NUMBER THEORY SEMINAR

The Gauss-Wilson Theorem for Partial Products

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WHERE: Chase 227

ABSTRACT:

For positive integers $M > 1$ and $n \equiv 1 \pmod{M}$ we define the *Gauss factorial* $((n-1)/M)_n!$ to be the product of all integers up to $(n-1)/M$ and relatively prime to n, a terminology suggested by Gauss's generalization of Wilson's theorem. While the multiplicative orders $\pmod{n}$ of Gauss factorials are completely determined when $M = 2$, the general case presents numerous interesting challenges. After some general results, this talk will concentrate on the special cases $M = 3$ and $M = 4$. The binomial coefficient theorems of Gauss and Jacobi are important tools, as are certain Pell equations and their solutions. Some large-scale computations are also involved. (Joint work with John B. Cosgrave.)

Any questions, please e-mail: rnoble@mathstat.dal.ca.