



# ASSOCIATION OF CHEMISTRY TEACHERS

## NEWS LETTER

ISSUE : 25 JANUARY - APRIL 2023



Promoting Excellence in Chemistry Education

# Association of Chemistry Teachers

## News Letter, January - April 2023

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## *From Editorial Desk*

**Prof. Wasudeo Gurnule**

Editor

Kamla Nehru Mahavidyalaya,  
Nagpur, Maharashtra.



I welcome the Newsletter as an effort undertaken by editor and all editorial board members. Wishing you a very happy, healthy and prosperous New Year 2023. The present Editorial Board has put in its bit of efforts, to make the newsletter as attractive and informative as possible. We are happy to inform you that the contribution of ACT ranges from International Olympiads, organizing Seminars, Workshops, Expert Invited talks, Innovating conceptual science experiments, Conferences, Talent search examination etc. The present issue of Newsletter includes the reports on the ACT activities, trends in chemistry and scientific news. We tried to direct the attention of our readers towards research trends taking place across the globe so as to motivate them to take up initiative in re-orienting themselves towards sustainability. We have also included reports on National and International Chemistry events. This issue also contains the reports of Global Women Breakfast, GWB -2023 organized by different zones across the country.

I take this opportunity to say many, many thanks to all my Editorial Board Members for their whole hearted co-operation extended to me.

With warm regards to one and all

### Members of Editorial Board

- ▶ **Prof. Dr. Brijesh Pare**, Govt. Madhav Science College, Ujjain
- ▶ **Prof. Dr. Damodar V. Prabhu**, Wilson College, Mumbai
- ▶ **Dr. Hemant Khanolkar**, Fr. Conceicao Rodrigues College of Engg., Mumbai
- ▶ **Prof. Dr. M. Swaminathan**, KARE, Krishnankoil
- ▶ **Dr. Subhash P. Singh**, A.N. College, Patna
- ▶ **Dr. Hemant Pande**, Formerly Hislop College, Nagpur
- ▶ **Dr. Rakhi Gupta**, IIS (deemed to be University) Jaipur
- ▶ **Dr. Umesh C. Jain**, Academic Heights Public School, Morena
- ▶ **Dr. Gitimoni Deka**, Rangia College, Rangia
- ▶ **Dr. Helen Kavitha**, SRM Institute of Science and Technology, Chennai
- ▶ **Dr. Vijay P. Singh**, N.C.E.R.T. New Delhi
- ▶ **Dr. Mannam Krishnamurthy**, Varsity Education Management Limited, Hyderabad
- ▶ **Prof. Dr. Sudesh Ghoderao**, RNC Arts, JDB Commerce and NSC Science College, Nashik Road, Nashik

## Honorary Members of ACT

We have great pleasure in bringing the updated list of honorary members of Association of Chemistry Teachers, who are sources of inspiration, guidance and support in activities of ACT.

**The editorial board of ACT News Letter is proud of the academic achievements of these legendary honorary members.**

### **Bharat Ratna Prof. C.N.R. Rao, FRS**

National Research Professor : Linus Pauling Research Professor,  
Jawaharlal Nehru Centre for Advanced Scientific Research, Jakkur, Bengaluru - 560 064  
E-mail : cnrrao@jncasr.ac.in



### **Padma Vibhushan Prof. M.M. Sharma, FRS**

Former Director, Institute of Chemical Technology, Mumbai - 440 019.  
2/3, Jaswant Baug, V.N. Purav Marg, Chembur, Mumbai - 400 071  
E-mail : profmmsharma@gmail.com



### **Padma Vibhushan Dr. R.A. Mashelkar, FRS**

CSIR Bhatnagar Fellow; Former Director General, CSIR, New Delhi.  
President, Global Research Alliance, National Chemical Laboratory, Pune - 411 008.



### **Dr. Nitya Anand**

Former Director, CSIR-Central Drug Research Institute, Lucknow.  
B-62, Nirala Nagar, Lucknow - 226 020  
E-mail : nityaanand1925@gmail.com



### **Prof. R.S. Mali**

Former Vice-Chancellor, North Maharashtra University, Jalgaon.  
B-2, Surajbun Housing Society, Aundh Road, Pune - 411 007.  
E-mail : rsmali@rediffmail.com



### **Prof. S. Jayarama Reddy**

Former Vice-Chancellor, S.V. University, Tirupati; Chancellor, SCSSV Mahavidyalaya, Kanchi  
201, Ameya Towers, Street No. 12, Tarnaka, Hyderabad - 500 017.  
E-mail : profsir@gmail.com



### **Padma Shri Prof. Jai P. Mittal**

Former Director, Chemistry - Isotope Group, BARC, Mumbai - 400 085.  
Chairman, Academic Board, UM-DAE Centre for Excellence in Basic Sciences,  
University of Mumbai, Kalina, Mumbai - 400 098  
E-mail : mittaljp2003@yahoo.co.in



### **Prof. Mihir K. Chaudhuri**

Former Vice-Chancellor, Tezpur University, Tezpur.  
Advisor, Education Department of Government of Assam, Gawahati - 781 006  
E-mail : chaudhurimihirk@gmail.com; mkc@tezu.ernet.in





**Padma Shri Prof. Dr. G. D.Yadav,**

National Science Chair, SERB, New Delhi  
Emeritus Professor of Eminence, Institute of Technology, Mumbai  
Former Vice Chancellor, Institute of Technology, Mumbai  
Email : [gdyadav@gmail.com](mailto:gdyadav@gmail.com)

**Prof. Dr. A. K. Bakhshi**

Chairman, National Resource Centre for Chemistry, MoE, GOI  
Chairman, Guru Angad Dev Teaching Learning Centre for e-Learning,  
SGTB Khalsa College, University of Delhi, Delhi  
Founder Vice Chancellor, PDM University, Bahadurgarh, Haryana  
Email : [akbakhshi@yahoo.com](mailto:akbakhshi@yahoo.com)



## Reports of Activities of ACT

### **NATIONAL SCIENCE DAY CELEBRATIONS Stem School, Guntur, A.P.**

**National Science Day** was celebrated at **Stem School**, Vidhya Nagar, Guntur, A.P. state on 28<sup>th</sup> February 2023 by the South zone of Association of Chemistry Teachers (ACT) and Regional chapter-11 of Indian Association of Physics Teachers (IAPT). **Dr. Mannam Krishna Murthy**, Secretary, ACT south zone acted as convener of these celebrations.

A science exhibition was arranged with 65 exhibits on this event. **Mr. Y.J.R. Bharat Reddy**, Correspondent of STEM School, inaugurated the exhibition. About 600 school students visited these exhibits and improved their understanding of scientific knowledge.

Science Talent Search Examination was conducted in 3 levels, which was coordinated by **Mr. A. Dileep Kumar**, Academic Director of the school. 395 students participated in the test and prizes were distributed to the winners.



*Dignitaries on the Dias*

**Mr. U. Lakshmana Suri**, Lecturer, Sri Chaitanya Educational Institutions, Vijayawada gave demo presentation of Physics Experimentation and fundamentals.

There were three academic presentation sessions. **Dr. M. Krishna Murthy**, Chief Executive Dean of Varsity Education Management Ltd., Hyderabad, gave a powerpoint presentation on the Role of Chemistry in our Modern life. **Mr. Kondamudi Ravindra Kumar**, Vice president RC-11, IAPT and

## WORKSHOP ON CHEMICAL ASPECTS OF WATER Intel High School, Perecharla, Guntur Dist., A.P.

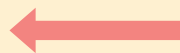
One day 'Workshop on Chemical aspects of Water' was organized at Intel High School, Perecharla, Guntur Dist., A.P. State, with the support of Association of Chemistry Teachers (ACT, Mumbai) on 6th March 2023. Dr. Mannam Krishna Murthy, Secretary, ACT South zone acted as convenor of the workshop. The inaugural session was chaired by Mrs. K. Rani Jaya, Principal, Intel High School. Er. K. Vasudeva Rao, Founder Trustee, Koneru Charitable trust, Gosala, Krishna Dist. was the chief guest and Er. Ch. Sivareddy, Retd. BSNL Engineer, Nudurupadu, Guntur Dist. was the guest of honour. The guests spoke on 'The thrust for water' and 'Purity requirement of water for human consumption'.

There were two workshop sessions, each for about two hours. Mr. K. Ravindra Kumar, Academic Dean, SKCM Educational Trust, Vijayawada and Dr. M. Krishna Murthy, Chief Executive Dean, Varsity Education Management Limited, Hyderabad acted as main resource persons to these sessions, by rotating to two batches of student participants. Chemical principles were discussed and demo experimentations were carried out on the purification of water, removal of hardness, use of detergents in laundry and using water as solvent.

In the concluding session Dr. K. Jaya Kumar, Tata health care, Guntur educated the participants on advocating 'use less water and save more'. About 300 students of Class IX and Class X participated in the talent search on 'the thrust for water'. Two best performances of the test were awarded with the prizes. Principal of the host institution was felicitated on behalf of ACT.



Dr. Mannam Krishna Murthy, Secretary South zone ACT is addressing the students





*Prize distribution by Guests to winners of talent search test organized by ACT*

### **National Level Workshop on Experiential Learning**

S. N. Mor College Tumsar, District Bhandara and Vigyan Bharati Vidarbha region, organized a two day National Workshop on Experiential Learning for School and College Science teachers of Bhandara District, under NEP 2020 on 27th and 28th of April 2023. Dr. P. K. Joshi and Dr. Hemant Pande were the Chief guest and Smt. Krishna Kannan and Smt. Manisha Sharma of Bharatiya Vidya Bhavan, Nagpur were the resource persons for the event.

National level workshop on experiential learning was organized at S. N. Mor College, Tumsar, District Bhandara. Dr Chetan Masram, Principal and Management of the college and Shri Naresh Chafekar Secretary, Vigyan Bharati Vidarbha Prant were Joint organizer. This was in continuation of our workshop at MPCOST Bhopal and was appreciated. 30 Teachers from Bhandara District, 15 Staff of the College and around 70 Students of UG and PG of the College attended it.

The first session of experiential learning was conducted by Smt. Krishna Kannan in chemistry. There were about 30 participants who were divided into six groups and they were asked to perform an activity of determining the amount of 3% acetic acid that is required to change the pH of water to 4 and the amount of 3% Sodium carbonate that would change it to 10.

Post lunch, a session on Biology was conducted by Smt. Manisha Sharma who guided the participants in preparing slide of the leaf, stem or flower they collected from the garden.



All participants enjoyed the experiential learning activity and felt the need of such learning in schools. Second day session began with Paresh Joshi, who started with questions on microscope optics and led to several concept clarity sessions like image formation, sharp images, etc followed by an experiment to measure the focal length of a given convex lens. This was then followed by the Valedictory session which included address by retired Education officer Mr. Ailwar, Dr. Shah both from Vigyan Bharati ,Bhandara District unit and Prof. Hemant Pande.

This workshop was possible due to support from Principal, management of S. N. Mor College, Tumsar and Shri Naresh Chafekar, secretary, Vigyan Bharati Vidarbha prant and his team. Special thanks to Arvindji Ranade for encouragement and support.



*Teachers performing the experiments*



*Participants in National Workshop*



## Report of GWB-2023

### “Global Women's Breakfast”

“Global Women's Breakfast”(GWB) is a world-wide event which is announced by “IUPAC” in association with prestigious sponsoring chemical societies and institutions (Royal Society of Chemistry, American Chemical Society, Chemistry Europe, Royal Australian Chemical Institute, DOW and NZIC) every year to celebrate the accomplishments of women's and girls in Science.

We, the Association of Chemistry Teachers feel immense pleasure to promote the program since 2021 in INDIA. In the year 2022, a total of 55 institutes participated in GWB 2022.

This year around 55 institutions, colleges and universities from different states of INDIA have registered to the event and organized several activities like e-Symposia, National and International Seminars, Workshops, Conferences and awareness programs at national and international levels to celebrate GWB -14 Feb. 2023 with the theme “Breaking Barriers in Science” as part of the UNESCO International Year of Basic Sciences for Sustainable Development announced by IUPAC for 2023.

The event was promoted by Prof Brijesh Pare (President ACT) Head, Department of Chemistry, Govt. Madhav Science PG, College, Ujjain, Dr. DV Prabhu, The General Secretary – ACT, and all the executive members and life members of ACT from different zones of INDIA.

Dr. Vijendra Singh, Assistant Professor, Department of Chemistry, SLAS, Mody University of Science and Technology (A Leading Women's University) Lakshmanagarh, Rajasthan was nominated as National Coordinator of the #GWB-2023 by ACT.

**IUPAC** INTERNATIONAL UNION OF PURE AND APPLIED CHEMISTRY

**ACT**

**C-Web**

**IUPAC Global Women's Breakfast #GWB-2023**

**Theme**  
**“Breaking Barriers in Science”**

**Association of Chemistry Teachers**  
Promotes

**#GWB 2023 in India**

Event Date: 14 February 2023, Event Type: Seminar, Venue: worldwide events; virtually or in person

**Website:** <https://iupac.org/gwb/>

**Prof DV Prabhu**  
Gen Secretary, ACT

**Prof Brijesh Pare**  
President, ACT

**Dr. Vijendra Singh**  
Convener #GWB2023

**Mailing Address of ACT: Homi Bhabha Centre for Science Education (TIFR) Mumbai**

## International Union of Pure and Applied Chemistry (IUPAC)

The International Union of Pure and Applied Chemistry (IUPAC) is the world authority on chemical nomenclature and terminology, including the naming of new elements in the periodic table; on standardized methods for measurement; and on atomic weights, and many other critically-evaluated data.

A neutral and objective scientific organization, IUPAC was established in 1919 by academic and industrial chemists who shared a common goal – to unite a fragmented, global chemistry community for the advancement of the chemical sciences via collaboration and the free exchange of scientific information.

### Global Women's Breakfast #GWB-2023

GWB was started from 2019 onwards by IUPAC. The main aim of the GWB is to demonstrate the need to build a network of both women and men working together to address the barriers and inequalities faced by women in science. IUPAC is in a unique position to serve as a leading organization and global platform where these difficult and persistent issues can be addressed in a transparent manner.

*"Gender Equality is not only a fundamental human right, but a necessary foundation for a peaceful, prosperous and sustainable world."*

## Association of Chemistry Teachers INDIA

The Association of Chemistry Teachers was launched in 2000 to serve as an apex national body of chemistry educators to promote excellence in chemistry education. The idea of formulating ACT was conceptualized by Homi Bhabha Centre for Science Education (TIFR) Mumbai. The Association brings together on a common platform higher secondary school teachers, college and university lecturers, professors, scientists, and researchers from the industry for organizing subject-related activities. Since its inception, ACT has worked tirelessly to strengthen chemistry education in India and to motivate students to pursue chemistry as a career.

**Let's come together on February 14, 2023 we will be "Breaking Barriers in Science" by including groups from all areas of science as part of the "International Year of Basic Sciences for Sustainable Development"**

Any query contact to Dr. Vijendra Singh  
Mody University of Science and Technology,  
Rajasthan.  
Mob: 8602567928



ASSOCIATION OF CHEMISTRY TEACHERS









## Global Women's Breakfast GWB - 2023

Organized by  
Department of Chemistry  
Rajiv Gandhi Govt PG College, Mandsaur ( M.P.)



National Webinar  
On  
"Breaking Barriers in Science"  
Date- 14 February 2023  
Under the aegis of IUPAC- GWB- 2023 in  
Association of Chemistry Teachers ( ACT)  
Time- 10:30 Am onwards  
**Registration Link**  
<https://forms.gle/qdJW4BpHdmh3TB2g8>

GWB was started from 2019 onwards by IUPAC. The main aim of the GWB is to demonstrate the need to build a network of both women and men working together to address the barriers and inequalities faced by women in science. IUPAC ( International Union of Pure and Applied Chemistry) is in a unique position to serve as a leading organization and global platform where these difficult and persistent issues can be addressed in a transparent manner.

Speaker 1



**Dr. Rajendra Singh Jadeja**  
Associate Professor  
The Maharaja Sayajirao University of Baroda,  
Gujarat

Speaker 2



**Dr. Anshul Singh**  
Assistant Professor  
Baba Mastnath University, Rohtak  
Haryana



Patron and Principal  
**Dr. L.N. Sharma**



Webinar Co-ordinator and  
HOD, Chemistry  
**Ms. Khushboo Mandawara**



Convener  
**Dr. Sheetal Shreemal**

Organizing Committee  
Ms. Sayma Parveen, Dr. Neetu Patel, Dr. Abhinav Patel, Ms. Babita Tongiya,  
Pro. Rajesh Bhatnagar, Smt. Sheela Jain & Mr. Dinesh Panwar

Advisory  
Dr. Brijesh Patel, President ACT    Dr. D. V. Prabhu, General Secretary ACT    Dr. Vijender Singh, National Coordinator GWB, 2023    Dr. S.D. Banerjee, HOD, Economics

**About the National Webinar**  
Department of Chemistry, Rajiv Gandhi Govt. PG College Mandsaur is proud to host the National Webinar on "Breaking Barriers in Science" on 14 Feb 2023 in the year when India will assume the "G20 presidency" for a year to secure global economic growth and prosperity.

The aim of this National Webinar is to establish an active network of both men and women to overcome the barriers to gender equality and the upliftment of women for a sustainable tomorrow.





## Institute of Sciences

In association with

Association Of Chemistry Teachers C/o Homi Bhabha Centre  
For Science Education (Tifr) Mumbai Celebrates

# The IUPAC Global Women's Breakfast GWB2023

Expert



**Prof. (Dr.) Purnima Nag**

Sr. Addl. Director - School of Engg. & Tech.  
& School of Life & Basic Sciences  
Jaipur National University - Jaipur

E-Certificate will be provided to all  
the registered participants

Webinar on

## Breaking Barriers In Science

Date : 14th Feb. 2023 ,  
Time : 12:30 PM, (IST)

Zoom ID : 714 9709 3441  
Pass Code : chemistry

Convenors

**Dr. Ashutosh Tripathi**

HEAD Institute of Sciences  
SAGE University, Indore

**Dr. Siya Upadhyay**

IUPAC, GWB  
Institute of Sciences





**IUPAC**

INTERNATIONAL UNION OF  
PURE AND APPLIED CHEMISTRY



**Government SSP College Waraseoni**  
**Department of Chemistry**  
**Organizes**  
**National Symposium**  
**On**

**“Coordination Chemistry & Catalysis”**

**Under the aegis of IUPAC-GWB-2023**

**in association with**

**Association of Chemistry Teachers**

**&**

**Waraseoni Chemical Society**

**Date:-**  
**14/02/2023**

**Time:- 12.30**  
**pm to 3.30 pm**



**Patron**  
**Dr. Praveen Shrivastava**  
**Principal**  
**Govt. SSP College**  
**Waraseoni**



**Eminent Speaker**  
**Mr. Nilay Kumar Pal**  
**Research Associate**  
**Department of Chemistry**  
**IIT Kanpur**



**Eminent Speaker**  
**Mr. Ved Prakash**  
**Research Associate**  
**Department of Chemistry**  
**IIT Roorkee**



**Convener**  
**Dr. Rakesh Choure**  
**HOD (Chemistry)**  
**Govt. SSP College**  
**Waraseoni**





**Department of Chemistry,  
Rani Rashmoni Green University  
Tarakeswar, Hooghly, West Bengal, India**



**&  
Association of Chemistry Teachers (ACT)**

**Mailing Address: Homi Bhabha Centre for Science Education (TIFR), Mumbai, India**

**in association with  
Government General Degree College, Singur  
Hooghly, West Bengal, India**

**Welcome you to**

**Global Women's Breakfast, 2023 [14<sup>th</sup> February, 2023 5:30 PM, IST]**

**in collaboration with  
IUPAC | INTERNATIONAL UNION OF PURE AND APPLIED CHEMISTRY**

**Theme: "Breaking Barriers in Science" On Google Meet and YouTube**

**Registration Link: <https://forms.gle/RWr7yPPtK5rxY8k68>**

## **PATRONS**



**Prof. Ashutosh Ghosh**  
[Vice-Chancellor]  
Rani Rashmoni Green  
University, Hooghly,  
West Bengal, India



**Dr. Santanu  
Chakrabarti**  
[Principal]  
Government General  
Degree College, Singur,  
West Bengal, India



**Prof. D. V. Prabhu**  
[General Secretary]  
Association of Chemistry  
Teachers [ACT],  
Mumbai




**Prof. Brijesh Pare**  
[President]  
Association of  
Chemistry Teachers  
ACT, Mumbai


## **EVENT COORDINATOR**

**Dr. Anrit Krishna Mitra**  
Assistant Professor, Department of Chemistry  
Government General Degree College, Singur  
Member of Executive Council, Association of Chemistry Teachers  
Email: [anbhrosia12june@gmail.com](mailto:anbhrosia12june@gmail.com)  
Phone: +91-9432164011



**SRM INSTITUTE OF SCIENCE AND TECHNOLOGY**  
Ramapuram Campus  
**FACULTY OF ENGINEERING AND TECHNOLOGY**  
**DEPARTMENT OF CHEMISTRY**  
in association with  
**ASSOCIATION OF CHEMISTRY TEACHERS, MUMBAI & INDIAN NATIONAL YOUNG ACADEMY OF SCIENCES (INYAS)**  
Celebrates  
**IUPAC - GLOBAL WOMEN'S BREAKFAST**  
Webinar On  
**BREAKING BARRIERS IN SCIENCE**  
14.02.2023 10.00 AM - 11.30 AM

**CHIEF GUEST**  
  
**DR. PRATIBHA JOLLY** IASAC, Max Planck Institute for Science and Society Fellow, MBI  
Ph.D. (Solid State Physics) from Indian Institute of Technology, Bombay  
Former Principal, Miranda House, University of Delhi  
TITLE: THE GATEWAY TO SOLID-STATE SCIENCE: A WOMAN'S JOURNEY

**EMINENT SPEAKER**  
  
**DR. NISHIMA WANGO**  
Assistant Professor  
Applied Science (Chemistry)  
U.S.T. People's University, Chongqing, China  
TITLE: WOMEN IN SCIENCE: CHALLENGES AND OPPORTUNITIES

For Registration : <https://srmpg.edu.in/academics/departments-of-chemistry/events/>  
E-Certificate will be given for all participants

Convenor  
**Dr. Helen P. Kavitha**  
Professor & Head/Chemistry  
SRMIST, Ramapuram, Chennai  
Vice President (South Zone), ACT

Coordinators  
**Dr. P. Arini**, Assistant Professor  
**Dr. K. Rama**, Assistant Professor  
Department of Chemistry SRMIST, Ramapuram, Chennai

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**IPS ACADEMY INDORE**  
Institute of Science and Research  
**International Seminar**  
**"Breaking Barriers in Science"**

  
**Global Women's Breakfast- 2023**

**Special Guest**  
**Dr. Pradeep Sharma**  
Scientific Advisor,  
New York

**Eminent Speakers**  
**Dr. Helen P. Kavitha**  
SRM IST, Chennai  
**Dr. Shilpi Mishra**  
IIT, Indore

**Young Rising Talent**  
**Mria Chowdhary**  
Western University  
Canada

Join us on  
**14<sup>th</sup> February 2023 (Tuesday) 2:30 PM onwards**  
Venue: Mess Auditorium, IPSA, Indore

Organized by  
**DEPARTMENT OF CHEMISTRY**  
ISR, IPS Academy, Indore  
In Collaboration with  
**IUPAC, ACT-TIFR, Mumbai & My Green Lab, California**

**Dr. Pratibha Sharma**  
Convenor, GWB  
IPS Academy Indore

**Dr. Ruchi Shrivastava**  
Head, Dept. of Chemistry  
ISR, IPS Academy Indore

**Dr. Premilata Gupta**  
Principal  
IPS Academy Indore

**ACT** **IUPAC** **Global Women's Breakfast- 2023** **California, USA my green lab.**

**Global Women's Breakfast**  
**GWB - 2023**

Organized by  
**Department of Chemistry**  
**Rajiv Gandhi Govt PG College, Mandasaur (M.P.)**

  
National Webinar  
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Time- 10:30 Am onwards  
Registration Link  
<https://forms.gle/qdJW48pHdnh3T82g8>

**Speaker 1**  
  
**Dr. Rajendra Singh Jadeja**  
Associate Professor  
Department of Chemistry  
The Maharaja Sayajirao University of Baroda,  
Gujarat

**Speaker 2**  
  
**Dr. Anmol Singh**  
Assistant Professor  
Baba Mastanath University, Bathuk  
Haryana

**Patron and Principal**  
  
**Dr. L.N. Sharma**

**Webinar Co-ordinator and**  
**HOD, Chemistry**  
  
**Ms. Khushboo Mandasaur**

**Convenor**  
  
**Dr. Sheetal Shrivastava**

**Organizing Committee**  
Ms. Sayma Parveen, Dr. Teenu Parat, Dr. Ashay Parat, Ms. Rashmi Tongke,  
Prof. Rajesh Bhawar, Mrs. Sheela Jain & Mr. Vinodh Parvath

**Advisory**  
**Dr. Brijesh Puro** President ACT  
**Dr. D. V. Prathiba** General Secretary ACT  
**Dr. Vamdev Singh** National Co-ordinator GWB-2023  
**Dr. S.P. Ramani** HODS, Economics

**About the National Webinar**  
Department of Chemistry, Rajiv Gandhi Govt. PG College Mandasaur is proud to host the National Webinar on "Breaking Barriers in Science" on 14 Feb 2023 in the year when India will assume the "G20 presidency" for a year to secure global economic growth and prosperity.

The aim of this National Webinar is to establish an active network of both men and women to overcome the barriers to gender equality and the upliftment of women for a sustainable tomorrow.





INTERNATIONAL UNION OF  
PURE AND APPLIED CHEMISTRY



## IUPAC Global Women's Breakfast #GWB-2023

Theme

# "Breaking Barriers in Science"

## And Celebration of National Science Day



Prof. Nageshwar Rao  
Vice Chancellor



INDIRA GANDHI NATIONAL OPEN UNIVERSITY  
**REGIONAL CENTRE, NAGPUR**

In Association with



Hislop College, Nagpur  
**Invites You**

for the

### Webinar (Hybrid Mode)



Dr. U. C. Pandey  
Director, RSD



Prof. Srikant Mohapatra  
Pro-Vice Chancellor



Prof. D. V. Prabhu  
General Secretary  
Association of Chemistry Teachers



Dr. Shachi Shah  
Director, SOITS

Dr. Shubhajit Halder  
Department of Chemistry  
Hislop College

"Breaking the Barriers in Science Education  
through Open University - Feedback of Teachers  
and students of IGNOU "

**14th February 2023 Tuesday**

**3.30 PM to 5.30 PM**

**Watch on**



[www.youtube.com/IGNOUNAGPUR](https://www.youtube.com/IGNOUNAGPUR)



<https://www.facebook.com/NagpurRC>



Dr. Lalita Kumar  
Prof. of Chemistry, SOS

Dr. P. Sivaswaroop, FRSC  
Senior Regional Director  
IGNOU Nagpur Regional Centre





## BHERULAL PATIDAR GOVERNMENT P. G. COLLEGE, MHOW, DISTRICT-INDORE (M.P.)

welcomes you to the national webinar organized in collaboration with the  
INTERNATIONAL UNION OF PURE AND APPLIED CHEMISTRY (IUPAC)



Powered By  
Association of Chemistry Teachers (ACT), C/o Homi Bhabha Centre for Science  
Education (TIFR), Mumbai, India

### "IUPAC Global Women's Breakfast 2023: Breaking Barriers and Expanding Frontiers in Science"

A quality initiative under the umbrella of IQAC

Date: 14<sup>th</sup> February 2023, TIME: 02.00 pm onwards



#### Eminent Speaker

Dr. Anupama Harshal W.  
Women in STEM, Consultant-  
Science Outreach Programme  
Govt. of India



#### Chief Guest

Dr. Vikas Shende  
Principal Scientist  
MPCST, Bhopal

Our Tagline: "Uccha Shikshit Yuva Sunhare Bhavishya ka Aadhar"











**Government SSP College Waraseoni**  
**Department of Chemistry**  
**Organizes**  
**National Symposium**  
**On**  
**“Coordination Chemistry & Catalysis”**  
**Under the aegis of IUPAC-GWB-2023**  
**in association with**  
**Association of Chemistry Teachers**  
**&**  
**Waraseoni Chemical Society**

**Date:-**  
**14/02/2023**

**Time:- 12.30**  
**pm to 3.30 pm**



**Patron**  
**Dr. Praveen Shrivastava**  
**Principal**  
**Govt. SSP College**  
**Waraseoni**



**Eminent Speaker**  
**Mr. Nilay Kumar Pal**  
**Research Associate**  
**Department of Chemistry**  
**IIT Kanpur**



**Eminent Speaker**  
**Mr. Ved Prakash**  
**Research Associate**  
**Department of Chemistry**  
**IIT Roorkee**



**Convener**  
**Dr. Rakesh Choure**  
**HOD (Chemistry)**  
**Govt. SSP College**  
**Waraseoni**

## Govt. Excellence Higher Secondary School, Madhavnagar, Ujjain

Excellence Science Club, Govt. Excellence Higher Secondary School, Madhavnagar, Ujjain (M.P) conducted GWB 2023 event on 14th February 2023. The quiz was a huge success. A total of 91 students participated in the quiz competition and a total of 21 questions with every question of 2 points. The quiz was created on Google forms.

Out of 91 students, we felicitated top 10 students with Certificates on the occasion and celebration event of National Science Day organized on 28th February 2023. Attached are some glimpses of the event.



*Audience during the programme*



*Speech by Dr. Yogendra Kumar Kothari*



*Winners of quiz on Scientists*



# Pandu College, Guwahati, Assam

Date: 14 February 2023

A popular talk on '**Chemistry in Everyday Life**' was organized by Department of Chemistry, Pandu College, Guwahati, Assam in association with Association of Chemistry Teachers (ACT), Mumbai on the occasion of Global Women's Breakfast 2023. Dr. Pallabi Borah, of Assam Don Bosco University was present as the resource person in the event. About fifty students from Chemistry and Botany Department took part in the interactive programme along with the esteemed faculties of the college. Dr. Manoj Sarma, Associate Professor, Department of Chemistry, Pandu College was the Coordinator of the event.



*Dr. Pallabi Borah delivering a presentation*



*Audience of GWB-2023*



## Kamla Nehru Mahavidyalaya, Nagpur

### GWB 2023

The Association of Chemistry Teachers (ACT), Mumbai, Department of Chemistry, Kamla Nehru Mahavidyalaya, Nagpur and Jagat Arts, Commerce and I.H.P. Science College, Goregaon, India organized GWB on “**Breaking Barriers in Science**” on **14<sup>th</sup> February 2023**. Around 4670 delegates including Professors, Scientists, Industrialists, Faculty Members, Research Scholars and Students from all over the world actively registered in this mega event.

The Chief Guest of the Inaugural function, **Dr. Smeeta A. Wanjarri**, Treasurer of Amar Sewa Mandal, Nagpur inaugurated the programme and in her address, she mentioned Importance of Instrumental methods for characterization of Materials. **Prof. D. V. Prabhu**, General Secretary, ACT Gave Inaugural address to the gathering on an important topic of Material Science and different techniques of characterization. President of Inaugural programme **Dr. Brijesh Pare**, President of ACT addressed the gathering on this occasion. Dr. D. S. Badwaik, Principal of Kamla Nehru Mahavidyalaya and Dr. N. Lanje, Principal of Jagat College have given the introductory remarks

Earlier, **Dr. Wasudeo Gurnule**, Convener of GWB 2023, welcomed the gathering and explained the theme of this Global women breakfast on “**Breaking Barriers in Science**”. The goal of this webinar was to provide a platform for interaction between eminent professionals, researchers and scholars of different fields from both academia and industry under one roof to discuss and share the state of the art development of Barriers in science and enlighten the future potentials of this Science.

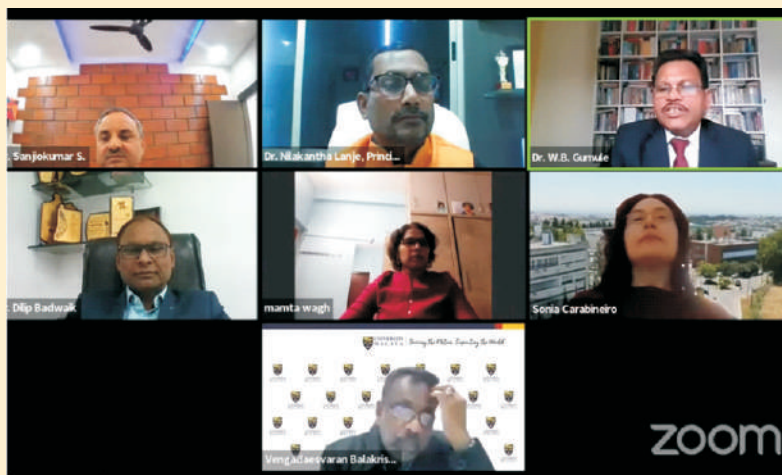
This Webinar was Inaugurated by the **Dr. Smeeta Wanjarri**, Treasurer Amar Sewa Mandal Nagpur, **Prof. Brijesh Pare**, President of Association of Chemistry Teachers, Chairman of Inaugural function, Prof. D. V. Prabhu General Secretary of ACT Mumbai, **Dr. Dilip Badwaik**, Principal of Kamla Nehru Mahavidyalaya, Nagpur, Dr. N. Lanje, Principal, Jagat College,, Goregaon and **Dr. Wasudeo Gurnule**, Convener of Webinar was present on this occasion.

**Dr. Smeeta Wanjarri** gave information regarding UNESCO has stated that the sustainability science approach is essential for effective decision, making with regard to global sustainability, since social, environmental and cultural systems are closely related. This approach is a powerful reminder of the complexity of the challenges the world is facing today. I feel it is the responsibility of academic institutions like us to endeavor to educate and advocate the development of this approach. This webinar is a part of such initiatives.

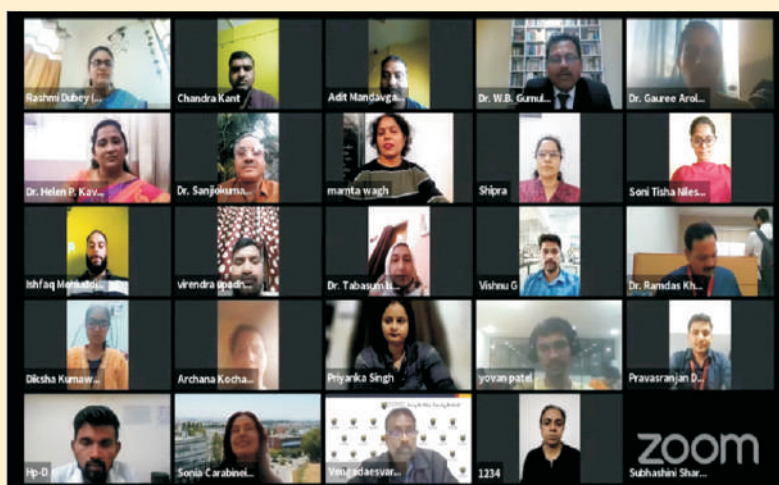
This webinar was conducted under the guidance of **Dr. Suhasini Wanjari**, President of Amar Sewa Mandal and **Adv. Abhijit Wanjarri**, Secretary of Amar sewa Mandal.

Principal **Dr. Dilip Badwaik** and **Dr. N. Lanje**, Principal gave introductory remarks of international webinar. During inaugural speech **Prof. Brijesh Pare** said that Webinar was much beneficial to the young researchers, PG students and faculty members working on material science. He said importance of different materials in daily life.

Dr. Wasudeo Gurnule, Convener of International Webinar welcome all the guest speakers and participants and explained the theme and objectives of organizing this webinar. For this webinar Eminent speakers were Dr. Vengadaesvaran V. Balakrishnan UM Power Energy Dedicated Advanced Centre, Wisma R & D University of Malaya, Kuala Lumpur, Malaysia gave a talk on 'Smart Self Cleaning building glass', **Prof. Sónia A. C. Carabineiro** Nova University of Lisbon, Portugal, gave a talk on 'Breaking Barriers with gold', **Prof. Helen P. Kavitha**, Head, Department of Chemistry, SRM Institute of Science and Technology, Ramapuram Campus, Chennai, India gave the talk on “Fostering towards an equal science”



**Eminent Speakers Prof. Sónia A. C. Carabineiro, Portugal & Prof. V. Balakrishnan during inaugural function**



**Participants during GWB-2023**



## Green Synthesis of Silver Nanoparticles and their Potential Applications

Nanotechnology is a young, developing technology with many uses. The combination of bio sensing platforms and medication delivery systems produced efficient treatment plans for biomedical applications. The outstanding qualities demonstrated by these materials have greatly enhanced these bio sensing and drug delivery systems. It involves the formation and usage of materials with one or more dimensions among 1 and 100 nm.

Nowadays, a varied series of physical and chemical procedures are utilised to create nanoparticles (NPs), which pose a risk to human health and the environment. Green nanotechnology, which blends green chemistry with engineering concepts to produce eco-friendly and secure nanomaterials, is used in conjunction with biological techniques to address this problem. Green nanotechnology is used to address problems that have a negative impact on both human health and the environment. However, for medical and biological uses wherever the pureness of NPs is crucial, biogenic reduction of metal precursors to produce corresponding NPs by using phytochemicals found in plants and plants' parts as well as microorganisms is environmentally friendly, less expensive, and free of chemical contaminants. These biological molecules from plants go through a carefully monitored assembling process to make them appropriate for the creation of metal nanoparticles. With regard to pharmaceutical applications with a therapeutic basis as well as applications related to energy and the environment, this study highlights the significance of the green synthesis of metal oxide nanoparticles employing a variety of cutting-edge techniques.

The antimicrobial properties of silver were well known to our forefathers. In the past, tonsillitis, chronic wounds, acute epididymitis, sepsis and infections have all been treated with silver salt and its colloidal formulations. They also been utilized to prevent baby eye problems. However, once antibiotics were discovered, their use was viewed as being obsolete. Recently, nano silver has made a remarkable comeback. Due to this, enormous determinations were made in nanotechnology, predominantly in the creation of environmentally friendly synthesis techniques for silver nanoparticles (AgNPs), in order to enable the use of nanoparticles in antimicrobial therapy. One of the most commercialised nanomaterials today, silver nanoparticles (AgNPs) are used in over 200 goods, including medical apparatus, antimicrobial coatings, photonic devices, molecular diagnostics and textiles, sensors, clothing, textiles, household appliances, conductive inks, home water filters, cosmetics, fillers, pastes and electronic. Owing to the utilisation of non-hazardous, biocompatible, and environmentally acceptable substrates and a moderately simple blend procedure under ambient settings, biological approaches for the production of AgNPs have enormous impact over chemical and physical procedures. Microorganisms and plants are used in the biological method. The key elements that could be taken into account when creating extremely steady and characterised nanoparticles are as follows:



**Dr. Rashmi Dubey**

**Department of Chemistry,  
Kamla Nehru Mahavidyalaya,  
Nagpur-440024**

1. *Choosing the best organism*: To produce nanoparticles, scientists must concentrate on the inborn characteristics of organisms, such as enzyme activity and biological pathways.

2. *Ideal circumstances for cell growth and enzyme activity*: If the substrate is present in a sub toxic amount, the growth would boost the enzyme's activity

3. *Optimal reaction conditions*: We must tune the bio-reduction conditions in the reaction mixture while taking into mind the yield and rate in order to manufacture metal nanoparticles on an industrial scale. Biocatalyst concentration, Substance concentration, exposure time, electron donor concentration, mixing rate, temperature, and light all need to be regulated and optimised.

### **Bacteria mediated synthesis of AgNPs**

A natural occurrence in bacterial, fungal, and plant biosystems called biological synthesis of nanoparticles creates nanomaterials with medicinal uses. The buildup of AgNPs inside the cell of *Pseudomonas stutzeri* AG259 from a silver mine was examined by Klaus and colleagues in 1999. The ability of bacteria to live in extremely silver-rich environments is the cause of the nanosilver buildup. According on the location, the manufacture of AgNPs by some silver-resistant bacterial strains may take place intracellularly or extracellularly.

### **Extracellular Synthesis**

In the extracellular process, bacterial or fungal cell wall components, organic compounds in the culture media, or microbial enzymes and proteins reduce metal ions for the creation of NPs. Nanoparticles are synthesised extracellular, or outside of the bacterial cell. These nanoparticles have been created utilising cells, culture supernatant, or aqueous cell-free extract. They come in a variety of shapes, including disk-shaped, cuboidal, spherical, triangular, hexagonal etc. [15] In 100mL of NB medium, *Pseudomonas* sp. THG-LS1.4 was grown. After one day of incubation at 28°C with an orbital shaker spinning at 120 rpm, the medium was centrifuged to separate the supernatant. The supernatant was combined with a 1mM final concentration of filter-sterilized  $\text{AgNO}_3$  solution, and then incubated for a further 48 hours at 120 rpm at 28 °C. Visual examination was used to check for changes in the colour of the culture media during the synthesis. Beckman Coulter's Avanti™ J-25 centrifuge, made in the USA, was used to collect the AgNPs at 12,000 g and 25 °C for 10 min. The AgNPs were then carefully washed in water to eliminate any remaining unconverted metal ions or other ingredients. After air drying, the pure nanoparticles were obtained as a powder. Due to the simplicity of recovering nanoparticles from the solution, extracellular techniques of production are preferable to intracellular synthesis.

### **Synthesis using biomass**

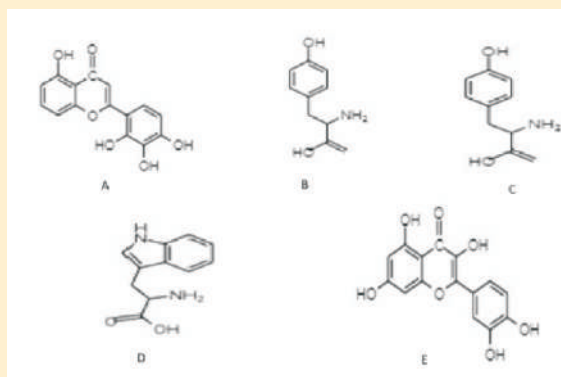
Some bacteria respond to silver salt exposure by producing extracellular AgNPs. (i) Biomolecules secreted into the environment by bacteria aid in decrease of Ag ions to AgNPs, and/or (ii) nanoparticles created inside the cell are concealed external. Both live and dried bacterial biomass were used in the demonstration of this synthesis. Extracellular AgNPs must be subjected to mild sonication in order to adhere to bacterial cell walls. In bacteria, the production of silver-containing nanoparticles such as  $\text{Ag}_2\text{S}$  and  $\text{Ag}_2\text{O}$  has been reported. However, Muthukumarasamy et al and Zakiet al show the synthesis of AgPNs



from *E. coli* biomass while they did not observe the development of crystalline AgNPs in the genus *Morganella*.

### Synthesis from plants

Phytoextraction, the process by which plants absorb minerals via numerous waters and soil residues, is how plants defend themselves against insects and herbivores. The accumulation of necessary metals to developing crops, as well as the mining of valuable metals from impractical ground sites (phytomining), phytoremediation, and regaining of pollutants, are major applications of phytoextraction. According to studies, the plant gathered metals in the form of nanoparticles. This has sparked attention in using plants as factories to create nanoparticles. Creation of nanoparticles, plants full-grown on the proper metal-enriched substrate have been investigated. *Medicago sativa* and *Brassica juncea* have both shown the capacity to accumulate AgNPs. Shankar et al introduced the use of plant broths and/or extracts in the manufacture of nanoparticles. In their research, substances that reduce metal ions remained isolated and employed as decreasing mediators in a synthetic reaction mixture, producing nanoparticles outside of cells.



**Figure 1**

Biomolecules for example amino acids, vitamins, polysaccharides, enzymes, tannins, phenolics, alkaloids, terpenoids, saponins, and proteins are present into extracts and serve as decreasing and stabilising agents (Figure 1). Plant extracts can also produce nanoparticles since they contain sugar. It is commonly known that linear monosaccharide's like glucose, which include an aldehyde, can function as reducing agents. Because of the

hydrolysis of sucrose, glucose, and fructose in acid. It is generally believed that the process by which sugars produce nanoparticles involves the oxidation of an aldehyde group into a carbonyl group, which in turn causes the decrease of metal ions and nanoparticle creation.

### Characterization of AgNPs

Understanding and controlling nanoparticle manufacturing and application depend on the characterization of AgNPs; numerous techniques are employed to measure various properties. The morphology of AgNPs is discovered using transmission and scanning electron microscopy (TEM, SEM). The size distribution of AgNPs can be determined using the Zetasizer Nano Series Analyzer. Energy dispersive X-ray spectroscopy (EDS) investigations are carried out using an emission scanning electron microscope with an EDS instrument. By demonstrating the plasmon resonance with the help of X-ray photo electron spectroscopy (XPS), X-ray diffractometry (XRD), Fourier transform infrared spectroscopy (FTIR), and UV-Vis spectroscopy, AgNPs creation is also confirmed. Additionally, XRD is used to determine crystallinity.

## APPLICATIONS OF SILVER NANOPARTICLE

1. The antimicrobial properties of Ag-NPs alongside the growth of *E. coli* have been reported by Sondi and Salopeck-Sondi [36]. The Ag-NPs have been shown to be an active biocide alongside broad-spectrum bacteria, including both Gram-negative and Gram-positive bacteria.

2. Bioaerosols are airborne biological particles such as bacteria, fungus, and viruses that can spread infectious, allergic, or toxic disorders. Particularly, it was discovered that the filters of heating, ventilation, and air conditioning (HVAC) systems accumulated a lot of indoor air bioaerosols. Antimicrobial Ag-NPs have been produced and proposed to be included into air filters to inhibit microbial growth. Ag-coated CNT hybrid nanoparticles (Ag/CNTs) have been produced and their properties have been investigated utilizing aerosol nebulization and thermal vaporization and condensation procedures.

3. In many underdeveloped nations, access to clean drinking water is a crucial social and health issue. In addition to being employed in chem-Ag-NPs, biologically manufactured nanosilver (bio-Ag-NPs) is also used to disinfect water of viruses.

4. Ag-NPs were also used therapeutically, mainly to heal burn wounds. For this test, a gel formulation (S-gel) containing Ag-NPs was developed.

5. By serving as a reservoir for the gradual release of ionic silver from the surface to the bulk and by preventing growth on the surface itself, Ag-NPs-coated paper may be useful for longer-term food preservation in addition to being used as antimicrobial coatings for household paints, biomedical and therapeutic fields.

6. AgNPs' distinct physical, chemical, and biological characteristics have a wide range of exceedingly potential industrial and medical uses. Therefore, AgNPs are employed in therapy due to their cytotoxic effects.

7. Infectious disorders instigated through viruses including SARS-Cov, influenza A/H5N1, influenza dengue virus, A/H1N1, HBV, HIV and novel encephalitis viruses have been reported to be developing and reemerging more frequently in recent years. These viral infections have a high probability of developing into highly contagious illnesses that harm public health. As previously indicated, Ag-NPs have demonstrated active activity against bacteria and fungus. Ag-NPs' antiviral properties, however, remain a mystery to scientists. There are surprisingly few studies that look into how Ag-NPs affect viruses.

In conclusion, it can be said that environmentally friendly synthetic methods that make use of bacterial and plant extracts are attractive substitutes for the production of AgNPs. However, morphological features like size and shape need to be precisely controlled in order to create AgNPs with enhanced bioactivities. Utilising concepts and tools from nanoscience and nanotechnology is a good strategy today within the framework of current global priorities. We have observed the interaction of several viral particles with nanomaterials, primarily focused on SARS-CoV-2, and emphasising COVID-19 disease prevention, diagnosis, and therapy as much as possible under the umbrella of nanotechnology. Viapermittinginitialfinding, these progresses will increase the persistence rate of cancer patients. Additionally, these developments being utilized to find the development of cancer and how it responds to treatment, which could help to improve cancer treatment strategies. The field of nanotechnology-based cancer diagnosis has made significant strides, and our comprehension of it has grown significantly. Nanotechnology offers excellent prospects to improve cancer diagnosis, which will ultimately improve the survival rate of cancer patients due to its high sensitivity, specificity, and multiplexed measuring capacity.



# Chemists Develop Sustainable Method To Remove “Forever Chemicals” From Water

Per- and Polyfluorinated substances (PFAS) are incredibly versatile chemicals. These fluorine-rich organic compounds are what make raindrops effortlessly glide off our outdoor jackets. They serve as the non-stick layer on food packaging paper and are crucial components in fire-extinguisher foams and the safety equipment used by firefighters. Since their introduction in the 1940s, the range and scope of products incorporating PFAS have expanded significantly.

However, this widespread use is where concerns arise. Due to their stable nature and lack of natural degradation pathways, these durable chemicals persistently accumulate in our environment, posing significant problems for both human health and our surroundings. Today, traces of PFAS can be found globally: from water, air, and soil to plants and animals. And inevitably, they find their way into humans as well.

Just how much of a health risk these chemicals pose is still not clear. Initial laboratory animal studies have shown that PFAS may impair reproductive health. What is clear is that these synthetic compounds do not belong in the natural environment and certainly not in living organisms. It, therefore, makes sense to find ways to try and reduce PFAS contamination levels in the environment.

A team of researchers led by Markus Gallei, Professor of Polymer Chemistry at Saarland University, Professor Xiao Su from the University of Illinois Urbana-Champaign, and their doctoral students Frank Hartmann (Saarland) and Paola Baldaguez (Illinois) have developed a new electrochemical method that can remove PFAS chemicals from water and then efficiently release them again for destruction. This new PFAS remediation platform allows these fluorinated contaminants to be collected, identified and then destroyed without needing to incinerate the filter.

In the method developed by the research team, the central role is played by metal-containing polymers known as metallocenes. Metallocenes first came on the scene in 1951 with the discovery of the iron-containing molecule ferrocene. Since then, many other metallocenes have been reported. Frank Hartmann, Markus Gallei, and their international team have found that electrodes functionalized with ferrocene or – even more effectively – with a cobaltocene synthesized by Frank Hartmann, are able to remove even minute quantities of PFAS molecules from water.

But the real key lies in the fact that if a voltage is applied to the ferrocene or cobaltocenemetallopolymers, they can 'switch' their electrical state and release the PFAS molecules previously captured. 'And cobalt is significantly better at doing this than iron,'

observed Frank Hartmann. 'We've found a means by which PFAS can be efficiently removed from water and then released again, effectively regenerating the electrode for further use. Chemists Develop Sustainable Method To Remove "Forever Chemicals" From Water



Graphical representation of a metal-containing polymer with ferrocene units used for reversible uptake of perfluorinated compounds. Credit: Markus Gallei

Unlike the activated carbon filter, which I have to destroy once it has become saturated with PFAS molecules, I can switch the metallocenes a thousand times, should I want to,' said Markus Gallei, summarizing the significance of the research work.

Having laid the foundations, Frank Hartmann, Markus Gallei, and their colleagues at the University of Illinois are now looking to upscale development to facilitate the removal of these highly persistent contaminants from our rivers and oceans.

### Why Are Mosquitos So Attracted to Me?

Some people are more attractive to mosquitos than others, and new research is starting to show why. This Reactions episode dives into the chemistry of the molecules on our skin that make some of us so much more appealing to these pesky insects. It also reveals which products we can use to try to deter them. Because I am a mosquito magnet. Mosquitoes love me. A mosquito would bite me no matter my pronouns.

I swear there can be eight people at a barbecue and every single mosquito makes a beeline directly to me, like I am their personal barbecue. That is why I have indoor barbecues, not recommended by the American Chemical Society. And guess what? If you're a mosquito magnet, we are not imagining it. There is really something that makes us more attractive to mosquitoes, at least. I always said pro-bos-kis when I worked in a *Drosophila* lab and it does seem that that's a valid pronunciation, but a pro-bos-sis is more accepted.



Before we get into why mosquitoes love specific people more than others, let's walk through what happens when these mini-vampires suck your blood. When a female mosquito lands on you, because it is only the females that bite, it inserts its proboscis into you. This proboscis is a tiny mouthful of six needles that saw their way into your skin. Two of the needles are serrated like a saw blade, but the proboscis is shaped in a way to minimize pain so that you don't immediately swat the mosquito off. There is a soft part that hits you first, and then the sawing action is combined with a light vibration so that less force is required. Some scientists are actually trying to design similarly shaped microneedles for more painless injections, which sounds good. So I guess mosquitoes are finally doing something good for society. Anyway, mosquitoes don't just suck your blood. They actually inject some of their saliva into you as well.

And while scientists are still trying to tease apart exactly which chemicals in the spit do what, some of them seem to act as numbing agents to keep you from noticing you've been bitten. Others seem to act as vasodilators and anticoagulants, keeping your blood vessels open and your blood from clotting. Now, there are over 100 proteins in mosquito saliva and not all of their functions are even known yet. But we do know that that cocktail of chemicals is also why we get itchy. So your body actually has an allergic reaction to mosquito bites, specifically to some of those 100 chemicals in the mosquito's spit. Your immune system recognizes the foreign mosquito proteins and starts up a histamine response. This brings white blood cells to the area and it also activates other immune tools that cause itchiness.

And I hate it all so much. They always find me and I always get itchy and sometimes those bites last for weeks. So how do they find me in the first place? Mosquitoes use a bunch of different sensory clues to find us. They can hone in on our body heat. They can follow the scent of CO<sub>2</sub> from our breath. And I guess also just see us sometimes 'cause we're really big and the mosquitoes are really small so they can see us. But those big, broad sensory clues give mosquitoes an idea about where humans are in general. Once they find our barbecue, how do they choose who to chomp down on? Well, there's another big way that mosquitoes find us. It's skin odor.

There have been lots of studies over the years to figure out what makes some people smell so much more delicious to some mosquitoes than others. Some studies have said that blood type is involved. Others indicate that what food or drink you've consumed might play a role. Some say that pregnancy might impact mosquito attractiveness. And then there are other studies that say that the presence or absence of a malaria infection might impact whether or not mosquitoes wanna bite you. So these studies suggest that people infected with malaria might smell more attractive to mosquitoes than others, which is fascinating because that would make it easier for the malaria parasite to be passed around. But different studies have all shown different magnitudes of effects and some of them have shown conflicting results.

Those of us who are mosquito magnets, we really truly are magnetic to mosquitoes because they chose our scent way more than others. Specifically, the strong attractors produced significantly higher levels of three carboxylic acids, pentadecanoic, heptadecanoic, and nonadecanoic acids. They also found 10 other unidentified compounds in the same chemical class. And also, because this study was done over the course of three years, they were able to show that it wasn't something variable like what food the participants had

eaten or whether or not they'd had a beer recently. These were stable attractants.

I didn't have to wait long because in May of 2023, there was another mosquito magnet study released from a different group. It again looked at what made some people more attractive to mosquitoes than others. But this study looked at *Anopheles gambiae*, another common mosquito species. And they used a fancy camera setup that watched as mosquitoes landed on warm body temperature targets laced with different smells including isolated attractants like CO<sub>2</sub> and whole body odor from six different humans. And the setup for this was amazing because they put the mosquitoes in a big caged outdoor arena and then had little pipes leading away from that arena. At the end of each of the pipes were tents that contained the targets and the different people. And they had fans that helped push the human scents through the pipes into the central arena so that the mosquitoes could choose where they wanted to fly to.

They put a fan next to a sleeping human and then attracted mosquitoes to them. Just truly delightful. They once again found that carboxylic acids were big differentiating factors between attractive and non-attractive human scents. But this time, they found butyric, isobutyric, and isovaleric acids leading the pack for most attractive.



Now, they did also find an interesting observation that the least preferred human subject had a high abundance of eucalyptol in their body scent. And yes, that sounds like eucalyptus because it is the main component of eucalyptus oil. Assuming the person isn't part tree, the compound likely came from plant-based foods and flavorings in their diet. Now, this is just one person. So this is just a hypothesis-generating observation rather than a big sweeping statement. But could eucalyptol in diets help keep mosquitoes away? Maybe, it's a cool hypothesis.

And that leads me to my last point, which is how we, the magnets, can try and defend ourselves. You might know that DEET is a big mosquito deterrent. DEET is the chemical name for N,N-diethyl-meta-toluamide. And basically, it is super stinky to the mosquitoes and makes it harder for them to smell us. We have a short on how it works if you wanna learn more. But what about repellents derived from nature? Things like citronella candles that everyone has on their porch in the summer. So let's try this out with our own homemade mosquito traps filled with dry ice to give off CO<sub>2</sub>. Because remember, the CO<sub>2</sub> and our breath is one of the biggest attractants to mosquitoes generally. I'm gonna put together four mosquito traps, one with just dry ice, one with DEET and dry ice, one with citronella and dry ice, and one with oil of lemon eucalyptus and dry ice.

I'm gonna leave these out overnight scattered around the yard, and then count how many mosquitoes I capture in each one the next day. So I failed. I failed so hard at catching a single mosquito in Southern California. So many mosquitoes flocked to me and I couldn't catch one. This is the one time in my life when I wanted a mosquito to come near me and like nothing, I got nothing. I have failed you, ACS Reactions fans, and I'm sorry. But Andrew and George are in DC where there are tons of mosquitoes. So I decided to send them to Rock Creek Park and see if they could test the effectiveness of different repellents.





### List of ACT Life Members During Jan' 2023 to April' 2023

Sr. No.	Names	LM No.	Institution
1	Neha K. Baku	2504	Department of Chemistry, Atmiya University, Kalawad Road, Rajkot, Gujrat, India - 360 005
2	Arshia Parveen	2505	Department of Chemistry, B. Raghunath ACS College, Boralkar Nagar, Jintur Road, Parbhani - 431 401, Maharashtra - India
3	Surendra Prakash Gupta	2506	Department of Life Science, SVIS, SVVV, Indore, M.P. - 453 111
4	Samreen Fatema	2507	Maulana Azad College of Arts, Science and Commerce, Aurangabad - 431001
5	Rajaputra Subhakaran Singh	2508	Room No.3-209, SOE III, Malla Reddy University, Hyderabad, Maisammguda, Kompally - 500100
6	Kassa Suresh Kumar	2509	Aditya Degree College, Lakshminarayana Nagar, Kakinada - 533 003
7	Satpute Sangita Subhash	2510	Vidya Pratishthan Arts & Science College, Vidyanagari, Baramati (Pune) - 413133
8	Ranjit Kumar Puse	2511	Mendua, Post Bhojpur Chiklod Road Near Bangrasiya Chouraha, Bhopal 464993 M.P. India
9	P. Gurumoorthy	2512	Dept. of Chemistry, Er. Perumal Manimekalai College of Engineering, Hosur, Tamilnadu - 635117
10	Abhijit Dutta	2513	Department of Chemistry, Patharkandi College, Karimganj, Assam, India - 788 724
11	S. Praveen Kumar	2514	PG & Research Department of Chemistry, KMG College of Arts & Science, Gudiyatham - 635803
12	Prem Prakash Solanki	2515	Department of Chemistry, Institute of Science, Banaras Hindu University, Varanasi - 221005 (Uttarpradesh)
13	Minita Ojha	2516	Agarwal P. G. CMaharaja Agrasen Marg, Agra Road, Jaipur-302003 Rajasthan
14	Krishna Srivastava	2517	Shri Ramswaroop memorial University, Lucknow - Deva Road, Utter Pradesh - 225 003
15	Priyanka Jain	2518	IIS (deemed to be University) SFS, Mansarovar, Jaipur - 302020

### List of ACT Life Members During Jan' 2023 to April' 2023

Sr. No.	Names	LM No.	Institution
16	Amita Gupta	2519	Agarwal P. G. College, Sanganeri Gate Agra Road, Jaipur - 302003
17	Preeti Jain	2520	Agarwal P. G. College, Agra Road, Jaipur (Rajasthan) 302003
18	Anil Kumar Bansal	2521	Agrawal P. G. College, Sanganari Gate, Jaipur (Rajasthan) - 302003
19	Mahima Sain	2522	Vedanta P. G. Girls College, Ringus, Dist. Sikar, (Rasthaan) - 332404
20	Ashish Sharma	2523	Department of Chemisty, Vedanta P. G. Girls College, Ringus, Dis. Sikar (Rajasthan) - 332404
21	Dipti Sharma	2524	Vedanta P. G. Girls College, Ringus, Dist.-Sikar, Rajasthan - 332404
22	Mahesh Kumar Paliwal	2525	Department of Chemistry, Vedanta P. G. College, Ringus, Dist.-Sikar Rajasthan - 332404
23	Rachna Kumawat	2526	Vedanta P. G. Girls College, Ringus, Dist.-Sikar, Rajasthan - 332404
24	Rajpal Lalsing Jadhav	2527	Chemistry Dept., Swa. Sawarkar Arts, Science & Commerce College, Beed - 431122
25	Dr. Chandrakant Dattatray Bhenki	2528	Shri S. H. Kelekar College, Devgad, Dist.- Sindhudurga - 416612
26	Vishwa Deepak Singh	2529	Department of Chemistry, D.A.V. P.G. College, Gorakhpur - 273 001



L.M./IM No.: \_\_\_\_\_

Receipt No. \_\_\_\_\_

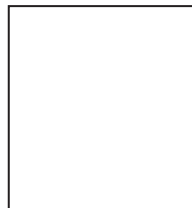


## ASSOCIATION OF CHEMISTRY TEACHERS (ACT)

Homi Bhabha Centre for Science Education  
Tata Institute of Fundamental Research  
103, NIUS Bldg., V.N. Purav Marg, Mankhurd, Mumbai-400 088.  
(Regd.No. Maharashtra Government, Mumbai 922,2010 G.B.B.S.D. dated 08/04/2010)  
**Website: [www.associationofchemistryteachers.org](http://www.associationofchemistryteachers.org)**

Date: \_\_\_\_\_

To,  
**The General Secretary,**  
Association of Chemistry Teachers,  
HBCSE(TIFR), Mumbai-400 088.



Dear Sir,

I/We wish to take the Life/Institutional Membership of A.C.T.

[Fees: Life Rs.1500/- and Institutional (one time payment) Rs.15,000/-]

A cheque/Demand Draft No. \_\_\_\_\_ dated \_\_\_\_\_ of Rs. \_\_\_\_\_  
drawn on \_\_\_\_\_ Bank, payable at par at Mumbai, in favour of "Association  
of Chemistry Teachers" is enclosed. (Outstation members should remit through demand draft only.)

1. Name : \_\_\_\_\_
2. Membership Sought : Life/Institutional
3. Qualifications : \_\_\_\_\_
4. Designation : \_\_\_\_\_
5. Date of Birth : \_\_\_\_\_
6. **Office address** : \_\_\_\_\_

Telephone : \_\_\_\_\_ Fax: \_\_\_\_\_ Email: \_\_\_\_\_  
7. **Residential address** : \_\_\_\_\_  
Mobile: \_\_\_\_\_ Landline: \_\_\_\_\_ Email: \_\_\_\_\_  
8. Area of teaching/research interest: \_\_\_\_\_

I am aware of the objective, rules and regulations of ACT and shall abide by them.

Place \_\_\_\_\_

Yours sincerely,

Date: \_\_\_\_\_

(Signature)

All correspondence should be made to the General Secretary, Association of Chemistry Teachers, 103,  
NIUS Bldg., Homi Bhabha Centre for Science Education (TIFR), V.N. Purav Marg, Mumbai -400 088.

### FOR OFFICE USE ONLY

ACT Membership awarded: Life/Institutional

Received from \_\_\_\_\_ a sum of Rs. \_\_\_\_\_

by Cash/cheque/DD no. \_\_\_\_\_ dated \_\_\_\_\_ drawn on \_\_\_\_\_

Bank being the \_\_\_\_\_ membership fees of ACT.

Membership No.: \_\_\_\_\_

General Secretary

Treasurer

ACT

ACT



# **ASSOCIATION OF CHEMISTRY TEACHERS**

**(Promoting Excellence in Chemistry Education)**

**Homi Bhabha Centre for Science Education (HBCSE, TIFR)**

**V.N. Purav Marg, Mankhurd, Mumbai - 400 088**

**[www.associationofchemistryteachers.org](http://www.associationofchemistryteachers.org)**



## **ACT NEWS LETTER**

**ISSUE - 25 JANUARY - APRIL 2023**