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AVVISO DI SEMINARIO

Si comunica che **giovedì 24 Gennaio a partire dalle ore 10**
si terrà presso l'aula **2R** (via Mesiano 77) il seguente seminario

Gyro-elastic multi-structures: Modelling, analysis and applications

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Gyro-elastic media possess special dynamic properties, unachievable in other mechanical systems, within both low and high frequency regimes. They also have the potential to open new pathways in the design of innovative structured materials and wave-rerouting systems for civil engineering assemblies. These motivations have recently led to the creation of several novel models describing the interaction of gyroscopic spinners with elastic systems [1-6].

In this talk, we first present an overview of existing models for gyro-elastic systems. Following this, we turn our attention to the transient analysis of a truss system composed of periodically placed masses interconnected by elastic rods and attached to gyroscopic spinners [7]. This analysis is based on an asymptotic model characterising the interaction of a spinner with a mass embedded in the truss system. Several examples are given that illustrate the transient features of special dynamic phenomena, including unidirectional interfacial waves and highly localised waveforms. Two important applications of the model are also proposed, that demonstrate gyro-elastic systems can be utilised to design an efficient structured topological insulator and a cloaking device for a discrete medium.

References

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[2] G. Carta, M. Brun, A.B. Movchan, N.V. Movchan and I.S. Jones (2014): *Dispersion properties of vortex-type monatomic lattices*, Int. J. Solids Struct. 51, 2213–2225.

[3] G. Carta, I.S. Jones, N.V. Movchan, A.B. Movchan and M.J. Nieves (2017): *"Deflecting elastic prism" and unidirectional localisation for waves in chiral elastic systems*, Sci. Rep. 7, 26.

[4] G. Carta, M.J. Nieves, I.S. Jones, N.V. Movchan and A.B. Movchan (2018): *Elastic chiral waveguides with gyro-hinges*, Quart. J. Mech. Appl. Math. 71, 157–185.

[5] M.J. Nieves, G. Carta, I.S. Jones, A.B. Movchan and N.V. Movchan (2018): *Vibrations and elastic waves in chiral multi-structures*, J. Mech. Phys. Solids 121, 387–408.

[6] M. Garau, G. Carta, M.J. Nieves, I.S. Jones, N.V. Movchan and A.B. Movchan (2018): *Interfacial waveforms in chiral lattices with gyroscopic spinners*, Proc. Roy. Soc. A. 474, 20180132.

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[7] M. Garau, M.J. Nieves, G. Carta, and M. Brun (2019): *Transient analysis of a gyro-elastic structured medium: unidirectional waveforms, preferential directionality and cloaking*, (submitted).

Tutti gli interessati sono invitati a partecipare.

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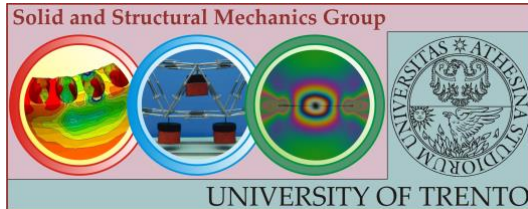
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