

# Graduate Seminar

## Speaker

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**Thursday, February 7, 2019  
1pm, HH-3017**

## Composition algebras and related groups

**Abstract:**

It is well known that the product of sums of two squares can itself be expressed as a sum of two squares, and this expression is tantamount to multiplicativity of the norm of complex numbers. The algebra of quaternions, discovered by Hamilton in 1843, also possesses a multiplicative norm, which allows one to express the product of sums of four squares as a sum of four squares. This can be taken one step further by constructing the algebra of octonions, discovered independently by Graves (1843) and Cayley (1845). Since their discovery, these so-called composition algebras have played a very important role in algebra and geometry, and they are closely related to many interesting transformation groups including the exceptional Lie groups. This talk is an introduction to composition algebras. Time permitting, we will also mention some of their many applications.