



# PIMS- SFU

## Distinguished Lecture Series

### Ken Ono (Emory University)

Nov 7, 2017

Room: ASB 10940

Simon Fraser University

Burnaby, BC

3:30pm

## Can you feel the Moonshine?

Borcherds won the Fields medal in 1998 for his proof of the Monstrous Moonshine Conjecture. Loosely speaking, 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 in the 1970s.

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 Moonshine for the first sporadic finite simple group which does not occur as a subgroup or subquotient of the Monster. The most recent Moonshine (announced here) yields unexpected applications to the arithmetic 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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KEN ONO is the Asa Griggs Candler Professor of Mathematics at Emory University. He is considered to be an expert in the theory of integer partitions and modular forms. His contributions include several monographs and over 150 research and popular articles in number theory, combinatorics and algebra. He received his Ph.D. from UCLA and has received many awards for his research in number theory. He was awarded a Presidential Early Career Award for Science and Engineering (PECASE) by Bill Clinton in 2000 and he was named the National Science Foundation's Distinguished Teaching Scholar in 2005. He serves as Editor-in-Chief for several journals and is an editor of The Ramanujan Journal. Visit his web page at <http://www.mathcs.emory.edu/~ono/>

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