

Department of Mathematics and Statistics  
**COLLOQUIUM**

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What's in a polynomial (or power series)?  
A partial history of the notion of 'content',  
from 1801 to 2014.

I will discuss some algebraic properties of polynomials (and power series). We consider polynomials  $f=f(t)$  whose coefficients lie in various rings  $R$  (e.g. the integers, polynomials  $g(x,y)$  whose coefficients are rational numbers, etc.). I will introduce the notions of ideals, their products, and the "content" ideal of a polynomial,  $c(f)$ . It is an interesting problem to study whether content is multiplicative, that is, whether  $c(fg)=c(f)c(g)$ . For polynomials over the integers, the answer is yes (Gauss, 1801). More generally, it is multiplicative up to a certain factor (Dedekind/Mertens, 1892). This relates to unique factorization and other algebraic properties. I will discuss progress (and setbacks) over the past two centuries, including recent generalizations of both formulas to the case of power series. Previous experience with rings is not assumed.

**TUESDAY, OCTOBER 27th**

**SCIENCE CENTER 199**

**Refreshments 4:15**

**Talk 4:30**

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