Brief report on Science Academies’ Lecture Workshop on Classical Mechanics

(December 4-6, 2014)

Organized by Department of Physics, Loyola College, Chennai

Convener: Prof. V. Balakrishnan, Dept. of Physics, IIT Madras
Coordinator: C. Joseph Prabagar, Dept. of Physics, Loyola College
Lecturers: Profs. Arul Lakshminarayan, S. Lakshmi Bala, Suresh Govindarajan and V. Balakrishnan
Dept. of Physics, IIT Madras, Chennai

The Workshop began at 9.00 am on December 4, 2014 with a short inaugural function. Rev. Fr. Dr. G. Joseph Antonysamy (Principal, Loyola College) felicitated the gathering. Dr. P. Sagayaraj (Head, Dept. of Physics, Loyola College) and Dr. S. Pauline, Dept. of Physics, Loyola College welcomed the participants. Prof. V. Balakrishnan in his inaugural address briefed the audience about the Science Education Panel of IASc and the various activities undertaken by the Science Academies in the cause of science education, including the summer student scholarships, refresher programmes, lecture workshops, journal publications, etc.

There were 6 academic sessions in all, 2 per day for 3 days. Each session comprised 2 ninety-minute lectures. Each of the 4 resource persons gave 1 lecture on each day. The details of the schedule and contents of the lectures are attached herewith.
The number of accepted applicants was 124, of whom 116 attended the Workshop. A Workshop kit was given to each participant. This comprised a spiral-bound 200 page note-book with a special cover design, a pen, a file folder and a copy of the Workshop schedule and lecture contents. The participants were particularly appreciative of the notebook and its cover design.

All 12 lectures were of the blackboard-and-chalk kind. The material covered was explained unhurriedly, with careful emphasis on the basic principles of the subject, and with many worked out examples to illustrate these principles. Throughout the Workshop, the participation of the audience was commendable, with frequent interaction between the lecturer and the audience. Though the “course” was an intensive one, audience interest remained high for the entire duration. Questions and free-ranging discussions invariably spilled over into the breaks between lectures and beyond the end of the evening session.

After the final lecture on the last day, there was a brief feedback session. Participants expressed their appreciation for the manner in which the Workshop had been organized and conducted. They expressed their gratitude to the Academies for sponsoring the workshop and thanked Loyola College for organizing the Workshop, and for making excellent arrangements for food and hospitality. Many participants requested that similar Lecture Workshops in the other subjects in the physics curriculum be held. Some teachers who participated in the Workshop also showed their interest in applying for and organizing similar Lecture Workshops in their colleges. Prof. V. Balakrishnan made brief concluding remarks, and urged interested students to go on to higher studies and research in physics.
Lecture Workshop on Classical Mechanics
Loyola College, Chennai, 4-6 December 2014

**Lecturers:** Arul Lakshminarayan (AL), S. Lakshmi Bala (SLB), Suresh Govindarajan (SG) and V. Balakrishnan (VB).

**Time-table:**

**Thursday, 4 December 2014**

09:00-09:30  *Registration and Inauguration*
09:30-11:00 Lecture 1  (VB)
11:00-11:20  *Coffee break*
11:20-12:50 Lecture 2  (SG)
12:50-14:00  *Lunch break*
14:00-15:30 Lecture 3  (AL)
15:30-15:50  *Tea break*
15:50-17:20 Lecture 4  (SLB)

**Friday, 5 December 2014**

09:30-11:00 Lecture 5  (VB)
11:00-11:20  *Coffee break*
11:20-12:50 Lecture 6  (SG)
12:50-14:00  *Lunch break*
14:00-15:30 Lecture 7  (AL)
15:30-15:50  *Tea break*
15:50-17:20 Lecture 8  (SLB)

**Saturday, 6 December 2014**

09:30-11:00 Lecture 9  (VB)
11:00-11:20  *Coffee break*
11:20-12:50 Lecture 10 (SG)
12:50-14:00  *Lunch break*
14:00-15:30 Lecture 11 (AL)
15:30-15:50  *Tea break*
15:50-17:20 Lecture 12 (SLB)
17:20-17:35 *Concluding remarks*
Objective: The main objective of this short but intensive Lecture Workshop was to help the participants develop an overall perspective of the general framework of classical dynamics, and of the Lagrangian and Hamiltonian formalisms in particular. The explicit working out of several appropriate physical examples was intended to aid this process.

Detailed contents of lectures:

Lectures 1, 5, 9 (VB)


Lectures 2, 6, 10 (SG)


Lectures 3, 7, 11 (AL)


Lectures 4, 8, 12 (SLB)


Suggested reading:

The literature on classical mechanics and dynamical systems is truly vast. Apart from specialised monographs on specific aspects of the subject, there are many excellent texts at the elementary, intermediate and advanced levels. A few of these texts are listed below, in order of increasing mathematical sophistication.

J. B. Marion and S. T. Thornton, *Classical Dynamics of Particles and Systems.*
I. Percival and D. Richards, *Introduction to Dynamics.*
J. V. Jose and E. J. Saletan, *Classical Dynamics: A Contemporary Perspective.*
SCIENCE ACADEMIES’ Lecture workshop on CLASSICAL MECHANICS.  
(December 4th, 5th & 6th 2014)  
- Organized by Dept. of Physics, Loyola college, chennai.

**Participants Details**

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<th>S.No</th>
<th>College/Institutions</th>
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**Total 116**
SCIENCE ACADEMIES’ LECTURE WORKSHOP ON CLASSICAL MECHANICS

ORGANIZED BY
DEPARTMENT OF PHYSICS
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