

Description

Wikipedia says “A Deployable Structure is a structure that can change shape so as to significantly change it’s size.” Guess what, It’s True! Hehe.

Picture this: it's a scorching sunny day in Vellore, and the heat is unbearable. Why not grab that umbrella from your bag and use it as a shade for you and your friend? The idea is simple: when the umbrella is packed inside your bag, it's in a compact, space-saving state. But when you open it up to shield yourself from the sun, it expands to cover more space—just like how things change from compact to expanded state when they're deployed!

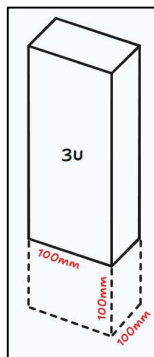
Just as an umbrella cannot be stored in its open state within the limited space of a bag, large space structures are also compactly stowed within the available space of a rocket. Once the rocket reaches the desired orbit, where space is abundant, the structure is then deployed.

Problem Statement

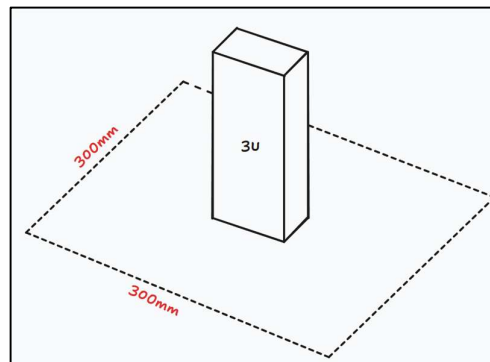
While the concept may seem straightforward, space poses unique challenges (**which is very exciting*). Compacting large deployable structures and planning their deployment sequence are complex tasks. There are additional challenges to consider, and Guerin is seeking assistance in finding a solution for the below

“You have to design a unique deployable structure/mechanism (representative of a Solar Array) for a 3U (10x10x30cm) CubeSat with maximum deployment area to minimum stowage volume” that must adhere to the following requirements

Stowed State Envelope



Deployed State Envelope



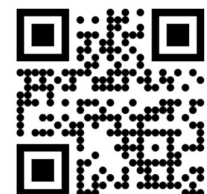
What is Expected from you?

- A simple working dummy Model/PoC should be developed which shows the “Deployment” (**with or without motors*).
- Team Size: ≤ 3
- Materials to look out for (**to get your hands dirty*)
 - Acrylic Sheets, Cardboard sheets, anything thick, Paper, Straws, Wooden sticks, Butter Paper, Lamination sheets, tapes, rubber bands etc.
- Bonus Points if you can further reduce the stowed volume.

So, what’s the outcome of the work that you do?

Interested or Passionate candidates with an “Out of the box thinking” will be offered

- Paid Internships at Guerin and opportunity to work with ISRO scientists.
- Treats on us at the Lassi Point in front of Woody’s.



*Hint: Take Inspiration from the Nature around you or other forms of paper folding or compliant mechanisms
Scan the QR code for some deployment references.*