SERHII KOVAL, Memorial University of Newfoundland
Weyl algebras and symmetries of differential equations

Let $\mathbb{K}$ be a field of characteristic zero. The first Weyl algebra A_1 is a unital associative $\mathbb{K}$-algebra generated by elements x and ∂ that satisfy the defining relation $\partial x - x\partial = 1$. The nth Weyl algebra is the n-fold tensor product $A_1^{\otimes n}$, and it is canonically isomorphic to the ring of differential operators $\mathbb{K}[x_1, \ldots, x_n][\frac{\partial}{\partial x_1}, \ldots \frac{\partial}{\partial x_n}]$.

Weyl algebras are fundamental objects in ring theory and they arise in many branches of mathematics and physics, for example, quantum mechanics, representation theory and noncommutative geometry. In this talk, I will discuss how algebras A_n arise in symmetry analysis of differential equations, and what new knowledge about the structure of A_n can be obtained using symmetries of differential equations. This talk is based on a joint project with Roman O. Popovych.