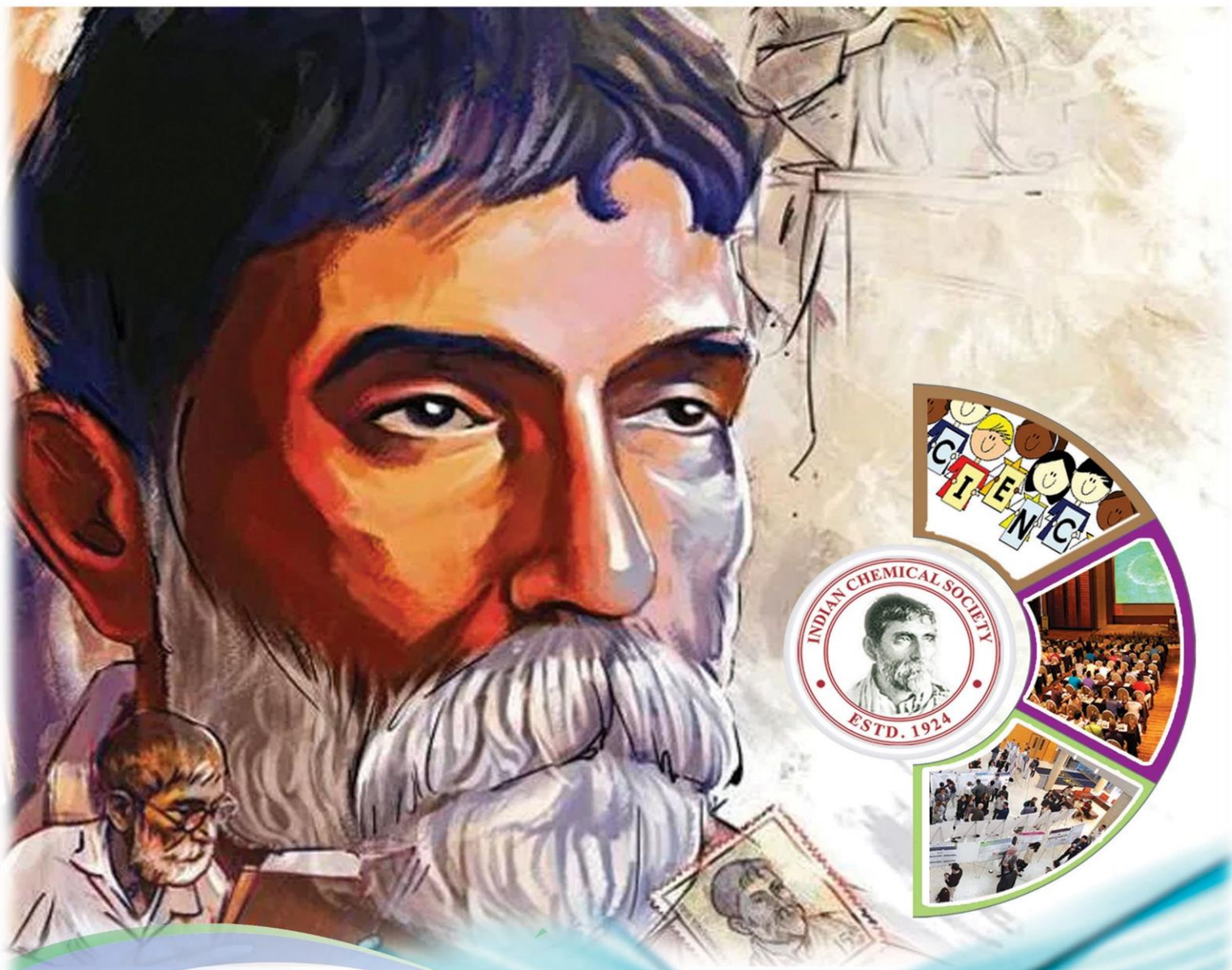


# CHEMICAL

# Warta



This issue is being published to Celebrate  
**160<sup>th</sup> Birth Anniversary of Acharya P. C. Ray**

Published by

**INDIAN CHEMICAL SOCIETY**

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**1<sup>st</sup> August  
2021**

## *Editorial-*

Dear Colleagues,

During the ongoing pandemic, with your support, we are publishing the 5<sup>th</sup> issue of Chemical Warta. We have also celebrated the 98<sup>th</sup> Foundation Day of the Indian Chemical Society. The dream of three young talented researcher J.N. Mukherjee, J.C. Ghosh and S.S. Bhatnagar was fulfilled in the year 1924 when the Indian Chemical Society was established by Acharya Prafulla Chandra Ray. Indian Chemical Society has been dedicated to promoting chemical research by publishing the research paper of Indian scholars. Today the society stands on the threshold of its centennial anniversary with large number of members spread across the globe. It is a matter of great pride that the journal of Indian Chemical Society is now being published by Elsevier and this has been possible with the relentless and untiring effort of our President, Prof. G.D. Yadav. Chemical Warta, an online news bulletin, is also the concept of Prof. G.D. Yadav.

The 98<sup>th</sup> Foundation Day of the Indian Chemical Society has been celebrated on 9<sup>th</sup> May 2021 on virtual mode. President of the society Padmashree Prof. G.D. Yadav presided over this meeting. In the same session, Prof. D.C. Mukherjee, the immediate Past President, apprised about the history of the Formation of the Indian Chemical Society.

Prof. G.D. Yadav, the President of the Indian Chemical Society, in his speech, discussed about the different aspects of Chemistry and an interrelation between Chemistry and Biology. According to him, in Chemical Engineering, biology plays a critical role. For the benefit of the society, Chemists and Biologists should work jointly. Chemical Engineers should know Biology, and Biologists should know Chemistry. Chemistry is a much broader Science. On this occasion, the Indian Chemical Society organized a student's competition on a virtual mode between school children from class V to Class XII in groups and graduates and postgraduate students. The topic was Sustainable Chemistry for a better future. Prof. G. Desiraju delivered the Keynote address on "Chemistry in Ancient Time: Foundation of Indian Heritage."

The Indian Chemical Society organized Webinar Internship Course on Process, Safety and Environment (Air, Water and Solid) from 10<sup>th</sup> April 2021 to 30<sup>th</sup> May 2021, from 6 to 9 p.m. every Saturday and Sunday. These events were held to uplift the technical knowledge of Postgraduate students, research

scholars, and technical persons from the industries. Resource persons from Academic Institutions, Universities, and Industries across India delivered lectures on the above topics.

In this issue of Chemical Warta, two beautiful talk on the occasion of 98<sup>th</sup> Foundation Day Celebration, presented by Prof. Yadav and Prof. Desiraju, been illustrated for our readers. We have also reported here the list of different awardees of the competitions held on ICS Foundation Day Celebration, May 09, 2021. We have also tried to collect information of some upcoming important scientific events, which may helpful for our readers.

We are thankful to all the council members of the Indian Chemical Society for their cooperation and support in publishing this issue. We appreciate the effort of Mr. Bitihotra Roymahapatra, student of Vivekananda Mission School, Haldia, West Bengal, for designing the cover page. We are also thankful to all ICS office staff for their cooperation and support.



Dr. Nibedita Chakrabarti  
Editor



Dr. Gourisankar Roymahapatra  
Editor



Prof. Chittaranjan Sinha  
Editor in Chief

## A Brief Report on 98<sup>th</sup> Foundation Day Celebration of Indian Chemical Society: 9<sup>th</sup> May- 2021

Scientific Session - Link: [meet.google.com/ycu-pvjb-etj](https://meet.google.com/ycu-pvjb-etj)

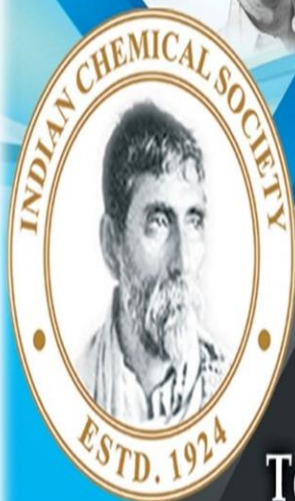
- Chairperson:** Padma Shri Professor G D Yadav  
President, Indian Chemical Society
- 10.00 AM:** Garlanding to Acharya P C Ray  
Palit Building, Science College, Calcutta University
- 10.10 AM:** Welcome address by -  
Prof. Chittaranjan Sinha  
Honorary Secretary, Indian Chemical Society
- 10.15 AM:** 'About the Society' by –  
Prof. D C Mukherjee  
Advisor, Indian Chemical Society
- 10.30 AM:** Inaugural address by-  
Prof. G D Yadav, President, Indian Chemical Society
- 11.00 AM:** Keynote Address by-  
Prof. Gautam R Desiraju, IISc., Bangalore on  
"Chemistry in Ancient Times: Foundation of Indian Heritage".
- 12.00 PM:** Vote of Thanks by-  
Prof. Sudip K Das  
Honorary Treasurer, Indian Chemical Society
- 12.00 PM to 5.00 PM:** Scientific Session II and Students' Competition
- 5.00 PM:** Valedictory Session



**98<sup>th</sup> Foundation Day Celebration**  
*of Indian Chemical Society*

Date : 9<sup>th</sup> May 2021, 10 am onwards

Platform - Google Meet



**Inaugural Address**

Padma Shri

**Prof. Ganapati Dadasaheb Yadav**

*President, Indian Chemical Society*



Topic : "Chemistry Meets Biology For a Happy Marriage"

≈ Time : 10:00 am ≈

**Keynote Address**

**Prof. Gautam Radhakrishna Desiraju**

*Indian Institute of Science Bangalore*



Topic : "Chemistry in Ancient Times : Foundation of Indian Heritage"

≈ Time : 11:00 am ≈

Link : [meet.google.com/ycu-pvjb-etj](https://meet.google.com/ycu-pvjb-etj)

## Appeal from the Honorary Secretary

To  
All the Fellows & Well Wishers  
Indian Chemical Society  
Kolkata



Dear Sir/Madam,

It gives me immense pleasure to inform you that the Foundation Day of our beloved Society, the Indian Chemical Society, is 9<sup>th</sup> May. It was founded by Acharya P. C. Ray as the Founder President in 1924 and the plan was initiated by J. C. Ghosh, J. N. Mukherjee and S. S. Bhatnagar in 1919 when they worked in the laboratory of the University College, London. The Society is associated with popularization of chemical sciences through arranging Seminars, Symposia, Conventions, Science competitions etc. amongst Researchers of Colleges, Universities, Institutes and School Students. The Society publishes an International Journal of Chemistry, Journal of the Indian Chemical Society (JInCS, Elsevier) along with a periodical *Education in Chemical Science & Technology*. The activities of the Society are regularly published in the website by the Chemical Warta. The administration is governed by an elected body of the Council Members from five different Zones of the country. Any Scientist/Professor/Researcher/Teacher/Student who has chemistry in the UG course of his/her academics can join with the Society as Member and Fellow. Higher learning institutes, Corporate Sectors may also join.

To celebrate the Foundation Day of the Society, a Special Program is going to be organized with Prof. G. D. Yadav, President, Indian Chemical Society as the President of the Program.

Theme Topic: Foundation Day – Prospects and Problems of the Indian Chemical Society

Date & Time: 9<sup>th</sup> May, 2021 (Sunday), 10.00 AM

Venue: Google Meet (Link would be communicated in due course)

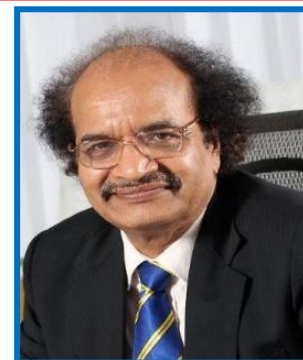
All the members, well-wishers and scientists are requested to join.

With regards  
Yours sincerely

Professor Chittaranjan Sinha  
Honorary Secretary  
**Indian Chemical Society**  
**e-mail: crsjuchem@gmail.com**

## Inaugural Address

**Prof. G.D. Yadav**  
**President**  
**Indian Chemical Society**  
**e-mail: gdyadav@gmail.com**



I welcome everybody present at the Celebration of Foundation Day of Indian Chemical Society on 9<sup>th</sup> May, 2021. Kobiguru Rabindra Nath Tagore's Birthday was also celebrated on 8<sup>th</sup> May. We have a plan of a yearlong Centennial Celebration from 9<sup>th</sup> May, 2022 with many programmes. Service to the Society was the motto of Acharya Prafulla Chandra Ray. Calcutta Corporation celebrated the 70<sup>th</sup> Birthday of Acharya Prafulla Chandra Ray and Rabindra Nath Tagore was also present there. Mahatma Gandhi wrote about the service and sacrifices made by Acharya Prafulla Chandra Ray. Gopal Krishna Gokhale also told that "Another Scientist in All India took place by the side of Dr. J.C. Bose on Dr. P.C. Ray". Interestingly Gopal Krishna Gokhale's Birthday is 9<sup>th</sup> May.

The dream of Acharya Prafulla Chandra Ray and few other scientists became true. The Journal of Indian Chemical Society is now published through Elsevier and it is part of Science Direct. Besides, Prof. Yadav, Editor-in-Chief there are six other editors. There are 61 international Advisory Board Members from 21 countries and the editorial manager platform is used. **Indian Chemical Society is now member of the Federation of Commonwealth Chemical Sciences Societies (2021)**. A formal function on 17<sup>th</sup> May will be held where all these Common Wealth Members will join. I will Chair one session.

There are five different types of membership is now introduced in the Society. The Society has incorporated new guidelines for fellowship. New category of life membership is also created. Students Membership and Institutional Memberships are also included. Corporate Membership has also been introduced. Society has also started online news Bulletin "Chemical Warta". A new Website is inaugurated. We celebrated Annual Convention of Chemists (2020) with ACS, RSC and Elsevier. 98<sup>th</sup> volume (2021) of Journal of the Indian Chemical Society has been published and three issues are already there, fourth issue is in progress. These can be seen in Science Direct Website. All the Members of Indian Chemical Society will have to subscribe to the Journal by paying a token of money, Rs. 800/- per annum or \$10 and for five years Rs. 3000/- or \$45. Institution will pay Rs. 6000/- and there would be account for the libraries. Out of 133 articles submitted, 50 articles have been accepted and others are rejected.

Another very good news is that the back issues from 1924 will be digitized soon with the help of Elsevier. And they will become part of our website and Science Direct will refer to these. Three industries, Xytel India Private Limited, Clean Science and Technology Limited and Meghmani Organics Limited have supported and some more will also participate. This year four special issues will be published - a special issue dedicated to Professor D. C Mukherji will be published in June 2021. The special issues on 'Soft-matter', Professor Sadhan Basu Centenary Issue, August Symposium and Annual Convention of Chemists issues will be published. We are also planning to have professor R. C Mehrotra Birth Centenary celebration along with publication of a special issue in February 2022.

## **“Chemistry Meets Biology for a Happy Marriage”**

The topic is all about beauty and charm of chemistry. Chemistry is different from the rest of the sciences. It is the ability of chemist to control the structure of microbes at the molecular level from complex natural products like vancomycin to nanoparticles and whole genomes. So, chemistry is a very beautiful and attractive science. Similarly, there is a beauty and charm of biology. Because cells actually are chemical reactors and reactors do so living organisms obey the laws of chemistry and physics. So you can think of cells as complex chemical reactors in which many different chemical reactions are proceeding simultaneously. So it's a very interesting on the other hand very complex body. There is a network of all these things. All cells are more similar than different if you look at on the inside. All cells need to complete similar task and in a broader sense they use the same mechanisms and reactions.

And so, this also will reflect on a singular origin of life. So very interestingly, I was reading something about the commissioning of Nobel Prizes. The number of chemistry Prizes awarded to the work rooted in the life sciences. At least 9 of the prizes since 2000 have gone to biologists simply shows that chemistry is a much broader science than people is to think. So, at the molecular scale, biology in chemistry. So if you are a chemist, you must learn biology, and if you are a biologist you must learn chemistry. In chemical engineering biology plays a very, very important role, so engineering students must study biology. So not only have the chemistry Nobel Prize is indeed become more biological in recent decades, but also the prizes of that nature tend to reward work outside of the chemical mainstream, being much more closely tied to research in the life sciences itself. So, chemistry Nobel Prizes are being shared out between genuinely different disciplines, and to see this this is a very interesting article which was published in Angewandte Chemie. The percentage of Nobel Prizes in chemistry for achievements in life sciences as a function of time, and the Nobel Prizes are being shared by biologist, and the number of biochemists on the Nobel Committee also has increased over the years. So, what this Seaman and



Restrepo say that is, no one has now mutated itself into what effectively the Noble Prize in chemistry on life sciences. So chemistry Nobel actually has added some of the most creative and original in recent decades, and you will find that making hours for working microscopy or material science, they surprise people every year and in regard to this they were another interesting article by Nobel Laureate, Ronald Hoffman, Cornell University. What did he say? He said that a call to our profession is to embrace the far end and Influential reach of chemistry. So, it is the Nobel Foundation and not Sony that has invented the dream machine. A way to turn the celebration of what human hands and minds can do into an incentive for young people to do more than what they ever dreamed they can do. In fact, this article is open access and is very beautiful article. What it means that when we also decided to enlarge the scope of membership of Indian Chemical Society, I had this in my mind. Now people from different disciplines may become members or fellows of Indian Chemical Society. Human body is the best chemical reactive or so called biochemical reactive and the organization and structure of the human body the engineering is so complex, but the basic sciences remain the same. Absorption of oxygen, desorption of carbon dioxide and that should also happen at the microscale. Otherwise, a human being will not be alive. And at the same time, because of this, biocompatible materials and different kinds of things. Chemistry of materials. That is help us to develop and reengineer the human body particular figure shows you what can happen when part by part we replace our body parts and this is very interesting, a high level of science, chemical science and biology has gone into this, and so one of the things which people talk about like Prof. Bob Langer, MIT. He was in tissue engineering as a chemical engineer, but his contributions and what he has done with regard to starting a so many startup companies with his students. It is amazing so tissue engineering and the kind of different type of materials. Which are made and you can reconstruct these tissues and the other thing which people talk about in science is the so-called microfluidics. Now if you see lots of papers in microfluid where chemical engineer's do chemistry; they are metal scientist. Everybody is working in that area and these parts in this particular place, you will see that these can be studied by using microfluids. So, fluid mechanics is very important. The flow is very more important.

Absorption reaction is very important, so what we understand now of the human the biology from both chemistry viewpoint and biology viewpoint and drug delivery and what not. So very interesting science has been developed. So, cells obey the laws of chemistry and this is a very complex network of chemical reactions. But this is happening simultaneously. Nitric oxide is given and very recently people were talking about nitric oxide being a cure for COVID and if this is all related to biology and development of new drugs and medicines. The Pharmaceutical industry is struggling to meet the ever-increasing demand for new drugs and Covid-19 Pandemic had challenge us to develop vaccines at a faster

pace. In fact, yesterday not even tomorrow people believe more in science than their faith. People are thinking that scientist will find out some cure for Covid and they will be able to enjoy their lives again. A decrease in the development of new drugs has been observed for years from 1991 to 2000. The total number of new drugs discovered in the 21 leading countries was 367, dropping to 251 during the period of 2001- 2010 and fewer and fewer new drugs are being tested in clinical trials. R&D takes longer time to develop potential new drug candidates and believe me, this is a combination of both chemistry and biology, so this was one of the articles very recently, Maximilian Benz, a coworker wrote that "Marrying chemistry with biology by combining on-chip solution-based on combinatorial synthesis and cellular screening". Impact of genomic resource, the disappearance of boundaries between biology and chemistry. Totally evident chemistry search to provide the interpretation of biological phenomena in terms of molecular structures and chemical principles and processes. Friedrich Wohler's experiment in which he prepared the known biological substance urea by heating the abiotic compound, ammonium cyanate. And he wrote to Jon's Jakob Berzelius, the famous capitalist scientist, "I must tell you that I can prepare urea without requiring a kidney of an animal, either man or dog". So that is very interesting and this is where the organic chemistry was born as a separate discipline. So what nature is teaching us how to manufacture anything on a larger scale, and precisely so nature has developed both templated and non-templated biosynthetic machinery, including the ribosome DNA and RNA polymerase, polypeptide and peptide synthesis and metabolic enzymes to make complex molecules with diverse functions. So, chemistry is not just structure activity but it is functionality, that is what has happened. So, we understand this. And so, nature has been our own source of chemicals. Living organism's carryout, a remarkable array of complex functions using natural molecules and molecular assemblies, ranging from Antibiotics and enzymes to the ribosome and photosynthetic center.

We have green bio-technology, we have white bio-technology and we have blue bio-technology. And as the name suggests this is one of the most important aspects of our technology. However, the challenge also still is how to develop medicine and therapies that can cure currently treatable diseases. How can medical bio-technology help us in it? So, there are many new biotechnological horizons, so you have to develop medicines, you have to make them in the lab and then take to the plants so there is a scale up of course. you have to read the genes and you have to amend the genes and you have to test and test and then you have to replace some of the old parts for the new technology. So in the new biotechnology there is the fusion of genetic cell biology and many other sciences. In order to further advance medicine. So and this cannot be done without the foundations in chemistry in medical biotechnology you know stem

cell therapy, gene therapy diagnostics, tissue engineering. As I mentioned before, or antibody therapy, DNA fingerprinting. Human Genome Project was the best thing which people came to know about 20 years ago and recombinant pharmaceuticals. So, in medical biotechnology medicines and therapies use proteins, enzymes, antibodies and other substances naturally produced in the human body to treat diseases, including genetic disorders, and this is where the hope for humankind lies. Biotechnology can also use living organisms like plant and animals cells, bacteria, viruses and yeast, and in the large scale production of human medicine for human use. So diagnostic tests that use biotechnology materials to detect the presence or risk of disease like cancer, genetic diseases or pollution of a cell or material very, very important and medicines, including advanced therapies like cell and gene therapy. Vaccines and diagnostics, or biopharmaceuticals. All these have the marriage of chemistry and biology. So you look at antibiotics for that matters and vaccines. And we know that the medical biotechnology has come to the fore to rescue us from any of these things. So, you have input from a gene of interest and output could be Biopharmaceuticals, Nutraceuticals, Cosmeceuticals, Agriculture. Again the boundaries of this sciences between chemistry and biology have disappeared. So, at the same time what is helping us is AI. The big data is driving biotechnology innovation so you can see that these are some of the recently published books. Very interesting books and you can look them for you by yourself so the practical applications of this biotechnology, the agriculture, medical and healthcare and chemical and environmental applications. So, gene therapy is much talked about and during 1980s there were experiments and perhaps you would have studied, you would have known that how one person died because of the gene therapy and the trails were suspended by then, President George Bush, Second George Bush and how it is being reinvented again. So, these are many, many interesting diseases where the target cells are identified, and the medicines and therapies are particularly with reference to these targets, so you have direct delivery or you have cell-based delivery. That is so called gene therapy. So, you could have it in vivo or ex vivo and because we are living in the vaccine days today, we have the whole agent vaccine or subunit vaccine like that. You will have inactivated or activated that is, so called MMR vaccine or the rabies vaccine, and so you have all these things in very relevant in today's world. This so called Pfizer and Moderna COVID19 vaccines, MRNA vaccines, so you can see the perspective. So, you have expansion of clinical application development of vaccines for preventing non infectious diseases, development for vaccines for therapy and development for vaccines to bioterrorism. So, there are all sorts of things which are doing thus and particularly with Covid 19 vaccine you can see the advanced Phase 1 Phase 2 and Phase 3 trial so that they will be cure for the entire world. Phase 4 and 5 vaccines are identified and being monitored for this. So, as some of these Covid 19 vaccines such as AstraZeneca, which we have in India, Moderna, Pfizer

Gamaleya Sputnik, Sinovac, Novavax, Janssen. So all these things back since you can see how they compare their efficacy and many times people have this misunderstanding. There's somebody had a vaccine but still he died because there is a percentage; right now it is 90 - 95% effective. That means 5% is outside. So, somebody may say that in that particular region it is not that the vaccine is effective on the masses. So, this is what we know about the recombinant HB vaccine.

Other interesting part about it is the biopharmaceutical where large biomedical molecules known as proteins and these usually target the underlying mechanisms and pathways of malady, so you have a chemical and biological drug and this is where the comparison lies. Your pharmaceutical discovery, the pharmaceutical development, Release, and in the Medicinal chemistry are working together. There are many many different things going to a clinical trial 3. So, in the biosimilar biological product that it is FDA approved compared to an FDA approved biologic, known as the reference product and biosimilar, is highly similar to reference products, biosimilar has no clinically differences. So, we have this Biosimilar Markets from 2019 to 2027. There will be 23%. So, what is happening that you would take bacteria from understudy devolvement develop is natural products and then you can find out the structure and the diversification of the structure. For example, this *Pichia Pastoris*. It is synthetic biology, Glycoengineering, Synthetic promoters, Molecular Tool box and you develop this biopharmaceutical. This is for example, so there is a marriage or biosynthetic machinery with traditional synthetic approaches. Like improved strategies required for generation of molecules, with defined physical, chemical and biological properties. On the living organisms remarkably adapt at, producing molecules and molecular assemblies with an impressive array of functions from enzymes and antibodies to photosynthetic centre. And there is also a confluence of the structural and chemical biology. Plain polypeptide synthases as biocatalyst for bio-based future. So, Type 3 plant polypeptide synthases biosynthesize a dazzling array of polyphenolic products that serve important roles in both plant and human health. They act as biocatalyst to generate new chemicals. So, we can see that this I have shown you earlier and you see the different types of enzymes and these molecules which we have been. You know prepared by using them.

So, they have several applications in chemical, biological, material sciences like generation of semi-synthetic enzymes, ion channels, DNA directed chemical synthesis, biosynthesis of proteins and DNAs from, unnatural building blocks, DNA or protein templated assembly of inorganic and organic materials. Combinatorial synthetic strategies inspired by nature, Construction of biohybrid thin films; use of enzymes in organic synthesis, generation of orthogonal enzyme inhibitor pairs.

So, you can see why should drug discover bother about biological networks? Because nearly all drugs can hit more than one effected target in an organism.

Not all non-target effectors are off-targets, metabolic systems or transporters.

So accumulated genomic, proteomic, analytical, pharmacological knowledge confirm that several highly efficacious drugs exert their overall therapeutic effect through a network of effectors. The output of the network determines the drug profile, whether it's good point or it's a bad.

There is a confluence of biology with chemist. The best example is photosynthesis. So, the biological research in areas of environmental science, ecology and agriculture and forestry. The photosynthetic machinery of the green plant has been used as a guiding concept in the development of photosynthetic molecular devices that are capable of splitting water and generating hydrogen. I work in the area of hydrogen Ion more; how exciting that hydrogen is going to be for our future applications of cross fertilization between biology and chemistry are finding expression in an increasingly expanding domain. So, of course this is so the biological solutions of healthcare industry. Uniqueness is targeted and personalized therapeutic and diagnostic solutions of particular diseases or illness. An unlimited amount of potentially safer products, Superior, theoretic and diagnostic approaches. And higher clinical effectiveness because of the biological basis of this is being known.

We also talk about green chemistry in engineering, so we can definitely apply to biotechnology for biomass conversion and example for depolymerization oxidation and reduction and so genomic studies of microorganisms which can degrade lignocelluloses and, convert them into useful fuels, chemicals in materials. There is a high throughput screening of meta-genomic libraries for novel enzymes that transform lignocellulose. So as far as engineering is concerned, you will have pyrolysis of heterogeneous residual mass, controlled reduction of carbohydrates.

Oxidation and degradation of lignin, so this is included in the so called bio-fuel in the context of bio-refineries. We have common natural biotic biochemistry and we can develop multifunctional biofactories using for example, the Rhodococcus as a host all sorts of things are being done in the literature, so the engineered microorganisms with a diverse set of modified or non native enzyme activities. Development and selection of mutated enzymes with improved properties to generate novel products and to provide improved processes for the manufacture of established products. So, the production of precursors, intermediates, and compounds which are important to the pharmaceutical industry. So the polypeptides, non-ribosomal peptide, steroids, vitamins and unnatural amino acids. Bacteria and fungi are engineered. The secondary metabolites known as polypeptides and non-ribosomal peptides, whose synthesis from simple carboxylic amino acid monomers is catalyzed by large multifunctional enzyme complexes called

as particular polypeptide synthesis and non-ribosomal peptide synthesis. Metabolic engineering actively pursued in bacteria and fungi and so based on that large number of drug molecules have been developed. You can see an array of whether they are anti-ulcerates or antidiabetics, diabetic is a huge disease in country like India or calcium channel blocker. So incidentally the marine biotechnology you can have several different products from sponges. Which are a pharmaceutical and so we have lot of these products from microalbum to ultimately coming to the engineering and scalar part of this you will have metabolic engineering, chemical catalysis and separation purification in formulation and you can see that all sorts of things can be done and the final goal is what to create world class, pharmaceutical manufacturing, new drugs and new manufacturing principles in downstream, particularly in biotechnology industry. Downstream make cost something like 80% so this is very very important. With reference to separation and purification.

What will be the next natural crisis of biotechnology? What will be the next humanity? What will be the next biology? What will be the next design? Can you do it yourself? All these questions are being asked. So finally, if you look at the ultimate human body engineering everything in our body, we can replace by biocompatible materials whether their hips or cochlear implants or ceramic teeth and what not okay? All these things are there. So, what it means ultimately cells obey the Laws of chemistry and also physics, unless chemist and biologists both work in tandem with engineers, whether, chemical engineers or biological engineers, spectacular progress cannot be achieved. Biotechnology, does not only involve the manipulation of DNA by means of genetic engineering. Rather the technology encompasses the use of living organisms or biological processes to make useful products. Biotechnology aims to target the causes of disease and not the symptoms. And that is why biotechnology offers one of the strongest hopes for patients to cure diseases. We know now what is happening in biotechnology - one of the several tools that can be effectively used to diagnose and cure the human diseases. It also improves the human health by innovating new ways.

So, in the year 2100, death will not be a problem. Life will be. Why I am saying that because look at this. I said in the beginning that there is a marriage of chemistry and biology; that is going to happen. Yes, we look at the molecular level what is happening and ultimately, we can see that this is the future per se. Biological Sciences and Chemical Sciences, marrying together, developing new ideas and then we will have a greater and better future.

## Keynote Address

### “Chemistry in Ancient Times; Foundation of Indian heritage”

**Prof. G. Desiraju**

**Solid State and Structural Chemistry Unit  
Indian Institute of Science, Bangalore, India**



The topic is Chemistry in Ancient Times: there are two schools of thoughts prevalent in India today about the science in ancient times. One school of thoughts says that everything that is happening today in science can be traced back to some old roots which were laid down in this country many millennia ago. This is obviously a fanciful idea. There is another school of thought which says that nothing that was laid down before in our society is of any relevance to the modern science today. Now, this is also equally unrealistic and in fact biggated point of view. So, there must be a middle ground simply because we are such an old country and we are also at some point was very rich country. The description of Science in ancient time looked at from this perspective. Berthelot, a chemist from France is the one who gave us this famous quotation that “Chemistry creates its objective”. He had correspondence with Acharya Prafulla Chandra Ray. According to Prof. Ray many extracts of Chemistry was written in Sanskrit before thirteenth century. Prof. Ray was in close correspondence with Berthelot prior to the year of writing this famous book “History of Hindu Chemistry”. “What is chemistry?” In any definition, old, medieval modern chemistry is a study of matter and its transformation, how to change one type of matter into another type of matter, and the core of chemistry is synthesis. Put things together to get some third thing? And immediately along with synthesis follows analysis. How do you take things bigger and split it up into smaller things? This interplay between analysis and synthesis is the most central thing of chemistry. You take matter, you analyze it, then using the analysis you try to make it again and through this process of analysis and synthesis you start making new substances, that is, in my view, the essence of chemistry. Now let us take first analysis. Now, as I said, Analysis is at the heart of vedicshashtras and that’s why without apology I will say that, the way in which our ancient chemistry itself was through the Hindu idioms that means the “panchabhuta”s the five primordial elements, ether, air, fire, water and earth are the rudiments of matter. Other culture has come to this “panchabhuta”s, if you look at the ancient Greeks, you know they identified all these five, but interestingly they got to ether was last. We took ether first. Very significant thing that, and “panchabhuta”s come at the very origin of “Veda”s.

Very surprisingly, the ancients recognized certain things that go even before the “panchabhuta”s. These are the “sanmatra”s, five of them, pancha “sanmatra”. So these are the five subtle elements, five arrows as it is called, sabda(sound), sparsha(touch), rupa(form), rasa(taste) and gandha(smell) and they define the primordial elements. And preference to the panchabhutas and panchasanmatras, which incidentally Acharya P. C. Ray mentioned in his monumental text. They come right from the most ancient of our scriptures. For example, “the Lord Shiva in the form of panchabhuta is worshiped today in five gigantic temples in south India, one for each of the panchabhutas. The thousand names of goddess Lalita, the Lalitasahastranamam, which actually comes to our Bramhandapurana. Names often called panchasanmatra. The one whose five arrows are sabda, sparsa etc. only by name number 949 she is called panchabhuteshi. So, there is no doubt that sanmatras came before panchabhutas. If one looks at these things, the modern scientist will have no difficulty in recognizing panchabhuta as a mean to describe matter, whereas the sanmatras describe properties of the matter. The first one ether (akasa), why did Hindus take it first, because it is something that can only be heard, the hearing is the first of the sanmatras. Then we come to Vayu or wind or breeze. One can not only hear it, but one can also feel it. Then comes Agni (fire), which can be heard, felt and seen. Then come to Jala or Apas (water), one can hear, feel, see and taste. And finally come to Prithvi, which the Greeks took first, we take it last, hear, feel, see, taste and smell. Smell actually is the last of the sanmatras. Hearing is the first. So, one can really see that matter using the sanmatras is defined in terms of properties and not structures. The structure and property correlation is again second essence of chemistry. And it is only now one is getting into property based analysis. Now look at this quadrant, which is a structure property quadrant. Now, for example, here in this top left hand corner, conventional crystal engineering or conventional physical organic chemistry or conventional medicinal chemistry. The same structure has the same property. This is nice. So, same property and same structure, is very well known. Similarly, a different property and a different structure, it is conventional, it is actually obvious. What is not so obvious is the two quadrants, same property but different structure, so, two different structures have the same properties and similarly same structures having different properties. And now we have enough examples in science, in chemistry of these last two quadrants. The properties and structures, sometimes they match, but, very often, they need not match also. So, which then is a more primary way of characterizing matter itself? Now, this was analysis. If one looks at the synthetic aspects of Hindu chemistry, it really starts from Atharvaveda from which come Ayurveda. In fact the two exemplary people, who told us about Ayurveda, are Charaka and Sushruta. Charaka comes earlier and he recognized Ayurveda as an Upaveda of Atharva Sutra and he considered it a direct revelation from the gods. Sushruta, who came later formalized all these a little bit better, in terms of Hindu philosophy and he analysed Ayurveda in terms of Nyaya and Vishakhadarshana of the Atharva Vedas itself, was much more compact, more scientific. But, both of them have no doubt that Ayurveda-



medicinal science came from the athavaveda itself. Vagbata, which came few centuries later, talked about both Charaka and Sushruta, he says, why is it after so many centuries, people only remember only these two names and forgotten the others. He says something, which is very important to Indian scientist to remember today, he says, a scientist is remembered not because he is old, but because what he said. Today, there is a tendency to overrate people who are old, or people who are director or vice chancellor or presidents of various associations or advisors. Because someone is science secretary in Delhi, does not make him a great scientist. And this is what was told by ancients long long ago. Two important books of the time are Rasayana and Rasaratnasamuchchaya. Rasa itself originally meant just mercury, which was very important in Shiva worship, and as it is used by best devotees by highest stand it is called “quicksilver”. The character of fixed quicksilver is that it is continuous, readily fusible, pure, heavy and that it can revert to its own natural state. So it was mercury based and then rasa simply became any metal, then it became any substance, it became essence, juice and from that you have the word Rasayana which is the modern word for chemistry.

The “charakasanghita” force of many many things which actually be surprising. The term epidemic was mentioned by Charaka as, “Although they are severe, not everybody dies during an epidemic. During an epidemic, those who are not fatally ill should resolutely stick to a righteous code of living.” So, what causes an epidemic? The root cause in unrighteousness or sin. Unrighteousness manifests as seasonal anomalies. It causes the ruin of communities by war or violence, which are triggered by greed, anger or conceit, it makes the subjects vulnerable to attack from demoniac agents and deadly creatures. Rulers who preside over a country, city or community, but lack probity. They can be counted on to deal unjustified with the officers, traders and people until righteousness disappears altogether and even God takes leave of the country. So, epidemics are not new, in the Hindu tradition. People knew how to tackle them and one should stick to a righteous code of living, even in these very bad days of pandemics. Even Bangalore today is in very bad shape. What is the righteous code of living?

Righteous code of living is to take that vaccine. After vaccination also one should follow the right way of wearing mask, keeping safe distance and washing hands several times. So this is the righteous way of living by Charaka and we should follow.

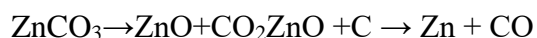
So, I shall quickly go through some other ideas. This man Kokatnoor lived in America in the early part of the nineteenth century, he was a consultant, but, you know, he tells us for instance, who said that gun powder was discovered by India and not China. It is known that to make gun powder, sulphur and nitrate are required. When gun powder was discovered, China had neither of them during that period. So, in the alluvial regions of Bihar and north western West Bengal one will get the saltpeter. Because not known in the anywhere in the world. Sulphur also is something that was known only to people of India in those days. There is a nice

article in journal of chemical education in 1948, one can have a look at it where one can have evidences. So, they knew about all these things, and the Judhhashastra and all that is something that was very well known.

There are twelve elements, which were known to the ancients. Ancients means people in India, people in West Asia, people in Egypt, people in China, where human being used to live in the old days. These elements were known in the free states and sometimes as compounds and from these let us just look at the metals. India had eight of them. And they are all very ancient things, copper, for example, is the first one known to human being in the purest form, so also, silver, gold etc. now the hindus had no problem in recognizing these metals. For example, in the Sri Rudramnamakamchamakam, part of the yajurveda, there is this nice verse, “hiranyangchameayashchameshishangchametrapushchameshyamangchamelohangchame”. There are a lot of lively discussions what the metals are, most of the people feel that Hiranya is gold, although a few people said it silver. There is definite confusion on what is ayash. Because according to one tradition silver vessel is not used in offering to lord Shiva. So, some people say it is silver, some people say, it is bronze. Shishang and trapu were not so much of controversy, many of the modern Indian languages, we have a word like shisha for lead, and trapu for tin. Shyama, again about the iron, although people sometimes say it could be bronze. Loham is almost certainly copper, the red colored metal. So, these, ancient metals are very well known, people knew about these metals very well. This is something was found in the area of modern-day Pakistan. These are pure copper flakes and believe it or not, they are probably used for printing, because these animal illustrations are all in a raised structure in a copper plate. So, these are probably used for some sort of printing. Now, how did they know about, firstly, getting copper and how to use it for printing? Copper in its free state is known and some of it is known in Baluchistan and West Asia. So, it is possible that, they extract the copper to make this, still, the fact that you can have plate was discovered that not more than 20-30 years ago. So, the fact is that, this thing is 2000-3000 years old, not something that happened yesterday.

Now, from all these metals we come down to these two reactive metals. Now, it is one thing to extract, metal is the most stable form, but the ore is not stable. So, the ore is reduced to some non-reactive metals, all chemists know that. What about these two reactive metals, iron and zinc. These are far more interesting. How did the ancients know about these? Now, iron ores are plenty and some kind of heating of iron or hematite, with some kind of carbon, gives you the iron. The zinc was also well known to ancient Hindus. Its extraction was very difficult. It has a low boiling point of  $907^{\circ}\text{C}$ . Now the problem with this low boiling point is that, at around 800 to  $900^{\circ}\text{C}$  temperature, most of the zinc is smelted with carbon or reducing agent to extract the metal. So, it needs such a kind of temperature very close to boiling point. Before, one can even reduce the ore and get the metal. So, the temperature difference between when the reduction occurs and metal boils is very very low. In the case of iron, high boiling point of iron ensures that, this is not going to happen. So, this is great problem

with zinc. So, the main ore of zinc is calamine, zinc carbonate and which is found in many places all over the world. Rasarnava and Rasaratnasamuchchaya called that it turns copper into gold. Calamine is called rasaka. Again, the word Rasa means substance. There are three kinds of it, namely yellow colour, and recently found out that, this is for crystal engineer and people, who are interested in solid state chemistry, that calamine is polymorphic. And it would be interesting to know that calamine mentioned in Rasarnava are actually modern polymorphs of carbonates. Indians discovered Brass before isolating zinc. They took copper, mixed it with calamine and heated the whole stuff together. Calamine got reduced and the zinc, which is formed in situ is alloyed with copper to form brass. Brass has yellow colour and it looks like gold and so it was stated by several alchemist that it converts copper into gold. We had more evidence, that we had zinc in India, there is a Chinese word, tutenagueie derived from an earlier tamil word, tuththanagam. When in 13<sup>th</sup> century the word jasadam was used, they knew the calamine is something different. Because of the difficulty of low boiling point, they could not extract zinc at the time of rasayana, at the time of rasarnava. The same work also going in west Paracelsus and the fellow called Basil Valentine, they identified zinc as semi metal, because they it is not malleable, so they even could not identify zinc as metal, whether could. Look at the way history is distorted. In the standard text book of inorganic chemistry, in most of the cases, India is hardly mentioned in the introduction. Brass and alloys of zinc and copper are known to ancients, that's rubbish, it was known to the Indian, more specifically it was known to the Hindus. He says about Basil valentine and Paracelsus and then he uses the word zinc, thus talked about tutenague, but he does not talk about the tamil word tuththanagam, finally he mentions India, and calamine. Then he goes on and on, but never mentioned that we could extract zinc at that time. There is a place called Zawar near Udaipur, where Rasarantasamuchchaya describes clearly how zinc is extracted from the ore, despite its low boiling point problem. What do they do? They take pallets, then in sodium bicarbonate, borax, the ore and brinjal shaped crucible, on heating zinc oxide by a carbonecious matter, a reducing flame of zinc vapour was observed. Zinc carbonate decomposes easily by using this brinjal shaped thing and this reducing agent.



These are the basic reactions of zinc extraction.

Now, what is more important is methodology. First problem in zinc extraction is high reactivity of zinc vapor. So, ore is mixed with charcoal and fired to give zinc oxide. Add more charcoal, salt, borax, cow dung, water to make into balls of 5 to 10 mm diameter, sun dry, fill in brinjal shaped retorts.

This is a distillation, where the heating is coming from the top, not from the bottom. There are two chambers, for lower condensing chamber is at the bottom, not at the top, and division between the chambers in the form of non-mortared bricks. Then the best part of this extraction. On reaching the temperature, CO blue flame was

replaced by white flame of zinc. Now, at that stage, reed burns off and seals opening here. In closed system distillation, reduced metal vapors forced downwards. This whole system can be called distillation upon decent and without this one can not get zinc. The whole thing is an exercise in holism.

If whole chemical system is taken together, structure of matter, properties of matter, and put them both together. The moment it is done the domain of complexity comes. You are coming further and further away from reductionist ideas but scientists in the west are doing. For example, they knew about calamine. They knew that it turns copper into gold. But today it is chemically wrong. But they knew there is something in calamine that converts copper into some yellow coloured metal. But they used that property a thousand years latter or more than that to be finally extraction zinc metal. So, property definitely came before structure. Zinc carbonate was used before knowing what zinc was. The fact that zinc carbonate contains zinc is not so important. The fact that is important is that, zinc carbonate was used to convert copper into Brass. So, structure and property come together. Supramolecular chemistry, systems biology, the tons of things that are cutting ages of science today. Require ideas like holism, complexity and emergence, which are extremely well known to our ancients. An emergent property is created when something becomes more than the sum of its parts. Why do for example ants walk in a straight line, why do birds fly in a V shaped formation, why is it that when you get a collection of people, sometimes some of them aggregates and some stand separately, what makes musical notes to put together to form ragas, what is a cell. Professor Yadav has just said that, cells follow the rule of chemistry. Of course, they do. They do because they are example of system biology and complexity. Somewhere, the chemical reactions alone will not tell the behavior of the cell. Yes, it is true that cells follow rule of chemistry. But there is something more than the rules. It is the way in which the rules are put together. Molecules are putting together to form crystals. Crystal engineering is all about these things. It comes from supramolecular chemistry, which again recognizes that whole is better than the sum of the parts, and in crystal engineering it is true context of crystals. So, when you take molecules to put them into crystals they don't behave just like a collection of molecules. They are something more than that. If one benzoic acid molecule is added to other benzoic acid molecule and form crystal. These dots are hydrogen bonds. These hydrogen bonds make benzoic acid molecule, benzoic acid dimer. Crystal of acetic acid looks very different from benzoic acid. Now, what makes a difference? It cannot be just the carboxylic group, because the carboxylic group is present in both. It cannot be just the phenyl or methyl group. There are several other compounds which differ by phenyl and methyl groups. But, does not show such difference. So, it is something to do with all those things put together. It is not just for one reason. It was well explained by Nagarjuna. It is not known whether he was hindu or buddhist. It is not known whether he lived in 1<sup>st</sup> century CE or third century CE. Some people say he was born in Madhyapradesh, some say in Maharashtra or Gujraat. There is another Nagarjuna, after whom

Nagarjunakunda is named, he was certainly a buddhist. Now, both new a bit of science. Who came first? A quotation is there “for the sprout does not exist in the seed which is its cause; it does not exist in each one of earth, water, fire, wind and so forth, which are agreed to be its conditions; nor in the combinations of causes and conditions, and it does not exist as separate from these, free from causes and conditions.” So then where do these sprouts come from? This is the question. Buddhist doctrines are derived from hindu scriptures. Although buddhism not agreed with Vedas. Once again, Two thousand names of goddess lalita. For example, nirakara - no shape -formless, nirvikalpa - devoid of seperateness, nirveda - she who has no difference, and vedanashini - she who promotes oneness. In all these cases it is just the oneness of things. Jumping between many and single one. If you take regular drug design, it is target based. For artificial drug design, it is data based. In case of covid, the target is not known. So the drug design stopped. No, it should not. So, you can look at the symptoms of patients and using that you can design the drugs. So, in other words you donot go for a reductionist approach. You have to take structure and property together. Otherwise, neither of them actually makes sense.

I have talked about some of these in an editorial in Angew.chem. Int. Ed., published few years ago and this is the Buddhist School of thoughts. This is the Samutpada. This really has important implications. I think, firstly we have to state, what is known about our country and what is good about our country. We can not expect foreigners to come and pick up all these things, if we have don't have pride to say what is already known in our country. Somebody will come from outside and say it, is something very stupid. They have not changed any text book in six years. Put this Nagarjuna in text book. I am not asking anything else. We are either silly or scared to talk about it. The great greek scientist Dmitri Mendeleev who used our idea of thinking, was not even recognized at that times. Mendeleev never got a Nobel Prize. Something not given to Mendeleev, then the prize itself is worthless. I will say why is his contribution so great? I mean you look at the periodic table. The Tellurium Iodine riddle, where the Iodine has a smaller atomic weight than Tellurium. For normally if you arrange it in accordance with atomic weight, they should change their positions. Mendeleev switched it around. Because he said following the model is more important than the actual atomic weight and he was right. Because the periodic table is based on atomic number, not on atomic weight. Actually, he was right. He did not know the reason, why he was switching it around, but he switched it around. Once again here the famous thing he did, Aluminium, gallium. Gallium was not known at that time. He calls it Ekaaluminium and gave all the properties. Similarly, germanium was not known. He called it Eka silicon and gave all the properties. And when gallium and germanium was actually discovered, it was found properties exactly matched, what Mendeleev said. This intuitive thinking, he did, that he knows aluminium like this, he knows germanium like this, he knows whole periodic table like this. He said it is unknown, it will be found. He was sure, it would be found. That certainty that gallium exists, was written by our most famous philosopher. The true test of

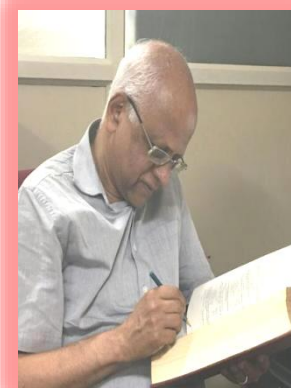
knowledge is certainty, which is a characteristic of intuitive thinking, rather than communicability, which characterizes intellectual knowledge. Communicability is what you write in the journals and the referee says something and then you try to communicate with him. Intuition does not oppose intellect but rather lies beyond it. In other words, intuitive knowledge, although it does not contradict necessity of reason, questions the sufficiency of reason. Intuition is not illogical, but super logical. In summary, both intellect and intuition must be synergized in the quest for the nature of ultimate reality.

I should end with this slide. I told you about panchabhutas, we worshiped panchabhutas in the form of lord shiva in five magnificent temples in south India. I talk so much about ether. I am showing a picture of temple where lord shiva is worshiped in the form of akasha. So, this is our tradition. This is who we are. This is what we are, and if we try to deny this and start with all other contorted explanation, we will not good in any endeavor, forget science. An American is best at being an American. A German is best at being a German. An Indian is the best in being an Indian. So, with these words, I would like to thank all of you for your very kind attention and once again. This is a message which I want to give you today and it is a homage to Acharya P. C. Ray. He was the first one who came and said what was there. Now for us to pick it up and try to not worship the past. No talk about who got Nobel Prize and who not. Mendeleev never got, so it's a rubbish prize. You have to have the strength of your conviction and you have to be able to say this is who I am. This is what was done and therefore as a modern Indian, I will be able to do even better. Thank you very much all.

## About Prof. G. R. Desiraju

Prof. Gautam Radhakrishna Desiraju is a famous Indian chemist and educationist who has contributed significantly to the themes of crystal engineering and weak hydrogen bonding. He is one of the most highly cited Indian scientists and has been recognized all over the world.

Professor Desiraju (Born, 1952, Madras) obtained his BSc degree (1972) from the St. Xavier's College, Bombay, and PhD degree (1976) from the University of Illinois at Urbana-Champaign, where he worked under the supervision of Professor David Y. Curtin and Professor Iain C. Paul. Between 1976 and 1978 he was a research scientist in Eastman Kodak Company, Rochester. He returned to India in 1978 and spent a year at Indian Institute of Science as a research fellow before he joined the University of Hyderabad in 1979 as lecturer. He became a Reader in 1984 and Professor in 1990. He pioneered the research in crystal engineering in India, which has major impact on the development of this subject, and now has grown immensely with nearly 200 independent research groups throughout the world.



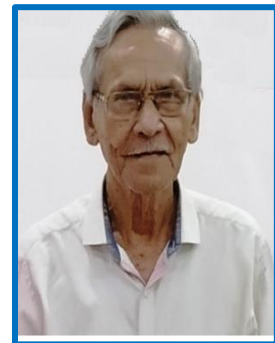
Professor Desiraju has received wide appreciation from the academic world and earned several awards and distinctions. To mention a few, Professor Desiraju was awarded with the Alexander von Humboldt Forschungspreis of the Alexander von Humboldt Foundation (Humboldt Award, 2000), TWAS Prize (2000) and Ranbaxy Award (2000). He was a Michael Visiting Professor in the Weizmann Institute of Science (2002). Desiraju is a Fellow of the National Academy of Sciences (India), Allahabad; Indian Academy of Sciences, Bangalore; and Academy of Sciences for the Developing World (TWAS). He has also received the Honorary Doctorate degree of the Universidad Nacional de Córdoba, Argentina and of the Rayalaseema University, Kurnool. He was awarded the Acharya P. C. Ray Medal (2015) of the University of Calcutta for innovation in science and technology. He was awarded the ISA medal for science of the University of Bologna for the year 2018. Indian Chemical Society felicitated Prof. Desiraju, with the most prestigious 'Life Time Achievement Award 2019' in recognition of his lifetime achievement in teaching and research in the field of Chemistry in general and Crystal Engineering in particular.

Prof. Desiraju, a dedicated academician, has contributed significantly to the development of Chemical Education and Research in India, built up a vibrant school of chemists and inspired a large number of students and colleagues who are carrying the torch of his mission.

## Celebration of 98<sup>th</sup> Foundation Day of Indian Chemical Society

**Prof. D. C. Mukherjee**

**Advisor, Indian Chemical Society**



98<sup>th</sup> Foundation Day of Indian Chemical Society has been celebrated on 9<sup>th</sup> May, 2021 on virtual mode due to Pandemic situation. President of the Society Padmashree Prof. G.D. Yadav presided over the meeting. Honorary Secretary of the Society Prof. Chittaranjan Sinha welcomed everybody to the Foundation Day Programme. It is my proud privilege to apprise about the history of the formation of the Chemical Society. The idea of foundation of the Society was conceived by three talented chemists of our country J. N. Mukherjee, J.C. Ghosh and S. S. Bhatnagar while carrying out their research work in the University of London in 1919 for the D.Sc. Degree. They took a decision that after coming back to India their aim would be to establish a Chemical Society like the Chemical Society of London. Returning to Kolkata they requested Acharya Prafulla Chandra Ray to form a Society headed by him. In the year 1924 the Indian Chemical Society, 4<sup>th</sup> oldest Society of India was established which was the outcome of National Spirit and it was the dire need of the day to establish the society for publishing the research paper of Indian Chemists as it became difficult day by day to publish their own research paper. A new era has dawned upon India.

Composition of the first Council of the Society:

The first President: Acharya Prafulla Chandra Ray

Vice Presidents - Gilbert J. Fowler and J. L. Simpson

Secretary - J. N. Mukherjee

Treasurer - P.C. Mitre

Members - B. B. Dey, H.E. Annet, B.H. Wilsdon, H. K. Sen, S. S. Bhatnagar, R.N. Sen, R. L. Datta and B.K. Singh

Editors of the Journal: N.R. Dhar and A.N. Meldrum.

Noble objective of the Society was Cultivation and Promotion of Chemistry and allied branches of sciences. This is a non-profitable organisation. Since its establishment the Society used to publish quarterly Journal but later on it became monthly journal. But our very dynamic President Padmashree Prof. G.D. Yadav has taken initiative to publish the Journal of Indian Chemical Society through foreign publisher Elsevier within a very short time. Dream of Acharya Prafulla Chandra Ray with three young talented Scientists has been fulfilled and now we are publishing through Elsevier. The journal will disseminate knowledge to the chemical world.



## List of Awardees of the Competitions held on ICS Foundation Day Celebration, May 09, 2021

### Indian Chemical Society Award of Excellence

#### Speech Competition

##### Group A (Class V and VI)

<b>Auhonaa Kundu</b>	Our Lady Queen of the Mission School, Class VI	1 <sup>st</sup>
<b>Archisman Roy</b>	South Point School, Class V	2 <sup>nd</sup>
<b>Oosiheerup Adak</b>	Dolna High School, Class VI	2 <sup>nd</sup>
<b>Soumit Roy</b>	Salt Lake School, Class V	3 <sup>rd</sup>

##### Group B (Class VII and VIII)

<b>Ranjana Chatterjee</b>	Kamala Girls' School, Class VII	1 <sup>st</sup>
<b>Tanmay Sunil Patil</b>	Euro School, Thane, Class VII	2 <sup>nd</sup>
<b>Shreyashi Ghosh</b>	Kamala Girls' School, Class VIII	3 <sup>rd</sup>

##### Group C (Class IX and X)

<b>Aritrika Das</b>	Mahapatra Mohanpur High School, Class X	1 <sup>st</sup>
<b>Priti Das</b>	Banipith Girls' H.S School, Class X	1 <sup>st</sup>
<b>Adreeta Das</b>	Kamala Girls' School, Class X	2 <sup>nd</sup>
<b>Anudeep Sinha</b>	Gyandeep Vidyapith, Egra, Purba Medinipur, Class X	2 <sup>nd</sup>
<b>Debalina Ghosh</b>	Banipith Girls' H.S School, Class X	3 <sup>rd</sup>
<b>Trisa Das</b>	Kamala Girls' School, Class X	3 <sup>rd</sup>

##### Group D (Class XI and XII)

<b>Roshnee Bose</b>	Bal Bharati Public School, Kharghar, Navi Mumbai 410210, Class XII	
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**List of Awardees of the Competitions held on  
ICS Foundation Day Celebration, May 09, 2021**

**Group E (UG & PG Students)**

**Category: Speech Competition**

<b>Debolina Dey</b>	Victoria Institution College, Kolkata	<b>Professor P C Mitter Award of Excellence</b>
<b>Nyssa Chakraborty</b>	Shri Shikshayatan College, Kolkata	<b>Professor N R Dhar Award of Excellence</b>
<b>Praneel Bhattacharya</b>	Heritage Institute of Technology, Kolkata	<b>Professor A N Meldrum Award of Excellence</b>
<b>Zarqa Hassan</b>	Victoria Institution College, Kolkata	<b>Professor B B Dey Award of Excellence</b>
<b>Sujata Bais</b>	Pt. Ravishankar Shukla University, Raipur	<b>Professor H K Sen Award of Excellence</b>

**Group F (Research Scholars & Others)**

**Category: Research Presentation**

<b>AasnaParui</b>	ACTREC Tata Memorial Centre, Homi Bhabha National Institute, Mumbai	<b>Professor Gilbert J Fowler Award of Excellence</b>
<b>Bijeta Mitra</b>	University of North Bengal, WB	<b>Professor J L Simpson Award of Excellence</b>
<b>Prasun Bhattacharjee</b>	The ICFAI University, Tripura	<b>Professor E R Watson Award of Excellence</b>

## Some other upcoming important events.....



### Swatantrata Ka Amrut Mahotsav

Vignyan Gurjari, Vadodara Unit, Indian Chemical Society, Vadodara Chapter and Indian Science Congress Association Baroda Chapter Organising Webinar to celebrate 160th Birthday Anniversary of **Acharya Dr. P.C. Ray** on Google meet

**7th August 2021, Saturday at 03:30 PM onwards**  
link: <https://meet.google.com/exu-ikwu-zdb>

#### Chief Guest



**Prof. Dr. Haribhai Kataria**  
**DEAN**

Faculty of Science  
The Maharaja Sayajirao University of Baroda

#### Speaker



**Prof. Dr. Chittranjan Sinha**  
**HEAD**

Department Of Chemistry  
Jadhavpur University, Kolkata

**Topic: Lifesketch of Acharya Dr. P.C. Ray**

**Time: 04:00 PM**



President  
**Dr. Maunik Jani**  
Vignyan Gurjari  
Vadodara Unit



Chairperson  
**Prof. Dr. Shubhangi S. Soman**  
Indian Chemical Society  
Vadodara Chapter



Convener  
**Prof. Dr. Sandhya Garge**  
Indian Science Congress  
Association Baroda Chapter

**Convener: Prof. Dr. Shubhangi S. Soman.**

**Co-Convener: Dr. R.V. Devkar (Secretary, VG, Vadodara Unit)**

**Co-Convener: Dr. R.N. Jadeja (Secretary, ICS, Vadodara Chapter)**

#### Organising Committee Members

Dr. Arun Patel  
Mr. Krunal Patel

Dr. Sujit Baram Kumar  
Prof. Dr. Neelima Kulkarni

Prof. Dr. Punita Parikh  
Prof. Dr. Pragnya Parikh



MSME Chamber of Commerce and Industry  
of India,



World Environment Day, E Waste, Plastics, Glass,  
Battery Recycling & E-Vehicle (Conference | Awards |  
Exhibition on 27th - 30th August 2021 at  
Vigyan Bhavan New Delhi



PLASTIVISION  
INDIA | 2023 | MUMBAI  
FEB 09 10 11 12 13

PLASTIVISION INDIA

MSMECCII will be honoring and thanking India's no 1  
Plastic Exhibitions PLASTIVISION INDIA particularly to **Mr  
Kailash Murarka Chairman** for supporting & Sponsoring  
our Upcoming events Global Conference , Asia Greentech  
Exhibitions & Business Excellence Awards from 27th to  
30th August 2021 at Vigyan Bhavan New Delhi India.

### Contact Us

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manjeshyadav14@gmail.com  
ighosh.1457@gmail.com | ighosh.chairman@msmeccii.in | www.msmeccii.in



**MSME Chamber of Commerce and Industry  
of India,**

**World Environment Day, E Waste, Plastics, Glass,  
Battery Recycling & E-Vehicle (Conference | Awards |  
Exhibition on 27th - 30th August 2021 at  
Vigyan Bhavan New Delhi**



**We have decided to honour PLASTIVISION INDIA for the  
No 1 Plastic Exhibitions in India at Mumbai 9th to 13th  
February 2023.**



**PLASTIVISION INDIA**

**Contact Us**

+91 9810690843 | +91 9810201957 | +91 9319912277 | +91 9654026629(Manjesh) |  
manjeshyadav14@gmail.com  
ighosh.1457@gmail.com | ighosh.chairman@msmeccii.in | www.msmeccii.in

# SCIENTIFIC TEMPER DAY

## Celebration

20<sup>th</sup> August, 2021 at 6:30 P.M.

Invited Lecture by

**Prof. Chittaranjan Sinha**

Professor & Former Head, Department of Chemistry  
Jadavpur University, Kolkata -700 032  
Honorary Secretary, Indian Chemical Society  
Kolkata – 700 009, India



Topic:

**"Why do we need scientific temper?"**

Meeting Mode:



**Organised By : Haldia Vigyan Parishad** HALDIA TOWNSHIP  
Haldia, West Bengal

Celebrating 75 Years of Indian Independence

Organised by

**Vivekananda Vijnan Mission**

West Bengal Chapter of Vijnana Bharati



स्वतंत्रता का अमृत महोत्सव

WEBINAR #1

*The Chemistry of Indigo  
and*

*Its Relation to the Indian Freedom Movement*

Speaker

Prof. Sayam Sengupta

Department of Chemical Sciences, IISER Kolkata

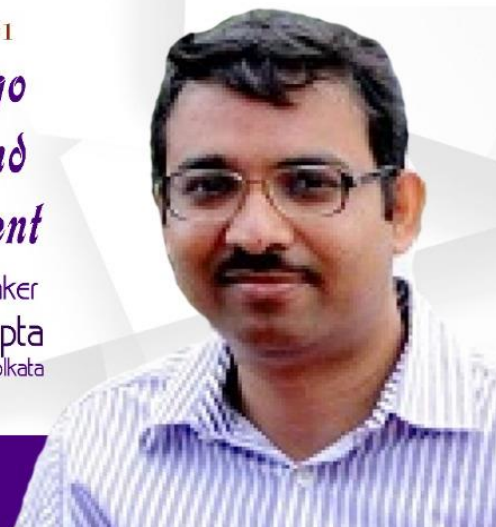
9<sup>th</sup> August 2021

4pm



Meeting Id : 406 085 9483

Watch Live On  
Vivekananda Vijnan Mission



**11th IconSWM-CE & IPLA Global Forum 2021**  
December 01 - 04, 2021  
Official Pre-event of 12th Regional 3R & CE Forum in Asia and the Pacific 2022

**Second Call for Paper and Support  
Brochure : Conference Announcement**

## 11th International Conference on Sustainable Waste Management & Circular Economy and IPLA Global Forum 2021

**Modes of Conference Attendance & Presentation: Virtual Mode**

**Date :** December 01 - 04, 2021, **Venue:** Jadavpur University, Kolkata, West Bengal, India

**Principal  
Organisers:**

International Society of Waste Management, Air and Water (ISWMAW), India  
International Partnership for Expanding Waste Management Services of Local Authorities (IPLA), Japan  
Centre for Sustainable Development and Resource Efficiency Management, Jadavpur University, India



CSD&REM, JU



**Under the aegis of :** International Society of Waste Management, Air and Water (ISWMAW)

**Submission Date :** Abstract in 250 words & Full Paper (not mandatory) by 30/09/2021 to [publication.iconswm@gmail.com](mailto:publication.iconswm@gmail.com)  
Special Issue of international journals : Waste Management & Research (SAGE); International Journal of Energy Sector Management & Books

**Organising  
Partners :**



Submit Full Paper; Join 11th IconSWM-CE & IPLA Global Forum 2021; Interact with Researchers from 40 countries in the International Collaborative Research Meeting at the all time lowest discounted Registration Fee under the pandemic COVID-19. Visit: [www.iswmaw.com](http://www.iswmaw.com)

### Papers / Best Practices Submission Details:

**Submit** Abstract within 250 word and Full Paper in minimum 6,000 & maximum 10,000 words by 30/09/2021 in A4 size, 11 font Times New Roman in English, MS Word containing the title of paper, author/(s) name, address, phone/mobile, fax, e-mail id etc., references for publication and presentation. Submission of Full paper is not mandatory.

**Submit the paper to :** [publication.iconswm@gmail.com](mailto:publication.iconswm@gmail.com) OR using this link: <http://forms.gle/K7isTTTLaeNHoydW8>

**Papers for Special Issues of International Journals and Book :** All accepted full papers will be selected for special issues of Journals, a) WM&R (SAGE), b) International Journal of Energy Sector Management (IJESM) (Science Direct), and c) Author's work will be selected to publish in different books by internationally well known publishers.

### Broad Topics of Paper:

**Abstract and Full Paper submission date: 30/09/2021. Full paper is not mandatory.**  
Submit paper using this link: <http://forms.gle/K7isTTTLaeNHoydW8>

- ❖ COVID-19 Waste Management (Code A)
- ❖ Waste Management Business in post COVID-19 era (Code: A)
- ❖ Research, Development and Innovation (Code: B).
- ❖ Policies, SDGs, International Cooperation, (Code: C).
- ❖ Biodiversity and Climate Change (Code: C1).
- ❖ 3R, Circular Economy, Resource Recovery & Efficiency (Code: D).
- ❖ Secondary Raw Materials & Recycled Products (Code: D)
- ❖ Marine littering, Plastic Waste Management & Plastic Recycling (Code: C1).
- ❖ Current Status, Best Practices and Implementation (Code: D1).
- ❖ Recycling, Treatment technologies and Final Sink (Code: E).
- ❖ SW Business, Smart Cities and Business Model, Urban Development (Code: F).
- ❖ MSW, E-Waste, HAZW, Bio-Medical Waste, CDW, Bio-Mass & Agri Waste, ELV (Code: F1)
- ❖ Waste Water Treatment & Water Resources Circulation (Code: F2).
- ❖ Agricultural & Agri-industry Waste and Vegetable Wastes (Code: G1).

All the delegates have to be registered to join the 11th IconSWM-CE & IPLA Global Forum. Registration details are available in annex brochure and in website.

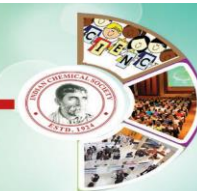
**Core Group: Chairman, 11th IconSWM-CE & IPLA Global Forum 2021: Prof. Sadhan Kumar Ghosh, Professor, Jadavpur University & President, ISWMAW**

**Composition of Core Group, Country Specific Working Group (CSWG) & International Scientific Committee will be announced.**

**About IconSWM - ISWMAW:** Sustainable waste management, sanitation and resources conservation are fundamental goals of the United Nations, articulated in SDG Sustainable waste management, sanitation and resources conservation are fundamental goals of the United Nations, articulated in SDG 2030, which has direct bearing on the quality of life for all, but more especially communities in cities. IconSWM is one of the biggest and popular conference platform of ISWMAW established in 2009 in India. 11th IconSWM-CE & IPLA Global Forum 2021 will deliberate on various issues related to policy, innovation and implementation in solid and liquid waste management and will be the official pre-event of Intergovernmental 12th Regional 3R Forum in Asia and the Pacific to be held in 2022 by Govt. of Japan and UNCRD.

**All communications to be made to the followings :** IconSWM-ISWMAW Head Quarters & Secretariat & IPLA Global Secretariat:

**Prof. Sadhan K. Ghosh, Chairman, IconSWM-CE, Professor, ME Dept. and Chief Coordinator, Centre for Sustainable Development & Resource Efficiency Management, Jadavpur University, Kolkata, India; M : +91 9830044464 / 8777686385, Email: [iswmaw@gmail.com](mailto:iswmaw@gmail.com); Other phones : +91 9038638642 / 9831050447 / 9883010828 / 8900541042 / 8240537668 /**



## Webinar on **'Waste to Wealth' : A Successful Journey**

*Organized by*



**EGRA ORGANISATION FOR THE CULTIVATION OF SCIENCE**

Estd.- 1984 :: Regn No.:- S/78096 :: Affiliation No.:-V3212344

VIGYAN PRASAR NETWORK :: DEPT. OF SCIENCE & TECHNOLOGY, GOVT. OF INDIA

*Distinguished Speaker*



### **Dr Nanda Gopal Sahoo**

Professor  
Dept. Of Chemistry  
Kumaun University , Nainital

**30th Aug.2021 :: 11.00 AM**

- Registration is free and mandatory.
- Registration will be closed at 12 noon on 29.08.2021
- Google meet link will be emailed to the registered participants on Aug. 29th & 30th
- Registered participants are requested to join the 'OCS Webinar Group' positively.
- Feedback link will be provided in the chat box of Google meet at the end of the webinar.

**Registration link:** <https://forms.gle/WsvcE4geyeguMPo1A>

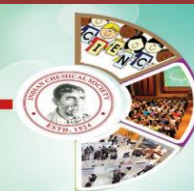
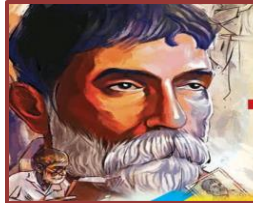
**Platform:** Google Meet

*For any query*

**E-mail:** [panda.manik.mp@gmail.com](mailto:panda.manik.mp@gmail.com)

E-certificate will be issued to the registered participants after successful submission of feedback form within the stipulated time.





On the Occasion of Celebration of

## AZADI KA AMRIT MAHOTSAV



A Thematic Webinar by Outstanding Scientist

### Shri Swapnesh Kumar Malhotra

Secretary, Indian Nuclear Society, Former Head Public Awareness Division, BARC, Department of Atomic Energy, Govt. of India, Former Raja Ramanna Fellow, and Former Secretary, Atomic Energy Education Society

ON

### Nuclear Power for Sustainable Development

**Date :** Saturday 4th September, 2021

**Time :** 12:00 pm

### Prof. Keshari Lal Verma

Vice-Chancellor  
Pt. Ravishankar Shukla University, Raipur, C.G.  
will preside over the Webinar

**Organisers** Public Outreach Centre and  
Institute of Renewable Energy Technology & Management  
Pt. Ravishankar Shukla University, Raipur, C.G.

### Prof. Kallol Kumar Ghosh

Professor, S.O.S. in Chemistry  
Director Public Outreach Centre  
Pt. Ravishankar Shukla University, Raipur, C.G.

### Prof. Girish Kant Pandey

Registrar  
Pt. Ravishankar Shukla University, Raipur, C.G.

### Prof. Sanjay Tiwari

Coordinator, Renewable Energy Technology & Management  
Professor, S.O.S. in Electronics & Photonics  
Pt. Ravishankar Shukla University, Raipur, C.G.



**NO**  
REGISTRATION FEE

Register through Google Forms  
<https://forms.gle/JVZtxNj8MBn8rHJJ9>  
Certificates will be provided to the webinar attendees



**CEE**  
Centre for Environment Education



**Paryavaran  
Mitra**



## WIPRO EARTHIAN SUSTAINABILITY EDUCATION PROGRAMME, 2021-22

### (Join Online Teachers Training Workshop)

STATE LEVEL PARTNER  
PARIBESH UNNAYAN PARISHAD (PUPA)  
IN COLLABORATION WITH  
MARINE AQUARIUM & REGIONAL CENTRE  
ZOOLOGICAL SURVEY OF INDIA, DIGHA

### Speakers



Dr. S. Balakrishnan  
Scientist D &  
Officer-in-Charge,  
MARC, ZSI



Dr. Dhriti Banerjee  
Director, ZSI



Dr. Amales Mishra  
Secretary, PUPA



Santanu Mitra  
Asstt. Zoologist, ZSI



Ms. Rinku Das  
Asstt. Teacher,  
Baruipur Girls School



Dr. Aditya Kapil  
Scientist- B, ZSI



Ms. Shushmita Mukherjee  
Asstt. Teacher (English),  
Ananda Ashram Balika Vidyapeeth



Ms. Debashree Dam  
Scientist-B, ZSI

### Programme Schedule

TIME	LIST
10:00-10:05	Welcome by Dr. S. Balakrishnan, Scientist D & Officer-in-Charge, MARC, ZSI, Digha
10:05-10:30	Inauguration & inaugural Speech by Chief Guest Dr. Dhriti Banerjee, Director, ZSI
10:30-10:50	Lecture 1: Marine Biodiversity & Sustainability by Santanu Mitra, Asstt. Zoologist, ZSI, Kolkata
10:50-11:05	Overview of Wipro-Earthian Project by Ms. Rinku Das, Asstt. Teacher, Baruipur Girls School
11:05-11:25	Lecture 2 : Waste & Sustainability by Dr. Aditya Kapil, Scientist- B, ZSI, Digha
11:25-11:45	Lecture 3 : Water & Sustainability by Ms. Shushmita Mukherjee, Asstt. Teacher (English), Ananda Ashram Balika Vidyapeeth, Kolkata
11:45-11:55	Concluding Remarks – Dr. Amales Mishra, Secretary, PUPA
11:55-12:00	Vote of Thanks by Dr. P.C. Tudu, Scientist-C, ZSI, Digha
Overall Co-ordinator - Ms. Debashree Dam, Scientist-B & In charge Outreach, ZSI, Digha	
Technical Support- Mr. Biswajit Biswas, PUPA	

Date: 5<sup>th</sup> September 2021  
Time: 10:00 am – 12:00 pm

Participation form link- <https://forms.gle/LSW7idq8LSVDTeKR7>

Google meet link- <https://meet.google.com/thz-zmzp-tzq>



Celebrating the 75<sup>th</sup> Year of Indian Independence



MEGA CONFERENCE  
OF SCIENCE COMMUNICATORS

## Indian Independence Movement & the Role of Science

OCT 20-21, 2021  
NEW DELHI

REGISTRATION  
& CALL-FOR-PAPERS



स्वतंत्रता का अमृत महोत्सव  
Swatantrata Ka  
Amrut Mahotsav

विद्यया ममोक्षे  
NISPR  
सीएसआईआर-मिस्टर

वि P  
व प्र  
VIGYAN  
PRASAR



## NCNST 2021

### National Conference on Nucleic acid Science & Technology

Celebrating the 150<sup>th</sup> Anniversary of the Discovery of DNA

August 10-13, 2021

Genomics  
Transcriptomics

Nucleic acid Secondary Structures  
Nucleic acid Nanotechnology & Application



This year coincides with the 150<sup>th</sup> years of discovery of DNA by Friedrich Miescher in the Seyler's Lab. Since our group works on DNA, CSIR-Institute of Minerals and Materials Technology is organizing "National Conference on Nucleic acid Science & Technology (NCNST) while Celebrating the 150<sup>th</sup> Anniversary of the discovery of DNA" during 10<sup>th</sup> August to 13<sup>th</sup> August 2021 for the benefit of students and scholars across institutions. The 10<sup>th</sup> August is the death anniversary of Prof. Felix Hoppe-Seyler and the 13<sup>th</sup> August is the birth anniversary of Prof. Friedrich Miescher. Thus, the scheduled time will be more appropriate for this online event to offer our gratitude for their groundbreaking work which shaped the Bioscience research.

### Eminent Speakers



**Prof. Krishna N Ganesh**  
Director, IISER Tirupati  
**Inaugural Address**  
10 Aug 2021  
03:00 - 03:45 PM



**Prof. Partha P Majumder**  
NIBMG Kalyani  
10 Aug 2021  
03:45 - 04:30 PM



**Dr Dhiraj D Bhatia**  
IIT Gandhinagar  
10 Aug 2021  
04:30 - 05:15 PM



**Dr Amit Kumar**  
IIT Indore  
11 Aug 2021  
03:00 - 03:45 PM



**Dr Tapasi Sen**  
INST Mohali  
11 Aug 2021  
03:45 - 04:30 PM



**Prof. Pradeepkumar PI**  
IIT Bombay  
11 Aug 2021  
04:30 - 05:15 PM



**Dr Sridhar Sivasubbu**  
IGIB New Delhi  
12 Aug 2021  
03:00 - 03:45 PM



**Dr Suchetan Pal**  
IIT Bhubilai  
12 Aug 2021  
03:45 - 04:30 PM



**Dr Souvik Maiti**  
IGIB New Delhi  
12 Aug 2021  
04:30 - 05:15 PM



**Dr Reji Varghese**  
IISER Thrivendrum  
13 Aug 2021  
03:00 - 03:45 PM



**Prof. Jyotirmayee Dash**  
IACS Kolkata  
13 Aug 2021  
03:45 - 04:30 PM



**Dr Shekhar C Mande**  
Director General, CSIR  
**Valedictory Address**  
13 Aug 2021  
04:30 - 05:30 PM

### Organizing Team



**Patron**  
**Prof. Suddhasatwa Basu**  
Director, CSIR-IMMT



**Convener**  
**Dr Umakanta Subudhi**  
usubudhi@immt.res.in  
+91-9938672226



**Co-Convener**  
**Dr T Pavan Kumar**  
pavantogapur@immt.res.in  
+91-8008105781

### Registration (Fee: Rs.100/- Only )

Link: <https://forms.gle/e4AttWgPA3m4TSyi8>

Last Date of Registration: August 05, 2021

e-Participation Certificate will be provided

### Participants

Academicians, Students,  
Scholars, Scientists & Teachers

### Committee Members

Dr Nabin K Dhal, Dr Bhabani S Jena, Dr Trupti Das, Dr Sony Pandey, Dr Nilotpala Pradhan,  
Dr Manish Kumar, Dr Satyajit Rath, Dr Satya R Sahoo, Mr Sanjeev Pandey, Mr Bikram K Parida



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CSIR-Institute of Minerals & Materials Technology, Bhubaneswar 751013, Odisha, [www.immt.res.in](http://www.immt.res.in)



IICHE Celebrating Platinum Jubilee Year - 2022

&

International Conference on Advances in Chemical and Materials Sciences  
(ACMS-2022)



(Hybrid Mode: Offline and virtual participation)

**February 24-26**

Organized by: Indian Institute of Chemical Engineers, Headquarters

**In association with**

National Institute of Technology, Jalandhar, Heritage Institute of Technology, Kolkata,  
And Osmania University College of Technology, Hyderabad

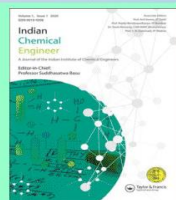
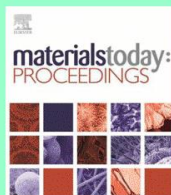
Separate Technical  
Session for the UG  
and PG students apart  
from Faculty/Research  
Scholars



**About: ACMS-2022:** The aim of ACMS-2022) to bring together students (UG and PG), scientists, researchers, academicians, and industrialists from various sectors to exchange the knowledge and share their experiences and latest research outcomes about all aspects of Chemical and Materials Science.

### Conference Journals

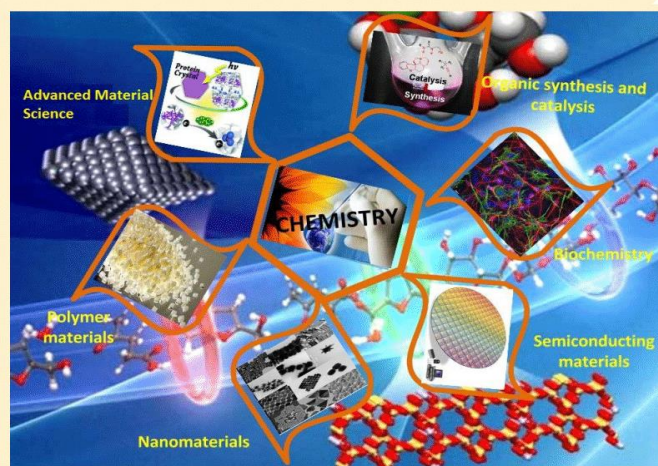
- 1) Materials Today Proceedings (Elsevier)
- 2) Journal of The Indian Chemical Society(Elsevier)
- 3) Taylor & Francis: Indian Chemical Engineers
- 4) Education for Chemical Engineers (Elsevier)



For more details visit conference website: <http://acms2022.iiche.org.in/>

Abstract  
submission  
through online

Best Presentation  
Award for all the  
Technical  
Sessions

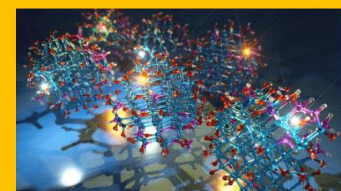


### Important Dates

Last Date of Abstract Submission  
(200 words):  
**30th September, 2021**

Abstract acceptance notification:  
15<sup>th</sup> October, 2021

Full paper submission for  
publication: **30<sup>th</sup> October, 2021**



Venue (Online/Offline):  
**HIT Kolkata**

(M): 9830752111 /9444954151

### Contact us

Organizing Secretary, ACMS-2022  
Indian Institute of chemical Engineers  
Dr. H.L. Roy Building, Jadavpur University Campus,  
Kolkata 700032; Email: [icacms2022@gmail.com](mailto:icacms2022@gmail.com) /  
[acms@iiche.org.in](mailto:acms@iiche.org.in)





**BIOSIMILAR**  
WORKSHOP  
DIGITAL EDITION

ADVANCES IN DIAGNOSIS, THERAPEUTIC INTERVENTIONS AND ANALYTICAL CHARACTERIZATION OF SARS-CoV-2 VIRUS

**04-08**  
OCTOBER 2021



22nd World Conference on  
Pharmaceutical Chemistry and Drug Design

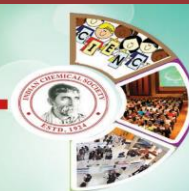
**DRUG CHEMISTRY 2021**

*Theme: Exploring the discovery and development of drugs*

**WEBINAR**  
September 21, 2021

<https://drug-chemistry.pharmaceuticalconferences.com/registration.php>





### A glimpse into the biography of the Nobel Laureate

Ada E. Yonath pioneered and studying the structural basis of a universal and fundamental process: translating the genetic code into proteins. She is focusing on ribosomes, the cellular "factories" performing this task. Thus, by investigating their action alongside the mechanisms acquiring antibiotics resistance, she has revealed the novel routes for structure-based drug improvements and design. In 2009 Yonath, received the Nobel Prize in Chemistry along with Venkatraman Ramakrishnan and Thomas A. Steitz for her studies on the structure and function of the ribosome, becoming the first Israeli woman to win the **Nobel Prize**. Out of ten Israeli Nobel laureates, the first woman from the Middle East to win a Nobel prize in the sciences, and the first woman in 45 years to win the Nobel Prize for Chemistry. Beside this, she is also the recipient of many prestigious awards. She holds honorary doctorates from almost all Israeli Universities and fellow member of many academic institutes.

### Conveners

Dr. Sajal Das  
Dr. Rajesh K. Das  
Dr. Prosenjit Saha (JISIASR)  
Prof. Pranab Ghosh



## INTERNATIONAL CONFERENCE ON Confluence of Chemistry & Biology: Exploring New Frontiers

Speaker: **Ada E. Yonath (Nobel Laureate in 2009)**

Affiliation: **Weizmann Institute of Science, Israel**

Jointly Organized by

Department of Chemistry, University of North Bengal, Darjeeling, India  
Centre for Interdisciplinary Sciences, JIS Institute of Advanced Studies and Research, Kolkata, JIS University  
CRSI North Bengal Local Chapter

In Association with

Department of Chemistry, CMS College, Kottayam, Kerala  
Department of Chemistry and Centre for Research, St. Teresa's College, Ernakulam, Kerala

Date: **October 12, 2020**

Time: **8:45 AM**

Title of the Lecture: **Next Generation Antibiotics**

Patron: Dr. Subires Bhattacharyya (Hon'ble Vice-Chancellor, NBU)

Guest of Honour: Prof. Ajoy Kumar Ray (Hon'ble Director, JISIASR)

Session Chair: Dr. Kakoli Bose (ACTREC/Tata Memorial Centre, Navi Mumbai)

Chairman: Prof. Anirban Misra (Head, Department of Chemistry, NBU)

### Members

Prof. M. N. Roy; Prof. B. Sinha; Prof. B. Biswas; Dr. Md. F. Hossain; Dr. N. Roy; Dr. S. Rana; Dr. H.S. Das; Dr. S. K. Das (Department of Chemistry, NBU)  
Dr. M. Hossain (Assistant Director, HRDC, NBU)  
Dr. Varghese C Joshua, Principal & Sumod M John, HoD Chemistry (CMS College); Dr. Lizzy Mathew, Principal & Dr. J. Varkey, HoD Chemistry (St. Teresa's College).  
Dr. S. Singha; Dr. S. Bhunia (JISIASR)

### About the Conference

This is our great privilege to have with us Nobel Laureate Prof. Ada E. Yonath. She will be delivering a popular lecture on next generation antibiotics which is intended to provide a broad platform of scientific interaction for the researcher and academicians in the emerging areas of chemistry-biology interface. The participants will definitely be enriched by her lecture.

### About NBU

University of North Bengal (NBU), accredited by NAAC with grade 'A', is the oldest place for higher education and research in this part of the country. The Department of Chemistry is the largest among the all the Departments in the University. The alumni of this Department are well placed in various academic and research positions of acclaimed institution and organization in the country and abroad. The Department is supported by UGC and DST through SAP and FIST programmes. For more details, please visit <http://nbu.ac.in>

### About JISIASR

The JISIASR offers research-based PG and research programmes along with certificate programmes in the field of Data Science, Health Science, and Interdisciplinary Sciences through three different centres. The institute has strong academic and research collaborations with the renowned institutions and autonomous bodies across the globe. For more details, please visit <https://jisiar.org/>

### About CRSI

The Chemical Research Society of India (CRSI) was established in 1999 as part of the 50th anniversary celebrations of the country's independence. The main objectives of the CRSI are to recognize, promote and foster talent in Chemistry and Chemical Sciences and to improve the quality of Chemical Education at all levels. In addition the society has active collaboration with all the leading chemical societies across the globe. For more details, please visit <https://www.crsi-india.org/>

Free Registration Link: <https://forms.gle/T2EN8BzJPKDr13bB8>

Participation only through registration on or before 10<sup>th</sup> October, 2020

For further details please call: +917029467375; +917318705076

Email: [sajaldas@nbu.ac.in](mailto:sajaldas@nbu.ac.in) & [rajeshkumardas@nbu.ac.in](mailto:rajeshkumardas@nbu.ac.in)



On the Occasion of **75<sup>th</sup>** year of Independence  
**Azadi Ka Amrit Mahotsav**  
 CSIR-National Institute of Science Communication & Policy Research, New Delhi  
 Organises  
**National Conference (Virtual)**  
**Science and Technology in India**  
 A Historical Introspection with a Contemporary Perspective  
**16-18 August 2021**

**Galaxy of Speakers**

 <b>Padma Vibhushan Dr. R. A. Mashelkar</b> <small>Former DG, CSIR</small>	 <b>Dr. Shekhar C. Maude</b> <small>Secretary, DST &amp; DG, CSIR</small>	 <b>Shri Jayant Sahastrabudhe</b> <small>National Organising Secretary, VIKRA</small>	 <b>Dr. Anil Sahastrabudhe</b> <small>Chairman, AICTE, New Delhi</small>	 <b>Prof. Raajana Aggarwal</b> <small>Director, CSIR-SCIPR</small>	 <b>Prof. Deepak Kumar</b> <small>Former Professor, IIT, New Delhi</small>
 <b>Prof. V. V. Krishna</b> <small>University of New South Wales, Sydney</small>	 <b>Prof. Rohini M. Godbole</b> <small>Indian Institute of Science, Bangalore</small>	 <b>Prof. Suchma Yadav</b> <small>Member, UGC &amp; Former VC, RPS Women University</small>	 <b>Prof. K. G. Suresh</b> <small>VC, Mahatma Jyotiba Phule National University of Journalism &amp; Communication</small>	 <b>Shivprasad Khened</b> <small>Former Director, Policy Services Centre, Mumbai</small>	

**Registration Link for participation**  
<http://nistads.res.in/node/1145>



DEPARTMENT OF SCIENCE AND TECHNOLOGY  
 GOVERNMENT OF INDIA  
 Through State S&T Councils' Network

*Celebrates*  
**VIGYAN UTSAV**  
**विज्ञानोत्सव**  
 STI for ATMANIRBHAR BHARAT  
 From September 2021 to August 2022

Organized by the Network of State S&T Councils,  
 all across the country

**75 Azadi Ka Amrit Mahotsav**

**STI ECOSYSTEM**

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- Women Scientists
- Science and Society
- Future Technologies
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- Industry for Atmanirbharta
- Intellectual Property Rights

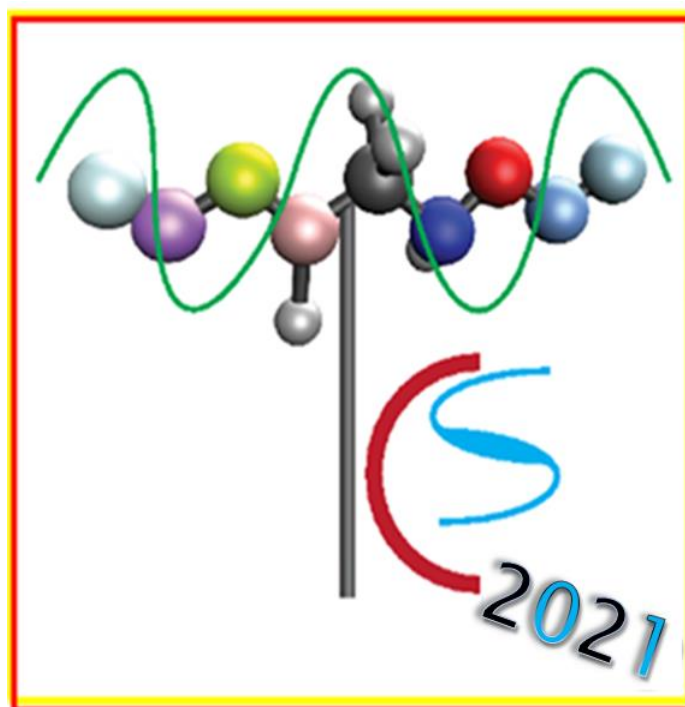
# AtmanirbharBharat





**12<sup>TH</sup> INTERNATIONAL CONFERENCE ON**  
Materials Processing and Characterization

@ NITTTR Chandigarh 6<sup>th</sup>-9<sup>th</sup> October 2021



*Theoretical  
Chemistry  
Symposium  
2021*

**December 11-14, 2021**

Department of Chemical Sciences  
Indian Institute of Science Education And Research Kolkata  
Mohanpur, Nadia - 741 246  
West Bengal, India



# CHEMICAL Warta



## One Day National Webinar

on

## Advancement of Chemistry at 21<sup>st</sup> Century

**2<sup>nd</sup> October, 2021**

**Time: 4:00 P.M.**

Platform: Microsoft teams  
Free Online Registration

*Organized by*



Department of Chemistry  
Raja Narendra Lal Khan Women's  
College (Autonomous)  
Midnapore, West Bengal, INDIA

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*In collaboration with*  
Indian Chemical Society (ICS)  
<http://indianchemicalsociety.com>

## Resource Persons



**PROF. SAMARESH BHATTACHARYA**

Professor in Chemistry  
Department of Chemistry  
Jadavpur University  
Kolkata 700032

Topic: *"Flavors of Chemistry"*



**PROF. CHITTARANJAN SINHA**

Professor in Chemistry  
Department of Chemistry  
Jadavpur University  
Kolkata 700032

Topic: *"Organic-Inorganic Hybrid Materials  
: An Integrated Platform for Sustainable  
Applications"*



**PROF. MODHU SUDAN MAJI**

Associate Professor in Chemistry  
Department of Chemistry  
IIT Kharagpur  
Kharagpur 721302

Topic: *"Chemistry: An Ocean of  
Opportunities"*



Webinar on  
**Role of Professional Body under New Education Policy (NEP – 2020)**



**Organized by**  
**Indian Institute of Chemical Engineers (IIChE), Headquarters**

### Distinguished Speakers



**Prof M.K. Jha**  
President, IIChE



**Prof G.D. Yadav**  
President, ICS



**Er. Narendra Singh**  
President, IEI



**Prof L.K. Awasthi**  
Director  
NIT Jalandhar



**Sh. Jayant Sahasrabudhe**  
National Organising Secretary Vijnana Bharti



**Sh. K.K. Aggarwal**  
Chairman  
NBA  
New Delhi



**Dr Avijit Ghosh**  
Honorary  
Secretary  
IIChE



DATE:  
Saturday  
September 25, 2021



Webinar link: <https://global.gotomeeting.com/join/569976333>



TIME:  
10:30 AM  
12:30 PM



National Webinar on  
**SUSTAINABLE DEVELOPMENT AND INTELLECTUAL PROPERTY RIGHTS**  
 Jointly Organized by  
 Department of Chemistry, Madras Christian College (Autonomous), Chennai &  
 Indian Chemical Society (ICS), Tamil Nadu Branch



**Date : 18-09-2021 (Saturday)**

**Time : 9.30 AM to 12.30 PM**

**Lecture I**

Chairperson: Dr. Nimmy Edwin  
 Assistant Professor, Department of Chemistry, MCC

**SPEAKER**

**Dr. VENKATA SUBRAMANIAN, RAMAN Ph.D.**

Senior Manager-Intellectual Property,  
 Sami-Sabinsa Group Limited, Bangalore

**TOPIC**

**INTELLECTUAL PROPERTY RIGHTS (IPR)**  
 (10.00 AM TO 10.45 AM)

(Dr. S. V. ANANTA KRISHNAN ENDOWMENT LECTURE)



**Lecture II**

Chairperson: Dr. R. Karthikeyan  
 EC Member, ICS-T.N. Branch

**SPEAKER**

**Dr. SULTAN AHMED ISMAIL, Ph.D., D.Sc.**

Member, Planning Commission, Govt. of Tamil Nadu &  
 Govt. of Chhattisgarh; Former Head, Department of Biotechnology  
 The New College, Chennai.

**TOPIC**

**CONTEMPORARY ENVIRONMENTAL ISSUES &  
 MITIGATION TOWARDS ECOLOGICAL SUSTAINABILITY**  
 (11.00 AM TO 11.45 AM)

**PRESIDED BY**

Dr. P. Wilson  
 Principal & Secretary,  
 MCC

**CONVENOR**

Dr. E. Iyyappan  
 The Head,  
 Department of Chemistry,  
 MCC

**CO-CONVENOR**

Dr. E. Rajkumar  
 Assistant Professor,  
 Department of Chemistry, MCC  
 EC Member, ICS-T.N. Branch

**ORGANIZING SECRETARY (ICS)**

Dr. E. Sukumar  
 Secretary, ICS-T.N. Branch &  
 National Vice-President, ICS

**ORGANIZING SECRETARY (MCC)**

Dr. C. Amirthavalli  
 Assistant Professor,  
 Department of Chemistry, MCC

**Meeting Platforms**



Registration Link:

**CLICK HERE**

(E-Certificates will be issued after receiving feedback form)



*All are Cordially Invited*



**Virtual International Conference  
on  
Recent Trends in Green Chemistry  
(ICRTGC-2021)  
28<sup>th</sup> -30<sup>th</sup> September 2021**

*An Initiative of*

**Akal University  
Talwandi Sabo, Bathinda, Punjab, India**



**In collaboration with the Indian  
Chemical Society, Kolkata**



Talwandi Sabo



**Organized by  
Chemical Science Society  
Department of Chemistry  
Akal University, Talwandi Sabo, Bathinda,  
Punjab- 151302  
Email: [rtgc\\_chm@auts.ac.in](mailto:rtgc_chm@auts.ac.in)  
Web: [www.auts.ac.in](http://www.auts.ac.in)**

## **DISTINGUISHED CONFIRMED SPEAKERS**

Padmashri Prof. G.D. Yadav, President, ICS, IN  
Prof. Brindaban Chandra Ranu, IACS, Kolkata, IN  
Prof. Asit K. Chakraborti, (Retd) NIPER, Mohali, IN  
Prof. Basudeb Basu, (Retd) NBU, WB, IN  
Prof. Anshu Dandia, (Retd) UR, Rajasthan, IN  
Prof. Rakesh K. Sharma, DU, New Delhi, IN  
Prof. Suman Lata Jain, IIP, Dehradun, IN  
Prof. Swapandeep Singh Chimni, GNDU, Punjab, IN  
Prof. Bimal Krishna Banik, PMFU, Saudi Arabia  
Prof. Sreekantha B. Jonnalagadda, UKZN, Durban  
Prof. Eder Joao Lenardao, UFPEL, Pelotas, Brazil  
Prof. Yunfei Du, Tianjin University, China  
Prof. Kamal U. Sadek, MU, Minia, Egypt  
Prof. Ângelo de Fátima, UFMG, Brazil  
Prof. Muthupandian Ashokkumar, UM, Australia  
Prof. György Keglevich, BU, Budapest, Hungary



**For further details please contact  
Dr. Bubun Banerjee (Convener)  
Mob: 8582804332/8637384658**

**75**  
Azadi Ka  
Amrit Mahotsav



IACS

**1<sup>st</sup>** Lecture in  
the Webinar Series



## Priyadarajan Ray – His Activities and Contributions

As Part of Celebrations of  
Azadi ki Amrut Mahotsav at IACS

By Prof. D. Banerjea  
Formerly, Sir Rashbehary Ghose  
Professor of Chemistry, Calcutta University,  
Life Member of IACS

Professor Priyadarajan Ray (1888–1982) joined the Association as an Honorary Professor with Professor Meghnad Saha as its Director. He was mostly responsible for organizing the chemical research wing, where he activated a new school of modern inorganic chemistry. After he retired from the IACS in 1958, he continued to function as a Supervisor-in-Charge of the History of Science unit of the Indian National Science Academy at the Asiatic Society, Calcutta for several years, guiding the investigations of a team of young workers on the progress of science in ancient and medieval India.



Join **Zoom** Meeting:  
[https://us02web.zoom.us/j/87069031180?](https://us02web.zoom.us/j/87069031180?pwd=ZU00cXhXM3VUOUk0SXhkaHIETy84QT09)  
[pwd=ZU00cXhXM3VUOUk0SXhkaHIETy84QT09](https://us02web.zoom.us/j/87069031180?pwd=ZU00cXhXM3VUOUk0SXhkaHIETy84QT09)  
**Meeting ID: 870 6903 1180.**  
**Passcode: 01102021**



Date & Time:  
**Oct 1, 2021**  
**04:00 PM**



विज्ञान एवं प्रौद्योगिकी विभाग  
Department of  
Science & Technology



## Augmenting Writing Skills for Articulating Research (AWSAR)



AWSAR is an initiative of Department of Science and Technology (DST), Government of India. It endeavors to disseminate Indian research stories of Science, Technology & Innovation being pursued in the country in a format that is easy to understand and interesting for all the stakeholders.

DST invites lucid stories from PhD scholars and Post Doctoral Fellows (PDF) with an aim to strengthen the ecosystem of science communication and inculcate scientific temperament in society.

## Submit Your Story

From 15<sup>th</sup> August 2021 till 30<sup>th</sup> September 2021

### Award categories

#### A. For PhD Scholars

- 1<sup>st</sup> prize: ₹1,00,000 (one)
- 2<sup>nd</sup> prize: ₹50,000 (one)
- 3<sup>rd</sup> prize: ₹25,000 (one)
- 100 selected entries: ₹10,000 each

#### B. For Post Doctoral Fellows

- One outstanding story: ₹1,00,000
- 20 selected entries: ₹10,000 each

For more information related to the AWSAR program please visit [www.awsar-dst.in](http://www.awsar-dst.in) or write to us at [connect.awsar@gmail.com](mailto:connect.awsar@gmail.com)

*Come,  
Join the new breed  
of science storytellers!*






## National Level Rx Technical Elocution Competition 2021




**WORLD PHARMACIST 25<sup>th</sup> SEPTEMBER DAY**



**THE BEST THREE PRIZES**  
 1<sup>st</sup> Rank : 2100/- Rs.  
 2<sup>nd</sup> Rank : 1100/- Rs.  
 3<sup>rd</sup> Rank : 501/- Rs.

**Result will be declared on 25<sup>th</sup> Sept. 2021 on [www.hrpatelpharmacy.co.in](http://www.hrpatelpharmacy.co.in)**



Competition will be held via Zoom App



Scan This QR Code For Registration

**Date of Competition 23<sup>rd</sup> Sept. 2021**

President IPA Dhule Branch <b>Dr. S. J. Surana</b>	Secretary IPA Dhule Branch <b>Dr. C. G. Bonde</b>	Convener/ Principal <b>Dr. S. B. Bari</b>	Co-ordinators Mr. Z. G. Khan/ Mr. P. B. Patil
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Registration Link: <https://forms.gle/qEV8n9bEDGgXJ2Nu8>  
 Registration fees: Rs. 50/-

Shirpur Education Society's

For details contact: 9767487709

### H. R. Patel Institute of Pharmaceutical Education and Research, Shirpur

NBA accredited B. Pharm course (2019-2022)  
 Approved by: AICTE, PCI, Govt of Maharashtra., DTE, KBC NMU Jalgaon  
 Estd-2004 An ISO 9001:2008 Certified, NIRF Ranked Institute



Shirpur Education Society's

## R.C. Patel Institute of Pharmaceutical Education and Research, Shirpur

[NBA Accredited - 6 Yrs (3rd Cycle); NAAC A Grade (2nd Cycle); NIRF - 50; CII- Gold; KBC NMU, Jalgaon- A Grade]


In Association with

### Indian Pharmaceutical Association

Dhule Local Branch, Shirpur

25th September 2021

## World Pharmacist Day



# NATIONAL LEVEL ESSAY COMPETITION


**THEME: ROLE OF PHARMACISTS IN PANDEMIC**

**Prizes**

1st Prize - ₹2100  
 2nd Prize - ₹1100  
 3rd Prize - ₹500

**REGISTRATION FEES ₹ 50**

**THE RESULT WILL BE DECLARED ON 25TH SEPT. 2021**



Last Date for Submission of Essay by Email  
22nd September 2021

Registration link:  
<https://forms.gle/7VyBSEuDATkaQcTV9>

Rules for Essay:  
The maximum word limit is 3000

**DR . S. J. SURANA**  
PRESIDENT  
IPA DHULE BRANCH

**DR . C. G. BONDE**  
SECRETARY  
IPA DHULE BRANCH

**DR . A. A. SHIRKHEDKAR**  
CONVENER

**MR. A. S. PATIL**  
CO - ORDINATOR



**SCHOOL OF PHARMACY  
& TECHNOLOGY MANAGEMENT  
SHIRPUR CAMPUS**

**INDIAN PHARMACEUTICAL ASSOCIATION  
STUDENT FORUM  
DHULE LOCAL BRANCH**



25<sup>th</sup> SEPTEMBER 2021

**WORLD PHARMACIST DAY**


THEME


PHARMACY: ALWAYS TRUSTED FOR YOUR HEALTH



## NATIONAL LEVEL PHARMA QUIZ

Date: 24<sup>th</sup> SEPTEMBER 

Time: 2 PM 

Exciting Cash Prizes for Winners 

E-certificates to all participants 

Register using this QR Code 

Last Date for registration: 22nd September  
Results will be declared on: 25th September



1st Prize: Rs. 2100

2nd Prize: Rs. 1100

3rd Prize: Rs. 500

**Dr. S. J. Surana**  
President  
IPA Dhule Branch

**Dr. C. G. Bonde**  
Secretary  
IPA Dhule Branch

**Dr. Vipin K. Parihar**  
Convener  
Associate Dean, SPTM

**Tarun R. & Shweta P.**  
Coordinators

 [ipa.studentforum.dhule@gmail.com](mailto:ipa.studentforum.dhule@gmail.com)

 9730722375 / 9359253155

 [ipasf.dhule](https://www.instagram.com/ipasf.dhule)





## Five Days International Conference On Current Trends in Chemical Sciences and their Industrial Applications (CTCSIA-2021) To Celebrate 160<sup>th</sup> Birth Anniversary of Acharya P.C. Ray

29<sup>th</sup> October-2<sup>nd</sup> November, 2021

*Organized By*  
School of Applied Science and Humanities (SAS&H)  
Haldia Institute of Technology (HIT), Haldia-721657, West Bengal, India  
(An Autonomous Institute)  
*In Collaboration With*  
Indian Chemical Society (ICS), Kolkata 700009, India




**Chief Patron**



**Dr. Lakshman Ch. Seth**  
Chairman, HIT

### Invited Speakers

 Prof. Takasiro Akitsu Tokyo University, Japan	 Dr. Swapan Kumar Ghosh Director, Nano Care Coats, Mumbai	 Dr. Amitava Pramanik IISc Bangalore	 Dr. Bidhan Chandra Bag DRDO, Nagpur, Maharashtra	 Dr. Asit Kumar Das RIL, Jamnagar, Gujarat	 Prof. Pijus Kanti Khatua HIT, Haldia, W.B.	 Prof. John Zhanhu Guo Knoxville, USA
 Dr. Poulomi Roy CSIR - CMERI, Durgapur, W.B.	 Dr. Arindam Indra IIT BHU, Varanasi, U.P.	 Prof. (Dr.) Bikash Bepari HIT, Haldia, W.B.	 Mr. Pritam Ghoshal IIT, Haldia, W.B.	 Dr. Soumen Sensarma Chembiotek, Kolkata, W.B.	 Prof. Masatoshi Ishida Kyushu University, Japan	 Dr. Asit Baran Panda CSIR-NMI, Jamshedpur
 Prof. Sudip Kumar Das University of Calcutta	 Dr. G. S. Kapoor IOCL R&D Centre, Faridabad	 Prof. (Dr.) Radharani Das HIT, Haldia, W.B.	 Prof. Chittaranjan Sinha Jadavpur University, Kolkata	<p><b>Communication</b></p> <p>Convener : Dr. Sibaprasad Maity    Jt. Convener : Dr. Avijit Ghosh E-mail : convener.ascience.chem@gmail.com Mob. : 943-445-3193 / 869-795-5330</p> <p>Registration Link : <a href="https://forms.gle/dC7CcU9agEwTgkKr5">https://forms.gle/dC7CcU9agEwTgkKr5</a></p>		

**Registration Link:**  
<https://forms.gle/dC7CcU9agEwTgkKr5>

## Upcoming... 'Online Internship Course' Register your seat at the earliest.....

### Course Structure

# 40

working hours  
(2 hours a day)

**Registration fee**

- i. For students: Rs.1000/-
- ii. For industrial personnel: Rs. 4000/-
- iii. Registration to ICS as Student Member + Webinar: 1200/-

For Industry, with registration Life Membership Rs 10,000/- and Life Fellowship, if qualified, for Rs 16000/-

Membership form available in the ICS website

Recommendation from the HOD/ Principal of College/ Registrar, University/ Director/Appointing Authority may be required for membership.

### Webinar Course Schedule

15<sup>th</sup> Sep. – 28<sup>st</sup> Nov. 2021

**Platform:** Google meet link

**Eligibility**

B.E./B.Tech in Chemical Engineering, Chemical Technology, Polymer Science and Technology, Biotechnology and Engineering, M.Sc. Physics, Chemistry, Material Science, Biotechnology, Microbiology, Marine Science, Nano Science, etc.

The course will start from 15<sup>th</sup> Sep. 2021 and details will be available in our website. The participants will be informed through their E-mail and group WhatsApp.

**Last date of registration** 14<sup>th</sup> September, 2021.

**Certificate will be issued after the completion of webinar.**



ICS – Headquarter Kolkata

Address: 92, Acharya Prafulla Chandra Road, Kolkata-700 009, West Bengal

<http://indianchemicalsociety.com>

### Webinar Internship Course

### “Emerging Trends in Nanomaterials for Different Device Architectures (ETNDDA-2021)”

## 15<sup>th</sup> Sep. – 28<sup>st</sup> Nov. 2021

Contact details

**Course Coordinator**

**Bank details**

NEFT/RTGS/ECS/Other Modes Details	
Name of Vendor	Indian Chemical Society
Bank Account Number	11152790242
Nature of Account	Current
Name of Bank	State Bank of India
Branch Name	Manicktala, Kolkata
Branch Code	01715
IFSC Code	SBIN0001715
PAN No.	AAAAH1238H
MICR Code	700002062
IBAN No.	SBININBB492
Vendor Address	92, Acharya Prafulla Chandra Road Kolkata – 700 009
City	Kolkata

**Prof. Sudip K Das**

**Dr. Subhasis Roy**

**Dept. of Chemical Engineering, University of Calcutta**

**Email: [icsskd@gmail.com](mailto:icsskd@gmail.com) Mobile: 8697304884/ 9775032952**

**Website: <https://indianchemicalsociety.com/>**

**A Brief Report on-**

**“Webinar Internship Course on Process Safety and Environment (Air, Water, and Solid)”**

*Organized by*

**Indian Chemical Society**

**10<sup>th</sup> April 2021 to 30<sup>th</sup> May 2021**

The Indian Chemical Society, a premier scientific society of India, was founded as a national forum for chemists and members of allied disciplines in the country. One of the primary objectives of the Society was to spread and uplift the technical knowledge among the graduate, postgraduate, research scholar, and also the technical personnel of Industries.

In this perspective, it was decided by the Indian Chemical Society that an internship course, Process Safety and Environment (Air, Water and Solid) -, fundamentals and management would be arranged during winter and summer vacations of the Institutes through webinars only because of the prevailing COVID-19 situation.

Accordingly, the first webinar internship course was conducted every Saturday and Sunday from 10.04.2021 to 30.05.2021. Each day the webinar was started at 6 PM, and the domain experts took three lectures of one-hour duration from academia and industries from India and abroad. 127 participants from B. Tech., M. Tech., M. Sc. and Research Scholar, and a few from industries had registered and completed the course.

The inaugural program was held on 10.04.2021. Prof. C. R. Sinha, Honorary Secretary of the Indian Chemical Society, welcomed all the participants. Padmashree Prof. G. D. Yadav, President of the Indian Chemical Society, gave the presidential speech. AshanenduMandal, the Course Coordinator, apprised everybody about the course and its importance. Prof. D. C. Mukherjee, the Former President, discussed the activities of the Society. Dr. Asit Kumar Das, Head Refinery, RIL, Jamnagar and Swami Shastaajanand, Principal, Ramkrishna Mission Residential College, Narendrapur, gave their plenary speech. Finally, the vote of thanks was given by Prof. S.K. Das, Chief Course Coordinator.

The eminent speakers who delivered lectures during the course were Prof. G. D. Yadav, Former Director, ICT, Mumbai, Dr. Swapan Das, VP, Resource Development Productivities Management Value Inc.

Calgary, Prof. T. Kumar, Former Director, IIT(ISM) Dhanbad, and NIT Durgapur, Prof. S. K. Das, Former Head, Department of Chemical Engineering, University of Calcutta, Mr. Roy, Former Head, BalmerLawrie& Co. LTD, Mr.Anjan Bhattacharya, Former General Manager, IOCL, Dr.GargiBhattacharjee, Prasanta Chandra MahalanobisMahavidyalaya, Mr. Sanjay Sen, Retd. Joint Chief Controller of Explosives, Dr.Priyanka Roy, Deputy Director (Medical), Department of Labour, Mr. Kumar Biswas, Former Joint Advisor, Petroleum Planning and Analysis Cell, SoumendranathDutta, Technip Energies, UK, AshanenduMandal, Former Chief General Manager, ONGC, Dr.SirshenduGuha, Deputy General Manager, EIL, Dr.Partho S.G. Pattader, Department of Chemical Engineering, IIT Guwahati, Dr.KunalSarkar, Senior Vice Chairman, Cardiac Surgeon, MedicaSuperspeciality Hospital, Kolkata, Dr.Siddartha Mukherjee, Technology Advisor, Air Liquide, Dr. Soma Nag, Chemical Engineering Department, NIT Agartala, Dr.KaushikNath, Prof. & Head, Department of Chemical Engineering, G. H. Patel College of Engineering & Technology, Dr.PallabGhosh, Prof., Department of Chemical Engineering, IIT, Guwahati, Dr.Ashim Bhattacharya, Principal Technology Advisor, Toyam Technologies, Dr.IndraMitra, Director- Technical and Project Development, Cambi India, Prof. Tapas Das, Saint Maztin's University, Washington, Prof. SadhanGhosh, Former Head, Mechanical Engineering Department, Jadavpur University, Prof. David O. Oluka, Former Head, Department of Civil Engineering, Covenant University, Nigeria, Dr.AsitBaranBiswas, Department of Chemical Engineering, University of Calcutta, Prof. Swami Vedajnananda , Department of Chemical Engineering, Heritage Institute of Technology, Dr.MunmunLaha, Chemical Engineering Dept., Birla Institute of Technology, Prof. K.M. Agarwal, Indian Institute of Social Welfare and Business Management, Mr.Sisir K. Chakraborty, Former Manager, Linde. The valedictory function, held on 30.05.2021, was addressed by Padmashri Prof. G. D. Yadav, President, Indian Chemical Society. The Vote of Thanks was given by Prof. C.R. Sinha, Secretary of the Indian Chemical Society.

The course coordinators were Prof. S. K. Das and Mr. Ashanendu Mandal