



Berlin  
Mathematical  
School

## BMS Kovalevskaya Colloquium

**Friday 15 April 2011 at 14:15**

*Tea before the lecture begins at 13:00*

BMS Loft, Urania, An der Urania 17, 10787 Berlin

### Kathrin Bringmann

*(U Köln)*



**Srinivasa Ramanujan**

#### Mock theta functions, probability and cellular automata models

In her talk, Kathrin Bringmann will speak about the occurrence of mock theta functions (certain peculiar series introduced by Ramanujan in his last letter to Hardy) in probability and cellular automata growth models.

Mock theta functions occur in several areas, including number theory, combinatorics, the representation theory of Lie superalgebras and in physics for example in the theory of black holes. In the talk, Kathrin Bringmann will mainly investigate one particular mock theta function which nicely relates to combinatorics and she will describe new methods to understand the asymptotic behavior of the associated partition functions. Moreover, she will show how this object also relates to probability and cellular automata models. All the work presented was done jointly with Karl Mahlburg.

Kathrin Bringmann was awarded the 2009 SASTRA Ramanujan Prize. Established in 2005, this \$10,000 prize recognizes exceptional work in fields explored by the Indian mathematician Srinivasa Ramanujan. Born in 1887, Ramanujan was a self-taught mathematical prodigy with particular interests in number theory and modular functions. To take note of Ramanujan's untimely death at the age of 32, the award is restricted to applicants no older than 32.

Bringmann was selected for her work on modular forms and mock theta functions. Ramanujan discovered these functions shortly before his death, and they have become one of his greatest contributions. The coefficients of these functions are easy to evaluate, making them similar to theta functions, which are involved in theories concerning moduli spaces and quadratic forms.