Title: Interactions between ergodic theory and number theory: from β-expansions to the Sierpinski gasket
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Abstract: In this talk we give an exposition on one of the interactions between ergodic theory and number theory. We will concentrate on the concept of β-expansions, which are representations of numbers of the form $x = \sum_{i=1}^{\infty} \frac{a_i}{\beta^i}$ with $\beta > 1$ a real number, and $a_i \in \{0, 1, \cdots, \lceil \beta \rceil - 1\}$. We explain first simple concepts in ergodic theory that can help us understand the asymptotic behaviour of a typical expansion. What typical is depends on the stationary measure under consideration, and each such measure highlights a particular property of points in its support, i.e. the world that the measure sees. We extend the one-dimensional ideas to higher dimensions and show how they can be used to study multiple codings of points in an overlapping Sierpinski gasket.