

# **Report on Science Academies' Lecture Workshop on “Modern Trends in Chemical Sciences”**

**March17-19, 2025 (3 Days)**

**Sponsored by**



Indian Academy of  
Sciences (IAS), Bangalore



Indian National Science  
Academy (INSA), New Delhi



The National Academy of  
Sciences (NASI), Allahabad

**Hosted by**

**Department of Chemistry**

**B.S. Abdur Rahman Crescent Institute of Science and Technology**

(Deemed to be University u/s 3 of the UGC Act, 1956)

An ISO 9001:2015 Certified Institution)

Chennai–600 048, Tamil Nadu



**Submitted by**

**Dr. S. Kutti Rani**

Coordinator

Professor & Director (PG Admissions)

Department of Chemistry

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## Brief Report

The Department of Chemistry, B.S. Abdur Rahman Crescent Institute Of Science and Technology, Chennai organized the Science Academies' funded Lecture Workshop on “Modern Trends in Chemical Sciences” on 17-19/03/2025 (3 Days) in association with the Indian Academy of Sciences (IAS), Bangalore, Indian National Science Academy (INSA), New Delhi and National Academy of Sciences

(NASI), Seminar hall-1, Convention center-BSACIST. The workshop's main objective was to introduce the recent developments in the frontier areas of chemical sciences by the

leading experts from IITM & IISc to the benefit of rural institutions' participants. The workshop is intended for UG and PG students, research scholars, and faculty members of Chemistry. It provides a common platform to interact with eminent scientists from the reputed research institutions of India. This lecture workshop covered the following areas as Organic & Inorganic Synthesis, Computational Chemistry, Materials Chemistry, Nanoscience & Nanotechnology, Catalysis, etc. A sum of 180 delegates attended the workshop, which includes faculty members, research scholars and students from various institutions.



### Day 1: March 17, 2025

#### Inaugural Session

The workshop was inaugurated by an invoking prayer (Qirat) followed by “Tamizhthai vazhthu”. Dr. S. Kutti Rani, Professor, Chemistry & Director (PG Admissions) welcomed the gathering.



Dr. A.K. Mishra, Professor and Dean Academic Research, Indian Institute of Technology Madras, delivered the special address. Dr. N. Raja Hussian (Registrar), B.S. Abdur Rahman Crescent Institute of Science and Technology, expressed the presidential address. Dr. I. Raja Mohamed, Professor & Dean (SPCS), B.S. Abdur Rahman Crescent Institute of Science and Technology, delivered the felicitation address.



#### **Science Academies Resource Persons and BSACIST Registrar**

Dr. N. Hajarabeevi, Professor and Head of the Department of Chemistry, delivered the vote of thanks. Dr. A.K. Mishra introduced the resource persons Prof. S. Natarajan, FNA, FASc, FNASC., IISc Bangalore, Prof. Balaji R. Jagirdar, FASc., IISc Bangalore, Prof. V. Subramanian, FNASC, FASc., IIT Madras, Prof. G.Sekar, IIT Madras and Prof. P. Anbarasan, IIT Madras to participants.

## Technical Session: I & II

In the Lecture-I, Prof. Dr. A.K. Mishra, IIT Madras, delivered a lecture on “Basics of Optical Absorption and Fluorescence Spectroscopy”.



**Prof.A. K. Mishra, IIT Madras, (left) & Prof. S. Natarajan, IISc Bangalore, (right)**  
**delivering lectures and interacting with students.**

During the session the professor discussed on real world applications, such as in sensors and imaging. During Lecture-II Dr. S. Natarajan, IISc Bangalore, presented a topic on “The usefulness of MOFs towards catalysis”. This lecture provided a strong foundation on how MOFs function and their potential in various catalytic applications. Later, he motivated the students to reach the higher education institution through competitive examinations.

### Technical Session: III & IV

In Lecture-III, Prof. V. Subramanian, IIT Madras, delivered a lecture on “Density Functional Theory and its Applications” The professor demonstrated the quantum and mechanical modeling of molecules in chemistry and material science, also he discussed on the practical applications of DFT, such as in catalysis and material design and demonstrated its real-world applications.



**Prof. V. Subramanian, IIT Madras (left) & Prof. B. R. Jagirdar, IISc Bangalore (right) delivering lectures and interacting with participants.**

In Lecture-IV Prof. B. R. Jagirdar, IISc Bangalore delivered a lecture on “All that does NOT glitter is also gold” this lecture explained about surface plasmon resonance and its role in gold nanoparticles and its potential applications in sensing and imaging.

## Day 2: March 18, 2025

### Technical Session: V-VI

In the Lecture-V, Prof. B. R. Jagirdar, IISc Bangalore, delivered a talk on the topic “For our energy demands, turn to hydrogen”. During his presentation, he focused on the potential applications of hydrogen in our energy demands and also elaborated the topic very well in energy applications.

In the lecture VI Prof. S. Natarajan, IISc Bangalore, delivered a talk on the topic “Usefulness of MOFs towards catalysis – II” during his presentation he explained the MOFs function in potential catalytic applications.



Prof. B. R. Jagirdar, IISc Bangalore, (left) & Prof. S. Natarajan, IISc Bangalore (right) delivering talk and interacting with participants.

### Technical session: VII-VIII

In Lecture VII& VIII Prof. P. Anbarasan, IIT Madras delivered a topic on “The Art and Science of Organic Synthesis – Past and Present”. During his presentation he guide us through the latest advancements and cutting-edge innovations shaping the field today.

In this session the professor highlights the significance of organic synthesis in scientific progress. At the end of the session, he provided the motivation regarding opportunities for position at IIT.



Prof. P. Anbarasan, IIT Madras, delivering talk and interacting with participant

### Day 3: March 19, 2025

#### Technical Session: IX & X

Lectures IX were presented by Prof. G. Sekar, IIT Madras, on “Basics of Asymmetric Synthesis”. During his presentation professor provided a deeper understanding of this fundamental concept in chemistry.

In Lecture X was presented by Prof. G. Sekar, IIT Madras, on “ Metal Nano catalyst for Organic Synthesis”. During his session, the professor explained the basic concepts of Organic Synthesis using Nano catalysts. At the end of the presentation professor gave valuable advice to the students and researchers to achieve their goals and also professor motivated them regarding opportunities for doing PhD with many funding opportunities given by the government.



**Prof. G. Sekar, IIT Madras, delivering talk and interacting with participant**

### **Technical Session: XI & XII**

The Lecture XI were presented by Prof. A.K. Mishra, IIT Madras, on “Basics of Photophysical Chemistry and Their Applications”. During his presentation professor gave as very useful information about “Origin of Fluorescence” and their applications.

The Lecture XII were presented by Prof. V. Subramanian, IIT Madras, on “Application of DFT”. During his session he explained about basic concepts of Nano chemistry (Carbon-based Nanomaterials, Structures, Types of Nanomaterials and its potential applications).



**Prof. A.K. Mishra, IIT Madras, (left) & Prof. V. Subramanian, IIT Madras (right)**  
**delivering talk and interacting with participants.**

### Valedictory Session

In the valedictory session, Prof. V. Subramanian and Prof. A. K. Mishra, IIT Madras were addressed their views and shared their experience about the interaction with students throughout the workshop. Subsequently, participants were shared their perception, in which they articulated their views. Further, they expressed that the science academies' workshop enabled them to understand the possibilities of research and academic institution collaborations. The workshop continued with feedback of the students and the certificate distribution by our guest. The workshop ended with the formal vote of thanks by Dr. N. Hajarabeevi, Professor and Head of the Department (Chemistry).



### Outcomes of the lecture workshop

- Understanding the advancements in chemical science and the importance of interdisciplinary research encourages the establishment of collaborative efforts with esteemed institutions like IISc and IIT.
- These partnerships are essential for conducting impactful research. Furthermore, recognizing the significance of competitive exams such as CSIR NET and GATE is crucial for career opportunities in centrally funded higher education institutes.
- To successfully navigate the path towards joining governmental research institutions, it is vital to identify and pursue the necessary routes to achieve this goal.

### **Participants Feedback Videos Drive Link Attached herewith:**



**Coordinator**

**Head of the Department**

**Dean**

**List of participants from outside of BSACIST**

| S.NO | List of Colleges  | No of Participants |
|------|---|--------------------|
| 1.   | Pachaiyappa's College,Chennai                                 | 22                 |
| 2.   | Pachaiyappa's College for Men,Kanchipuram                     | 04                 |
| 3.   | Madurai Kamaraj University,Madurai                            | 08                 |
| 4.   | The New College, Chennai                                      | 04                 |
| 5.   | Dhanalakshmi Srinivasan Arts and Science College,Mamallapuram | 03                 |
| 6.   | Bharath Institute of Higher Education Research                | 10                 |
| 7.   | Akshaya College of Art and Science                            | 02                 |
| 8.   | Queen Mary's College, Chennai                                 | 08                 |
| 9.   | Takshashila University, Tindivanam                            | 05                 |
| 10.  | Govt Arts College for Men, Krishnagiri                        | 07                 |
| 11.  | Presidency College, Chennai                                   | 01                 |
| 12.  | Chennai Institute of Technology, Chennai                      | 01                 |
| 13.  | University of Madras, Chennai                                 | 01                 |
| 14.  | SRM University, Kattangulathur                                | 01                 |
| 15.  | Rajah Serfoji Govt College, Tanjore                           | 06                 |
| 16.  | VISTAS, Pallavaram  | 01                 |
| 17.  | Guru Nanak College  | 01                 |
| 18.  | Quaid & Millath Govt College                                  | 02                 |
| 19.  | Bharathi Women's College                                      | 01                 |
| 20.  | Tagore Institute of Engineering and Technology                | 01                 |
| 21.  | Alagappa University   | 01                 |
| 22.  | Anna University   | 04                 |
| 23.  | VIT, Vellore  | 01                 |
|      | <b>Total No of Participants</b>                               | <b>95</b>          |



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Indian Academy of  
Sciences (IAS), Bangalore



Indian National Science  
Academy (INSA), New Delhi



The National Academy of  
Sciences (NASI), Allahabad



## Three Day Lecture Workshop on “Modern Trends in Chemical Science”

*Organized by*  
**Department of Chemistry**

### Resource Persons



**Prof. Dr. A.K. Mishra**  
Indian Institute of Technology  
Madras



**Prof. Dr. S. Natarajan**  
Indian Institute of Science  
Bangalore



**Prof. Dr. B. R. Jagirdar**  
Indian Institute of Science  
Bangalore



**Prof. Dr. V. Subramanian**  
Indian Institute of Technology  
Madras



**Prof. Dr. G. Sekar**  
Indian Institute of Technology Madras  
Chennai



**Prof. Dr. P. Anbarasen**  
Indian Institute of Technology  
Chennai

### Workshop Coordinator

**Dr. S. Kutti Rani**  
Professor and Director  
(PG Admissions), BSACIST

### Workshop Convener

**Prof. Dr. A.K. Mishra**  
Professor & Dean Academic Re  
Indian Institute of Technology,



17-19, March 2025

09.30 AM - 05.00 PM



**Department of Chemistry**  
Organizes  
A Three-Day Lecture  
Workshop on  
**“Modern Trends  
in  
Chemical Sciences”**  
**17-19 March, 2025**

**Sponsored by**

Indian Academy of Sciences, Bangalore  
Indian National Science Academy, New Delhi  
The National Academy of Sciences, Allahabad



**Convener**

Dr. A. K. Mishra  
Professor & Dean Academic Research  
Indian Institute of Madras (IIT-M)  
Chennai-600 036.

**No  
Registration  
Fee**



Registration Link :  
[https://docs.google.com/forms/d/1zrfpuVgBQbb486yjpgcmZuBkgC\\_1t\\_aTcDjap5CeaDYc/edit](https://docs.google.com/forms/d/1zrfpuVgBQbb486yjpgcmZuBkgC_1t_aTcDjap5CeaDYc/edit)



**About the Institution**

B.S. Abdur Rahman Crescent Institute of Science and Technology (BSACIST) established in 1984, is a prestigious institution situated in the lush green area of Chennai, near Tambaram. With a legacy of 40 years of excellence, the institute offers a broad range of academic programs. It offers 57 courses across 12 different schools, including 32 undergraduate programs, 25 postgraduate programs, and Ph.D. opportunities in all departments. The institution is becoming a prominent figure in higher education, known for its quality, security and strong placement support. We welcome students from around the world, and our programs are designed to provide them with the knowledge and skills needed to achieve their goals and advance on their path to success.

**Coordinator**

Dr. S. Kutti Rani  
Professor & Director (PG Admissions)  
Department of Chemistry  
B.S. Abdur Rahman Crescent Institute of  
Science and Technology, Chennai – 48.

**Mobile No: 94442 06191**



## About the Workshop

A Three-Day Lecture Workshop is planned for the benefit of undergraduate, postgraduate students, PhD scholars and faculties. The workshop is tailored to align with current trends in chemical sciences offering valuable insights for students and researchers across different fields. The workshop covers the basics of spectroscopic techniques, Organic synthesis, the role of catalysts and energy storage and production, etc.,



**Seminar Hall I,  
Convention  
Centre, BSACIST**



**17- 19 March, 2025**



**09:15 AM to 4:30 PM**

## Resource Persons



**Prof. A.K. Mishra**  
IIT Madras



**Prof. S. Natarajan**  
IISc, Bangalore



**Prof. V. Subramanian**  
IIT Madras



**Dr. Balaji R. Jagirdar**  
IISc, Bangalore



**Prof. G. SEKAR**  
IIT Madras



**Dr. P. ANBARASAN**  
IIT Madras





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“Modern Trends in Chemical Sciences”**

*Organized by Department of Chemistry*

**B. S. Abdur Rahman Crescent Institute of Science and Technology,  
Chennai - 48**

**PROGRAMME SCHEDULE**

**17-19<sup>th</sup> March, 2025**

| <b>DAY-1(17-03-2025)</b>            |  |
|-------------------------------------|--|
| <b>TIME</b>                         | <b>EVENT</b>   |
| 9:00 am-9:30 am                     | Registration   |
| 9:30 am-10:00 am                    | Inauguration   |
| <b>Lecture Session-I</b>            |  |
| 10:00 am-11:30 pm                   | <b>Lecture-I- Professor A.K. Mishra</b><br>Title: Basics of optical absorption and fluorescence spectroscopy |
| <b>11:30am-11:45am-TeaBreak</b>     |  |
| <b>Lecture Session-II</b>           |  |
| 11.45 pm- 1.15 pm                   | <b>Lecture-II- Professor S. Natarajan</b><br>Title: The usefulness of MOFs towards catalysis- I              |
| <b>01:15-2:15pm- Lunch Break</b>    |  |
| <b>Lecture Session- III</b>         |  |
| 02: 15 pm-03.45 pm                  | <b>Lecture-III- Professor V. Subramanian</b><br>Title: Density functional theory                             |
| <b>03:45pm -04:00pm - Tea Break</b> |  |
| <b>Lecture Session- IV</b>          |  |
| 04:00 pm-05:30 pm                   | <b>Lecture- IV- Professor B.R. Jagirdar</b><br>Title: All that does NOT glitter is also gold!                |



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**PROGRAMME SCHEDULE**

**DAY-2 (18-03-2025)**

| TIME                                | EVENT  |
|-------------------------------------|--|
| <b>Lecture Session-V</b>            |  |
| 10:00 am-11:30 pm                   | <b>Lecture- V-Professor B.R. Jagirdar</b><br>Title: For our energy demands, turn to hydrogen           |
| <b>11:30am-11:45 am-Tea Break</b>   |  |
| <b>Lecture Session-VI</b>           |  |
| 11.45 pm- 1.15 pm                   | <b>Lecture- VI-Professor S. Natarajan</b><br>Title: The usefulness of MOFs towards catalysis- II       |
| <b>01:15-2:15pm- Lunch Break</b>    |  |
| <b>Lecture Session- VII</b>         |  |
| 02: 15 pm-03.45 pm                  | <b>Lecture- VII-Professor P. Anbarasan</b><br>Title: The Art and Science of Organic Synthesis-Past     |
| <b>03:45pm –04:00pm - Tea Break</b> |  |
| <b>Lecture Session-VIII</b>         |  |
| 04:00 pm-05:30 pm                   | <b>Lecture- VIII-Professor P. Anbarasan</b><br>Title: The Art and Science of Organic Synthesis-Present |



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**PROGRAMME SCHEDULE**

**DAY-3 (19-03-2025)**

| TIME                                  | EVENT  |
|---------------------------------------|--|
| <b>Lecture Session-IX</b>             |  |
| 10:00 am-11:30 pm                     | <b>Lecture- IX- Professor G. Sekar</b><br><b>Title: Basics of Asymmetric Synthesis</b>                                     |
| <b>11:30 am-11:45 am-Tea Break</b>    |  |
| <b>Lecture Session-X</b>              |  |
| 11.45 pm- 1.15 pm                     | <b>Lecture- X-Professor G. Sekar</b><br><b>Title: Metal Nanocatalysts for Organic Synthesis</b>                            |
| <b>01:15-2:15 pm- Lunch Break</b>     |  |
| <b>Lecture Session- XI</b>            |  |
| 02: 15 pm-03.30 pm                    | <b>Lecture- XI-Professor A.K. Mishra</b><br><b>Title: Basic concepts of photophysical chemistry and their applications</b> |
| <b>03:30 pm -03:45 pm - Tea Break</b> |  |
| <b>Lecture Session-XII</b>            |  |
| 03.45 pm-05:00 pm                     | <b>Lecture- XII-Professor V. Subramanian</b><br><b>Title: Applications of DFT</b>  |
| 05.00 pm - 05.30 pm                   | <b>Valedictory Function</b>  |