Joint Seminar: "Geometry&Physics"-DFT (IFIN-HH) and "Geometry"-IMAR (Geometry&Physics Homepage) (Geometry Homepage)

Seminar organizers: Mirela Babalic (NIPNE) & Sergiu Moroianu (IMAR)

Zoom link: https://us02web.zoom.us/j/891199217919

Date: Wednesday, January 20, 2021, 17:00 Bucharest time (15:00 GMT)

Title: **Heterotic solitons on four-manifolds**

Speaker: **Carlos Shahbazi** (Univ. of Hamburg, Dept. of Math.)

Abstract: I will discuss four-dimensional Heterotic solitons, defined as a particular class of solutions of the equations of motion of Heterotic supergravity on a four-manifold M. Heterotic solitons depend on a parameter κ and consist of a Riemannian metric g, a metric connection with skew torsion H on TM and a closed one-form φ on M. In the limit $\kappa \to 0$, Heterotic solitons reduce to a class of generalized Ricci solitons and can be considered as a higher-order curvature modification of the latter. If the torsion H is identified with the Hodge dual of φ, Heterotic solitons consist of either flat tori or closed Einstein-Weyl structures on manifolds of type $S^1 \times S^3$ as introduced by P. Gauduchon. More generally, I will construct several families of Heterotic solitons as suspensions of certain three-manifolds with prescribed constant principal Ricci curvatures, amongst which we find hyperbolic manifolds, manifolds covered by $\mathrm{Sl}(2,\mathbb{R})$ and $\mathrm{E}(1,1)$ or certain Sasakian three-manifolds. These solutions exhibit a topology dependence in the string slope parameter κ and yield, to the best of our knowledge, the first examples of Heterotic compactification backgrounds not locally isomorphic to supersymmetric compactification backgrounds. Work in collaboration with Á. Murcia and A. Moroianu.