

**Raffaele Vitolo** (Universita del Salento, Lecce, Italy)

*Local variationality through symmetries and conservation laws*

**Abstract:** In this talk we consider Yang-Mills-type equations. We first suppose that the number  $n$  of independent variables fulfills  $n \geq 3$ , and that the equations are of second order. Then we show that the existence of translational symmetries and conservation laws, and gauge symmetries and conservation laws, implies that the equations are locally variational. An example shows that higher order Yang-Mills-type equations do not have this property, at least if  $n \geq 4$ .