

Crystal Engineering

Overview

Crystal engineering stands at the crossroads of chemistry and crystallography. The term *crystal engineering* was first suggested in 1955. Active research in this area has been ongoing for the past 25 years. Crystal engineering is a subject that seeks to establish connections between structure and function. It is therefore of very wide scope. These areas include materials science and engineering, pharmaceutical science, and a wide variety of technological enterprises. This adaptability is inherent in any subject that lies at the intersection of many thought streams. Students come to this subject with different viewpoints and take away from it different lessons that they have learned.

The molecule is paramount in chemistry. But rather than talk about molecules in themselves, we discuss in this course *assemblies of molecules* and why molecules associate in specific ways. A crystal is a very precise and specific type of molecular assembly. Crystal engineering teaches us how to bring molecules together precisely as we want.

This course aims to provide a basic understanding of intermolecular interactions in the context of crystal packing. Further, the students will learn how to utilize these weak supramolecular interactions in the design of new solids with desired physical and chemical properties.

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| Modules: | 15 hours of Lectures and 12 hours tutorials: November 13 to November 17, 2023. Number of participants for the course will be limited to 25. |
| You Should Attend If... | <ul style="list-style-type: none">• You are a BSc/MSc/PhD student of Chemistry, Materials Science and allied disciplines.• You are a Faculty of Chemistry or allied disciplines.• You are Post-doc Candidate/ Research Associate working at any University/Institution of India or Abroad in the area of Chemistry, Materials Science and allied disciplines.• You are a corporate Professional working in research wing of any Private or Public Organizations. |
| Fees: | The participation fees for taking the course are as follows: Participants from abroad: US\$ 500 Industry/ Research Organizations: Rs. 10,000 Academic Institutions/ Faculty: Rs. 5000 Students & Research Scholars: Rs. 2000 Above fees include all instructional materials, computer use for tutorials, and 24 h free internet facility. The participants will be provided with accommodation on a payment basis. |
| Mode of Registration: | All prospective participants need to do web registration for the course on GIAN (http://www.gian.iitkgp.ac.in/GREGN/Index) portal by making a onetime non-refundable payment of Rs. 500/-. After the mandatory web registration, only the shortlisted participants will be informed by email to register for the course by making full payment of the course registration fee either by NEFT (Account holder name: Director, IIT Bhilai , Account No. 7793000100014077; IFSC Code: PUNB0957100; Bank: PNB, Sardar Vallabh bhai Patel Market) or by sending a demand draft in favor of "Director, IIT Bhilai" payable at Punjab National Bank, Dumartarai, Raipur, Chhattisgarh before the last date of registration. Please send an email to the course coordinator in case of any questions: raghavender@iitbhilai.ac.in |

Course Co-ordinator

Dr. Raghavender Medishetty

E-mail: raghavender@iitbhilai.ac.in

LINK: <http://www.gian.iitkgp.ac.in/GREGN/index>

Foreign Faculty

Prof. Jagadese J. Vittal is an Emeritus Professor in the Department of Chemistry, National University of Singapore (NUS). He received Ph.D. from Indian Institute of Science, Bangalore. After working as a postdoctoral fellow at the University of Western Ontario, Canada, he managed the X-ray facility in the Department of Chemistry. In 1997, JJ accepted a faculty position at NUS. He also established the service crystallography facility in the Department of Chemistry. He held a *World Class University Chair Professorship* at the Gyeongsang National University, Jinju, South Korea (2009-2013). JJ's current major research interests include various aspects of solid-state materials, coordination polymers and metal-organic frameworks, and solid-state photoreactivity. He co-authored "Crystal Engineering— a Textbook" with G. R. Desiraju and A. Ramanan and edited two books on crystal engineering. He is a Fellow of the *Royal Society of Chemistry*, *Singapore National Institute of Chemistry*, *Indian Chemical Society*, and *International Association of Advanced Materials*. He was the founder and organizing committee member of *Singapore National Crystal Growing Challenge* (1997-2016).



Host Faculty

Dr. Raghavender Medishetty is a faculty member in the Department of Chemistry, Indian Institute of Technology Bhilai. He graduated from NUS, Singapore as a prestigious Presidential Graduate fellow. He has received an Alexander von Humboldt postdoc fellowship and worked at the Ruhr-University of Bochum and Technical University of Munich, Germany. He received the Rising Star award at the 16th Asian Crystallographic Association (AsCA-2019) meeting. His primary research interests include solid-state materials, photochemistry, photophysical, and nonlinear optical behavior of metal complexes, MOFs, and hybrid materials.



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