Lecture Programme for students of class XI and XII,
in association with National Academy of Sciences, Allahabad,
to be held at the Chennai Mathematical Institute, Siruseri
on 20th & 21st July 2015.

Monday, 20th July:

Time	Speaker	Title
10.00-11.00	**Amritanshu Prasad, IMSc.**	**The Platonic Solids** Abstract: Platonic solids are three dimensional analogues of regular polygons. But unlike regular polygons which are infinite in number, there are only five Platonic solids: the tetrahedron, the cube, the octahedron, the dodecahedron, and the icosahedron. I will tell you the story of these Platonic solids, and we will explore their properties by building origami models of some of them.
11.00-11.30		**Discussion**
11.30-11.45		**Tea break**
11.45-12.45	**Kamal Lodaya, IMSc.**	**From programs to processes to phones** Abstract: In school computer science we are taught about programs written in a strictly defined "language". In November 2014, a robot spacecraft called Philae landed on a comet and started running some programs, for example to photograph the comet surface. Who wrote these programs? Were they in some programming language? Suppose I am sending some messages to my friend on my phone. Is there a program behind this? Am I supposed to be using some programming language? This talk is about how the idea of programming and language has changed over time.
12.45-13.15		**Discussion**
13.15-14.15		**Lunch**
14.15-15.15	**Manjari Bagchi, IMSc.**	**Twinkle, twinkle little stars; Yes, I know what you are!** Abstract: In this talk, first I will mention what are the objects we see in the night sky (stars, planets, galaxies). I will also mention about different types of galaxies, stars. Then I will discuss how stars are born, why they shine, how they grow, how they die, and what happens after their death.
15.15-15.45		**Discussion**
15.45-16.00		**Tea break & disperse**

Tuesday, 21st July:

Time	Speaker	Title
10.00-11.00	**Priyavrat Deshpande, CMI**	**Plausible reasoning - a first step towards shaping our mathematical worldview** Abstract: Most of us see Mathematics as a discipline which has rigid standards and is codified and clarified by logic. During our school years we often miss out on a facet of Mathematics that has fluid standards, allows creativity and also challenges our beliefs. In my session I plan to lead an interactive discussion on plausible reasoning and demonstrate the experimental nature of Mathematics.
11.00-11.30		**Discussion**
11.30-11.45		**Tea break**
11.45-12.45	**Meghana Nasre, IIT-M**	**Stable Marriage Problem** Abstract: In a small village where every person knows everybody, suppose all eligible bachelors and bachelorettes are married off by a match-maker. In addition, assume that the match-maker is aware of each person's preferences. How should the match-maker pair off the suitors such that no one is tempted to break the engagement? This seemingly fictitious question, known as the Stable Marriage is a well-studied problem in Computer Science. Apart from the wide applicability of the problem in real-world scenarios like college admissions, assigning roommates to hostel rooms and many others, there exists a deep and beautiful mathematical structure underlying it. In this talk we will cover both these aspects – the practical motivations to study the Stable Marriage problem, the celebrated Gale and Shapley algorithm to solve it, and finally some surprisingly useful properties of the solution.
12.45-13.15		**Discussion**
13.15-14.15		**Lunch**
14.15-15.15	**K. Narayan, CMI**	**Black holes and the Bekenstein-Hawking entropy** Abstract: I'll briefly describe some examples which illustrate the laws of thermodynamics. Then I'll discuss thermodynamics in the context of black holes (endpoints of gravitational collapse of massive stars) and the Bekenstein-Hawking formula for black hole entropy, concluding with some modern perspectives and open questions.
15.15-15.45		**Discussion**
15.45-16.00		**Tea break & disperse**