# The 2nd Combinatorics Day

## Saturday, 17th of March of 2012

DMUC, room 2.5

Abstracts

12:00-12:30 **William Keith** (CELC, UL):

Congruences and symmetries of the eta-power polynomials

**Abstract:** Powers of the eta function, $\prod (1-q^k)^{b-1} = \sum \frac{q^n}{n!} p_n(b)$, have a beautiful expansion in terms of the hooklengths of partitions given by Nekrasov and Okounkov, and independently by Guo-Niu Han. It seems to have escaped notice that the polynomials $p_n(b)$ exhibit numerous symmetries: internally, the coefficients in certain arithmetic progressions are equidistributed modulo any prime, in analogy to the classical partition congruences, and externally, the factorizations of the $p_n(b)$ are periodic modulo any prime, in a fashion that will be made precise. The talk will summarize current best results and describe a wide array of open questions.