

My research thema is Ricci solitons and Algebraic Ricci solitons. My plan is as follows.

(1) **Semi-algebraic Ricci solitons in the Lorentzian setting**

M. Jablonski defined a semi-algebraic Ricci soliton in Riemannian case. Using the theory of algebraic Ricci solitons and semi-algebraic Ricci solitons, he investigated homogeneous Ricci solitons. I will consider a semi-algebraic Ricci soliton in the Lorentzian setting. In pseudo-Riemannian case, there exist algebraic Ricci solitons which are not semi-algebraic Ricci soliton. I will study semi-algebraic Lorentzian Ricci solitons more deeply.

(2) **Algebraic Ricci solitons on Nilpotent Lie groups with pseudo-Riemannian left-invariant metrics**

In [6], we constructed nilsolitons of H -type in the Lorentzian setting. I consider in the pseudo-Riemannian case. Since the negative part is one in the Lorentzian case, we can construct nilsolitons of H -type in the Lorentzian setting. In the pseudo-Riemannian case, I can not use this theory, and I need another theory.