Séminaire d'algèbre, topologie et géométrie
Jeudi 25 avril à 14h
Salle I

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Bonn / Yale

Ramanujan's mock theta functions and quantum modular forms

Ramanujan's last letter to Hardy (c. 1920) contains a list of curious q-series he calls "mock theta functions." Despite much research interest in these functions in the decades following Ramanujan's death, due to combinatorial structures, their asymptotic properties, related identities, among other things, the precise roles played by these functions within the theory of modular forms (complex valued functions obeying certain symmetries) was not well understood until recently (c. 2002).

In this talk, we will review the development of the theory of "mock modular forms" over the last decade, beginning with Ramanujan's original peculiar q-series as examples. We will also revisit Ramanujan's last letter to Hardy, and prove one of Ramanujan's remaining claims about mock theta functions. We will show how Ramanujan's claim is in fact related to "quantum modular forms," newly defined by Zagier (c. 2009).

This is joint work with K. Ono (Emory U.) and R.C. Rhoades (Stanford U.).