

# NUMBER THEORY SEMINAR

## *On the Number of Representations as a Sum of $s$ Squares*

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ABSTRACT: Fermat's 'two square' theorem says that an odd prime  $p$  can be expressed as a sum of two integer squares if and only if  $p \equiv 1 \pmod{4}$ . From this theorem we can deduce exactly which integers  $n$  have a representation as the sum of two squares. A natural question is then, 'How many representations does  $n$  have?' Furthermore, what can be said about representations as the sum of  $s$  squares for  $s$  larger than 2? In this talk, I'll discuss how we can use modular forms to give an exact formula for the number of representations of  $n$  as a sum of  $s$  squares for  $5 \leq s \leq 8$ . I'll also talk about how the same technique can be extended to the cases  $s = 3$  and  $s = 4$  (though it is quite a bit more difficult).

WEDNESDAY, APRIL 17, 2013  
2:40 - 4:00 PM  
ROOM 527 WACHMAN HALL  
DEPARTMENT OF MATHEMATICS