1172-58-220   **Yury Ustinovskiy*** (`yuraust@gmail.com`), 17 Memorial Drive East, Chandler-Ullmann Hall, Room 225, Bethlehem, PA 18015. *Variational approach to the steady Generalized Kähler-Ricci solitons.*

This talk concerns Generalized Kähler-Ricci solitons (GKRS) - geometric structures independently arising in the context of supersymmetric sigma models, generalized geometry of Hitchin and Gualtieri, uniformization problems in non-Kähler geometry and Einstein-Weyl geometry. GKRS are natural generalizations of Ricci-solitons, incorporating a torsion term.

Every Generalized Kähler (GK) structure on a smooth manifold M admits an infinitesimal variation parametrized by $C^\infty(M, R)/$. Integrating such infinitesimal variations we obtain a notion of GK class, and it makes sense to study existence and uniqueness questions for GKRS in a given class. Following the fundamental ideas in Kähler geometry, we define a weighted J-functional on the GK class of a log-nondegenerate GK manifold. This functional naturally extends the Aubin' functional in Kähler geometry, and J-functional of Apostolov and Streets in nondegenerate GK setting. We prove that a log-nondegenerate GK structure is a critical point for the weighted J-functional if and only if it is a gradient steady GKRS. We use this functional to prove rigidity of solitons in a given GK class, and use the latter to deduce complete classification of compact GKRS for $\dim M = 4$ (joint with V.Apostolov and J.Streets) (Received August 29, 2021)