agenda items were taken up and after considerable discussions following decisions were taken.

- 1. The minutes of the last meeting held on 23 March 2022 were considered and approved
- 2. The tentative schedule for the events to be organized in the current academic year were discussed and finalized as follows-
 - Bookmark Making Competition was tentatively decided in September 2022.
 - Wall Magazine Competition was tentatively decided in October-December 2022.
 - A 7 Days workshop was tentatively planned in the month of March 2023.
- 3. Faculty Coordinators and student members for each event were discussed and finalized.

The meeting ended with a vote of thanks.

IIS (Deemed to be University), Jaipur

Department of Chemistry

Attendance Sheet

Date: 10th July 2022

S. No.	Name	Designation	Signature
1	Dr. Deepak Singh Rajawat	Sr. Assistant Professor (Member)	Pat
2	Dr. Ruchi Singh	Sr. Assistant Professor (Member)	NO
3	Dr. Lav Varma	Assistant Professor (Member)	Lol

Agenda for the Meeting of the Chemical Association to be held on

27th August 2022

- To consider and approve the minutes of the last meeting held on 10th July 2022.
- To discuss the date and schedule of the upcoming events in the current academic year.
- To finalize the theme, objectives of the event and necessary planning for the organization of the event.

Minutes of the Meeting of Chemical Association held on 27th August 2022, at 3.15 pm, at IISU Campus

The following members were present:

S. No.	Name	Designation
1	Dr. Deepak Singh Rajawat	Coordinator
2	Dr. Ruchi Singh	Member
3	Dr. Lav Varma	Member

At the outset of the meeting held on 27th August, the coordinator, Dr. Deepak Singh Rajawat welcomed all the members of Chemical Association Committee. The agenda items were taken up and after considerable discussions following decisions were taken.

Decisions taken for the upcoming events to be celebrated are as follows-

- 1. The dates for the events decided in the previous meeting were discussed and finalized as follows-
 - Bookmark Making Competition- 16 Sept 2022
 - Wall Magazine Competition- 31 October- 10 December 2022
- 2. Faculty coordinators in consultation with other members, discussed and finalized the theme and objectives of the events.
- 3. Created a schedule, rules and regulations for the event planning process.
- 4. Names of the judges for both events were discussed and finalized.

Meeting ended with a vote of thanks.

Chemical Association Report 2022-23

IIS (Deemed to be University), Jaipur

Department of Chemistry

Attendance Sheet

Date: 27th August 2022

S. No.	Name	Designation	Signature
1	Dr. Deepak Singh Rajawat	Sr. Assistant Professor (Member)	Port
2	Dr. Ruchi Singh	Sr. Assistant Professor (Member)	18
3	Dr. Lav Varma	Assistant Professor (Member)	Low

Agenda for the Meeting of the Chemical Association to be held on

20th November, 2022

- To consider and approve the minutes of the last meeting held on 27th August 2022.
- To discuss about the date and schedule of the 7 Days workshop to be organized in the current academic year.
- To discuss the theme, objectives of the event and necessary planning for the organization of the event.

Minutes of the Meeting of Chemical Association held on 20th November 2022, at 3.15 pm, at IISU Campus

The following members were present:

S. No.	Name	Designation
1	Dr. Deepak Singh Rajawat	Coordinator
2	Dr. Ruchi Singh	Member
3	Dr. Lav Varma	Member

At the outset of the meeting held on 20th November, Dr. Deepak Singh Rajawat welcomed all the members of the Chemical Association Committee. The agenda items were taken up and after considerable discussions following decisions were taken.

- 1. The dates for the 7 Days workshop were discussed and finalized.
- 2. Faculty coordinator in consultation with other members, discussed and finalized the theme and objectives of the events.
- 3. Target group for the workshop was decided.
- 4. Different topics to be covered in 7 Days workshop were discussed and finalized.

Meeting ended with a vote of thanks.

IIS (Deemed to be University), Jaipur

Department of Chemistry

Attendance Sheet

Date: 20th November, 2022

S. No.	Name	Designation	Signature
1	Dr. Deepak Singh Rajawat	Sr. Assistant Professor (Member)	Fit
2	Dr. Ruchi Singh	Assistant Professor (Member)	20-
3	Dr. Lav Varma	Assistant Professor (Member)	Land

Agenda for the Meeting of the Chemical Association to be held on 25th February, 2023

- To consider and approve the minutes of the last meeting held on 27th August 2022.
- To discuss about the date and schedule of the 7 Days workshop to be organized in the current academic year.
- To discuss the theme, objectives of the event and necessary planning for the organization of the event.

Minutes of the Meeting of Chemical Association held on 25th February, 2023 at 3.15 pm, at IISU Campus

The following members were present:

S. No.	Name	Designation
1	Dr. Deepak Singh Rajawat	Coordinator
2	Dr. Ruchi Singh	Member
3	Dr. Lav Varma	Member

At the outset of the meeting held on 20th November, Dr. Deepak Singh Rajawat welcomed all the members of the Chemical Association Committee. The agenda items were taken up and after considerable discussions following decisions were taken.

- 1. Created a schedule, rules and regulations for the workshop.
- 2. Duties were distributed to the members for the organization of 7 Days workshop.
- 3. List of speakers for different topics to be covered during 7 Days workshop were finalized.

Meeting ended with a vote of thanks.

IIS (Deemed to be University), Jaipur

Department of Chemistry

Attendance Sheet

Date: 25th February 2023

S. No.	Name	Designation	Signature
1	Dr. Deepak Singh Rajawat	Sr. Assistant Professor (Member)	Fit
2	Dr. Ruchi Singh	Assistant Professor (Member)	set.
3	Dr. Lav Varma	Assistant Professor (Member)	Le

List of Activities organised

2022-23

S. No.	Type of Event (Workshop /Seminar /FDP etc.)	Title of the event	Date	Venue	Name of Resource person (if any) with designation, address, email address & contact no.	No. of Participants/ Beneficiaries	Name of Collabora ting Agency (if any) with address & contact no.	Weblin k	Annexure No. of Report
1	Competition	Bookmark Making Competitio n	16 Sept 2022	C-506		35			Annexure 1
2	Guest Lecture	Structuring and Writing a Scientific Research Proposal	30 Sept 2022	Ojas Hall	Dr. Sanjay Batra, CDRI, Lucknow	35	-		Annexure 2
3	Competition	Wall Magazine Competitio n	31 Oct- 10 Dec 2022	C-405		21			Annexure 3
4	Workshop	7 Days workshop on "Scientific and Technical Writing"	13 Mar- 19 Mar 2023	C-506	Dr. Neelima Gupta, Dr. Manisha Patni, Dr. Deepak Singh Rajawat, Dr. Lav Varma, Dr. Priyanka Jain	40			Annexure 4

Annexure I

Report

Title of the Event: Bookmark Making Competition Type of the Event: Competition Date: 16 September 2022, 1.00-1.45 pm Time: 1.00 pm Venue: C-506 Target Group: UG and PG Students No. of Participants: 35 Activity Coordinators: Dr. Ruchi Singh, Dr. Lav Varma, Dr. Deepak S. Rajawat

Objective: To celebrate World Ozone Day 2022 by commemorating this year's theme 'Global cooperation to protect life on earth'.

Summary/Description: A Bookmark making competition was organised by the IISU Chemical Association in the Department of Chemistry on 16th September 2022 from 1.00 to 1.45 pm to celebrate World Ozone Day. The theme of competition was 'Global cooperation to protect life on earth'. Students turned up with great zeal, participated enthusiastically and displayed their creativity to justify the event's theme. A total of 35 bookmarks were prepared by the participants. The activity was enjoyed by all. The competition ended with a group photograph. Winners were selected by a panel of judges, based on their creativity and justification of the theme.



Judges for the event were:

- 1. Dr. Pragya Sinha, Associate Professor, Dept. of Chemistry
- 2. Dr. Varsha Goyal, Associate Professor, Dept. of Chemistry
- 3. Dr. Trapti Gupta, Associate Professor, Dept. of Chemistry
- 4. Dr. Ruchi Singh, Sr. Assistant Professor, Dept. of Chemistry

Position	Name	Enrollment No.	Course & Semester
Ι	Ms. Priyanka Gurjar	IISU/2022/33754	MBA (Finance) Sem-I
II	Ms. Anika Rastogi	IISU/2020/31965	B.Sc. Sem-V
III	Ms. Jaya Tanwar	IISU/2022/33911	B.Sc. B.Ed. Sem-I
IV	Ms. Ritika Sharma	IISU/2020/31753	B.Sc. B.Ed. Sem-V
V	Ms. Pragya Singh	IISU/2021/33323	M.Sc. Chemistry Sem-III

Outcome: The event provided a platform for students to showcase their creativity and express their understanding and awareness about the Ozone Layer and its protection. The activity was enjoyed by all. Undoubtedly, the bookmark competition was informative and helpful for the students.

Weblink: https://chemistry.iisuniv.ac.in/content/bookmark-making-competition

Attachments of Annexure I



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September 13, 2022

NOTICE

This is to inform all the UG and PG students of the Department that the IISU Chemical Association is organizing a **Bookmark Making Competition** on **16 September 2022** to celebrate the World Ozone Day. Students are required to bring the necessary material to make a bookmark on the theme 'Global Cooperation Protecting life on Earth.' The theme recognises the wider impact of the Montreal Protocol on climate change and the need to act in collaboration, forge partnerships and develop global cooperation to address climate challenges and protect life on earth for future generations.

٠	Time	4	1.00 pm- 1.45 pm
	Venue	:	Room C-506

Interested students may give their names to Dr. Ruchi Singh, Dr. Deepak Singh Rajawat or Dr. Lav Varma by 15 September 2022. However, spot registration will also be considered.

Students are required to reach the venue by 12.50 pm.

Winners will be selected based on their creativity and justification of the theme.

Dr.['] Manisha Patni Head, Department of Chemistry

Dr. Ruchi Singh Activity Co-ordinator

Attendance Sheet

Name of the department: Chemistry

Name of the activity: Bookmark Making Competition

Category: Competition

Total Number of students: 35

Date & Time: 16/9/2022 ; 1:00 pm

Venue: C-506

S. No	Name of the student	Enrolment number	Programme
1.	Ms. Pragya Singh	IISU/2021/33323	M.Sc.
2.	Ms. Renu Sharma	IISU/2021/32523	M.Sc.
3.	Ms. Vanisha Sharma	IISU/2021/33238	M.Sc.
4.	Ms. Priyanka Relan	IISU/2021/33373	M.Sc.
5.	Ms. Rasadhika Sharma	IISU/2021/33336	M.Sc.
6.	Ms. Garima Yadav	IISU/2021/32678	M.Sc.
7.	Ms. Anushruti	IISU/2021/33014	M.Sc.
8.	Ms. Amisha Gurjar	IISU/2021/33610	M.Sc.
9.	Ms. Ankita Meher	IISU/2021/33503	M.Sc.
10.	Ms. Ankita Sheoran	IISU/2021/33525	M.Sc.
11.	Ms. Sonia swami	IISU/2021/33501	M.Sc.
12.	Ms. Aarushi Singh	IISU/2022/34318	B.Sc. (H.)
13.	Ms. Tanvi Singh	IISU/2022/34184	B.Sc. (H.)
14.	Ms. Jaya Tanwar	IISU/2022/33911	B.Sc. B.Ed.
15.	Ms. Vishakha Parihar	IISU/2022/33957	B.Sc. (P.C.)
16.	Ms. Sakshi Agarwal	IISU/2022/33888	MFA Sem I
17.	Ms. Mridul Mathur	IISU/2022/34730	MFA Sem I
18.	Ms. Priyanka Gurjar	IISU/2022/33754	MBA Sem I
19.	Ms. Nancy Purohit	IISU/2020/31887	B.Sc. Sem V (P.C.)
20.	Ms. Mansi Rathore	IISU/2020/31954	B.Sc. Sem V (P.C.)
21.	Ms. Kritika Khandelwal	IISU/2020/31524	B.Sc. Sem V (H.)
22.	Ms. Ishika Gyanchandani	IISU/2020/31712	B.Sc. Sem V (H.)
23.	Ms. Himanshi Jain	IISU/2020/31985	B.Sc. Sem V (P.C.)
24.	Ms. Avani Sharma	IISU/2020/31675	B.Sc. Sem V (P.C.)

25.	Ms. Tanya Mudgal	IISU/2020/27224	B.Sc. Sem V (B.Ed.)
26.	Ms. Ritika Sharma	IISU/2020/31753	B.Sc. Sem V (B.Ed.)
27.	Ms. Anika Rastogi	IISU/2020/31965	B.Sc. Sem V (P.C.)
28.	Ms. Bhoomika rathore	IISU/2020/32007	B.Sc. Sem V (P.C.)
29.	Ms. Princy Pushpangadan	IISU/2020/27161	B.Sc. Sem V (P.C.)
30.	Ms. Devanshi Gupta	IISU/2020/31391	B.Sc. Sem V (B.Ed.)
31.	Ms. Ritambhara Joshi	IISU/2020/31418	B.Sc. Sem V (B.Ed.)
32.	Ms. Soumya Singh	IISU/2020/33252	B.Sc. Sem V (P.C.)
33.	Ms. Himanshi Ramchandani	IISU/2020/31375	B.Sc. Sem V (B.Ed.)
34.	Ms. Komal Chugh	IISU/2020/27091	B.Sc. Sem V (B.Ed.)
35.	Ms. Akshita Kaviya	IISU/2020/31340	B.Sc. Sem V (P.C.)

Annexure II

Report

Title of the Event: Guest Lecture Type of the Event: Guest Lecture Date: 30 September 2022 Time: 3.00-4.00 pm Venue: Ojas Hall Target Group: Research Scholars & Faculty members of all sciences No. of Participants: 35 Resource Person: Dr. Sanjay Batra Topic- "Structuring and writing a Scientific Research Proposal" Activity Coordinators: Dr. Ruchi Singh, Dr. Deepak S. Rajawat, Dr. Lav Varma

Objective: To acquaint the faculty members and research scholars with the basic process of project submission and to enhance their knowledge about the do's and don'ts regarding the project submission to various agencies like DST and CSIR etc.

The Department of Chemistry under the aegis of IISU Chemical Association organized a guest lecture on 30th September 2022 on the topic Structuring and Writing a Scientific Research Proposal for all the research scholars of sciences in Ojas Hall, IIS (Deemed to be University) on 30th September, 2022. The guest lecture was given by Dr. Sanjay Batra, Medicinal and Process Chemistry Division, CSIR- Central Drug Research Institute, Lucknow. Dr. Krishna S. Sharma, Advisor, IIS (deemed to be University), felicitated Dr. Sanjay Batra for the guest lecture.

Professor Batra started the lecture by explaining the basic proposal of writing Research Proposal Paper. The topics that were covered while this lecture was how to write a paper, Programmes such as Commonwealth Fellowship and German Fellowships that offer a great platform to the foreign student, what is Research, purpose of Research, importance of creativity and innovation and also the other things such as funding, execution, grants and scope.

He gave an overview on a good project proposal, an original impacting idea and its adequacy to funding agency requirements. The key point that needs to be focused by the beginners were also discussed. Professor Batra further explained the ways to write summary and title emphasizing on the fact that they should be brief. Apart from the merits and ways of writing Research Proposals, the causes of rejection and ways to avoid them were also discussed.

The event ended with a warm vote of Thanks. It was greatly receipted by the research scholars and faculty members.

Chemical Association Report 2022-23 |





Outcome: The guest lecture provided an excellent knowledge about Structuring and writing a Scientific Research Proposal to the research scholars as well as faculty members

Weblink: https://chemistry.iisuniv.ac.in/content/guest-lecture-dr-sanjay-batra

Attachment of Annexure II



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September 27, 202

NOTICE

The IISU Chemical Association is organizing a Guest Lecture on 'Structurin and Writing a Scientific Research Proposal' for all Research Scholau and faculty members of Science stream.

Speaker :		Prof. Sanjay Batra Medicinal and Process Chemistry Division CSIR- Central Drug Research Institute Lucknow	
Date	:	30 September 2022	
Time	:	3:00 pm -4:00 pm	
Venue	:	Ojas Hall	

All are requested to attend the same.

Dr. Manisha Patni Head, Dept. of Chemistry

List of Participants

Name of the department: Chemistry

Name of the activity: Guest Lecture

Total number of participants: 51

Date & Time: 16/9/2022 ; 3:00 pm

Venue: Ojas Hall

1	Prof.	K.S. Sharma
2	Prof.	Ramphal Sharma
3	Dr.	Priyanka Mathur
4	Dr.	Geeta Pandey
5	Dr.	Neelu Kanwar Rajawat
6	Dr.	Anju Sharma
7	Dr.	Keerti Sharma
8	Dr.	Shilpi Rijhwani
9	Dr.	Smita Purohit
10	Dr.	Sreemoyee Chatterjee
11	Dr.	Payal Chaturvedi
12	Dr.	Radhika Sharma
13	Dr.	Nidhi Gupta
14	Dr.	Charu Sharma
15	Dr.	Neha Batra
16	Dr.	Shewane Bishnoi
17	Prof.	R. K. Bansal
18	Prof.	Raakhi Gupta
19	Dr.	Manisha Patni
20	Dr.	Pragya Sinha
21	Dr.	Varsha Goyal
22	Dr.	Trapti Gupta
23	Dr.	Ruchi Singh
24	Dr.	Deepak Singh Rajawat
25	Dr.	Lav Varma
26	Dr.	Priyanka Jain
27	Ms.	Chandani Mathur
28	Ms.	Akanksha Khandelwal
29	Dr.	Ritu Jain
30	Dr.	Nidhi Bhargava
31	Dr.	Rimpy Shukla

32	Dr.	Rajni Gupta
33	Ms.	Mudita Menon
34	Dr.	Ekta Mittal
35	Ms.	Manisha Sisodia
36	Ms.	Pragati Sharma
37	Ms.	Nausheen Baig
38	Ms.	Prerna Sain
39	Ms.	Priyanka Suthar
40	Ms.	Saksham Tiwari
41	Ms.	Manisha Singhal
42	Ms.	Manjyot Kaur
43	Ms.	Preeti Sharma
44	Ms.	Kusum Rani
45	Ms.	Harkish Rathore
46	Ms.	Shobhana Mishra
47	Ms.	Sakshi Mehta
48	Ms.	Damini Soni
49	Ms.	Zoya Hussain
50	Ms.	Priyal Vijay
51	Ms.	Mahima Tanwar

Annexure III

Report

Title of the Event: Wall Magazine Competition Type of the Event: Competition Date: 31 Oct to 10 Dec 2022 Time: 9.30 am Venue: C-405 Target Group: PG Students No. of participants: 21 Activity Coordinators: Dr. Lav Varma, Dr. Ruchi Singh, Dr. Deepak S. Rajawat,

Objective: The objective of the Wall Magazine Competition was to motivate PG students to actively participate in knowledge sharing, cultivate the habit of reading scientific content in a scholarly manner, and innovatively showcase their knowledge.

Summary/Description: The IISU Chemical Association in the Department of Chemistry organized a wall magazine competition titled "Travel with Science" for M.Sc. (Chemistry) students from 31 October to 10 December 2022. The competition was held under the theme of "Latest News in Chemistry." The participating students were divided into six groups named Argon, Xenon, Krypton, Helium, Neon, and Radon. The students were required to create and display wall magazines highlighting various aspects of the latest news in chemistry, such as Noble Laureates in Chemistry, toxicity, chemical treatments of wastes, Indian chemistry scientists, and more.



FILTERATION

The participants exhibited tremendous enthusiasm and demonstrated their creativity in justifying the event's theme. A total of seven wall magazines were created and showcased by the participants. The wall magazines served as an effective medium for sharing knowledge and innovatively engaging with the subject matter.



The panel of judges viz. Dr. Raakhi Gupta, Dr. Manisha Patni, Dr. Deepak S. Rajawat and Dr. Lav Varma, evaluated the wall magazines based on creativity and justification of the chosen topic. After careful deliberation, the winners were selected. The first position was secured by the group Krypton, while the second position was awarded to the group Argon. The winners' exceptional efforts and innovative approach to the competition were acknowledged and appreciated.

Outcome: The Wall Magazine Competition achieved its objectives of motivating M.Sc. students to actively participate in knowledge sharing and fostering the habit of reading scientific content in a scholarly manner. The event provided a platform for students to showcase their creativity and express their understanding of the latest developments in the field of chemistry. The efforts put in by the participants were commendable. The event served as a testament to the passion and talent of the M.Sc. students in the Department of Chemistry. The activity was enjoyed by all. Undoubtedly, the wall magazine was informative and helpful for the students as well as for the teachers.

Weblink: https://chemistry.iisuniv.ac.in/content/wall-magazine-competition-0

Attachments of Annexure III



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November 3, 2022

NOTICE

The Department of Chemistry under the aegis of IISU Chemical Association is organizing Wall Magazine Competition **"Travel with Science"** from 31 Oct 2022 to 10 Dec 2022. The students are required to prepare the necessary material on the theme **"Latest News in Chemistry**" and display it on the space provided. It is compulsory for the students of MSc Sem I and III. Best entries will be awarded. The students have to be ready with the display in room C 405 on every Monday by 10.30 am as per the schedule given below.

S. No.	Dates	Group	Name of Group members	Class
1	31 Oct-5 Nov 2022	Argon	Renu Sharma, Pragya Singh & Radhika Garg	M.Sc. Sem III
2	7 Nov- 12 Nov 2022	Xenon	Krati Sharma, Manvi Agarwal & Garima Yadav	M.Sc. Sem III
3	14 Nov- 19 Nov 2022	Krypton	Sonia Swami, Ankita Sheoran & Anushruti	M.Sc. Sem III
4	21 Nov- 26 Nov 2022	Helium	Amisha Gurjar, Ankita Maher & Rasadhika Sharma	M.Sc. Sem III
5	28 Nov - 3 Dec 2022	Neon	Harsha Sharma, Vanisha Sharma & Priyanka Relan	M.Sc. Sem III
6	5 Dec - 10 Dec 2022	Radon	Rashi Bala Vyas, Tanisha choudhary, Ritika & Anisha	M.Sc. Sem I

The rules for the wall magazine competition is mentioned here.

- 1. The content of magazine should be displayed on every Monday before 10.30 am.
- 2. The content should be justified with the given topic i.e. Latest News in Chemistry.
- Display should be neat, clean and readable with clear visibility. It should be catchy. Source
 of the content should be mentioned necessarily.
- Judgement of the wall magazines will be based on justification of the topic with clear display in an attractive and innovative manner.

For the details and clarification, please contact to any of the following-

- > Dr. Deepak Singh Rajawat
- > Dr. Ruchi Singh
- > Dr. Lav Varma

Dr. Manisha Patni Head, Department of Chemistry

Attendance Sheet

Name of the department: Chemistry Name of the activity: Wall Magazine Competition Category: Competition Total number of students: 21 Date & Time: 31 Oct - 10 Dec 2022; 1:00 pm

Venue: C-405

S. No.	Dates	Group	Name of Group members	Class
		Name		
1	31 Oct-5 Nov 2022	Argon	Renu Sharma, Pragya	M.Sc. Sem III
			Singh & Radhika Garg	
2	7 Nov- 12 Nov 2022	Xenon	Krati Sharma, Manvi	M.Sc. Sem III
			Agarwal & Garima Yadav	
3	14 Nov- 19 Nov 2022	Krypton	Sonia Swami, Ankita	M.Sc. Sem III
			Sheoran & Anushruti	
4	21 Nov- 26 Nov 2022	Helium	Amisha Gurjar, Ankita	M.Sc. Sem III
			Maher & Rasadhika	
			Sharma	
5	28 Nov – 3 Dec 2022	Neon	Harsha Sharma, Vanisha	M.Sc. Sem III
			Sharma & Priyanka Relan	
6	5 Dec – 10 Dec 2022	Radon	Rashi Bala Vyas, Tanisha	M.Sc. Sem I
			Choudhary, Ritika &	
			Anisha	

Annexure IV

Report

Title of the Event: 7 Days workshop on "Scientific and Technical Writing" Type of the Event: Workshop Date: 13 to19 March 2023 Time: 9.30 am Venue: C-506 Target Group: UG(H.), PG and Ph.D. Students No. of participants: 40 Activity Coordinators: Dr. Deepak S. Rajawat, Dr. Ruchi Singh, Dr. Lav Varma

Objectives:

- To familiarize students with the basic features and functionality of tools such as Word, Excel, PowerPoint, Origin & ChemDraw.
- > To develop and improve the scientific and technical writing skills in the participants.
- > To sensitize the participants on Issues related to plagiarism and ethics in scientific writing.

A 7 days workshop on "Scientific and Technical Writing" was organised by the IISU Chemical Association in the Department of Chemistry from 13 to 19 March 2023 as a part of the celebration of National Science Week. Different sessions on different topics were taken by the faculties of the Department of Chemistry and explained the handling and usage of different Microsoft tools and software. In this series, a guest lecture was also organized on "Scientific Writing-Essentials of Writing a Scientific Report" by Prof. Neelima Gupta from the University of Rajasthan. Different topics covered in this 7 Days workshop are-





Speaker for the session 1 on Day 1 was Dr. Priyanka Jain.

Dr. Priyanka Jain conducted a session on Microsoft Word formatting, covering various features and tools. The session began with an introduction to formatting options such as font styles and sizes, emphasizing their impact on document presentation. Paragraph formatting was explained, focusing on indentation, alignment, and spacing. The use of styles and themes to maintain consistency throughout documents was highlighted, simplifying the formatting process. Insertion and editing tools such as text boxes, shapes, symbols, pictures, and hyperlinks were introduced, with specific applications for dissertations and seminars. The session also included reviewing tools for collaborative editing, proofreading, and feedback, including spell check, grammar check, track changes, and comments. Overall, the participants benefited from the session, gaining knowledge and skills to create professional and visually appealing academic materials. They were able to apply the techniques learned to enhance the quality and presentation of their work.



Speaker for the session 2 on Day 2 was Dr. Lav Varma

Dr. Lav Varma conducted a session on Microsoft PowerPoint, focusing on creating effective presentations. He emphasized the importance of well-structured and visually appealing presentations that engage the audience. The session included real-time demonstrations, allowing participants to practice the techniques. Key topics covered were effective slide design, including clear content, fonts, colours, and relevant visuals. The concept of master slides was explained to maintain consistent formatting. Animation and transition effects were demonstrated, with guidance on their appropriate usage. Efficient use of the PowerPoint ribbon and shortcut keys was taught to streamline the creation process. Slide organization tips were

provided, emphasizing logical structure and visual hierarchy. Participants gained practical skills and confidence to create impactful presentations using PowerPoint's tools and features.



Speaker for the session 3 on Day 3 was Dr. Priyanka Jain

Dr. Priyanka Jain conducted a demo session on the powerful features of Microsoft Excel during the third day of the workshop. Participants were guided on graph preparation and mathematical calculations in Excel. Dr. Jain emphasized the importance of organizing data in a tabular format for easy graph creation and introduced various chart types suitable for different data types. Participants learned to customize chart appearance for improved readability. Mathematical calculations were covered using formulas, functions, and cell referencing. Participants gained knowledge of basic operations, built-in functions, and efficient application of formulas to multiple cells. Excel's data analysis tools, such as sorting, filtering, and conditional formatting, were introduced to enhance data interpretation. The session equipped participants with skills for effective data analysis and presentation using Excel's features.



Speaker for the session 4, Dr. Deepak Singh Rajawat demonstrated the usage of Origin, a data analysis and graphing software widely used in scientific research and data visualization. He provided a comprehensive overview of Origin and demonstrated various methods for plotting graphs such as line plots, scatter plots, bar charts, histograms and more. He also explained detailed customization of graph elements such as axis labels, adjusting colours, changing plot style, adding titles, grid lines, legends, error bars, and annotations. Advanced features of Origin such as 3 D plotting, contour plots, and multi-panel graphs were also demonstrated, which are particularly useful for visualizing complex data sets. Throughout the session, Dr. Rajawat provided hands-on demonstrations, allowing participants to follow along and practice the techniques being taught. By the end of the session, participants gained a thorough understanding of Origin and its data analysis and graphing capabilities.



The speaker for the session on Day 5 was Dr. Neelima Gupta, Professor, University of Rajasthan, Jaipur. She has given a lecture on "Essentials of Writing a Scientific Report". Dr. Gupta's lecture provided participants with valuable insights into the process of scientific writing and its importance for the future of research. She highlighted the importance of writing a well-structured scientific document, which provides an overview of the research and its objectives. Participants learned how to effectively summarize their research work concisely. She explained how a comprehensive review of existing research helps identify the research gap, builds a strong theoretical foundation, and supports the significance of the study. Dr. Gupta also explained the importance of accurate referencing and introduced participants to various citation styles commonly used in scientific writing, such as ACS and IEEE. The lecture

concluded with a Q&A session. Dr. Gupta addressed a range of queries, further enhancing the participants' understanding of the topic.

Overall, Dr. Neelima Gupta's guest lecture on the essentials of writing a scientific report provided valuable insights and knowledge to the participants. The lecture shed light on the challenges and opportunities in the field of research and highlighted the significance of effective scientific writing. The organizers expressed their gratitude to Dr. Gupta for sharing her valuable insights and expressed hope for more such lectures in the future.



On the final day of the workshop, Dr. Manisha Patni conducted a demonstration on the use of ChemDraw software to create and explore organic structures. Dr. Patni's expertise in using ChemDraw and her effective teaching approach made the session highly informative and accessible to participants. During the demonstration, Dr. Patni demonstrated the step-by-step process of drawing various organic structures. She also explained how to manipulate and modify existing structures using editing tools. She also demonstrated some keyboard shortcuts and commands increase the efficiency in creating chemical structures. Dr. Patni explained,

how to depict the aspects of stereochemistry accurately in ChemDraw, Dr. Patni demonstrated the use of ChemDraw to draw reaction schemes and provided practical examples and real-time visuals. In addition to the drawing capabilities, Dr. Patni also highlighted other features of ChemDraw, such as molecule searching, chemical property prediction, and spectral analysis. Apart from this, Dr. Lav Varma also explained different ways of sharing the files via google drive and other methods also. Dr. Varma provided insights into various methods of sharing files, including Google Drive and other alternative methods. Participants gained practical knowledge on how to effectively share their files with colleagues, collaborators, or other stakeholders.

By the end of the session, participants were equipped with the ability to accurately represent various organic compounds, chemical reactions and prediction of their chemical properties and spectral analysis. They also learned how to leverage the benefits of cloud storage and collaboration tools to enhance their productivity and streamline their workflow.

At the end of every session, assignments were given to the students. They completed the assignments and submitted to the respective resource persons.

After the workshop, Dr. Manisha Patni, the Head of the Chemistry Department, expressed her gratitude to all the participants and extended a warm vote of thanks. Dr. Patni acknowledged the active participation and enthusiasm displayed by the students throughout the workshop.

Dr. Patni also expressed her appreciation for the faculty members who dedicated their time and efforts to organize and conduct the workshop. Their expertise and guidance provided valuable insights to the participants, enhancing their understanding and knowledge in the field of chemistry.



Furthermore, Dr. Patni highlighted the significance of the workshop in providing practical knowledge, fostering critical thinking skills, and promoting collaborative learning among the participants. Both students and teachers benefitted from the informative sessions and interactive discussions, which further enriched their understanding of the subject matter. The informative and helpful nature of the workshop ensured that it was a valuable experience for all involved.

The workshop ended on a positive note, leaving a sense of fulfilment and accomplishment among the participants.

Outcome: The workshop was a resounding success. The workshop provided valuable insights, enhanced understanding, and practical skills to the participants. It fostered critical thinking, collaborative learning, and promoted effective scientific and technical writing. The participants left the workshop with a sense of fulfilment and accomplishment, making it a valuable and enriching experience for all involved.

Weblink: https://chemistry.iisuniv.ac.in/content/7-days-workshop-%E2%80%9Cscientific-and-technical-writing%E2%80%9D

Attachments of Annexure IV







A Seven Days Workshop on " Scientific and Technical Writing"

13-19 March, 2023

Notice

The IISU Chemical Association of Department of Chemistry, IIS (deemed to be University), Jaipur is organizing **A Seven Days Workshop on "Scientific and Technical Writing"** from 13 to 19 March 2023 as a part of celebration of National Science Week. The Programme schedule is given below.

Date	Time	Торіс	Resource Person
13 Mar 2023	9.30-11.00 am	Microsoft Word	Dr. Priyanka Jain
14 Mar 2023	9.30-11.00 am	Microsoft PowerPoint	Dr. Lav Varma
15 Mar 2023	9.30-11.00 am	Microsoft Excel	Dr. Priyanka Jain
16 Mar 2023	9.30-11.00 am	Origin Working with shared files	Dr. Deepak Singh Rajawat Dr. Lav Varma
17 Mar 2023	9.30-11.00 am	ChemDraw	Dr. Manisha Patni
18 Mar 2023	9.30-11.00 am	Scientific Report Writing	Dr. Neelima Gupta
19 Mar 2023	Till 11.00 pm	Assignment Submission	

It is compulsory for all UG (H), PG and PhD students of the Department to attend this workshop.

Please note the following important points:

- The session will begin sharp at 9.30 am every day in C-506
- You are required to assemble at least 15 minutes before the start of the session.

IISU Campus, Gurukul Marg, SFS, Mansarovar, Jaipur-302020 (Rajasthan) +91 141 2400160, 2400161 🗆 Email Id: iisuniversity@iisuniv.ac.in 📮 Web.: www.iisuniv.ac.in







- Please carry your laptops on all the days with the software installed like MS Office word, excel, powerpoint, chemdraw, origin etc.
- Assignments will be given to the participants after each session.
- Certificate of participation (E-certificates) will be given only to those participants, who attend all the sessions and submit the given assignments on time.
- The submitted assignments will be considered for the activity component of continuous assessment of the following paper codes-

Topic	Paper Codes
MS-Word, MS-Excel	CHY 423 B, CHY 223, CHY 613, CHY 412, CHY 212
MS-PowerPoint	CHY 421, CHY 221, CHY 614, CHY 411, CHY 211
Origin, Shared files	CHY 426, CHY 222, CHY 612, CHY 413, CHY 213
ChemDraw	CHY 214, CHY 414, CHY 611, CHY 224, CHY 424B,
4	CHY 425B

For more information the brochure is also attached herewith.

Head

Department of Chemistry

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Attendance Sheet

Name of the department: Chemistry

Name of the activity: 7 Days Workshop on "Scientific and Technical Writing"

Category: Workshop

Total number of students: 30

Date & Time: 13/3/2023 To 19/3/3023; 9:30 am

Venue: C-506

S.No.	Name	Class	Semester
1	Ankita Maher	M.Sc.	Sem IV
2	Ankita Sheoran	M.Sc.	Sem IV
3	Anushruti	M.Sc.	Sem IV
4	Harsha Mishra	M.Sc.	Sem IV
5	Krati Sharma	M.Sc.	Sem IV
6	Pragya Singh	M.Sc.	Sem IV
7	Priyanka Relan	M.Sc.	Sem IV
8	Radhika Garg	M.Sc.	Sem IV
9	Rasadhika Sharma	M.Sc.	Sem IV
10	Renu Sharma	M.Sc.	Sem IV
11	Sonia Swami	M.Sc.	Sem IV
12	Anisha Choudhary	M.Sc.	Sem II
13	Harshita Joshi	M.Sc.	Sem II
14	Rashi Bala Vyas	M.Sc.	Sem II
15	Ritika Saini	M.Sc.	Sem II
16	Shraddha Bathla	M.Sc.	Sem II
17	Tanisha Choudhary	M.Sc.	Sem II
18	Anshika Bansal	B.Sc.(H)	Sem VI
19	Ayushi Shekhawat	B.Sc.(H)	Sem VI
20	Ishika Gyanchandani	B.Sc.(H)	Sem VI
21	Kritika Khandelwal	B.Sc.(H)	Sem VI
22	Rimjhim Jangid	B.Sc.(H)	Sem VI
23	Sapna	B.Sc.(H)	Sem VI
24	Arya Sharma	B.Sc.(H)	Sem IV
25	Jyoti	B.Sc.(H)	Sem IV
26	Khushi Rathore	B.Sc.(H)	Sem IV
27	Aarushi Singh	B.Sc.(H)	Sem II
28	Ridhi Sharma	B.Sc.(H)	Sem II
29	Riya Upadhyay	B.Sc.(H)	Sem II
30	Romiya Singh	B.Sc.(H)	Sem II





Time Zones: The motions of the Earth Planet

The Earth has resembled to that of sphere with compressed polar axis and being out slightly around the equatorial area i.e. oblate spheroid. The earth oblate is caused by the force of gravity and rotation which dictates central part to deform into a centrifugal force that leads to an oblate structure.

The earth is engaged in several motions through space each at a different level of magnitude and it is divided in to two categories: large scale movements and small scale movements. The large scale movements have limited significance to the earth because it needs a long time span to produce major changes. The small scale motions cause the earth to change its position constantly in respect of Sun. This motions is responsible for changing seasons and the alternations of day and night, weather and form the basis of our system of keeping time.

The movement of the earth around the sun is the basis of calendar of the year. The revolution time around the sun is 365 days 5 hrs and 49 minutes (365 days long). The earth orbital path (actually broad ellipse) has perihelion (nearest to sun) and aphelion (away or farthest location from sun) position which effects the seasons and temperature on earth in respect of hemispheres.

Rotation is the basis of our calendar day and due to the earths' west ward motion (west to earth). It can be described as counter clock wise from north and clockwise from south or eastward if is earth is viewed from a point in space above the equator.

All places on the earth complete one 360° rotations in a 24hour period. It rotates through an angle of 1° every 04 minutes. Earth is inclined approximately 23½ from perpendicular axis.

The earth has been drawn lines connecting the two poles and they measure from equator east to west or vice versa. Such lines are called meridians. The parallels are imaginary lines that could be used to measure distances from north to south or vice versa from equator. The prime meridian and the place are measured with the help of longitudes of a Time Zone Map of the World $\overline{$

***The blue-colored countries use half-hour deviations from the standard time zones.

place in arc degrees of parallels. The Royal observatory at Greenwich confirms that the prime meridians is universally accepted as a meridian by itself to measure arc of a number of distances and the value of meridians 1° (degree) of longitude. The lines of longitudes have a range of 180° (degree) starting form 0° (degree) east or west. The approximate distance of one degree at equator is 111 KM or 69 miles.

The basic unit of time is the solar day which is the period of time needed for the sun to make one apparent 360° circuit of the sky. The solar day is of course divided into unit of hour minute and second.

Local time is historically used for establishing the time of day has been solar noon. Until the late 1800's communication made the time of mean occurrence of solar noon the official instant of noon and then simply subdivided the periods between solar noon into the approximate hours, minutes and seconds at every meridian.

During nineteenth century major shortcoming were occurred and eventually it was discontinued over most of

Dr. R.S.Vijayvergia

Department of Geography

the world and finally standard time zones were developed for acquiring precisely time at places in respect of meridians.

Our present standard time system was officially established from the U.S.A. in November 1883 and adopted by most other countries. The standard time system is based on the position of noon sun but only at selected meridians of longitudes rather than at each specific site. The areas surrounding these standard meridians all have the same official time.

The earth rotates 15° in one hour the standard time zone differs by exact one hour intervals. Thus there is 24 time zones cover the earth. Time zones are the functional basis of standard time.

A zone on the terrestrial globe the is approximately 15° longitude vide and extends from pole to pole and within which a uniform clock time is used. The meridian used as the centres of their respective time zones are multiples of 15°. The basis for all the time zones is Greenwich meridians

and time zones established by this meridians is called Greenwich Mean Time (GMT).

The standard time were followed by each time zone would be exactly centred on its standard meridian and would extend 7°30' (Seven degree thirty minutes) both east and west from the meridian to the boarders of adjacent time zone Indian Standard Time (IST) is determined by 82½° E longitude which locates Mirzapur (UP).

International Date line is the boundary (180° Longitude) where each calendar day starts and separates two dates; when somebody cross the date line travelling towards east of the meridian he has to subtract a day and crossing the line towards west he has to add a day as per the time zone (04 minutes per longitude + or – as the case may be).

Hence, all the phenomenon regarding time, season, duration of day-night is connected with the motions of Earth.



check the answers to the crossword published in the previous issue, scan this QR code.

Science Crossword

in a solution. A solution thatcontains very little solute is called dilute. Asolution that contains a relatively largeamount of solute is said to be concentrated.

3 An organelle that contains the entire DNA of the organism

4 A boundary between two of the Earth'splates that are moving away from each other

6 The last stage of the scientific methodwhere explanations are made about why thepatterns identified in the analysis sectionoccurred.

8 The change in position of an object.Computed from the final position minus theinitial position. Common units of measureare meters

9 Organelles that are the internal "bones" of the cell. They exist in thick and thin tubules.

11 A solid in which atoms or molecules have aregular repeated arrangement

12 A substance composed of more than oneelement that has a definite composition and distinct physical and chemical properties

15 The top layer on a leaf. It is a nonlivinglayer consisting primarily of wax that isproduced by the epithelium, a cell layerdirectly underneath



Across

1 An apparent grouping of stars in the sky thatis used for identification purposes. Thesestars are not necessarily near each other inspace since they are not necessarily thesame distance from the Earth.

 $\ensuremath{\mathsf{2}}$ A unit of measure for the relative intensity of sounds

5 The region on a continent where new crustis being created, and the plates on eitherside of the rift are moving apart

7 The part of a vector that lies in the horizontalor vertical direction

Down

A common unit of density is gramsper milliliter

that are moving toward each other.

equator an object is.

measured in Amperes

river

14 A boundary between two of the Earth'splates

16 The celestial coordinate similar to that oflatitude

on the Earth. This measures howmany degrees,

minutes, and seconds northor south of the celestial

17 A fan shaped deposit of material at themouth of a

18 The flow of charge past a point per unit time; it is

1 A measure of the amount of solute that ispresent

Answers will be published in the next issue of the Science Spectrum

Source : https://mycrosswordmaker.com/

THIS WEIRD CHEMICAL BOND ACTS LIKE A MASH-UP OF HYDROGEN AND COVALENT BONDS

Hydrogen atoms sandwiched by fluorine exhibited the quirk of chemistry

Dr Lav Varma Department of Chemistry



Fluorine atoms (illustrated in green) squeeze a hydrogen atom (orange) between them, when dissolved in water (red and silver). Researchers used infrared laser light (red lines) to study the chemical bond that formed (branching blue lines), which acts like a hybrid between a hydrogen bond and a covalent bond.

Chemistry students around the world are acquainted with covalent bonds and hydrogen bonds. A study now reveals a strange kind of bond that acts like a hybrid of the two. Its properties raise questions about how chemical bonds are defined,

Hydrogen bonds are usually considered as weak electrical attractions rather than true chemical bonds. Covalent bonds, on the other hand, are strong chemical bonds that hold together atoms within a molecule and result from sharing of electrons among atoms. Now, researchers have reported that the unusually strong type of hydrogen bond is actually a hybrid, as it involves shared electrons, blurring the distinction between hydrogen and covalent bonds.

Andrei Tokmakoff of the University of Chicago said, "Our understanding of chemical bonding, the way we teach it, is very much black and white". The new research shows that "there's indeed a continuum."

Tokmakoff and colleagues characterized the hybrid bond by observing groups of atoms called bifluoride ions, consisting of a single hydrogen atom sandwiched between a pair of fluorine atoms, in water. Conventionally, the hydrogen atom is bound to one fluorine by a covalent bond and to the other fluorine by a hydrogen bond.

Researchers utilized infrared light to vibrate bifluoride ions and measured the response of hydrogen atoms, revealing a series of energy levels at which the hydrogen atoms vibrate. In a typical hydrogen bond, the gap between these energy levels decreases as the atom moves further up the energy ladder. But instead, the researchers found that the spacing between the energy level increased. This behaviour indicates that the hydrogen atom was shared between the two fluorine atoms equally, rather than being tightly bound to one fluorine atom by a covalent bond and more loosely bound by a usual hydrogen bond to the other fluorine. Study co-author Bogdan Dereka, at the University of Chicago said, "In this arrangement, the difference between the covalent and hydrogen bond is erased and is no longer meaningful"

Computer calculations showed that this behaviour depends on the distance between the two fluorine atoms. As the fluorine atoms get closer to each other, they squeeze the hydrogen between them, the normal hydrogen bond becomes stronger, until all three atoms start sharing electrons like covalent bond, forming a single link. The researchers call this a hydrogen-mediated chemical bond. For fluorine atoms that are farther apart, the conventional explanation of distinct covalent and hydrogen bonds still apply.

The hydrogen-mediated chemical bond can nott be explained by either pure hydrogen bond or a pure covalent bond, the researchers conclude. "It's actually some hybrid of both," says chemist Mischa Bonn of the Max Planck Institute for Polymer Research in Mainz, Germany.

Hydrogen bonding occurs in a wide variety of substances, most notably in water. Without hydrogen bonding, water should be a gas at room temperature instead of a liquid. Most hydrogen bonds in water are weak, but water with excess hydrogen ions can form strong hydrogen bonds similar to bifluoride ions. Two H₂O molecules can sandwich a hydrogen ion, creating what is known as a Zundel ion, in which the hydrogen ion is equally shared between the two H₂O molecules. The new results reverberate the behaviour of Zundel ion, says chemist Erik Nibbering of the Max Born Institute for Nonlinear Optics and Short Pulse Spectroscopy in Berlin.

Strong hydrogen bonds are thought to involved in the transport of hydrogen ions. This process is vital for a variety of biological mechanisms including powering cells and for technologies like fuel cells. So better understanding these bonds could shed light on a variety of effects.

And the new observation has insinuations for how scientists understand basic principles of chemistry. Bonn said, "It touches on our fundamental understanding of what a chemical bond is,"

This afresh understanding of chemical bonding also provokes questions about what qualifies as a molecule. Atoms connected by covalent bonds are considered part of a single molecule, while those joinedby hydrogen bonds can remain separate entities. So bonds like this raise the question, "when do you go from two molecules to one molecule?" Tokmakoff says

WHY DOES A FROG CROAKO

A male frog can attract a mate by using a mating call. Not only do frogs have vocal cords, like us, but most also have a vocal sac, which is an inflatable membrane that acts like an amp. The frog breathes in, closes its nostrils and forces air back and forth between the lungs and the vocal sac, which vibrates the vocal cords. The air resonating inside the vocal sac amplifies the call.



Source : HowItWorks170

ARTIFICIAL HEART MADE FROM MAGNETS AND TITANIUM



Researchers have come up with an artificial heart: BiVACOR; a titanium, pumpless, device with spinning magnets which looks nothing like a bonafide heart. The BiVACOR is a total artificial heart designed to take over the complete function of a patient's failing heart.

BiVACOR was developed by Dr Daniel Timms, who began developing artificial hearts when his father Gary, a plumber, suffered a heart attack in 2001.

Heart failure affect a large number of people every year, and treatment options are slim. Medication can help, but some people need a heart transplant for a full recovery. Still, donor hearts are hard to find because the number of people who need a heart far exceeds what's available. And, donor hearts have many conditions to be fulfilled. The blood type and size need to be just right.

The BiVACOR is designed to be a long-term device that can replace the total function of the patient's native heart. The small, compact device uses proven rotary bloodpump technology to provide the required cardiac output. The system comprises a magnetically levitated rotor located between opposing pump casings. The key feature that enables this device to support both the left and right sides of the heart is the left and right impeller blades, which are mounted on either side of the rotating hub. The hub is levitated and rotated via an electromagnetic motor and bearing arrangement on top of the pump casings. The dedicated hydraulic design of the impellers, combined with state-of-the-art magnetic levitation (MAGLEV) technology, permits control of the circulation to be finetuned by means of a differential fluid output. An external controller and batteries provide power to the internal device via a percutaneous driveline.

Pragya Singh

Department of Chemistry

The BiVACOR and human hearts work on entirely different principles. A human heart has two distinct sides. Blood first loops from the smaller, right side to the lungs and back, so that its oxygen can be replenished; it then crosses over to the larger, stronger left side, which pumps it forcefully into the body. The BiVACOR heart is one combined chamber. It sends blood in two directions using its spinning disk, or "rotor," which has two differently contoured sides, each shaped to create the appropriate level of blood pressure. Where the heart of a healthy adult beats anywhere between sixty and a hundred times a minute, the BiVACOR spins at between sixteen hundred and twenty-four hundred r.p.m.

BiVACOR heart in transitional state, currently they are not open for human transplantations. However, they have conducted successful trials in animals like sheep and they survived for several months.

Currently, artificial hearts only sustain life for about 130 days (although a lucky few have lasted for over 4.5 years), but BiVACOR promises to last as much as ten years. The company has tested it in a cow, which lived and was healthy 90 days later and could exercise on a treadmill. And the heart has been temporarily placed in humans just before they received an actual heart transplant.

BiVACOR has once again raised hopes that artificial hearts could put an end to the fraught and often futile search for donor hearts. The new design has not only raised millions of dollars in funding, but has also has gained support from the Texas Heart Institute.

BiVACOR is finally preparing to launch its first human trials. Successful human trials could mean patients no longer have to wait and hope that a donor heart will become available to them.

Source : https://www.sciencefocus.com/news/artificial-hearts-made-from-magnets-andtitanium-could-save-many-lives/

MICROPLASTIC PARTICLES NOW DISCOVERABLE IN HUMAN ORGANS AND HUMAN PLASMA

What are actually these microplastics? Microplastics, defined as pieces of plastic smaller than 5 mm in size, and are shed by synthetic clothing being washed, vehicle tyres, and the spillage of plastic pellets used by manufacturers. The physical breakdown of plastic litter also creates them. Rain washes them into rivers and the sea, but they can also be blown by the wind and end up in fields. These microplastics are consumed via food and water, and to breathe them in. Microplastics have polluted the entire planet, from Arctic snow and Alpine soils to the deepest oceans. Their potential impact on human health is still studied and a lot of researchers are working in this area.

The researchers have identified chemical traces of plastic in tissue. But isolating these minuscule fragments is difficult, and contamination from plastics in the air is also a challenge. Generally, the analytical method is used by the researchers to identify dozens of types of plastic including the polyethylene terephthalate (PET) used in plastic bottles and the polyethylene used in plastic bags. To test this technique, they took 47 samples of lung, liver, spleen and Kidney tissue from the tissue bank that was established to study neurodegenerative diseases. As it was seen that microplastic particles could be detected in every sample. They detected bisphenol A (BPA), a chemical used to make plastics in all 47 samples. The US Environmental Protection Agency is concerned about BPA because "it is a reproductive, developmental and systemic toxicant in animal studies". The researchers examined lung, liver, spleen and kidney tissue as these organs are likely to be exposed to microplastics.

Charles Rolesky, one of the team member working as a researcher in Arizona State University said, "In a few short decades, we've gone from seeing plastic as a wonderful benefit to considering it a threat". Another member Varun Kelker of Arizona State University said' "we never want to be alarmist, but it is concerning that these non-biodegradable materials that are present everywhere (may) enter and accumulate in human tissue, and we don't know the possible health effects". Microplastics are those less than 5mm in diameter and nanoparticles have a diameter of less than 0.001 mm. Both form largely from the abrasion of larger pieces of plastic dumped into the environment. Research in wildlife and laboratory animals has linked exposure to tiny plastic to infertility, inflammation and cancer. Other work has shown different kinds of nanoparticles from air pollution are present in human heart and brain, and have been



linked to brain cancer.

Harsha Mishra Department of Chemistry

Microplastics were detected in human blood for the first time in March, with scientist finding the tiny particles in 80% people tested, showing the particles can travel around the body and may lodge in organs. The researchers analysed blood samples from 22 anonymous donors, all healthy adults and found plastic particles in 17. Half the sample contained PET plastic, which is commonly used in drinking bottles, while a one third contained polystyrene, used for packaging food and other products. A quarter of the blood sample contained polystyrene, from which plastic carrier bags are made.

After the plastics were detected in blood, they are also found in lungs. Laura Sadofsky said, "we did not expect to find the highest number of particles in the lower region of the lungs or the particles of the sizes we found. It is surprising as the airways are smaller in the lower parts of the lungs and we would have expected particles of these sizes to be filtered out or trapped before getting this deep". Recently in a research, samples of healthy lung tissue from next to the surgery targets were taken. It analysed particles down to 0.003 mm size and used spectroscopy to identify the type of plastic.

A 2021 study in Brazil on autopsy samples found microplastics in 13 of the 20 people analysed. Polyethylene, used in plastic bags, was one of the most common particles found in lungs. A US study of lung cancer patients in 1998 found plastic and plant fibres in more than 100 samples. In cancerous tissue, 97% of the samples contained the fibres and in non-cancerous samples, 83% were contaminated.

Microplastics have been found in the placenta of pregnant women, and in pregnant rats they pass rapidly through the lungs into the heart, brain, and other organs of the fetus. Workers exposed to high levels of microplastics are also known to have developed diseases. The study in general shows that babies and young children are more vulnerable to chemical and particle exposure.

The big question is what is happening in our body? Are the particles retained in the body? Are they transported to certain organs, such as getting past the blood brain barrier? And these levels are sufficiently high to trigger diseases? We urgently need to find answer to these questions so that we can further proceed with the ways to tackle this problem.

> Source : https://www.theguardian.com/environment/2020/aug/17/microplasticparticles-discovered-in-human-organs



MALARIA VACCINE For Intramuscu (IM) Injection Only

to the per

20ml

Use a 22-25 gauge neede Choose the injection site a needle length that is appro-

he World Health Organization(WHO) on 6th October 2021allowed the widespread use of the world first vaccine against malariaa common mosquito borne disease that claims more than four lakhlives every year. Developed by Galaxo Smith Kline the vaccineknown as RTS,S / AS01, has already been administered to nearly eightlakh children in Ghana, Kenya and Malawi as a part of a pilotprogramme since 2019. The WHO endorsement paves the way of useof this vaccine outside the pilot programme, in all areas where malariais known as to be widely prevalent. But the RTS,S / AS01 vaccine, known by its brand name Mosquirix, is considered only the first steptowards effective immunization of global population against malaria. This vaccine is able to prevent serve of malaria in only 30% of thecases and the quest for the more effective vaccine is still underway. The vaccine act against P.falciparium, the most deadly malariaparasite globally, and the most prevalent in Africa among childrenwho received 4 doses in large scale clinical trials, the vaccine wasable to prevent approximately 4 in 10 cases of malaria over 4-yearperiod. This is the first Malaria vaccine that has completed the clinicaldevelopment process, and received a positive scientific opinion fromEuropean Medicines Agency (EMA).WHO's recommendation is based on the advice of its two globaladvisory bodies, one for immunization and the other formalaria.WHO has recommended that in context of comprehensivemalaria control the RTS,S/AS01 Malaria vaccine be used forprevention of

Renu Sharma Department of Chemistry

P.falciparum malaria in children living in the regionswith moderate to high transmission as defined by it, The malariavaccine should be provided in schedule of 4 doses and children fromfive months of age for the reduction of malaria disease and burden. The next step for The WHOrecommended malaria will includeunding decisions for the global health community for border rollout inendemic countries, and the country decision-making on whether toadopt the vaccine as a part of national malaria control strategies. Avaccine is breakthrough addition to the malaria toolkit and can helpget malaria control back on track. A malaria vaccine has taken muchlonger to come to fruition because there are thousands of genes inmalaria compared to around a dozen in coronavirus, and are very highimmune response is needed to fight. "The vast majority of vaccinehaven't worked because it's very difficult".Other recent clinical evidences show the strategic delivery of thevaccine just prior to the high malaria transmissions season in areaswhere malaria is highly seasonal, can optimize impact and markedlyreduced mortality, especially when combined with otherrecommended malaria control interventions. Malaria is known to bethe world's deadliest disease in human history, having claimedmillions of lives. Even now, the disease kills over four lakh everyyear, according to WHO figures. This is still a huge improvement from twenty years ago, when close to double the number of peoplewhile succumbing to the disease. Malaria is most endemic in Africa, with Nigeria, Congo, Tanzania, Mozambique, Niger and BurkinaFaso together accounting for over half the yearly deaths. In 2019, there were estimated 229 million cases of malaria worldwide ,and theestimated number of malaria deaths that year stood at 409,000. Children aged under five years are the most vulnerable group affectedby malaria; in 2019, they accounted for 67% (274,000) of all malariadeaths worldwide. India is one of the countries badly affected by the disease. Death due to malaria has come down sharply in last few yearsofficially these are only hundred now but infections continue to be inmillions globally the elimination.

> Source: https://indianexpress.com/article/technology/science/yearender-2021-indianexpress.com/article/technology/science/yeafirst-malaria-vaccine-milestone-7700400/

THE SCIENCE OF CLIMATE CHANGE

A polar bear walks along a rocky shore, looking for food. The bear would usually be on the sea ice hunting for seals, pouncing when the seal comes up to breathe. But the ice has started to melt earlier and re-form later than it has in the past. Without the sea ice, the polar bear must scavenge for other, less nutritious food.

These changes in polar sea ice are a result of climate change. But this isn't just affecting polar bears—climate change affects everyone.

Climate is sometimes mistaken for weather. But climate is different from weather because it is measured over a long period of time, whereas weather can change from day to day, or from year to year. Climate can be affected by Earth's atmosphere. Our Earth is surrounded by an atmosphere made up of gases. When sunlight enters our atmosphere, some of the 'suns heat is trapped by the gas, and some bounces back out into space. By trapping that heat, our atmosphere keeps Earth warm enough to live on. Without it, our planet would be very cold, like Mars.

The cause of current climate change is largely by human activity, like burning fossil fuels, like natural gas, oil, and coal. Burning these materials releases what are called greenhouse gases into Earth's atmosphere. There, these gases trap heat from the sun's rays inside the atmosphere causing Earth's average temperature to rise. This rise in the planet's temperature is called global warming. The warming of the planet impacts local and regional climates. Throughout Earth's history, climate has continually changed. When occurring naturally, this is a slow process that has taken place over hundreds and thousands of years. The human influenced climate change that is happening now is occurring at a much faster rate.

Here's how it works: the planet's temperature is basically a function of the energy the Earth absorbs from the sun (which heats it up) and the energy Earth emits to space as infrared radiation (which cools it down). Because of their molecular structure, greenhouse gases temporarily absorb some of that outgoing infrared radiation and then re-emit it in all directions, sending some of that energy back toward the surface and heating the planet. Scientists have understood this process since the 1850s.

Today, however, we are the ones causing CO2 levels to increase at an unprecedented pace by taking ancient carbon from geologic deposits of fossil fuels and putting it into the atmosphere when we burn them. Since 1750, carbon dioxide concentrations have increased by almost 50 percent. Methane and nitrous oxide, other important anthropogenic greenhouse gases that are released mainly by agricultural activities, have also spiked over the last 250 years.

We know based on the physics described above that this should cause the climate to warm. We also see certain telltale "fingerprints" of greenhouse warming. For example, nights are warming even faster than days because greenhouse gases don't go away when the sun sets. And upper layers of the atmosphere have actually cooled, because more energy is being trapped by greenhouse gases in the lower atmosphere.





Carbon comes in three different masses: 12, 13 and 14. Things made of organic matter (including fossil fuels) tend to have relatively less carbon-13. Volcanoes tend to produce CO2 with relatively more carbon-13. And over the last century, the carbon in atmospheric CO2 has gotten lighter, pointing to an organic source.

We can tell its old organic matter by looking for carbon-14, which is radioactive and decays over time. Fossil fuels are too ancient to have any carbon-14 left in them, so if they were behind rising CO2 levels, you would expect the amount of carbon-14 in the atmosphere to drop, which is exactly what the data show.

It's important to note that water vapor is the most abundant greenhouse gas in the atmosphere. However, it does not cause warming; instead it responds to it. That's because warmer air holds more moisture, which creates a snowball effect in which human-caused warming allows the atmosphere to hold more water vapor and further amplifies climate change. This so-called feedback cycle has doubled the warming caused by anthropogenic greenhouse gas emissions.

In fact, surface temperatures actually mask the true scale of climate change, because the ocean has absorbed 90 percent of the heat trapped by greenhouse gases. Measurements collected over the last six decades by oceanographic expeditions and networks of floating instruments show that every layer of the ocean is warming up. According to one study, the ocean has absorbed as much heat between 1997 and 2015 as it did in the previous 130 years. Numerous studies have found that more than 90 percent of scientists who study Earth's climate agree that the planet is

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be heating up. Instead, data show that the upper atmosphere has actually cooled in recent decades since volcanoes mainly act as climate coolers, they can't really explain recent warming. However, scientists say that they may also have contributed slightly too rising temperatures in the early 20th century. That's because there were several large eruptions in the late 1800s that cooled the planet, followed by a few decades with no major volcanic events when warming caught up.

On top of that, warmer weather is

warming and that humans are the primary cause. Currently, more than 97 percent of publishing climate scientists agrees on the existence and cause of climate change. We know that, from 1900 until the 1950s, solar irradiance increased. And studies suggest that this had a modest effect on early 20th century climate, explaining up to 10 percent of the warming that's occurred since the late 1800s. However, in the second half of the century, when the most warming occurred, solar activity actually declined. This disparity is one of the main reasons we know that the sun is not the driving force behind climate change.

Another reason we know that solar activity hasn't caused recent warming is that, if it had, all the layers of the atmosphere should

aiding the spread of infectious diseases and the vectors that transmit them, like ticks and mosquitoes. Research has also identified troubling correlations between rising temperatures and increased interpersonal violence, and climate change is widely recognized as a "threat multiplier" that increases the odds of larger conflicts within and between countries.

In other words, climate change will bring many changes that no amount of money can stop. What could help is taking action to limit warming.

The challenge is that we need to reduce emissions now to avoid damages later, which requires big investments over the next few decades.

Source : https://www.nytimes.com/article/climate-change-global-warming-faq.html



lubricate and protect our eyes from infection. As a side note, this link between the back of our throat and our eyelids also explains how someone can appear to 'drink' a liquid, such as milk, and shoot it out through their eyelids.



WATER PROCESSING: LIGHT HELPS DEGRADE HORMONES

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Micropollutants in water are frequently hormones that accumulate in the environment and can harm humans and animals. Researchers from the Karlsruhe Institute of Technology (KIT) and the Leibniz Institute of Surface Engineering (IOM) in Leipzig have created a method for photocatalytically degrading these pollutants as they pass through polymer membranes. It was published in the journal Nature Nanotechnology. Irradiation with light triggers a chemical reaction, as a result of which steroid hormones are degraded on the membranes coated with titanium dioxide.

Hormones used in contraception or agriculture enter the wastewater wherever people live.

Steroid hormones, such as sex hormones and corticosteroids, can build up in the environment and have a negative impact on humans and animals by impairing behavioural development and fertility. Male fish, for example, may develop female sexual characteristics as a result of sex hormones. As a result, it is critical to remove hormones, as well as other micropollutants, from wastewater before they enter the natural water cycle, from which drinking water is extracted.

"Providing people with safe drinking water is currently one of the most pressing global challenges", says Professor Andrea Iris Schafer, Head of KIT's Institute for Advanced Membrane

Technology (IAMT). "Micropollutants pose a significant threat to our future because they impair fertility and brain function."

The method is inspired by Solar Cell Technology. Schafer has studied water processing by nanofiltration for many years. She employs polymer membranes with nanometersized pores for

this purpose. However, nanofiltration necessitates high pressure and, as a result, a lot of energy.

Furthermore, micropollutants may accumulate in polymer membrane materials and slowly enter the filtered water. Even if the pollutants are separated completely, a flow of concentrated

pollutants may develop and require further treatment.



Inspired by Professor Bryce S. Richards' work on solar cell technology, Schafer came up with the idea to coat polymer membranes with titanium dioxide and design photocatalytic membranes.

Photocatalytically active titanium dioxide nanoparticles are applied to microfiltration

membranes, which have slightly larger pores than nanofiltration membranes. Irradiation with

light then triggers a chemical reaction, as a result of which steroid hormones are degraded on the membranes.

"We developed a water catalyst," Schafer summarises her work. Steroid hormones were removed in continuous flow mode using photocatalytic polymer membranes down to the analytical detection limit of 4 ng/l. In fact, the concentrations measured were very close to the WHO's new Drinking Water Guideline limit of 1 ng/l. The researchers are currently optimizing their technology by reducing the amount of time and energy required. Furthermore, they emphasize the use of natural light. Their research focuses on using photocatalysis to degrade other pollutants, such as industrial chemicals like perfluoro-alkylated and polyfluorinated substances

(PFAS) or pesticides like glyphosate. Another goal is to improve technology.

Interview of our Alumna Dr. Manjinder Kour

PeerJ Physical Chemistry spoke to 12th Triennial Congress of the World Association of Theoretical and Computational Chemists (WATOC 2020) PeerJ Award winner Manjinder Kour

Can you tell us a bit about yourself and your research investigation of iron-sulphur coordination compounds,

I am working in the group of Prof. Eric Boyd at Montana State University (MSU), USA. I am both a computational and experimental chemist. I thrive on tackling problems with relevance to practical applications that have clear public benefit. My PhD research included the design, controlled synthesis, purification, characterization of structurally controlled compounds and, quantum calculation to decipher the reactivity, reaction mechanism, diastereoselectivity, thermodynamic stability, molecular properties, coordination, and spectroscopy of newly synthesized organic compounds and organometallic complexes. During my first postdoc, I used a variety of approaches to relate molecular chirality, reactivity, coordination, excited states, fundamental interactions, photochemistry, catalysis, and reaction mechanism to the molecular properties of compounds. Currently, I am working on iron-sulphur coordination compounds at MSU. The goal of this project is to uncover the mechanisms that underpin how methanogenic archaea reduce pyrite (FeS₂) and assimilate reduction products, including metals of national strategic importance to meet biosynthetic demands. Under the supervision of my external supervisor, Prof. Robert K. Szilagyi at University of British Columbia - Okanagan, Canada, I work closely with a group of microbiologists, geochemists, biochemists, and surface scientists for this project.

What first interested you in this field of research?

Pyrite (FeS₂) is the most abundant sulfide mineral in the Earth's crust and is common in environments inhabited by methanogenic archaea. FeS₂ can be reduced by methanogens, yet the chemical transformations that take place at the surface of FeS₂ during reduction are not clear. To bridge this critical knowledge gap, I am developing fundamental structural models and exploring the chemical space that connects the abiotic pyrite reduction and dissolution reactions to biotic FeS cluster acquisition in methanogens. Using state-of-the art imaging, spectroscopic, and computational approaches, we are probing the reaction mechanisms, rates, and chemical transformations at the surface of FeS₂ during reduction, focusing on molecular interactions at the mineral-cell interface. Our emphasis is on the computational

investigation of iron-sulphur coordination compounds, clusters, nanoparticles and mineral surfaces, and synchrotron spectroscopy of inorganic and organometallic complexes involved in FeS2 reduction. Information from modeling and experiments will ultimately be used as a framework to improve the recovery of trace



metals of bioenergy and national security relevance from pyritic ores.

Can you briefly explain the research you presented at WATOC?

At WATOC 2020, I presented my work on the development of atomic-scale models for low temperature pyrite reduction reactions. We developed models for FeS2 , Fe1-xS, and bulk, surface, and nanoparticulate FeS mack /FeS (aq) phases . We used the bulk mineral structures for validation of the computational level of theory. The mineral surface models were created to feature the most reactive crystal faces as determined experimentally. A new nanoparticle construction strategy was presented that considers the rectangular, pentagonal, and hexagonal building blocks in FeSmack , FeS, , and Fe1-xS, respectively. The nanoparticle models as molecular maquettes of mineral surfaces will provide us with the versatility to describe geometric and electronic structure changes, energetic consequences of electrochemical reduction, small molecule coordination and electron transfer, surface decomposition, and HS- release along the $FeS_2 \rightarrow Fe1-xS \rightarrow FeS$ mack continuum.

What are your next steps?

Computational models as virtual nanoreactors will be utilized to determine the mechanism of abiotic reductive dissolution of pyrite through proposed pyrrhotite intermediate and formation of mackinawite-like nanoparticles. The continuation of the work will involve the investigation of heterometal substitution as experimentally shown for the considerable increased reactivity of pyrite nanoparticles when they are doped with Ni ion.

Source : https://peerj.com/blog/post/115284886318/watoc-award-winners-4/

A National Event 4-Minute Research Pitch

A National event, '4-Minute Research Pitch', was collaboratively organised by The Department of Chemistry, IIS (deemed to be University), Jaipur and Govt. Madhav Science College, Ujjain on 15-16 April 2022 under the aegis of ACT's Research Convention 2021. A total of 558 registered delegates witnessed the event. 71 Undergraduate and Postgraduate students, research scholars and faculty members shared their research-ideas on the current advancements in frontier areas of Chemistry. The Association of Chemistry Teachers was represented by Prof. D.V. Prabhu, General Secretary, ACT & Govt. Madhav Science PG College, Ujjain was represented by its principal Dr. Arpan Bharadwaj. The Keynote Lecture was delivered by Prof. Sourav Pal, Director, Indian Institute of Science Education and Research, Kolkata. He enlightened the audience with the versatile role of chemistry in life, emphasising its industrial applications, while Prof. P. K. Chattaraj from IIT, Kharagpur, delivered the invited talk.

The major thrust areas covered in three technical sessions spread over two days were: Synthetic Organic Chemistry, Organometallics and Co-ordination Chemistry, Material Science, Bio-organic and Green Chemistry, Solid State Chemistry, Environmental Chemistry, Computational Chemistry, Chemical Education, Drug Design and Pharmacology, Nuclear and Radiochemistry, Analytical Chemistry, Electrochemistry, etc.

The expert talks were delivered by Prof. A. Sakthivel, Central University of Kerala; Dr. Amrit Krishna Mitra, Govt. General Degree College in Singur, West Bengal; Prof. Tanmoy Chakraborty, School of Basic Sciences and Research, Sharda University; Dr. Wasudev Balaji Gurnule, Kamla Nehru Mahavidyalaya, Nagpur; Prof. Helen P. Kavitha, Institute of Science and Technology, Tamil Nadu; Prof. Pradeep Bhatnagar, Dean, Faculty of Sciences, IISU, and Dr. Manisha Patni, Head, Department of Chemistry, IISU. The presentations were evaluated by a panel of experts and best presentations in each category were awarded. Prof. Brijesh Pare, President, ACT and Prof. R. K. Bansal, Department of Chemistry, IIS (deemed to be University), Jaipur announced the results.



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