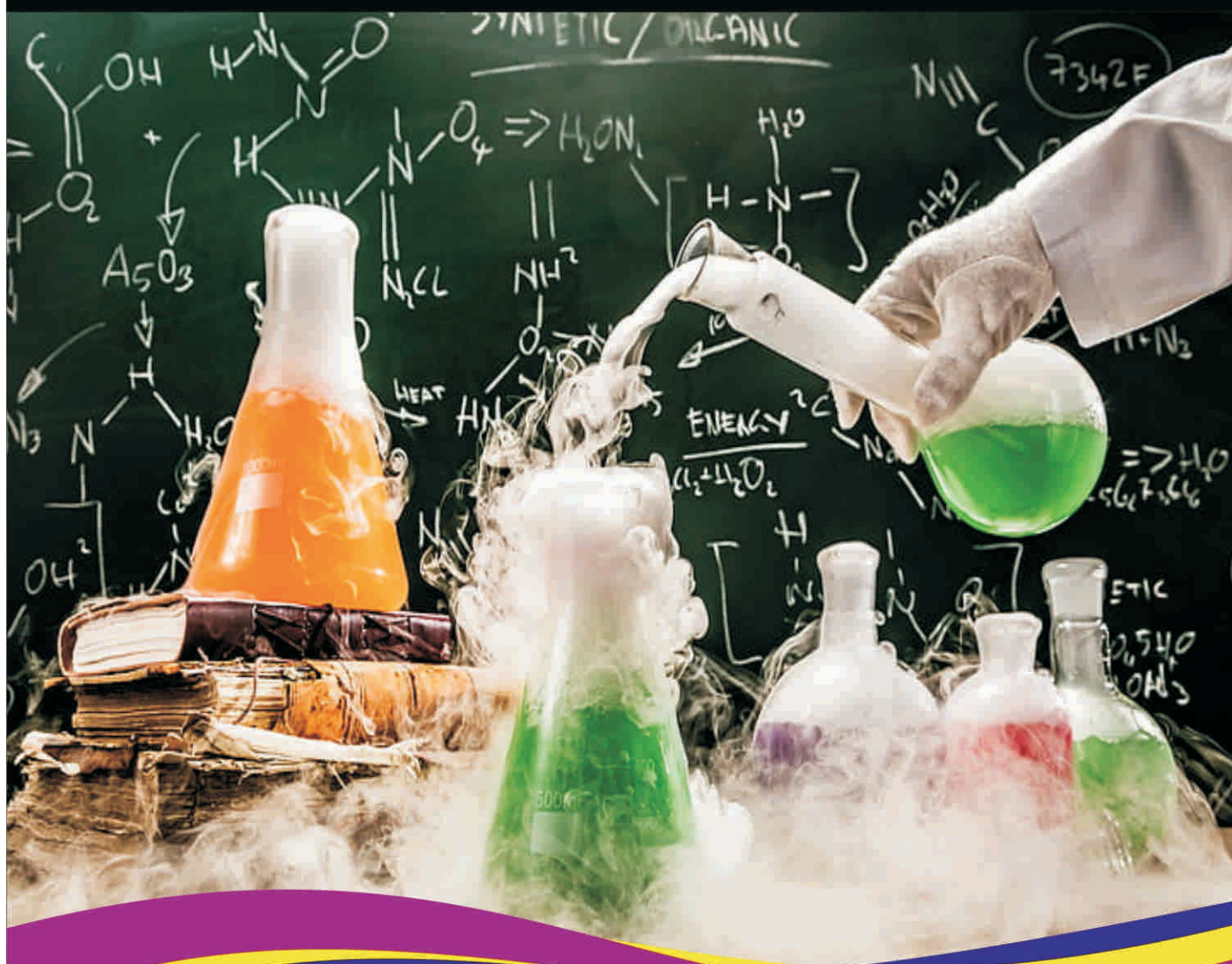


# ASSOCIATION OF CHEMISTRY TEACHERS

## NEWS LETTER

ISSUE : 21 SEPTEMBER - DECEMBER 2021



Promoting Excellence in Chemistry Education

# Association of Chemistry Teachers News Letter, September - December 2021

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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 in advance the entire fraternity of ACT, a Merry Christmas, a very happy, healthy and prosperous New Year 2022. The present Editorial Board has put in its bit of efforts, to make the newsletter as attractive and informative as possible. We tried to direct the attention of our readers towards advanced research trends taking place across the globe so as to motivate them to take up initiative in re-orienting themselves towards advanced topics of research and teaching methods. We are bringing the issue of the newsletter with the activities of ACT, articles of current topic, scientific news and reports of international and National webinars. We have also included the report of NCCT-2021 and brief profiles of ACT -2021 award winners. This issue also contains the reports of ACT Research Convention-2021 organized by different zones.

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

### 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
- ▶ **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



## Spectrum of Activities of ACT

**Prof. D. Rama Rao**, ACT Life Member, organized One Day State Level Student Colloquium on "The noble contributions of Nobel Laureates to Mankind" at P. R. Government College (Autonomous), Kakinada, AP. On November 11, 2021.

**Dr. Mini Kuriacose**, organized Webinar Chemistry Lecture Series during November 2021-February 2022, at Saintgits College of Engineering, Patha Muttom, Kottayam, Kerala, on "Crystal Engineering from Molecules to Materials" On December 18, 2021.

**Prof. Keyur D. Bhatt**, Head, Department of Chemistry, Mehsana Urban Institute of Science, Ganpat University, Mehsana, Gujarat, organized Chem Fest 2021 National Symposium on Nanomaterial's on December 20-22, 2021.

**Prof. Wasudeo Gurnule**, Secretary ACT west Zone and **Prof. M. Swaminathan**, Executive Member of ACT, South Zone, organized ACT Research Convention 2021, Lecture Series on Frontier areas of Chemistry Research: International E-Conference on Sustainable Futuristic Materials in Association with Kamla Nehru Mahavidyalaya, Nagpur, Kalasalingam Academy of Research and Education(KARE), Krishnacoil and J. M. Patel College, Bhandara On November 29-30 2021.

**Prof Helen Kavitha**, Vice-President ACT South Zone, organized E-Poster Chemistry Competition on December 3, 2021.

**Prof. Wasudeo Gurnule**, Secretary ACT west Zone, organized International Webinar on Chemistry Education (ACT Research Convention-2021) in Association with Govt. Madhav Science PG College, Ujjain and Kamla Nehru Mahavidyalaya, Nagpur, on December 22-23, 2021.

**Prof Mannam Krishnamurthy**, Secretary of ACT South Zone, organized National Chemistry day Celebrations at Sri Chaitanya Junior College, Edupugallu, Krishna District, AP, 500 Std. XII students took part in a Science Quiz. 150 Std. XI students took part in two presentations on "Chemistry in Medicine" on December 10, 2021.

**Dr. Mini Kuriakose**, Department of Chemistry, College of Engineering (Autonomous), SAINTGITS, Kerala, Organized SAINTGITS Webinar on Crystal Engineering: From "Molecules to Materials", on December 18, 2021.

## Reports of Activities of ACT

### National Chemistry Day-2021

#### 1. Sri Chaitanya Junior College, Edupugallu, Krishna Dist., Andhra Pradesh



National Chemistry Day was organized jointly by **Infinity Learn, Hyderabad** and **Association of Chemistry Teachers, Mumbai** at **Sri Chaitanya Junior College, Edupugallu, Krishna Dist., Andhra Pradesh**. The celebrations were co-ordinated by **Dr. Mannam Krishna Murthy**, Secretary, ACT South Zone.

In the forenoon of December 10, 2021 a 'talent search' in the form of on-line 'Science quiz on Chemistry in Medicine'. **Mr. T. Suryanarayana**, Manager, Infinity Learn, had taken care on providing digital plot-form for the quiz. 490 Class XII students from 18 different colleges of East Krishna District participated in four individual parallel time slots.

**Dr. Mannam Krishna Murthy**, Chief Executive Dean, Varsity Education Management Limited, Hyderabad gave a powerpoint presentation on 'Chemistry is bigger than life' and explained popular concepts of chemistry. The concluding session was chaired by **Mr. Paturi Srinivas**, Principal, Sri Chaitanya Junior College, Edupugallu. **Ms. Gudipudi Keerthi**, Sri Vaibhavi College, Gosala received first prize of the science quiz. Student participants interacted with the subject experts. The celebrations were concluded with useful ideas of chemistry basics.





## 2. Department of Chemistry, Sant Gadge Baba Amravti University, Amravati

The department of Chemistry, Sant Gadge Baba Amravati University in collaboration with Association of Chemistry Teachers (ACT) Mumbai celebrated NATIONAL CHEMISTRY DAY 2021 on 10<sup>th</sup> December 2021. The main purpose of this program was to highlight the contribution of chemistry, create interest and inculcate scientific temperament among the students.

Chief Guest was Prof. Dr. R. M. Jugade, Professor in Analytical Chemistry at Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur and Guest of Honor was. Dr. V. M. Tangade, Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur and program was chaired by Prof. Dr. A. S. Aswar, Head, Department of Chemistry, Sant Gadge Baba Amravati University, Amravati and Prof. J. M. Barabde, Convener shared the dais.

Chief guest **Prof. Dr. R.M. Jugade** highlighted the importance of chemistry in our everyday life and also during the pandemic situation. **Dr. V. M. Tangade** said chemistry is a creative science essential for sustainability and improvements to our way of life. **Prof. Dr. A. S. Aswar** said every branch of science is important but the contribution of chemistry is most important. **Dr. J. M. Barabde**, Convener of program delivered a introductory remark and outline the objectives of the program. The program was attended by large number of students from different P.G. Centers and University departments.



# ACT RESEARCH CONVENTION

BEYOND THE CRISIS : AN ACT WEBINAR SERIES



## ACT RESEARCH CONVENTION 2021



ACT announces its Research Convention 2021

“ACT Invites you to a series of webinars focusing on the new advancements in the world of Chemistry”

PATRON



**Prof. Brijesh Pare**  
President, ACT  
Member, Science PG College, Jijam

PATRON



**Prof. D V Prabhu**  
General Secretary, ACT  
Wilson College, Mumbai

NATIONAL CONVENOR



**Dr. Raakhi Gupta**  
Secretary Central Zone, ACT  
(Elected to be Chemistry), Jijam

### Webinar on Chemistry Education

Dates: 22-23 December 2021

**Prof. Wasudeo Gurnule**

ACT Zonal Secretary, West Zone  
Kamla Nehru Mahavidyalaya, Nagpur

**Prof. M Swaminathan**

ACT Zonal Member, South Zone  
Kulasekhar Academy of Research and Education, Krishnankot, Tamil Nadu

### 4 Minute Research Pitch

Date: 17 February 2022

**Dr. Raakhi Gupta**

ACT Zonal Secretary, Central Zone  
(Elected to be Chemistry), Jijam

### Lecture Series-Frontier areas of chemistry research

Dates: 29-30 November 2021

**Prof. M Swaminathan**

ACT Zonal Member, South Zone  
Kulasekhar Academy of Research and Education, Krishnankot, Tamil Nadu

**Prof. Wasudeo Gurnule**

ACT Zonal Secretary, West Zone  
Kamla Nehru Mahavidyalaya, Nagpur

### Lecture-cum-Demonstration series- Chemistry Laboratory Safety

Date: 20 January 2022

**Prof S.P. Singh**

ACT Zonal Secretary, East Zone  
Associate Professor, Dept. of Chemistry  
A.N. College, Panna (Philippines University)

### Lecture-cum-Demonstration series- Standard procedures and instrumentation Techniques in chemistry research

Date: 20 January 2022

**Dr. Amrit Mitra**

ACT Zonal Member, East Zone  
Griet General Degree College, Singur, Hooghly, West Bengal

### Lecture-cum-Demonstration series-synthesis of some commercial or utility products

Date: 7 January 2022

**Dr. Amar Srivastava**

ACT Zonal Member, North Zone  
DAVPG College, Kangra

### Appreciation of research papers

Date: 7 January 2022

**Dr. Sanchay Jyoti Bora**

ACT Zonal Group Member, North East Zone  
Panda College, Guwahati, Assam

### E-Poster Competition

Date: 3 Dec. 2021

**Prof. Helen P. Kavitha**

ACT Zonal Vice President, South Zone  
SIAM Institute of Science and Technology  
Bannaganur, Chennai

Advisors

**Prof. S.D. Samant**

Past President, ACT, ACT Member

**Prof. Sudha Jain**

Past President, ACT  
Principal, GSEAP PG College, Lucknow

**Prof. D.C. Deka**

Past President, ACT, Zone Chairman  
Jal Bahadur University, Lakshimpur, Assam

**Prof. R.K. Bansal**

Member to be Chemistry, Jijam

Association of Chemistry Teachers (ACT)

C/o Homi Bhabha Centre for Science Education (HBCSE), TIFR, Mumbai



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. In its 20 years of existence and its dedicated service to the academic community, it has not only worked towards capacity-building of Chemistry teachers but has also organized a number of subject related activities to bring together higher secondary school teachers, college and university lecturers, professors, scientists researchers and industry experts on a common platform. In fact over a period of time, it has launched a number of flagship programmes which have become quite popular and are being organized regularly. It is no exaggeration to say that since its inception, ACT has worked tirelessly to strengthen chemistry education in India and to motivate students to pursue chemistry as a career. The research convention is yet another noteworthy feat in its journey of existence of 20 years.

The concept of research convention took seed in its executive council meeting held in February 2020, just before the Corona Pandemic breakdown. It was decided that - in keeping with the New Education Policy and Education 4.0 - the ACT must take initiative in promoting research amongst students and teachers. As a result, the work towards an annual research-related/centric convention was begun and with the support from all EC members, the concept was taken forward in the right earnest. The research convention aimed at providing teachers and young researchers with an insight into the multifaceted dimensions of research.

The diverse topics mandated to cover the step-by-step process of conceptualizing and conducting excellent research, ranging from Chemistry education, 4 Minute research pitch, Lecture Series: Frontier Areas of Chemistry Research, E-Poster Competition, Appreciation of Research Papers, Lecture cum demonstration series: Chemistry Laboratory safety, Lecture cum demonstration series Standard procedure and instrumentation technique in chemistry research, Lecture cum demonstration series: synthesis of some commercial or utility products in 2021.

Once topics were finalized, it was decided to organize a number of seminars, workshops and conferences, exploring different aspects of research as part of a series. Of course at the time of conceptualizing it was planned to organize these events in offline or physical mode. But the plans had to be changed with the breakdown of Corona and to navigate the unprecedented times of the global pandemic and go beyond the prevailing crisis, online mode was then adopted. Though it came with challenges but it also gave us an opportunity to go global and make these events International in nature. On looking back, one can say with pride that the whole Research Convention – 2021 evolved wonderfully and successfully despite the pandemic. It is heartening to put on record that all zones were active and enthusiastically worked to make this activity successful. It was well organized, the lectures were of good quality, the IT platforms were good, and the attendance was beyond our expectation. Even though it was completely optional, hundreds of students and teachers from not only India but abroad also registered and attended. The comments sent by

them are all encouraging. Had these seminars been arranged in physical mode, we would not have received even a fraction of this response. In fact, by way of these webinars, ACT has been successful in accomplishing its mission of promotion of Chemistry education and research in India and capacity-building of Chemistry teachers and students.

ACT supported the organization of these webinars by providing financial assistance wherever required and the registration for all delegates was free. The consolidated report compiled here gives the details of the different webinars conducted as part of this research convention series. The feedback taken in all the webinars is quite encouraging and has motivated the Association to continue organizing the convention every year.

## First Activity

**Date** : 29-30 November 2021  
**Title of the Event** : International E-Conference on Sustainable and Futuristic Materials (SEM-2021)  
**Organizing Institution** : Kalasalingam Academy of Research and Education, Krishnankoil, J. M. Patel College, Bhandara and Kamla Nehru Mahavidyalaya, Nagpur  
**Convener** : Prof. M. Swaminathan  
**Organizing Secretary** : Prof. Wasudeo Gurnule  
**Total No. of registrations in the event** : 4115

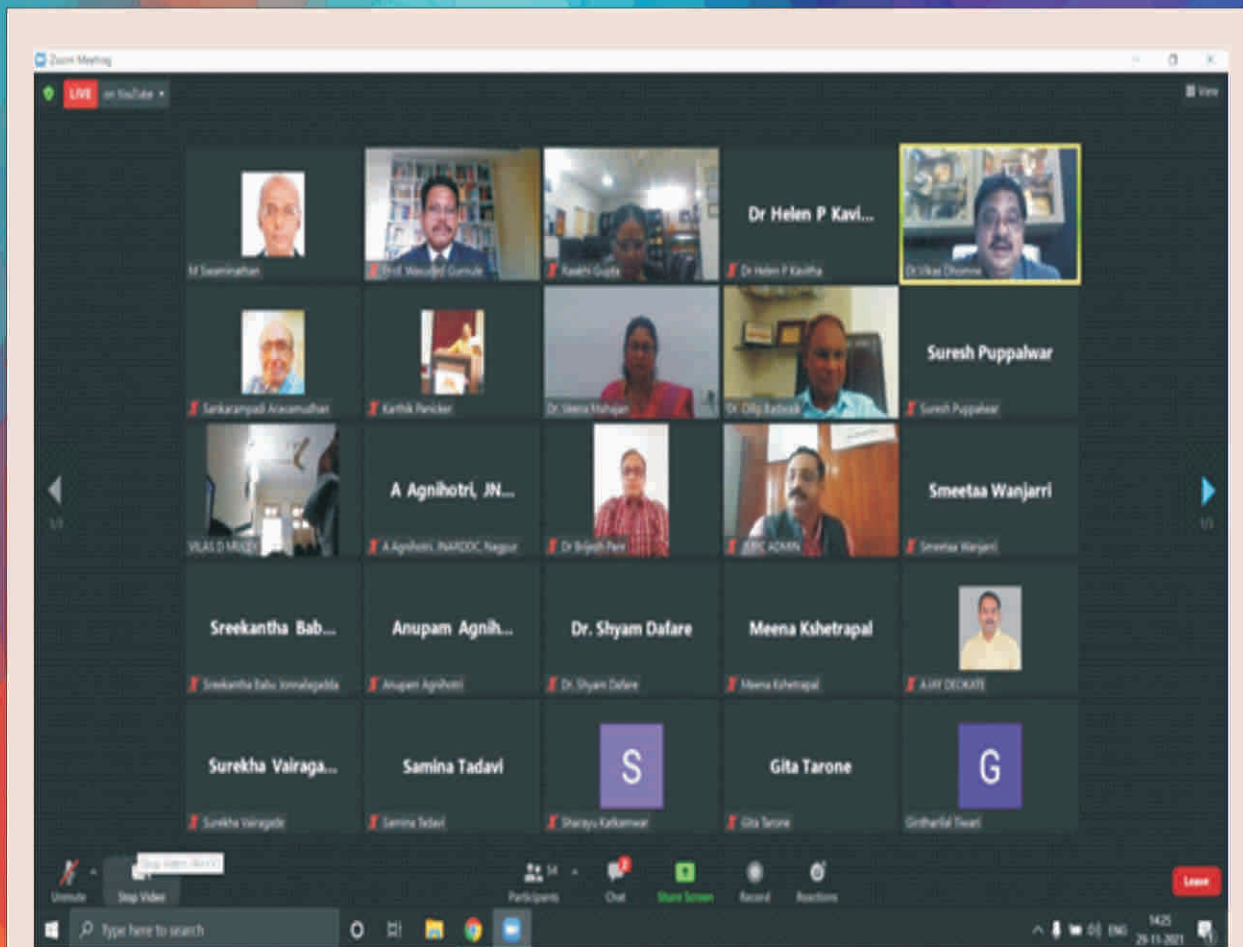
**Speakers** : **Prof. Dalila HAMMICHE**  
Université Abderrahmane Mira-Bejaia, Algérie  
**Topic:** Plastics Derived from Biomass

**Prof. Sreekanth B Jonnalagadda**  
University of KwaZulu-Natal, Durban, South Africa  
**Topic:** Novel materials as recyclable catalysts for organic synthesis and water treatment

**Dr. M. V. Reddy**  
Centre of Excellence in Transportation Electrification and Energy Storage (CETEES), Canada  
**Topic:** Electrochemistry of Lithium Battery Materials

**Prof. B. Neppolian**  
SRM Research Institute & Technology, SRM University, Chennai, India  
**Topic:** Ultrasonic assisted TiO<sub>2</sub> based photocatalysts for Environmental Remediation

**Dr. Chinnakonda S. Gopinath**  
National Chemical Lab., Pune, India  
**Topic:** Solar Energy to Chemical Energy Conversion through assembled catalysts



ACT Research Convention 2021, International E-Conference on Sustainable and Futuristic Materials (SFM - 2021)



Dr. Anupam Agnihotri  
Director, JNARDDC, Nagpur



Dr. Smeetaa Wanjarri  
Secretary, Amar Sewa Mandal

## Second Activity

- Date** : 3 December 2021  
**Title of the Event** : E-Poster Competition  
**Topic:** Sustainable Chemistry for Green World  
Carbon Capture and Storage  
**Organizing Institute(s)** : SRM Institute of Science and Technology  
Ramapuram Campus, **Chennai**  
**Convener** : **Prof. Helen Kavitha**  
**Total No. of registrations in the event** : 534

**RAMAPURAM SRM** **ACT Research Convention 2021**

**ASSOCIATION OF CHEMISTRY TEACHERS (ACT), MUMBAI**  
IN ASSOCIATION WITH  
**SRM INSTITUTE OF SCIENCE AND TECHNOLOGY**  
Ramapuram Campus

**E-POSTER COMPETITION**

**Topics :** ▶ **Sustainable Chemistry for Green World**  
▶ **Carbon Capture and Storage**

**03.12.2021** **4.00 PM to 6.00 PM**

**Participants: U.G, P.G Students and Research Scholars**

**Rules**

- All the Posters must be original.
- It can also be edited with pictures using editing applications.
- Posters will be judged relevant to the content, theme, originality & presentation.
- Each participant can submit a maximum of 1 entry.
- Two minutes for presentation.

**Registration Link:**  
<https://forms.gle/3tZ4mvBQAUkH7sv6>

**Last Date for Registration: 01-12-2021**

E-Certificates will be given to all the presenters  
Winners will get Merit Certificates & Prizes

**PATRONS**

**Prof. Brijesh Pare**  
President, ACT  
Madhav Science PG College, Vijain

**Prof. D. V. Prabhu**  
General Secretary, ACT  
WISDOM College, Mumbai

**Dr. M. Murali Krishna**  
Dean (B & T)  
SRM IST, Ramapuram

**NATIONAL CONVENER**

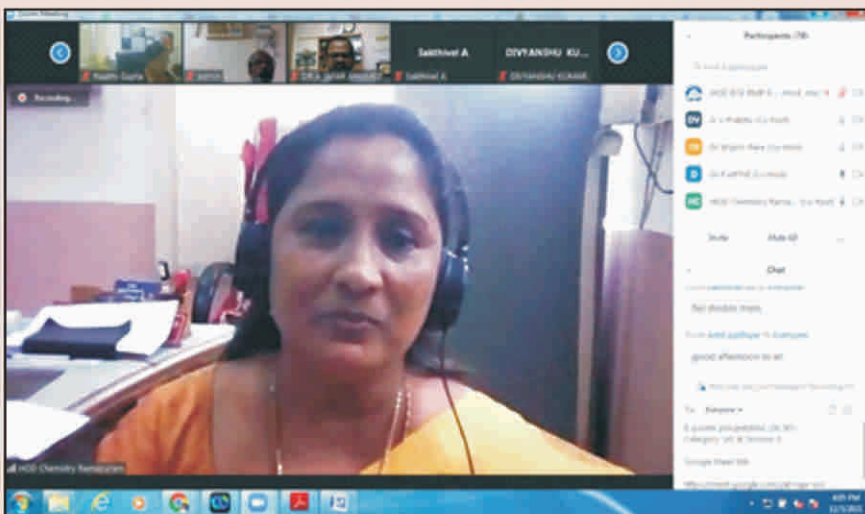
**Dr. Raakhi Gupta**  
Secretary - Central Zone, ACT  
IS (Deemed to be University), Jaipur

**CONVENER**

**Prof. Helen. P. Kavitha**  
ACT Zonal Vice President, South Zone  
Head / Chemistry, SRM IST, Ramapuram

**REGISTER FOR FREE**

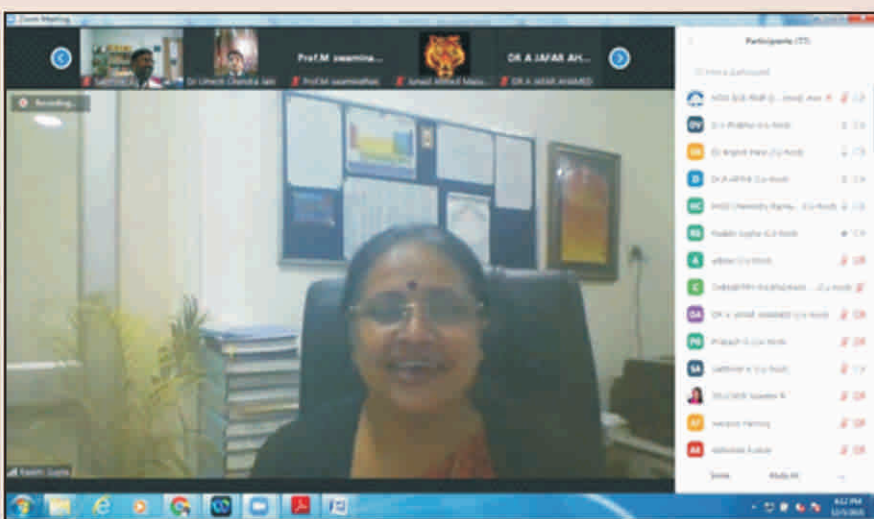
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**Prof. Helen Kavita**  
Convener, E-Poster  
Competition



**Prof. D. V. Prabhu**  
General Secretary  
ACT



**Prof. Rakhi Gupta**  
National Convener  
ACT Research  
Convention 2021

# National Convention of Chemistry Teachers (NCCT)

*Organised by*

**Association of Chemistry Teachers,**

**C/o Homi Bhabha Centre for Science Education (TIFR), Mumbai**

*Hosted by*

**Department of Chemistry,**

**Sikkim Manipal Institute of Technology, SMIT, Rangpo, Sikkim**

**NATIONAL CONVENTION OF CHEMISTRY TEACHERS (NCCT 2021)** was organized in the virtual mode (due to COVID 19 pandemic) along with International Conference on Recent Trends in Chemistry and Chemistry Education on December 28-30, 2021 at Department of Chemistry, Sikkim Manipal Institute of Technology, SMIT, Rangpo, Sikkim under the Convenorship of Prof Nayan Bhattacharyya, Head, Department of Chemistry, SMIT, Sikkim.

Dr (Lt. General) Rajan S Grewal, Honourable Vice Chancellor, Sikkim Manipal University was the Chief Guest and Prof Dr Arnab Bhattacharyya, Director, Homi Bhabha Centre for Science Education (TIFR), Mumbai was the Honourable Guest of Honour. Dr G L Sharma, Director, SMIT delivered the Presidential Address.

There were invited lectures from eminent experts from USA, Germany, Spain and UAE.

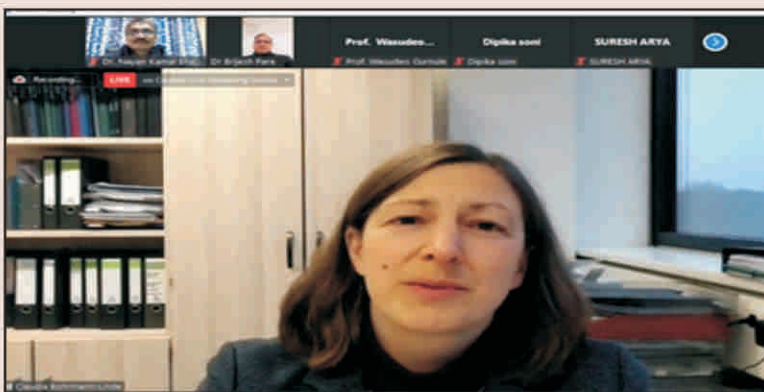
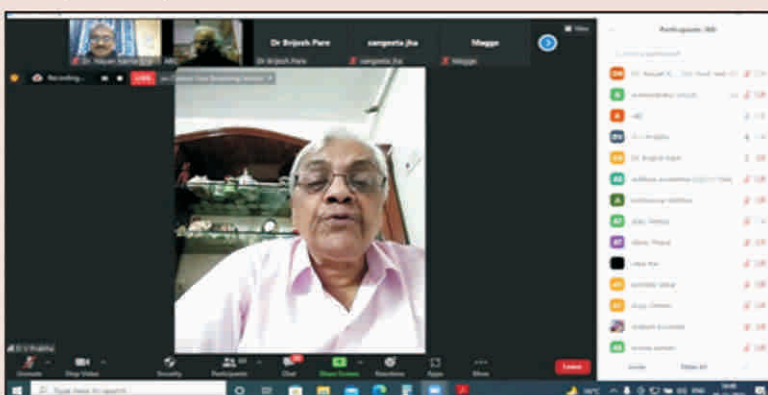
## **Invited Lectures were delivered by**

- 1) **Prof Fathy Hassan**, Chemistry and Biochemistry College of Science, United Arab Emirates University, UAE.
- 2) **Prof Ghanashyam Bez**, North Eastern Hill University (NEHU), Shillong, Meghalaya
- 3) **Dr. Swapnali Hazarika**, Principal Scientist, Chemical Engineering Group, CSIR\_NEIST, Jorhat, Assam
- 4) **Prof. Santiago Gomez Ruiz**, Rey Juan Carlos University, Mostoles, Madrid, Spain
- 5) **Dr. Ettigounder (Samy) Ponnusamy**, Fellow and Global Manager, Millipore Sigma, St. Louis, Missouri, USA.
- 6) **Dr. Venkat Narayan**, Principal Polymer Scientist. Anthara Technologies Consulting Inc., McKinney, Texas, USA
- 7) **Prof. Dr. Utpal Bora**, Department of Chemical Sciences, Tezpur University Assam.
- 8) **Prof. Claudia Bohrmann-Linde**, Professor of Chemistry, Didactics, Bergische Universitat, Wuppertal, Germany
- 9) **Prof. Mohammad Al-Sayah**, American University of Sharjah, UAE

- 10) **Dr. Ilias Ali**, Innovation and Research Manager, Printpack Inc., USA
- 11) **Prof Manas Kanti Deb**, School of Studies in Chemistry, Pt. Ravishankar Shukla University, Raipur
- 12) **Prof. Sourav Pal**, Director, IISER-Kolkata and Former Director, CSIR National Chemical Laboratory, Pune

There were **92 presentations** by the participants for which best paper presentation prizes were awarded.

The ECM and AGM of ACT were held on December 28 and December 29, 2021 respectively.



Virtual meeting of Chemistry Section (2017 - 2021) and International Engineering in Green Design in Chemistry & Environmental Education (IC2E/CCE) 20th Meeting (8-10 December 2021)

*A study of alternative cyanide sources to the synthesis of aryl nitriles*

**PERIYATHI P.**  
Dr. Periyathi P.  
Associate Professor  
Dept. of Chemical Sciences  
Tamil University,  
Vellore

**DOZN<sup>2</sup>.0: A QUANTITATIVE GREEN CHEMISTRY EVALUATOR FOR A SUSTAINABLE FUTURE**

Samy Ponnusamy, PhD  
Fellow & Global Manager - Green Chemistry  
For SMIT/NCC, December 28, 2021

INMORCK

**Polymer Network**

• Mesh size  $\xi$

• crosslink bond

• Physical junction

• Entanglement

$\xi_c$  = Molecular weight of chains between crosslinks.

S.H. Aswathy, U. Narendrakumar, I. Manjubala, Heliyon 6 (2020)

Prof. K. Subbaker... Sanksha Tamang Dr. Veer Singh B...

**INTRODUCTION - SYNTHESIS OF NANOMATERIALS**

**Top-down approach** starts from smaller components built up into more complex assemblies

**Bottom-up approach** creates nanoscale devices by using larger, externally controlled ones to direct their assembly.



## ACT AWARDS - 2021

ACT AWARDS for 2021 were presented to the outstanding Chemistry teachers of the country in recognition of their dedicated services to Chemistry Education and Research. Association of Chemistry Teachers is proud to honour

### 1. ACT Life Time Achievement Award 2021-

**Prof. Swapan K Saha**, Ex-Professor and UGC Emeritus Fellow,  
Department of Chemistry, North Bengal University, Darjeeling, West Bengal.

### 2. ACT Shri Anupam Sinha Best Chemistry Teacher Award 2021

**Prof. Dr. Susmita Sen Gupta**, Department of Chemistry,  
B N College, (affiliated to Gauhati University), Dhubri, Assam.

### 3. ACT Best Woman Chemistry Teacher Award 2021

**Prof. Dr. Jyotirekha G. Handique**, Director, HCB School of Science and Technology,  
K. K. Handique State Open University, Assam and Professor (on lien) Department  
of Chemistry, Dibrugarh University, Dibrugarh, Assam.

### 4. ACT Prof P R Singh Award for Outstanding Contribution to Chemistry Education 2021

**Prof. Dr. B. S. Balaji**, Associate Professor, School of Biotechnology,  
Jawaharlal Nehru University, JNU, New Delhi.

### 5. ACT Dr Uma Sai Prakash Chemistry Popularization Award 2021

**Prof. Dr. D. Ramachandran**, Department of Chemistry, Acharya Nagarjuna  
University, Nagarjunanagar, AP.

### 6. Prof. Lallan Singh Award for Best PG Chemistry Teacher (State Universities) 2021

**Prof Dr Ajay Taneja**, Department of Chemistry, Dr. B. R. Ambedkar  
University, Agra.

### 7. Prof. Dr. Bhupendra Sahai Saxena Award for Best PG Chemistry Teacher 2021

**Prof. Dr. Navin G. Shimpi**, Department of Chemistry, University of  
Mumbai, Kalina Campus, Mumbai.

### 8. Prof. P. B. Punjabi Award for Outstanding Contribution to Research in Chemical Sciences 2021

**Principal Prof. Dr. Anna Pratima Nikalje**, Department of Chemistry,  
Wilson College (Autonomous), Mumbai.

## A 3D printed lock and key model to aide teachers to teach chemistry to visually challenged students

**Prof. Dr. B. S. Balaji,**

School of Biotechnology, Jawaharlal Nehru University, JNU

New Delhi 110067

E-mail : [bsbalaji@mail.jnu.ac.in](mailto:bsbalaji@mail.jnu.ac.in)

According to a report published by the National Programme for Control of Blindness (NPCB), India is home to a third of the world's blind population (about 10 million). The challenges faced by the blind people are numerous. Even teachers of such students face various limitations to teach these children.

In order to alleviate the problems faced by visually challenged people, various support efforts had been carried out by Government of India. Despite these policy measures, when it comes to education, the visually impaired are still not adequately benefited. A survey conducted by the National Council of Educational Research and Training (NCERT) shows, vast majority of the blind children (around 70 %) are not enrolled in any form of education system.

We all know reading and writing are fundamental skills one has to master in order to enjoy intellectual freedom, personal security, independence and have equal opportunities to study and work. Due to lack of getting information through visual clues, the visually challenged children may suffer in perception and concept formation which is one of the fundamental requirements for learning especially subjects like chemistry. To support effective and efficient teaching learning activities for both teachers and students, Braille- a special tactile or touch based system in which raised dots represent the letters of the alphabet is used to teach them how to read.

There are many reasons why blind and partially sighted learners are unable to participate in pure sciences. Some of them include the necessity for the teacher to know Braille to teach blind children, lack of appropriate access technologies, some of the special need teaching materials are too expensive for schools and teachers to acquire, many times they are of short supply, and specifically for science subjects the great challenge is the difficulty of translating equations, graphs, and diagrams into an accessible format. Moreover, many teachers do not have adequate training in teaching blind and partially sighted learners. There are few misconceptions like the visually challenged students are slow learners.

We have developed a simple lock and key model to teach chemistry concepts to visually impaired children. We have included both **Braille and alphanumeric letters** in our

model. The model cards are like a puzzle cards. We have six categories to represent various chemical notations. They include letters (representing elements), numbers, arrows, signs (plus, minus), superscript and subscript. With these 6 categories we can make various representation of chemical concepts. We can create ions both positive and negative, we can create chemical equations. In our models we have included a standard CPK (Corey-Pauling-Kolton colouring) convention that is universally accepted coding for representing chemical elements. Introducing the colour convention at the early stage helps the students learn and understand molecular modelling when they pursue research career. This model can be used not only for visually challenged students, but even normal students can also use it. Using puzzle cards can be like a fun activity for children and it will attract student's interest in learning scientific concepts.

Since we know the current limitations for science education to blind children by the teachers, we have designed our model to address many of these short comings. First, in our model we have included normal letters along with Braille as a means for the sighted students to learn whereas the teacher need not have to be an expert in Braille. Our lock and key models were created using 3D printing technology with biodegradable polymers. These are easy to use, easily dismantlable, light weight. It can be easily integrated into regular curriculum. It is easily affordable and does not require expensive technologies for implementation.

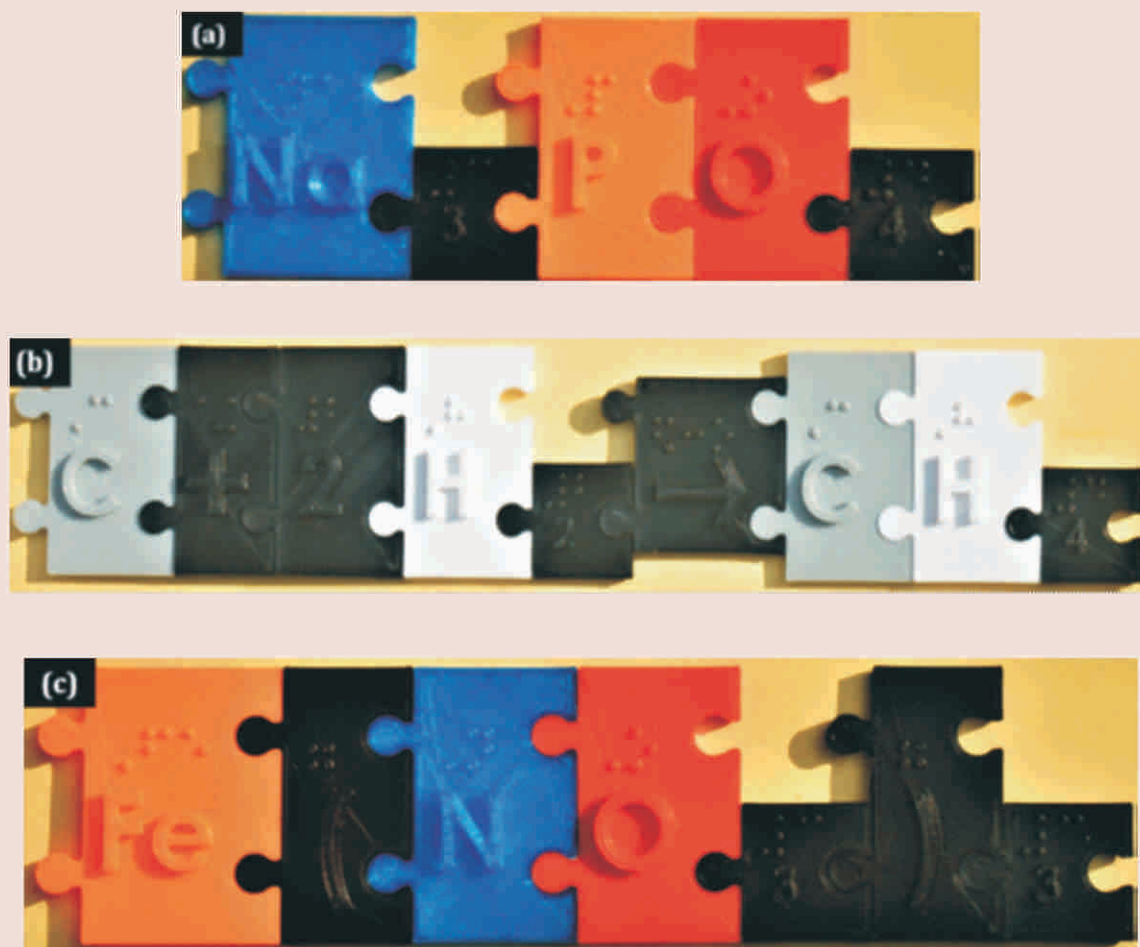
We believe this model can help all the teachers who are teaching low vision and visually challenged students immensely by giving fair access to education which is often neglected due to lack of support. In fact, we have conducted a small survey and found that teaching science, especially chemistry through this model helps in improving blind and low vision student's (BLV) retention of concepts through interactions with tactile models. It is helping them build their own mental model for learning and solving scientific equations, through interactive approaches. We also found that integrating these tactile models with teaching keeps the students involved in their self-paced learning and it engages them for a longer duration.

We have created open-source repository of basic building block design files for writing chemical formulas, equations. Anyone who is having access to 3D printer can download our design files and print it and start using it to learn or teach chemistry concepts. The lock and key fitting are convenient and easy to adopt by learners including BLV students, because the puzzle pieces can be connected together in the desired manner (any number of times), replacing the need for magnetic letters and board. All the 3D models are embossed with Braille labels and conventional alphanumeric letters to aid both BLV and sighted learners together.

We strongly believe that every piece of material, instrument, or text can be appropriately modified to make science accessible for the blind and visually impaired population through creativity, skill, and tenacity. We have shown one such example and want

many more people to create more accessible options for inclusive education. By using these lock and key models, it is possible to write, explain, and present molecules and chemical equations to BLV students by a teacher in an easy and efficient way.

This work has been published in “Creating Atom Representations Using Open-Source, Stackable 3D Printed Interlocking Pieces with Tactile Features to Support Chemical Equation Writing for Sighted and Visually Impaired Students, Ishu Singhal and B. S. Balaji, *J. Chem. Educ.* **2020**, 97, 118–124”.



**Figure 1.**

- (a) Ionic compounds which can be written using ions depicted in  $\text{Na}_3\text{PO}_4$ ,
- (b) Chemical equations were presented with the formation of some basic organic molecules:  $\text{C} + 2\text{H}_2 \rightarrow \text{CH}_4$ ,
- (c) Ionic compounds representation  $\text{Fe}(\text{NO}_3)_3$

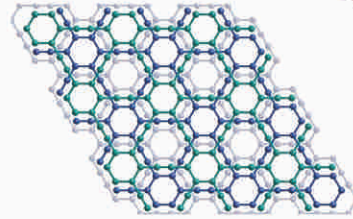
## Academic Participation of ACT Members

1. **Prof. Wasudeo Gurnule**, Secretary of ACT West Zone, delivered a Talk on “Advanced Materials: Nanomaterials”, in Refresher Course in Chemistry organized by University of Mumbai, Mumbai., on 17th September 2021.
2. **Prof. Wasudeo Gurnule**, Secretary of ACT West Zone, delivered a Talk on “Demonstration of Chemistry Experiments and Importance of Science”, in Indradhanush; A Science Exhibition-Cum-Demonstration Programme organized by Society for Promotion of Material Science Nagpur and sponsored by DST, New Delhi., on 22nd September 2021.
3. **Prof. M. Swaminathan**, EC Member of ACT, South Zone, delivered a talk in Webinar on Wisdomized Physics Embedded Chemistry, organized by Department of Humanitites and Science, Panimalar Engineering College, Autonomous, Affiliated to Anna University, Chennai, on 21<sup>st</sup> October 2021.
4. **Prof. Mannam Krishnamurthy**, Secretary of ACT, South Zone, participated in Chemistry World Webinar on Automated Capsule Chemistry: do more, faster, on 14th October 2021.
5. **Prof. Wasudeo Gurnule**, Secretary of ACT West Zone, delivered a Talk on “Demonstration of Basic Chemistry Experiments”, in Indradhanush; A Science Exhibition-Cum-Demonstration Programme organized by Society for Promotion of Material Science Nagpur and sponsored by DST, New Delhi., on 21st October 2021.
6. **Prof. Wasudeo Gurnule**, Secretary of ACT West Zone, delivered a Keynote on SBR-Carbon Black Rubber Nanocomposite, in International Symposium on Nanotechnology and Innovations for 4IR in Asia-Pacific and Beyond organized by Department of Chemistry, University of Dakha, Bangladesh STEM Foundation, Bangladesh, on 19th November 2021.
7. **Prof. Wasudeo Gurnule**, Secretary of ACT West Zone, delivered a Talk on “Demonstration of Basic Science Experiments”, in Indradhanush; A Science Exhibition-Cum-Demonstration Programme organized by Society for Promotion of Material Science Nagpur and sponsored by DST, New Delhi., on 16th December 2021.



## News, Views & More

### Graphyne: Long-Hypothesized Next Generation “Wonder Material” Created for First Time



**CU Boulder scientists have successfully synthesized graphyne, which has been theorized for decades but never successfully produced.** For over a decade, scientists have attempted to synthesize a new form of carbon called graphyne with limited success. That endeavor is now at an end, though, thanks to new research from the University of Colorado Boulder.

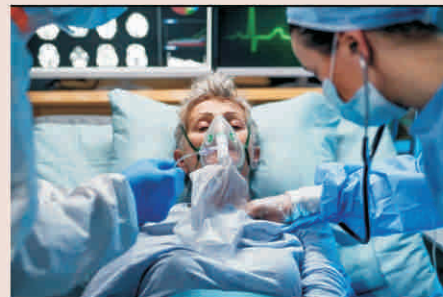
Graphyne has long been of interest to

scientists because of its similarities to the “wonder material”

graphene—another form of carbon that is highly valued by industry and whose research was even awarded the Nobel Prize in Physics in 2010. However, despite decades of work and theorizing, only a few fragments have ever been created before now.

### Two Years After Infection, Half of People Hospitalized With COVID-19 Still Have at Least One Symptom

- Study of 1,192 participants hospitalized with COVID-19 in Wuhan, China, between January 7th and May 29th, 2020, followed up at six months, 12 months, and two years after discharge.
- Physical and mental health improved over time regardless of initial disease severity, with 55% reporting at least one symptom caused by the initial COVID-19 infection at two years compared to 68% at six months.
- In general, patients recovered from COVID-19 tend to be in poorer health two years after the initial infection compared to the general population, indicating some patients need more time to recover fully.
- Around half of study participants had symptoms of long COVID – such as fatigue and sleep difficulties – at two years, and experienced poorer quality of life and ability to exercise, more mental health issues, and increased use of health-care services compared to those without symptoms of long COVID.



Two years after infection with COVID-19, half of the patients who were admitted to the hospital still have at least one symptom, according to the longest follow-up study to date, published on May 11, 2022 in *The Lancet Respiratory Medicine*. The research study followed 1,192 participants in China infected with SARS-CoV-2 during the first phase of the pandemic in 2020.

While physical and mental health generally improved over time, the analysis suggests that COVID-19 patients still tend to have poorer health and quality of life than the general population. This is especially the case for participants with long COVID, who typically still have at least one symptom including fatigue, shortness of breath, and sleep difficulties two years after initially falling ill.



## List of ACT Life Members During September to December 2021

Sr. No.	Names	LM No.	Institution
1	Dr. Smt. Manmeet Kaur Makkad	2363	Govt. Madhav Science PG College, Dewas road, Ujjain, MP- 456001
2	Dr. Arpan Bharadwaj	2364	Govt. Madhav Science PG College, Dewas road, Ujjain, MP- 456001
3	Dr. Mohd. Sameer Ahmed	2365	Lords Institute of Engineering & Technology, Survey no. 32, Himayath Sagar, Hyderabad, Telangana- 500091
4	Dr. Rehana Anjum	2366	Lords Institute of Engineering & Technology, Survey no. 32, Himayath Sagar, Hyderabad, Telangana- 500091
5	Dr. Smt. Shakuntala Pandey	2367	Govt. Madhav Science PG College, Dewas road, Ujjain, MP- 456001
6	Dr. Archana Kushwaha	2368	Govt. Madhav Science PG College, Dewas road, Ujjain, MP- 456001
7	Dr. Kalpana Virendra Singh	2369	Govt. Madhav Science PG College, Dewas road, Ujjain, MP- 456001
8	Dr. Deependra Singh Raghuvanshi	2370	Govt. Madhav Science PG College, Dewas road, Ujjain, MP- 456001
9	Dr. Rekha Nagwanshi	2371	Govt. Madhav Science PG College, Dewas road, Ujjain, MP- 456001
10	Dr. Jeeven Singh Solanki	2372	Govt. Madhav Science PG College, Dewas road, Ujjain, MP- 456001
11	Dr. Bhagwan Swaroop Gupta	2373	Govt. Madhav Science PG College, Dewas road, Ujjain, MP- 456001
12	Suman Vishwakarma	2374	Govt. Madhav Science PG College, Dewas road, Ujjain, MP- 456001
13	Mr. Mukesh Kumar Prajapati	2375	A.P.S University, Rewa, MP- 486003
14	Pankaj Raizada	2376	School of Advanced Chemical Sciences, Shoolini University, Solan, HP- 173229

## List of ACT Life Members During September to December 2021

Sr. No.	Names	LM No.	Institution
15	Mr. Pardeep Singh	2377	School of Advanced Chemical Sciences, Shoolini University, Solan, HP- 173229
16	Tapas Kumar Koley	2378	Koley Chemistry Classes, BA- 127, Salt Lake City, Sector-1, (North) Bidhanagar, Kolkata- 700064
17	Dr. P. Pazhanisamy	2379	Dept. of Chemistry, Sir Theagaraya College, Chennai, Tamil Nadu- 600021
18	Dr. S. Nithiya	2380	Dept. of Chemistry, Sir Theagaraya College, Chennai, Tamil Nadu- 600021
19	Dr. Usha J.	2381	Dept. of Chemistry, Sir Theagaraya College, Chennai, Tamil Nadu- 600021
20	Dr. S. Loganathan	2382	Dept. of Chemistry, Sir Theagaraya College, Chennai, Tamil Nadu- 600021
21	Dr. Ruchi Dubey Sharma	2383	Dept. of Chemistry, Career College, BHEL Square, Sector A, Govindpura, Bhopal, MP- 462023
22	Dr. Anita Singh	2384	Dept. of Chemistry, Career College, BHEL Square, Sector A, Govindpura, Bhopal, MP- 462023
23	Dr. Anita K.	2385	Dept. of Chemistry, Career College, BHEL Square, Sector A, Govindpura, Bhopal, MP- 462023
24	Dr. Suparna Ghosh	2386	Dept. of Chemistry, Career College, BHEL Square, Sector A, Govindpura, Bhopal, MP- 462023
25	Dr. Shweta Sharma	2387	Dept. of Chemistry, Career College, BHEL Square, Sector A, Govindpura, Bhopal, MP- 462023
26	Dr. Amit Shivajirao Waghmare	2388	Shri. SSPM Arts, Science & Commerce College, Nagar Manmad road, Rahuri, Ahmednagar, Maharashtra- 413705
27	Mr. Firoj Hassan	2389	Dept. of Chemistry, Integral University, Dasauli, Kursi road, Lucknow, UP- 226026
28	Mr. Malik Nasibullah	2390	Dept. of Chemistry, Integral University, Dasauli, Kursi road, Lucknow, UP- 226026



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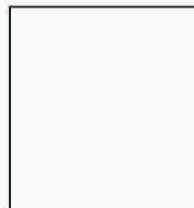


### ASSOCIATION OF CHEMISTRY TEACHERS (ACT)

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**

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. \_\_\_\_\_  
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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 : \_\_\_\_\_
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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.

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# ASSOCIATION OF CHEMISTRY TEACHERS

(Promoting Excellence in Chemistry Education)

C/o. Homi Bhabha Centre for Science Education (HBCSE, TIFR)

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

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## ACT NEWS LETTER

ISSUE - 21 SEPTEMBER - DECEMBER 2021