Science Academies' Lecture Workshop on

'Fundamentals of Mathematical Analysis'

Organized by

Department of Mathematics, CHRIST [Deemed to be University], Bangalore-29

February 27 and 28, 2018

Report

The Science Academies' Lecture Workshop on 'Fundamentals of Mathematical Analysis' was successfully organized and completed by the Department of Mathematics, CHRIST [Deemed to be University] on 27th and 28th of February 2018 saw an overwhelming response from the student community. A total strength of one hundred (91) students from different colleges from the city of Bengaluru along with host institution itself also took part in this workshop. Apart from, the faculties, non-teaching staff of the host department were involved in this event to make it a grand success.

A total of 8 lectures (each of the 4 resource persons gave 2 lectures on each day) of 90 minutes duration were delivered by the four well-known Indian scientists/teachers covering the fundamental aspects of mathematical analysis in this Science Academies' lecture-workshop. The topic of the lectures was carefully selected by the convener Dr Kaushal Verma, IISc, Bengaluru, to ensure that the participants get a comprehensive understanding of the fundamentals in mathematical analysis in order to pursue their studies further. There were altogether 8 lectures delivered by the following:

1) Prof. Kaushal Verma, Department of Mathematics, Indian Institute of Science, Bengaluru.
2) Prof. Arvind Ayyer, Department of Mathematics, Indian Institute of Science, Bengaluru.
3) Prof.R Venkatesh, Department of Mathematics, Indian Institute of Science, Bengaluru.
4) Prof. Sivaguru, TIFR-CAM, Bengaluru.

Two-day Science Academies' Lecture workshop was inaugurated on 27th February 2018 at 9.00 AM in Seminar Hall, main campus, CHRIST (Deemed to be University), Bengaluru. Dr. S.U Kulkarni, the Dean of Sciences, CHRIST (Deemed to be University) and Dr. T. V. Joseph, the Head of the Department of Mathematics, CHRIST (Deemed to be University) and the convener Prof. Kaushal Sharma, IISc, Bengaluru addressed the gathering to set the tone for the event. Mr Mahanthesh B, the programme coordinator welcomed the guests, the resource persons and the participants from various colleges in the city while Dr Mayamma Joseph, Professor, Department of Mathematics, expressed her wishes and gave a vote of thanks.

The first two sessions in the morning for the workshop was by Prof. Kaushal Verma, Dept. of Mathematics, Indian Institute of Science, Bengaluru. His talk was on the topic 'Stone Weierstrass Theorem'. He gave the students the basic understanding of metric spaces, Weierstrass approximation, and the Stone Weierstrass Theorem with an intuitive approach. It was truly an eye-opening session that introduced the students to new, exhilarating possibilities.

Dr Ayyer, Dept. of Mathematics, Indian Institute of Science, Bengaluru, handled two lectures of the afternoon session on 'Linear Algebra to the rescue of combinatorics'. The topic was fascinating for all students because the discussed basics of graph theory were new mathematics not yet exposed to undergraduates. He discussed in detail about trees and cycles in mathematics with analogies from real life by giving a crystal clear understanding to all present. Two theorems; Cauchy-Binet theorem and Cayley's theorem; were discussed over the duration of the two lectures. He had cleared the doubts of the students with intense interaction during the half an hour tea break. Every student left the first day inspired and motivated to approach these concepts in a different light in the future.

The second day of the workshop started with the fifth Lecture by Dr. R. Venkatesh, Dept. of Mathematics, Indian Institute of Science, Bengaluru on the 'Jordan-Chevalley decomposition of a matrix and its applications'. The lecture started interactively with a discussion of the interesting concepts of group theory and modern algebra. Several facts/theorems he proved with a neat explanation and also he shed light on consequences and applications of these theorems. Additional discussion with students he carried out during tea break. The sixth lecture of his comprised of explanation of Jordan Blocks, the Jordan Form, and the Cayley-Hamilton theorem. The final

Lecture set VII and VIII were handled by Prof. Sivaguru, Dept. of Mathematics, TIFR-CAM, Bengaluru on 'Some aspects of sequences and series'. The topic although already covered by most undergraduates was decisively presented to everyone present with a fresh and intuitive take leaving all students with new found respect and confidence in manoeuvring around sequences and series. These lectures were very exciting and interesting for the participants.

Finally, we had a closing session. Participants were asked to give their feedback. A few participants from different colleges spoke about various aspects of the workshop. They felt this workshop was really beneficial for them and will help them in the future. This kind of workshops also helps to gather more information as well as knowledge about various topics in Mathematics that are related to each other. So they suggested that this kind of workshop should be continued more in the near future. Overall, the feedback was positive and the workshop ended after thanking all who have contributed to the workshop in one way or other. All the resource persons specially thanked the audience and the host institution for a fruitful and successful organization of the two-day workshop. On the whole, this two-day workshop was a very fruitful experience and left the participants honestly looking forward to more such gatherings. Hopefully, the future will see some commendable mathematicians emerging from amongst this crowd of inspired young individuals.

It is my pleasure to place on record the appreciation and thanks from the Department of Mathematics, CHRIST [Deemed to be University] to the Indian Academy of Sciences for the excellent support we received in organizing the Workshop in a systematic way. Thanks to Dr. Ravikumar and Dr Geetha for promptly responding to all the e-mails and for approving the proposal. The financial support by the Academies helped us conduct the programme in a smooth manner. Special thanks to Professor Kaushal Verma for his willingness to be the convener of the workshop and for the careful selection of the topics and speakers. Sincere words of appreciation to Dr. Aravind Ayyer, Dr. R Venkatesh and Dr. Sivaguru for their wonderful lectures. The Workshop underscored the need and necessity of providing a solid foundation in Mathematics to the young students aspiring for higher learning in Mathematics. This is often a big challenge to a teacher in the regular classroom environment; for the teachers' often focus on making the average excellent. We look forward to collaborating with the Indian Academy of Sciences in organizing similar programme in the future and contribute in the best way possible in nurturing skills of the young students who love to learn Mathematics.

Details of Participants

Sl. No.	Institution	No. of Students
1.	Jyoti Nivas College	8
2.	Kristu Jayanti College	6
3.	MLA College	6
4.	Mount Carmel College	8
5.	St. Joseph's College	5
6.	Christ [Deemed to be University]	55
Total		**88**

Workshop Convener

Dr Kaushal Verma

Speakers

Dr Kaushal Verma, IISc, Bengaluru.

Dr Arvind Ayyer, IISc, Bengaluru.

Dr R Venkatesh, IISc, Bengaluru.

Dr Sivaguru, TIFR-CAM, Bengaluru.

Photo Gallery