1086-49-896   **Ioan R Ionescu*** (`ioan.r.ionescu@gmail.com`), LSPM, University Paris 13, Sorbonne Paris Cit, 99 Av. J-B. Clement, 93430 Villetaneuse, France. *From Cheeger problem to limit analysis.*

The talk focuses on a new limit analysis method, called Discontinuous Velocity Domain Splitting method (DVDS). To solve the nonlinear PDE problem associated to ductile rupture (failure), DVDS considers a special class of velocity fields: the body is splinted into sub-domains animated by rigid motions. The collapse flow velocity field results in localized deformations only, located at the boundary of the sub-domains. The associated numerical technique is mesh free and its it based on a level set description of the partition and on genetic minimization algorithms.

For the scalar flow of a von-Mises material, DVDS is exact in solving the limit load problem. DVDS formulation reduces to the famous geometry problem of Cheeger, related to the eigenvalues of the Laplacian operator. One of the challenges is to know if these results are still valid in the vectorial case.

Two applications will be considered: dense avalanches onset of shallow natural structures and homogenization techniques for porous crystals. (Received September 15, 2012)