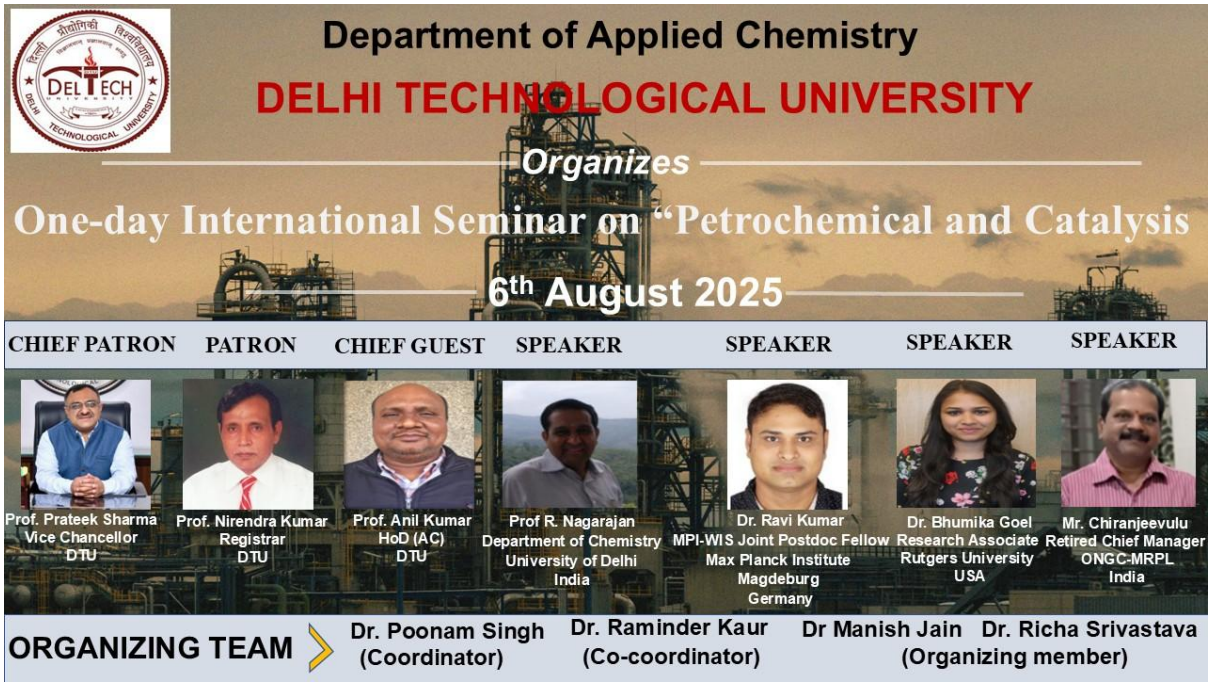
One-day International Seminar on "Petrochemical and Catalysis"

On 6th August 2025



The **Department of Applied Chemistry, Delhi Technological University (DTU), Delhi**, organized a **One-day International Seminar on "Petrochemical and Catalysis"** on **6th August 2025**. The seminar provided a valuable platform for knowledge exchange among academicians, researchers, and industry experts, focusing on recent advancements and challenges in petrochemical sciences and catalysis.

Inaugural Session (9:30 AM- 10:30 AM)

The **Chief Guest, Prof. Anil Kumar, Head of the Department of Applied Chemistry, DTU**, welcomed the distinguished speakers and participants, emphasizing the relevance of catalysis and petrochemical research in building sustainable energy solutions and eco-friendly industrial practices.

Technical Sessions (10:30 AM- 6:00 PM)

The technical program featured four expert lectures by distinguished speakers from academia and the industry Sector:

1. **Prof. R. Nagarajan (University of Delhi, India) (10:30 AM – 11:30 AM)**

Topic: ***"The role of materials chemists in the petroleum industry."***

Prof. Nagarajan emphasized the vital role of materials chemists in enhancing efficiency, safety, and sustainability within the petroleum sector. He explained how novel catalysts designed by materials chemists improve refining processes such as catalytic cracking, reforming, and desulfurization—resulting in higher fuel yields and reduced environmental impact. His lecture also highlighted the development of corrosion-resistant alloys, advanced polymers, and

membranes for pipelines, drilling equipment, and storage systems. Further, he discussed the use of nanomaterials and adsorbents for pollutant removal and emission control. By bridging fundamental chemistry with industrial requirements, Prof. Nagarajan illustrated how materials chemists drive innovation in petroleum refining to make processes more efficient, cost-effective, and environmentally responsible.

----------High Tea (11:30 AM- 12:00 Noon)----------

2. Dr. Bhumika Goel (Rutgers University, USA) (12:00 PM- 1:00 PM)

Topic: ***"Controlling the Movement of Protons and Electrons with Amine-Functionalized CpN_3 Ligands Coordinated to Iron"***

Dr. Goel presented her cutting-edge research on ligand design for transition-metal catalysis, focusing on the regulation of proton and electron transfer processes. She demonstrated how amine-functionalized CpN_3 ligands coordinated to iron enable precise control over these fundamental steps, thereby stabilizing reactive intermediates and enhancing catalytic cycles. Her findings showed potential applications in renewable energy technologies such as hydrogen evolution, CO_2 reduction, and water splitting. By combining fundamental organometallic chemistry with practical energy solutions, her talk highlighted the promising role of iron-based catalysts as sustainable and cost-effective alternatives to precious metal systems.

----------Lunch (1:00 PM- 2:00 PM)----------

3. Dr. Ravi Kumar (Max Planck Institute, Magdeburg, Germany) (2:00 PM- 3:00 PM)

Topic: ***"Computational Bio-Inspired High-Valent Metal Catalysis: Role of Ligand Architecture, Oxidation State, and Nuclearity"***

Dr. Kumar delivered an insightful lecture on the use of computational chemistry to unravel catalytic mechanisms in high-valent metal complexes. He explained how variations in ligand architecture, oxidation state, and nuclearity directly influence catalytic reactivity, selectivity, and stability. By adopting bio-inspired approaches that mimic enzymatic systems, his research offers strategies for designing highly efficient catalytic pathways for oxidation, hydrogenation, and C–H bond activation. His talk demonstrated how computational studies not only accelerate the rational design of catalysts but also reduce trial-and-error experimentation, ultimately contributing to greener and more sustainable petrochemical transformations.

4. Mr. Chiranjeevulu (Retired Chief Manager, ONGC-MRPL, India) (3:00 PM- 4:30 PM)

Topic: ***"An Overview of Petroleum Refinery (Including Career Guidance and Opportunities)"***

Drawing from decades of industrial experience, Mr. Chiranjeevulu provided a comprehensive overview of petroleum refining operations, including crude distillation, catalytic cracking, hydroprocessing, and product purification. He discussed the challenges faced by modern refineries in balancing efficiency with environmental compliance and emphasized the ongoing shift towards green technologies and renewable integration. Importantly, he also addressed the participants with valuable career guidance, outlining opportunities in research, process optimization, safety management, and sustainability initiatives within the petroleum and

petrochemical sectors. His session effectively connected academic learning with industrial practice, motivating young scholars to explore impactful careers in this domain.

Valedictory Session (4:30 PM- 6:00 PM)

The seminar concluded with a Vote of Thanks delivered by Dr. Poonam Singh (Coordinator). On behalf of the Department of Applied Chemistry, she extended her heartfelt gratitude to Prof. Prateek Sharma, Vice Chancellor, DTU, and Prof. Nirendra Kumar, Registrar, DTU, for their constant encouragement and support. Special appreciation was conveyed to Prof. Anil Kumar, Head of Department (Applied Chemistry, DTU), for his guidance in organizing the seminar.

Dr. Singh expressed deep gratitude to all the eminent speakers — **Prof. R. Nagarajan**, **Dr. Bhumika Goel**, **Dr. Ravi Kumar**, and **Mr. Chiranjeevulu** — for their invaluable lectures and for enriching the participants with diverse academic and industrial perspectives. She also acknowledged the efforts of the organizing committee members, faculty colleagues, research scholars, students, and the administrative staff for their contributions toward the smooth and successful conduct of the seminar.

She concluded with the hope that the deliberations and insights gained during the seminar would inspire new research collaborations, strengthen academia–industry partnerships, and promote sustainable advancements in petrochemical and catalytic sciences.

Lastly, the certificates were provided to all the participants.

Organizing Committee

The seminar was meticulously coordinated by **Dr. Poonam Singh (Coordinator)** and **Dr. Raminder Kaur (Co-coordinator)**, with the support of **Dr. Manish Jain** and **Dr. Richa Srivastava (Organizing Members**). Their dedicated efforts ensured the smooth execution of the event.

Conclusion

The One-day International Seminar on ***"Petrochemical and Catalysis"*** successfully fulfilled its objective of fostering dialogue between academia and industry. The diverse range of sessions, covering materials chemistry, molecular catalysis, computational modelling, and industrial refinery operations, offered participants a holistic perspective of the field. The seminar enriched students and researchers with advanced knowledge, inspired collaborative ideas, and provided practical insights into career opportunities in the petrochemical sector.

The event concluded with a vote of thanks, acknowledging the invaluable contributions of the speakers, dignitaries, and participants, making the seminar a highly impactful and memorable academic endeavour.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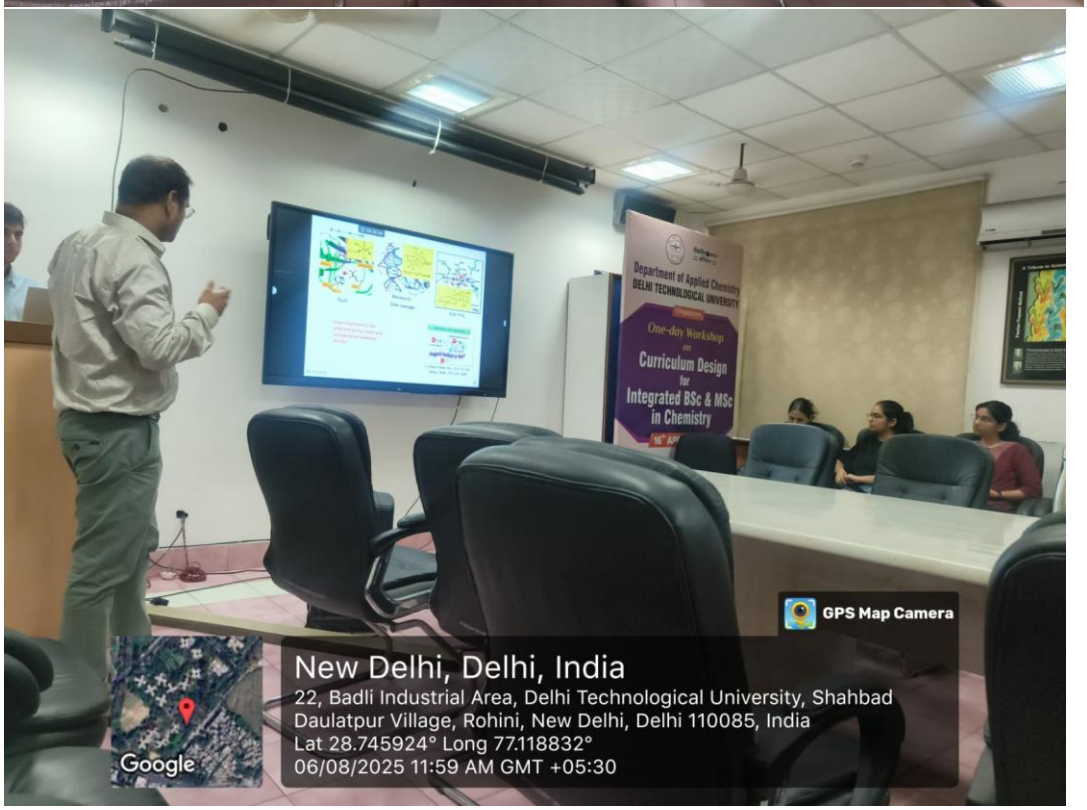
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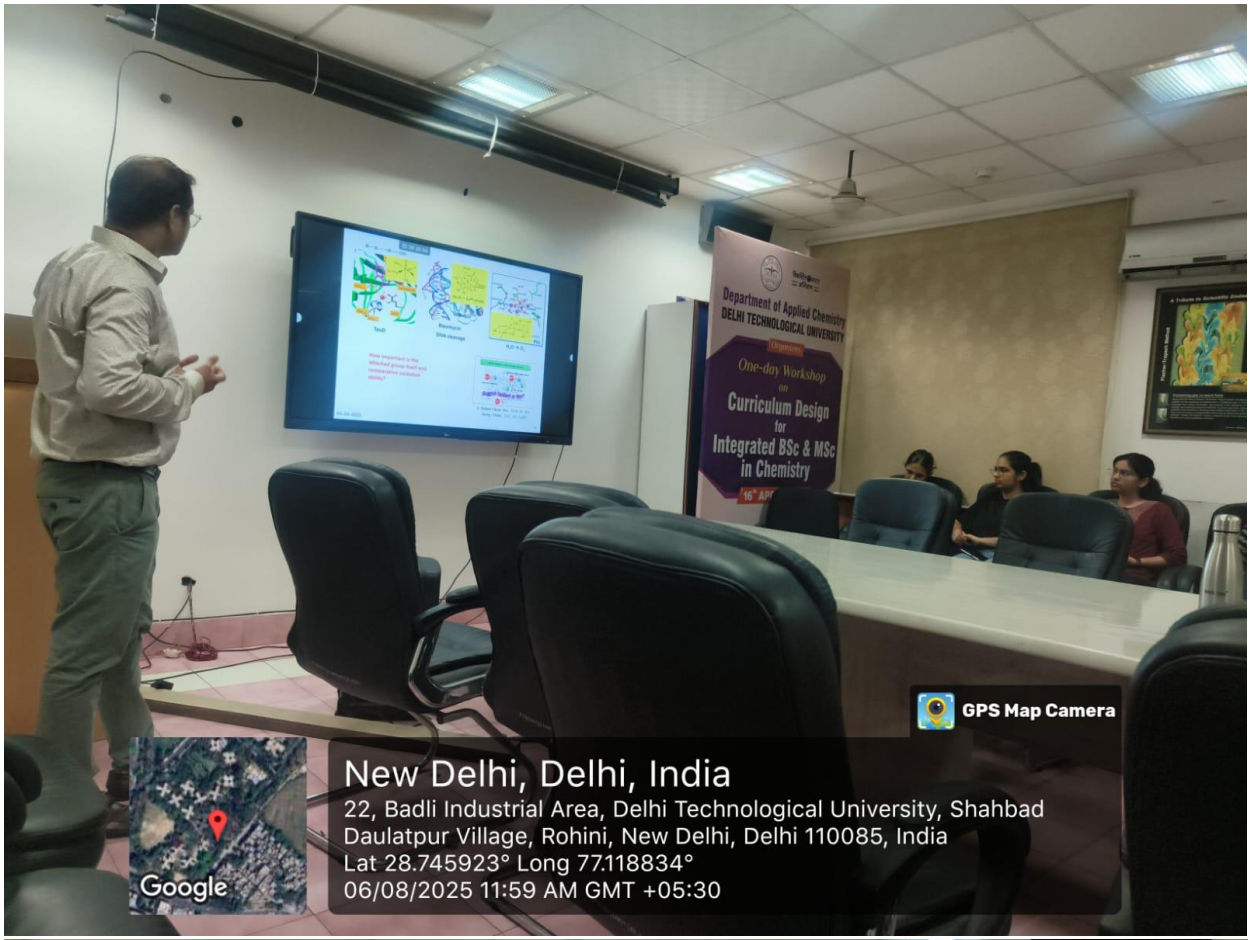
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