

# University of Miami, Physics Department Colloquium

---

**Date:** Wednesday, November 8, 2023

**Time:** 4:00 pm – 5:00 pm

**Zoom link:** <https://miami.zoom.us/j/94578713834?pwd=WU9jcmF2eWtjOHlmNXh1Y0Fhb1BXQT09>

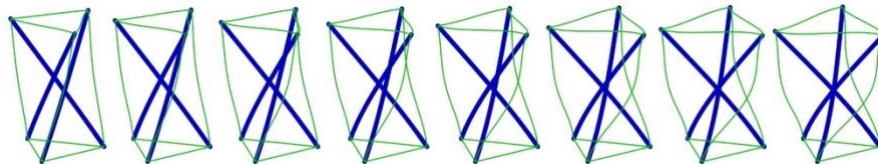
## Building stable tensegrities for engineering applications

**Dr. Ajay B. Harish**

University of Manchester, U.K.

### Abstract

Tensegrity structures have been extensively studied over the last years due to their potential applications in modern engineering like metamaterials, deployable structures, planetary lander modules, etc. Many of the form-finding methods proposed continue to produce structures with one or more soft/swinging modes. These modes have been vividly highlighted and outlined as the grounds for these structures to be unsuitable as engineering structures. This work proposes a relationship between the number of rods and strings to satisfy the full-rank convexity criterion as a part of the form-finding process. Using the proposed form-finding process for the famous three-rod tensegrity, the work proposes an alternative three-rod tensegrity that is stable. The work demonstrates that the stable tensegrities suitable for engineering are feasible and can be designed.



**Biography:** Dr. Ajay B. Harish is a Lecturer (equivalent to US assistant professor) in Engineering Simulation and Data Science at the School of Engineering, University of Manchester, UK. His group has an expertise in the development of physics- and data-driven techniques for modelling fluid- structure interaction with a focus on of thin- structures using high-performance computing. In the recent years, his group has been focusing on applications of tensegrities for biomedical and bio-inspired engineering. He has also been a visiting faculty in University of Cambridge (UK), JNCASR (India) and A\*Star (Singapore) in the recent past.



His academic training includes Doctor of Engineering in Mechanical Engineering from Leibniz University Hannover (Germany); Masters in Aeronautics from California Institute of Technology (USA); B.Tech in Mechanical Engineering from NITK Surathkal (India). He was offered the prestigious Ramanujan Fellowship from the Government of India in 2022. He has received the Russel R. Vought Fellowship in 2007-08, scholarship from Continental AG in 2011-15, was honored with the Viktor-Rizkallah Award for best international researcher by the Leibniz Foundation in 2016, Best researcher in Mechanics by the Mechanics division of Leibniz Foundation in 2017, LUT Foundation scholarship in 2017 and 2019.