

**Open dynamical systems:
 β -expansion map on an interval with a hole**

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Mathematics

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Time: 3.00pm – 4.00pm
**Venue: MAS Executive Classroom 2 #03-07,
School of Physical and Mathematical Sciences**

Abstract: The study of open dynamical systems, first proposed by Pianigiani and Yorke in 1979 in the context of billiards, has attracted attention on account of both its dynamical interest and applications. We will discuss some recent results on expanding interval maps with a hole. Let $T_\beta : [0, 1) \rightarrow [0, 1)$ be an expanding map defined as $T_\beta(x) = \beta x \pmod{1}$, with $\beta \in \mathbb{N}$, and let $0 < a < b < 1$. Let \mathcal{W} denote the set of all initial conditions in $[0, 1) \setminus (a, b)$ whose forward orbit under T_β does not intersect with the hole (a, b) . We will discuss results which exhibit the relationship of the Hausdorff dimension of the set \mathcal{W} with the position and size of the hole. This is a generalization of the work by Glendinning *et al.* for the doubling map T_2 . We will also define a notion of escape rate and illustrate how escape rate depends on the size and position of the hole for the product of expanding maps.

Speaker Biography

Nikita Agarwal is currently Assistant Professor and Head-in-charge of Mathematics at IISER Bhopal, a teaching and research Institute, established by the Government of India. Her research interests lie in pure and applied dynamical systems. The topics include ergodic theory and statistical properties of dynamical systems, network theory - dynamics of complex systems as networks of coupled dynamical systems, bifurcation theory, quantitative and qualitative study of attractors on smooth surfaces. Dr. Agarwal received her Bachelor's degree in Mathematics from Lady Shri Ram College, Delhi University, INDIA and her MS and PhD degrees from the University of Houston, Texas, USA.

Host: Division of Mathematical Sciences, School of Physical and Mathematical Sciences