Ziegler-Bottema dissipation-induced instability and related topics

Dr. Oleg Kirillov
Helmholtz-Zentrum Dresden-Rossendorf

In 1952 Hans Ziegler of ETH Zurich discovered that even an infinitesimally small viscous damping can: (i) destabilize a marginally stable ideal elastic system under the action of a follower force and (ii) diminish by a final amount the instability threshold calculated for the ideal system. The first phenomenon is known as a dissipation-induced instability and the second - as the destabilization paradox. The paradox attracted attention of such researchers as Oene Bottema, Vladimir Bolotin, George Hermann and many others. Its resolution requires a combination of singularity theory, perturbation theory of multiple eigenvalues of non-self-adjoint operators, and theory of Hamiltonian and reversible systems. The two phenomena are universal and take place in both solid and fluid mechanics. I will discuss both the general results and applications with historical remarks.

Tutti gli interessati sono invitati a partecipare.

Il seminario è organizzato dal gruppo di Scienza delle Costruzioni
(D. Bigoni, L. Deseri, N. Pugno, M. Gei, A. Piccolroaz, F. Dal Corso, M.F. Pantano, R. Springhetti)