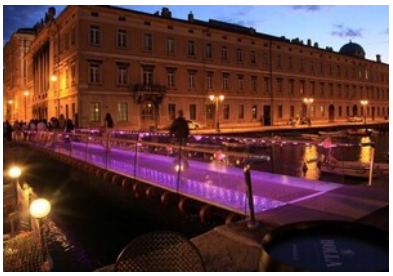

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On the stability and deformability of topological stars

Thursday, 22 June 2023 16:00 (45 minutes)

Topological stars, or top star for brevity, are smooth horizonless static solutions of Einstein-Maxwell theory in 5-d, that reduce to spherically symmetric solutions of Einstein-Maxwell-Dilaton theory in 4-d. In the framework of the fuzzball program, they represent possible microstate geometries for non-supersymmetric black holes. The study of linear scalar perturbations of top stars allows to argue for their stability and deformability. With different techniques, including WKB approximation, numerical analysis and quantum Seiberg-Witten curves, one can identify three classes of quasi-normal modes: long-lived meta-stable, prompt ring-down and 'blind' modes. The corresponding frequencies have negative imaginary part, thus suggesting linear stability for top stars. Moreover the tidal Love and dissipation numbers, encoding the response to tidal deformations, can be determined. Similarly to black holes, both of them vanish in the static limit; however, contrary to black holes, the dynamical Love number is non-trivial and there are no dissipative effects at linear order.

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