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Technical Workshops Series

One-Day Intensive Workshop on An Introduction to Practical NMR Spectroscopy

Wave 1

- Organized by Central NMR Facility, NCL and Venture Center -

Learn	<p>Nuclear Magnetic Resonance Spectroscopy (NMR): Fundamental Principles. Sample Preparation Techniques. Qualitative & Quantitative Analysis using NMR; Practical applications of NMR in the Industry. NMR Method Development Strategies. Live demonstration of experiments; Mini-workshop on data interpretation with real data; Quick update on latest techniques/developments; Workshop is intended to be basic.</p>
Organized by	<ul style="list-style-type: none"> • Central NMR Facility • Venture Center – a Technology Business Incubator
For whom	<ul style="list-style-type: none"> • Industry professionals wishing to expand their skill sets (Industries – Pharma; Environmental; Forensic; Food; Agrochemical, etc) • Students and staff of polymer/ materials sciences/ engineering/physical/organic/inorganic/analytical chemistry/biological & biochemical sciences wishing to equip themselves for industry jobs • Maximum 20 seats; First-come-first-serve.
Course Director	Dr P. R. Rajamohan
VC Organization Team	Sujaya Ingale, Edna Joseph, Deepa Bhosle
When	Saturday, 1st August 2015, 8:30 am – 5:30 pm
Where	<ul style="list-style-type: none"> • Classroom Sessions: E-classroom, Venture Center, 100 NCL Innovation Park, Dr. Homi Bhabha (Pashan) Road, Pune-411008 • Lab Sessions: National Chemical Laboratory (NCL), Dr. Homi Bhabha (Pashan) Road, Pune-411008
Contact	<p>Ms. Lipika Biswas Venture Center, 100, NCL Innovation Park, Dr. Homi Bhabha Road, Pune – 411008; Phone: +91-20-2586-5877; Email: eventsdesk@venturecenter.co.in</p>
Cost	<ul style="list-style-type: none"> • Micro and small enterprises/ individuals: Rs. 2000/- • Medium and large companies/ others: Rs. 4000/- • Students with valid ID card: Rs. 900/-



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Introduction

Nuclear Magnetic Resonance (NMR) spectroscopy has become the dominant method of analysis for organic compounds, because in many cases it provides a way to determine an entire structure using one set of analytical tests. It is also increasingly used in inorganic chemistry and biochemistry, where it also provides a lot of valuable structural information. The medical technique of Magnetic Resonance Imaging (MRI) uses the same principles.

Common applications of NMR include; **Structure elucidation, Chemical composition determination, Formulations investigation, Raw materials fingerprinting, Mixture analysis, Sample purity determination, Quality assurance and control, Quantitative analysis, Compound identification and confirmation, Analysis of inter- and intramolecular exchange processes, Molecular characterisation, Reaction kinetics examination, Reaction mechanism investigation.**

This workshop aims to give an introduction to the Fundamentals of NMR spectroscopy for industry professionals and students. The workshop will be conducted by an expert having vast experience working on high end NMR Spectrometers. The workshop includes lab sessions and data interpretation exercises. The workshop shall also discuss some recent trends and new developments in research and industry relating to **NMR spectroscopic techniques.**

Course Outline

- NMR Spectroscopy (NMR): Fundamental principles; Basic concepts; Essential concepts. Instrumentation & instrument parameters. Sample preparation techniques.
- Qualitative & Quantitative Analysis using NMR. Practical Applications of NMR in the Industry.
- Lab tour. Demo for few samples (at Central NMR Facility)
- Mini-workshop on data interpretation with real data. Quick update on latest techniques/developments and advanced applications.

Course includes

- Course notes including slides, case studies, application notes
- Lab session and tour
- Access to restricted website with online compilation of resources for NMR Spectroscopy
- One-on-one feedback on data interpretation exercise
- Certificate of Participation issued by Venture Center and Central NMR Facility - NCL
- Course includes tea and lunch at Venture Center cafeteria

***Please note participants are requested to carry their own laptops for the data interpretation session**



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Time	Session title	Venue
8:30 to 9:00	Registration	Foyer Learning Center, VC
9:00 to 9:15	Introduction to the course and faculty	E-classroom, VC
9:15 to 11:00	Basic principles of NMR;Basics of Instrumentation; Sample preparation techniques.	E-classroom, VC
11:00 to 11:30	Tea	Foyer Learning Center, VC
11:30 to 13:00	Analysis using one-dimensional and two-dimensional NMR. Principles of experimental techniques in demo session (Solution state: 1D 1H, 13C, COSY/TOCSY, HSQC. Solid state: 1D, 1D with MAS, 1D with CP-MAS). Various areas where NMR methods are applied.	E-classroom, VC
13:00 to 14:00	Lunch	Cafeteria, VC
14:00 to 15:30	Demonstration of experiments discussed in lecture	Central NMR Facility, NCL
15:30 to 16:00	Tea	Foyer Learning Center, VC
16:00 to 17:00	Data Interpretation: One-dimensional data analysis using specview. Two-dimensional data interpretation.	E-classroom, VC
17:00 to 17:30	Closure – Feedback, Certificate distribution	E-classroom, VC

Anchor Faculty
Dr P. R. Rajamohanam, Central NMR Facility, NCL
Dr T. G. Ajithkumar, Central NMR Facility, NCL
DrSapnaRavindranathan, Central NMR Facility, NCL
Dr M. UdayaKiran, Central NMR Facility, NCL



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About the organizers

About Venture Center

Entrepreneurship Development Center (Venture Center) – a CSIR initiative – is a Section 25 company hosted by the National Chemical Laboratory, Pune. Venture Center strives to nucleate and nurture technology and knowledge-based enterprises by leveraging the scientific and engineering competencies of the institutions in the Pune region in India. The Venture Center is a technology business incubator supported by the Department of Science & Technology's National Science & Technology Entrepreneurship Development Board (DST-NSTEDB). Venture Center's focuses on technology enterprises offering products and services exploiting scientific expertise in the areas of materials, chemicals and biological sciences & engineering. For more information, visit <http://www.venturecenter.co.in/>

About Central NMR Facility at National Chemical Laboratory, Pune

Central NMR Facility is a Resource Center of CSIR-NCL created in the year 2000 and provides NMR support required for the scientific activities of the laboratory in solution state and solid state. The Center maintains and operates six NMR spectrometers operating at 200, 300, 400, 500 and 700 MHz. Although the primary users of this facility are from the research community within the laboratory, the facility is open to researchers in other educational institutions and industries. Apart from the technical support, the Center also plays an integral part in the basic and applied research activities of the Laboratory. The scientists associated with this Resource Center also carry out research activities on application of NMR spectroscopy in diverse areas of chemical, biological and materials sciences.

NMR Spectrometers :

Bruker AV-200 : A two channel standard bore (54mm) spectrometer for solution state NMR , magnet field strength 4.7 Tesla,

Bruker AV-300 ; A three channel wide bore (89mm) spectrometer for solid state NMR and micro-imaging , magnet field strength 7.05 Tesla.

Bruker AV-400: A two channel standard bore (54mm) spectrometer for solution state NMR, magnet field strength 9.39 Tesla.

JEOL ECX-400: A two channel standard bore (54 mm) spectrometer for solution and solid state NMR , Magnet field strength 9.39 Tesla.

Bruker AV-500: A three channel standard bore (54 mm) spectrometer for solution and solid state NMR , Magnet field strength 11.75 Tesla

Bruker AV-700: A three channel standard bore (54 mm) spectrometer for solution and solid state NMR, magnet field strength 16.44 T.