Rings whose Derivations are Closed under taking Compositions

Undergraduate Math Club
CORNELL UNIVERSITY

$$\partial(x \cdot y) = x\partial(y) + \partial(x)y$$

Speaker

Nikita Borisov

ABSTRACT

Given a ring R, a map $\delta : R \to R$ is a derivation if it is additive and satisfies the Leibniz rule ($\delta(ab) = \delta(a)b + a\delta(b)$ for all $a, b \in R$). It is well known that the set of derivations on a ring, denoted Der(R), form a Lie ring (i.e. Der(R) is closed under addition and lie brackets $[\delta_1, \delta_2] = \delta_1 \circ \delta_2 - \delta_2 \circ \delta_1$), but are typically not closed under composition. Take for instance the formal derivative on polynomials of x; the double derivative doesn't satisfy the Leibniz rule. We would like to study the cases when they are closed under composition (i.e. Der(R) forms a ring) with a particular focus on finite rings.

September 28th at 5:15pm

Malott 532 ⋆ Refreshments