



# Physical Research Laboratory, Ahmedabad

## Colloquium 19 - 12

**Speaker:** Prof. Mahan Mj  
Professor, School of Mathematics,  
Tata Institute of Fundamental Research (TIFR), Mumbai

**Title:** “Hyperbolic Geometry and Chaos in the Complex Plane”

**Time:** Wednesday, 21 August 2019, 16.00 hrs.

**Venue:** K.R. Ramanathan Auditorium, PRL

### Abstract

Instances of hyperbolic geometry come up in nature whenever a system starts developing fast interconnections. Examples include trees, the human brain, and the internet. A tell-tale signature is the existence of a fractal in one dimension less, e.g. the surfaces of trees and brains in the above examples. After dealing with the above examples, we shall discuss a special case where the fractals emerge in the complex plane as a result of symmetries of hyperbolic 3-space. These symmetries act on the complex plane as well; however the dynamics being chaotic, it is hard to get a hold on them directly. Instead, we go to hyperbolic geometry in 3 dimensions, set up a dictionary between the two and finally get a hold on the fractals in the complex plane through our study of hyperbolic geometry in 3 dimensions.

### The Speaker

Prof. Mahan Mj, also known as Mahan Maharaj and Swami Vidyanathananda, is a renowned mathematician and monk of the Ramakrishna Order. He is currently Professor of Mathematics at the Tata Institute of Fundamental Research in Mumbai. After his early education in Calcutta, he went to IIT-Kanpur, initially to major in Electrical Engineering, but then switched to mathematics and graduated from IIT Kanpur with a Masters degree in mathematics in 1992. He then moved to the US for his PhD and earned a doctorate from U.C. Berkeley in 1997. He then returned to India where he worked briefly at the Institute of Mathematical Sciences, Chennai in 1998. He then joined the Ramakrishna Mission the same year, received his saffron robe and became a monk in 2008.

Prof. Mahan Maharaj received the Shanti Swarup Bhatnagar award in 2011 and the Infosys Prize for Mathematical Sciences in 2015. He was Professor and Dean of Research at the Ramakrishna Mission Vivekananda University till 2015 and then moved to the School of Mathematics, Tata Institute of Fundamental Research, Mumbai.

Prof. Mahan Maharaj has made a substantial impact in the fields of geometric group theory, low-dimensional topology and complex geometry. His work in all these fields is characterized by its creativity and clever use of delicate geometric arguments.

**Tea at 15:30 hrs**  
**ALL ARE WELCOME**

