Summer Workshop
(Over online Zoom platform)
on
Recent Advances in Spectroscopy, Catalysis and Synthesis
Department of Chemistry
IIT Kanpur

June 14 – July 02, 2021

The primary aim of this workshop is to expose students to challenging areas of chemical research. It intends to connect students to the cutting-edge techniques and methodologies used in advanced research. This workshop would provide a platform to engage 4th Year BS, BS-MS and 2-year MSc students in the Department who have missed summer internships and related programs and those who are yet to return to campus due to pandemic. The theme for this year is "Recent Advances in Spectroscopy, Catalysis and Synthesis", covering a wide range of subjects involving both fundamental aspects and applications.

Who can register: 4th Year BS, BS-MS and 2-year MSc students of Department of Chemistry, IIT Kanpur (However, all are welcome to attend)

Registration process: Registration link will be provided by email (chmug@lists.iitk.ac.in)

Registration fee: Nil

Last date to register: June 06, 2021
Tentative topics to be covered

Week 1: Theme – Spectroscopy
June 14, Mon: Gas phase spectroscopy
June 15, Tues: Materials and spectroscopy
June 16, Wed: Spectroscopy at interfaces
June 17, Thu: Single molecule spectroscopy
June 18, Fri: Spectroscopy in characterization

Week 2: Theme – Catalysis
June 21, Mon: Main group elements in catalysis
June 22, Tue: Ligand design in catalysis
June 23, Wed: Sustainable processes and products
June 24, Thu: Photocatalysis at surfaces
June 25, Fri: Enzyme catalysis

Week 3: Theme – Synthesis
June 28, Mon: Strategy in synthesis
June 29, Tue: Bioinspired materials
June 30, Wed: Synthetic methodologies
July 01, Thu: Design and synthesis of vaccine
July 02, Fri: Stimuli-responsive materials

Each day there will be two lectures; 3:00 – 4:30 PM and 5:00 to 6:30 PM.

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**Summer Workshop 2021: Recent Advances in Spectroscopy, Catalysis and Synthesis**  

https://zoom.us/j/91826849166?pwd=aEZUb3diZHjYmYrTkrRZcWwtrZ29tUT09  
Meeting ID: 918 2684 9166  
Passcode: EW58vd  

**Program Schedule**  
June 14, Monday 2:45 PM: Introductory remarks by HoD and Coordinator  

**Week 1: Theme – Spectroscopy**  
**Day 1 (June 14, Monday): Gas phase spectroscopy**  
1.A. (3:00 – 4:30 PM) “Good” vibrations: importance of anharmonicity and Fermi resonances – Prof. K. Srilahi  
1.B. (5:00 – 6:30 PM) Spectroscopic studies of step-wise solvation and dissociation of HCl molecule – Prof. D. Mani  

**Day 2 (June 15, Tuesday): Materials and spectroscopy**  
2.A. (3:00 – 4:30 PM) Photonic Crystal Lasers – Prof. M. Ranganathan  
2.B. (5:00 – 6:30 PM) Photoelectron spectroscopic investigations of perovskite materials – Prof. D.L.V.K. Prasad  

**Day 3 (June 16, Wednesday): Spectroscopy at interfaces**  
3.A. (3:00 – 4:30 PM) Water evaporation from free surfaces of aqueous solutions – Prof. A. Chandra  
3.B. (5:00 – 6:30 PM) Understanding the electronic properties of molecular materials at solid-solid interface – Prof. T.G. Gopakumar  

**Day 4 (June 17, Thursday): Single molecule spectroscopy**  
4.A. (3:00 – 4:30 PM) 1D & 2D fluorescence correlation spectroscopy – Prof. P. Sen  
4.B. (5:00 – 6:30 PM) Approaching spatial and temporal control at nanoscale with femtosecond pulses – Prof. D. Goswami  

**Day 5 (June 18, Friday): Spectroscopy in characterization**  
5.A. (3:00 – 4:30 PM) Characterization of organic compounds by special NMR experiments – Prof. M.K. Ghorai  
5.B. (5:00 – 6:30 PM) NMR and EPR Spectroscopy of Paramagnetic Molecules – Prof. S.P. Rath  

**Week 2: Theme – Catalysis**  
**Day 6 (June 21, Monday): Main group elements in catalysis**  
6.A. (3:00 – 4:30 PM) The concept of frustrated Lewis pair and its utility in catalysis – Prof. V. Chandrasekhar  
6.B. (5:00 – 6:30 PM) Low-coordinate main-group compounds for small molecule activation and catalysis – Prof. V. Chandrasekhar  

**Day 7 (June 22, Tuesday): Ligand design in catalysis**  
7.A. (3:00 – 4:30 PM) In search of catalysts to meet the challenges of sustainable processes and products – Prof. J.K. Bera  
7.B. (5:00 – 6:30 PM) Hydrogen, Hydride, Hydrogenses: Bioinspired Ligands and Catalysts for Hydrogen Production – Prof. R. Angamuthu  

**Day 8 (June 23, Wednesday): Sustainable processes and products**  
8.B. (5:00 – 6:30 PM) Sustainable Catalysis: challenges, impacts and opportunities – Prof. B. Sundararaju  

**Day 9 (June 24, Thursday): Photocatalysis at surfaces**  
9.B. (5:00 – 6:30 PM) Challenges in Plasmon Driven Reduction of CO2 to Chemical Fuels – Prof. V.G. Rao  

**Day 10 (June 25, Friday): Enzyme catalysis**  
10.A. (3:00 – 4:30 PM) Metallohydrolases: Role of Metal Ions in the Hydrolytic cleavage of an RNA-model Phosphodiester – Prof. R.N. Mukherjee  
10.B. (5:00 – 6:30 PM) Green approaches to organic synthesis using enzymatic catalysis – Prof. R. Gurunath  

**Week 3: Theme – Synthesis**  
**Day 11 (June 28, Monday): Strategy in synthesis**  
11.A. (3:00 – 4:30 PM) Strategy in Asymmetric Synthesis – Prof. V.K. Singh  
11.B. (5:00 – 6:30 PM) Total Synthesis of Natural Products through Novel Synthetic Strategies – Prof. D.H. Dethe  

**Day 12 (June 29, Tuesday): Bioinspired materials**  
12.A. (3:00 – 4:30 PM) Bioinspired Assemblies for Biomedical Applications 1 – Prof. S. Verma  
12.B. (5:00 – 6:30 PM) Bioinspired Assemblies for Biomedical Applications 2 – Prof. S. Verma  

**Day 13 (June 30, Wednesday): Synthetic methodologies**  
13.B. (5:00 – 6:30 PM) Unveiling New Frontiers of Chemical Space and Efficient Synthetic Design – Prof. A. Singh  

**Day 14 (July 01, Thursday): Design and synthesis of vaccine**  
14.B. (5:00 – 6:30 PM) Engineering Traditional & New Generation of Vaccines – Prof. N. Parveen  

**Day 15 (July 02, Friday): Stimuli-responsive materials**  

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