# SYMPLECTIC NILMANIFOLDS AND APPLICATIONS

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The talk is devoted to the remarkable sequence of principal smooth $S^1$-bundles $\{M^n - > M^{n-1}; n \geq 2\}$. This sequences are defined by the nilpotent groups of the polynomial transformations of the real line. Each $M^n, n \geq 2$, is a smooth nilmanifold with a 2-form which gives a symplectic structure on any $M^{2k}$. Such manifolds play an important role in different areas of mathematics. We will discuss the differential-geometric and algebro-topologic results and unsolved problems concerning this manifolds.