

Baylor Undergraduate Lecture Series  
in  
**Mathematics**  
Tenth Annual Lectures



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**Public Lecture**

**Ramanujan: The Man Who Knew Infinity**

Thursday, January 18, 2018 4:00 pm

Marrs McLean Science Building MMSCI 101

Ramanujan's work has had a truly transformative effect on modern mathematics, and continues to do so as we understand further lines from his letters and notebooks. In this lecture, the speaker will talk about Ramanujan matters today, and explain why Hollywood made the 2016 film about him. The speaker is an Associate Producer of the film *The Man Who Knew Infinity* (starring Dev Patel and Jeremy Irons) about Ramanujan. He will share several clips from the film in the lecture. The speaker will also share some of Ramanujan's work which are most accessible to the general public.

**Colloquium Lecture:**

**Can't you just feel the Moonshine?**

Friday, January 19, 2018 4:00 pm

Marrs McLean Science Building MMSCI 301

Richard Borcherds won the Fields medal in 1998 for his proof of the Monstrous Moonshine Conjecture. Formulated in 1979 by John Conway and Simon Norton, the conjecture asserts that the representation theory of the Monster, the largest sporadic finite simple group, is dictated by the Fourier expansions of a distinguished set of modular functions. This conjecture arose from astonishing coincidences noticed by finite group theorists and arithmetic geometers. Recently, mathematical physicists have revisited moonshine, and they discovered evidence of undiscovered moonshine which some believe will have applications to string theory and 3d quantum gravity. The speaker and his collaborators have been developing the mathematical facets of this theory, and have proved the conjectures which have been formulated. These results include a proof of the Umbral Moonshine Conjecture, and the last remaining problem raised by Conway and Norton in their groundbreaking 1979 paper. The most recent Moonshine (announced here) yields unexpected applications to the arithmetic of elliptic curves thanks to theorems related to the Birch and Swinnerton-Dyer Conjecture and the Main Conjectures of Iwasawa theory for modular forms. This is joint work with John Duncan, Michael Griffin and Michael Mertens.



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