A Report on
The three day Lecture program on
“EMERGING TRENDS IN CATALYSIS & BIO CATALYSIS”
11th to 13th AUGUST 2009

The lecture program had a galaxy of eminent speakers covering an exhaustive blend of topics within the purview of this year’s theme of ‘Emerging Trends in Catalysis & Bio Catalysis’. The Lecture program was held between 11th to 13th August 2009 at Prashanthi Nilayam campus and was attended by the Under graduate, Post Graduate, MPhil Scholars, Research Scholars, Senior lecturers, Readers, Professors, Honorary consultants for Research Program in our University and Visiting faculties of the Department of Chemistry, Sri Sathya Sai University. The students and Research Scholars from Department of Biosciences and Department of Physics were also invited for the lecture program.

Invited speakers with faculty of Department of Chemistry, Sri Sathya Sai University

A good blend of academic and industrial research was discussed and presented. This lecture program was of immense help to the students and Research Scholars of the university in terms of interaction with the experts and the resulting exposure to the latest trends in this field. The lecture program was held in the Multimedia centre of Prashanthi Nilayam campus equipped with the latest audio-video facilities, mike systems, along with the Video conferencing facility that connects the three campuses of the University (Post graduate campus at Prashanth Nilayam, Under graduate campus for men in Brindavan, Bangalore and Undergraduate campus for women in Anantapur). The Post graduate students and the Research Scholars along with their Professors and Senior lecturers were present in the multimedia centre where the lectures were delivered. The undergraduate students who are doing their Honours in Chemistry from the other two campuses of Sri Sathya Sai University
were connected by the Video conferencing facility and they actively participated in the lecture program.

**Day 1:**

As has been the culture of our University, the first day of the conference commenced with the lighting of a lamp accompanied by the Vedic hymns chanted by the post graduate students which symbolizes the higher purpose of all scientific endeavours, which is worshipping God by service to mankind in a better way.

Professor Chelli Janardhana, Head, Department of Chemistry, Sri Sathya Sai University delivered the welcome address for all the dignitaries from the scientific community who were invited for this lecture program.

![Professor Chelli Janardhana](image)

The inaugural address for the lecture program was given by Prof. Vishwanath Pandit, Vice Chancellor, Sri Sathya Sai University. He emphasised the importance of interdisciplinary approach in the scientific research and suggested all the Heads of Science Departments including Physics, Biosciences and Mathematics along with Chemistry to encourage interdisciplinary approach in their field of research and take the valuable inputs of the invited speakers in this regard.

![Prof. Vishwanath Pandit](image)
This was followed by a Video documentary on Sri Sathya Sai System education which gives great emphasis on Character building along with the academic excellence.

The keynote address for the conference was given by Prof. V. Chandrashekar from Indian Institute of Technology, Kanpur and he gave a talk on Metathesis which is one of the most useful and productive catalytic reactions in chemistry. He also spent some time on history of Nobel Laureates in Chemistry igniting the young scientists in students to take up the challenge and achieve the greatest dream of all the scientists.

Prof. V. Chandrashekar

The session I for the day commenced after the keynote address with Prof. Govind Rao of University of Maryland, Baltimore as the Chair Person. The first lecture was delivered by Prof. Mukesh Doble from Department of Bio-technology, Indian Institute of Technology, Chennai. He spoke on “Enzymatic degradation of poly carbonates”. This topic is very relevant in todays scenario where waste disposal has become a critical issue and all environmentalists getting together to work out a solution in this direction. Prof. Mukesh Doble threw some light in this direction.

Prof. Mukesh Doble

The second speaker for the session was Prof. T.K.Chandrashekar, Director, National Institute of Science Education and Research (NISER). He spoke on “Receptors for Cation and Anions”, where he described the studies going on the design and synthesis of receptor molecules
capable of selectively binding and transporting substrates which are being used to develop artificial membranes permeable to the bound species.

Prof. T.K.Chandrashekar

The session concluded with question answer session between students, faculties and the invited speaker.

The session II of the first day was chaired by Prof. Mukesh Doble and the last speaker for the day was Prof. Somanath Mitra, Department of Chemistry and Environmental Science, New Jersey Institute of Technology, Newark, NJ. The title of his lecture was “Dispersible nanomatal Carbon Nanotube-Hybrids with potential application in Homogeneous catalysis”. He dwelt on the basics of nanotubes, its role in catalytic reactions and also their environmental impact.

Prof. Somanath Mitra

The session concluded with question answer session between students, faculties and the invited speaker.
**Day 2:**

The Day two had three sessions with eight speakers which included two students of the university. The first session for the day was chaired by Prof. V. Chandrashekhar of IIT Kanpur. The First speaker of the day was Dr. Dinesh Jagadeeshan, an alumnus of Sri Sathya Sai University where he received his Masters Degree in Chemistry in the year 2005 and went on receive his PhD from Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR). He spoke on “Methanation of Carbonates” where he showed the potentiality of Methane as being used as potential fuel in near future and described the synthetic route of converting the Metal carbonates to Methane.

![Dr. Dinesh Jagadeeshan](image)

The second speaker for the session was Dr Praveen Vadlan, Assistant professor, Grain Science and Industry Department, Kansas State University. The title of his lecture was on “Biofuels and Platform Chemicals from Agricultural resources: Biocatalysis and Microbial Fermentation”. He threw some light on the upcoming Bio based economy which constitutes 20 % of US chemical market (worth around 160 billion dollars) by 2010. This economy is based on production of Bio-fuels and Bio-chemicals from agricultural resources.

![Dr Praveen Vadlan](image)
The third speaker for the morning session was Prof. V. Lakshminarayanan, Raman Research Institute. He spoke on “Electrochemistry for the study of Bio-materials and electrocatalysis for the energy generation”. He dwelt on the electroanalytical methods for the quantitative determination of biomaterials and studies related to understanding of biological electron transfer processes on solid electrode surfaces.

Prof. V. Lakshminarayanan

The session concluded with question answer session between students, faculties and the invited speaker.

A Post graduate student clarifying his doubts

The fourth session of the three day lecture program had two speakers and was chaired by Prof. Somanth Mitra, NJIT. The first speaker was Prof. Govind Rao, Director, Center for Advanced Sensor Technology (CAST), University of Maryland, Baltimore who spoke on “Real time Bio-process sensors”. He emphasised the role and importance of process analytical technology for therapeutic biomolecules in less time and at less expense as the usual FDA protocols of drug manufacturing is very time consuming and costly.
Dr. Govind Rao

The next speaker for the session was Dr. R. Sai Sathish, Research assistant professor, CAST, University of Maryland, Baltimore. He is an Alumnus of Sri Sathya Sai University where he received his Bachelors and Masters Degree in Chemistry and went on to receive his PhD in the year 2007. He spoke on "High-resolution surface plasmon coupled resonant filter: A low cost analytical tool with applications in bio-catalysis, medicine and the environment". He showed how Nanoscale photonic devices and structures can control the reflection, transmission and polarization properties of magnetic field to achieve high spectral resolution of light.

Dr. R. Sai Sathish

The session concluded with question answer session between students, faculties and the invited speaker.

Some more inquisitive minds raise question
The fifth session of the lecture program was chaired by Prof. T.K. Chandrashekar, Director, National Institute of Science Education and Research (NISER). The first speaker was Prof. V. Chandrashekar, IIT Kanpur who spoke on “Catalysis by molecules and nanoparticles”. He basically dwelt upon Molecular Pd-catalyzed reactions, Recyclable Hybrid Polymer-supported catalysts and Pd-nanoparticle-catalysis.

Prof. V. Chandrashekar

The next speaker was Sri S. Ashwath Narayana, PhD Scholar, Department of Bio Sciences, Sri Sathya Sai University. He spoke on “Biosynthesis of Silver Nanoparticles” where he dwelt on plant mediated synthesis of silver nanoparticles which offers many advantages over microbial catalyzed methods. He showed that biological synthesis of nanoparticles was indeed a green chemistry method which is not only cost effective but also energy efficient.

Sri S. Ashwath Narayana

The last speaker for the session was Sri K. Naga Sai Visweswar, MPhil Scholar. He spoke on “Cyclic B-(1→3), (1→6)-Glucan: Scope and applications”. He discussed the biological functions and potential applications of cyclic β-glucan in the separation sciences and pharmaceutical industries.
The session concluded with question answer session between students, faculties and the invited speaker.

**Day 3:**

The third day commenced with the sixth session of the lecture series chaired by Dr. Praveen Vaidian, Assistant professor, Grain Science and Industry Department, Kansas State University. There were three speakers in the morning session and the first speaker was Dr. V. Vijay Lakshmi, Deputy Director at National Institute of Nutrition, Hyderabad. She spoke on “Tissue Engineering- An Overview” and showed us the role of tissue engineering in the functional replacement of tissue for clinical use.

The next speaker was Dr. Nageswara Rao, Reader, Department of Chemistry, Sri Sathya Sai University who spoke on behalf of Dr. R. Venkateswarlu, Professor of Organic Chemistry, Andhra University who could not turn due to some unavoidable circumstances. The material was sent by Dr. Venkateswarlu which was presented by Dr. Nageswara Rao. The title of the lecture was “New methods for development of bioactive lignans based on Natural products”. He dwelt on new methods for synthesis of lignans, isolation and characterisation of new natural products, transformations of naturally occurring lignans to possibly bioactive
compounds. Finally the biological testing method of these extracted and synthesized compounds were described.

**Dr. G. Nageswara Rao**

The last speaker for this session was Prof. Nanduri Srinivasan, Senior Director, Medicinal Chemistry, Aurigene Discovery Technologies Limited, Bangalore. He is an Alumnus of Sri Sathy Sai University where he received his Bachelors and Masters Degree in Chemistry and went on to receive his PhD from the same University. He spoke on “Discovery of a novel lipid lowering Drug” where he has emphasized the role of cholesterol absorption inhibitors like statins and their influence in reversing the Atherosclerosis which is a Coronary heart disease (CHD).

**Prof. Nanduri Srinivasan**

The session concluded with question answer session between students, faculties and the invited speaker.

The seventh and the final session of the three day lecture program was chaired by Dr. Siva Kumar, Senior Lecturer, Department of Chemistry, Sri Sathy Sai University. The first speaker of the session was Dr K.B. Ramachandran, Department of Biotechnology, IIT Chennai. He spoke on “Kinetics of Hydrolysis of Palm Oil by Lipase”. He dwelt on a kinetic model based on the mechanism of the reaction for the lipase-catalysed hydrolysis of palm oil in bi-phasic oil-aqueous system. The model was shown to be verified with experimental results at low enzyme concentration.
The next speaker for the session was Prof. T.K.Chandrashekar, Director, National Institute of Science Education and Research (NISER) who spoke mainly on "Expanded Porphyrins: Third Order NLO Materials" as a part of his valedictory address for the lecture program. He dwelt upon synthetic methods developed for the new expanded porphyrins with 26, 30, 34, 44 and 54π systems. He highlighted the role of insertion of Rh(I) into cavity of π-π linked systems and showed how it significantly enhanced the aromaticity and the $\sigma^{(2)}$ values. He explained that the magnitude of $\sigma^{(2)}$ values observed were good enough for device applications.

The session concluded with question answer session between students, faculties and the invited speaker.

There was an overall review of all the lectures conducted during the three day program with discussion leading to alignment of all lectures with the underlying theme of the program.
Summary session

The three day lecture program concluded with the vote of thanks delivered on behalf of Department of Chemistry of all the three campuses of the University by Dr. Jagadeswara Rao, Reader, Department Of Chemistry, Sri Sathya Sai University. All the invited speakers were duly felicitated.

Dr. Jagadeswara Rao

IMPACT AND REFLECTIONS:

This kind of lecture program opens avenues for the students to pursue their course of interest depending on the exposure they get and fires their imagination right from the undergraduate level. The post graduate students are in a better position to select their field of investigation if they choose to go for research by attending this type of lecture program. The Research Scholars of the University get valuable insights in their field as some of them are directly working on this area of research and the others can extract some useful ideas of from this program. This lecture program also gives platform for the research scholars to present their work and get very useful feedbacks from the experts. This inspires and gives a research ambience to the postgraduate students who get to see their seniors sharing the same platform with the experts in the field and motivates them to get more and more involved into the line of thinking that demands research aptitude. In short, it ignites the young mind of aspiring young scientists by giving them a sneak-peek into the latest research activities.
PARTICIPANTS IN THE LECTURE PROGRAM:
SCHEDULE OF THE THREE DAY LECTURE PROGRAM
11th AUGUST, 2009

Inaugural Session

08:45 am - 08:55 am Lighting of lamp & Vedam chanting
08:55 am - 09:05 am Welcome address—Prof. C. Janardhana
09:05 am - 09:20 am Inaugural address by Vice-Chancellor, SSSU
09:20 am - 09:45 am Video on Sri Sathya Sai System of Education
09:45 am - 10:30 am Keynote address - Prof. V. Chandrasekar
10:30 am - 10:45 am Break

Session I

Chairperson: Prof. Govind Rao
10:45 am - 11:30 am Prof. Mukesh Doble
"Enzymatic degradation of polycarbonate"
11:30 am - 12:15 pm Prof. T. K. Chandrashekar
"Receptors for Cations and Anions"
12:15 pm - 12:30 pm Q & A session/Discussion
12:30 pm - 01:30 pm Lunch

Session II

Chairperson: Prof. Mukesh Doble
01:30 pm - 02:15 pm Prof. Somenath Mitra
"Dispersible Nanometal-Carbon Nanotube Hybrids With Potential Application in Homogeneous Catalysis"
02:15 pm - 2:30 pm Q & A session/Discussion
12th AUGUST, 2009

Session III

Chairperson: Prof. V. Chandrasekar
08:30 am – 08:50 am Sri. Dinesh Jagadeeshan
"Methanation of Carbonates"
08:50 am – 9:30 am Dr. Praveen Vadlanı
"Biofuels and Platform Chemicals from Agricultural Resources: Biocatalysis and Microbial Fermentation"
09:30 am - 10:15 am Prof. V. Laxminarayan
"Electrochemistry in Study of Biomaterials"
10:15 am - 10:30 am Q & A session/Discussion
10:30 am - 10:45 am Break

Session IV

Chairperson: Prof. Somenath Mitra
10:45 am - 11:30 am Prof. Govind Rao
"Real-time Bioprocess Sensors"
11:30 am - 12:15 pm Dr. R. Sai Sathish
"High-resolution surface plasmon coupled resonant filter- A low cost analytical tool with applications in biocatalysis, medicine and the environment"
12:15 pm - 12:30 pm Q & A session/Discussion
12:30 pm - 01:30 pm Lunch

Session V

Chairperson: Prof. T. K. Chandrashekar
01:30 pm - 02:15 pm Prof. V. Chandrasekar
"Catalysis by Molecules and Nanoparticles"
Student Presentations:
02:15 pm - 2:40 pm Sri. S. Aswath Narayana (PhD Scholar, SSSU)
“Biosynthesis of Silver Nanoparticles”
02:40 pm- 3:00 pm Sri. K. Naga Sai Visweswar (M.Phil Student, SSSU)
“Cyclic B-(1→3), (1→6)-Glucan: Scope And Applications”
03:00 pm – 3:15 pm Q & A session/Discussion

13th AUGUST, 2009

Session VI

Chairperson: Dr. Praveen Vadhani
08:45 am - 09:30 am Dr. V. Vijayalakshmi
“Tissue Engineering—An Overview”
09:30 am - 9:50 am Dr. G. Nageswara Rao
“Transformations of Naturally Occurring Lignans into Bioactive Lignans”
9:50 am – 10:35 Dr. Nanduri Srinivas
“Discovery of a Novel Cardiovascular Drug”
10:35 am - 10:50 am Q & A session/Discussion
10:50 am - 11:05 am Break

Session VII:

Chairperson: Dr. B. Sivakumar

11:05 am - 11:50 am Prof. K.B. Ramachandran
“Lipase Catalysed Reactions for Fatty Acid”
11:50 pm - 12:30 pm Valedictory Address Prof. T. K. Chandrashekar
12:30 pm - 12:45 pm Summary of the Lecture Programme
12:45 pm – 1:00 pm Vote of Thanks - Dr. S. Jagadeeswara Rao