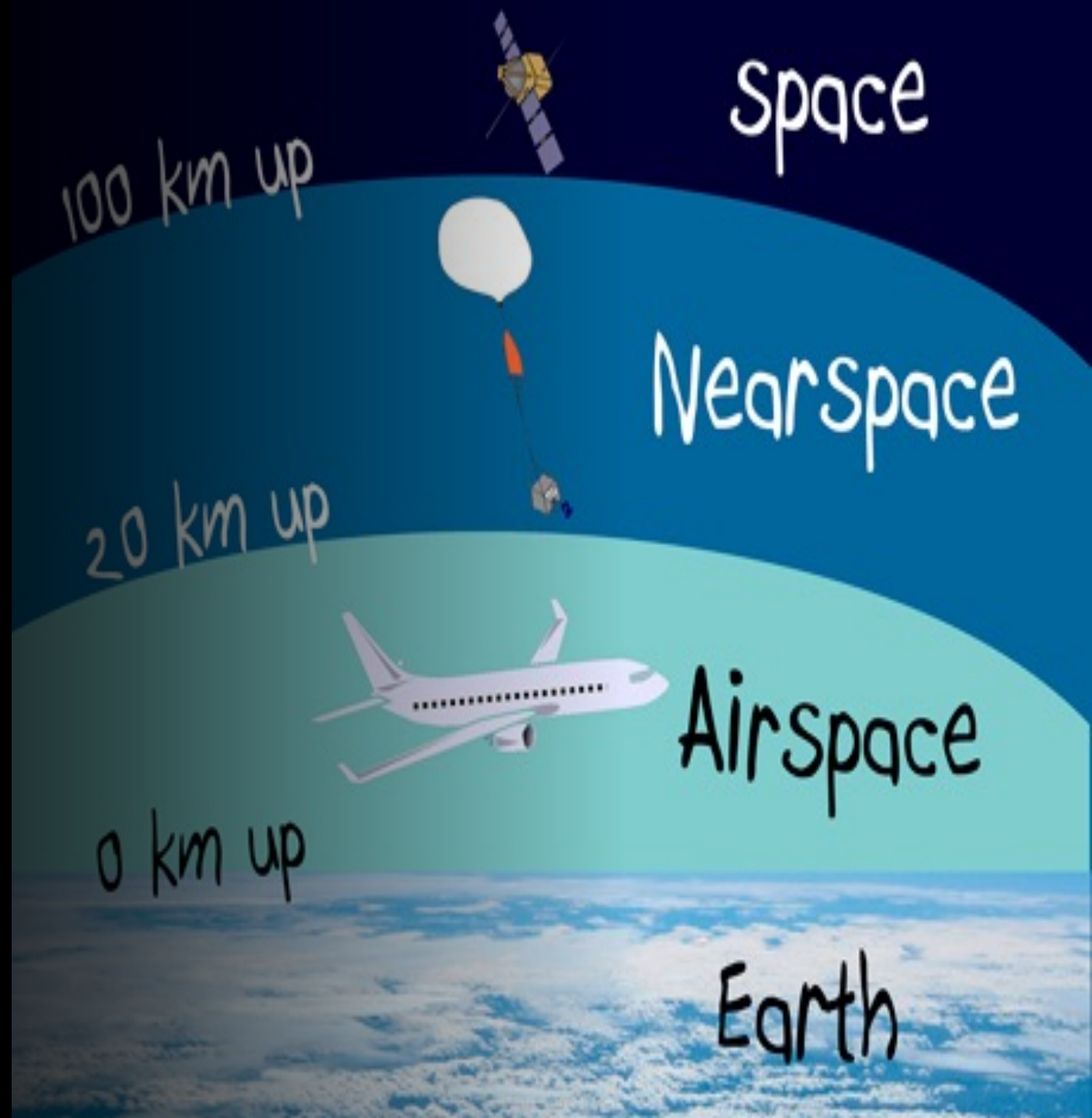
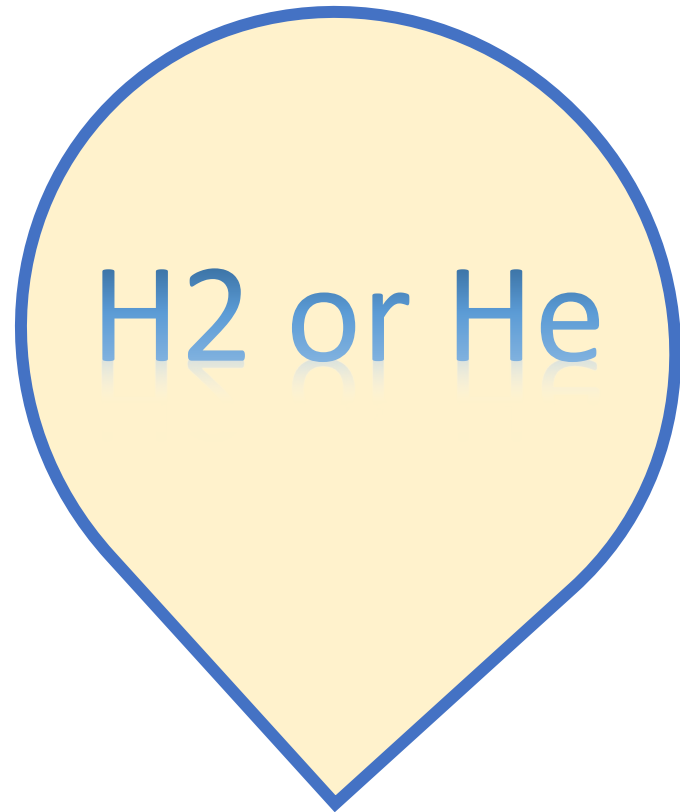


Design improvement of high-altitude balloons

By Dr.Krishna



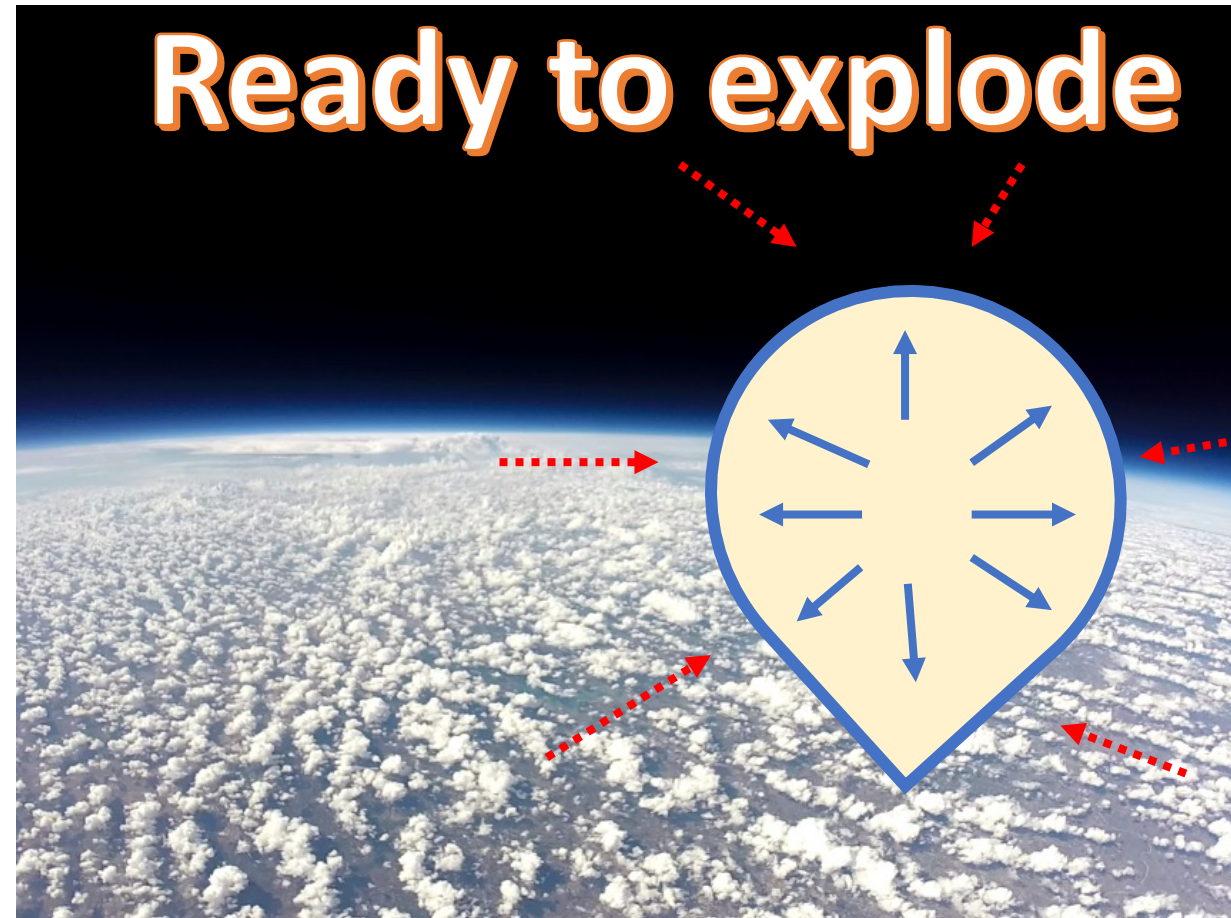
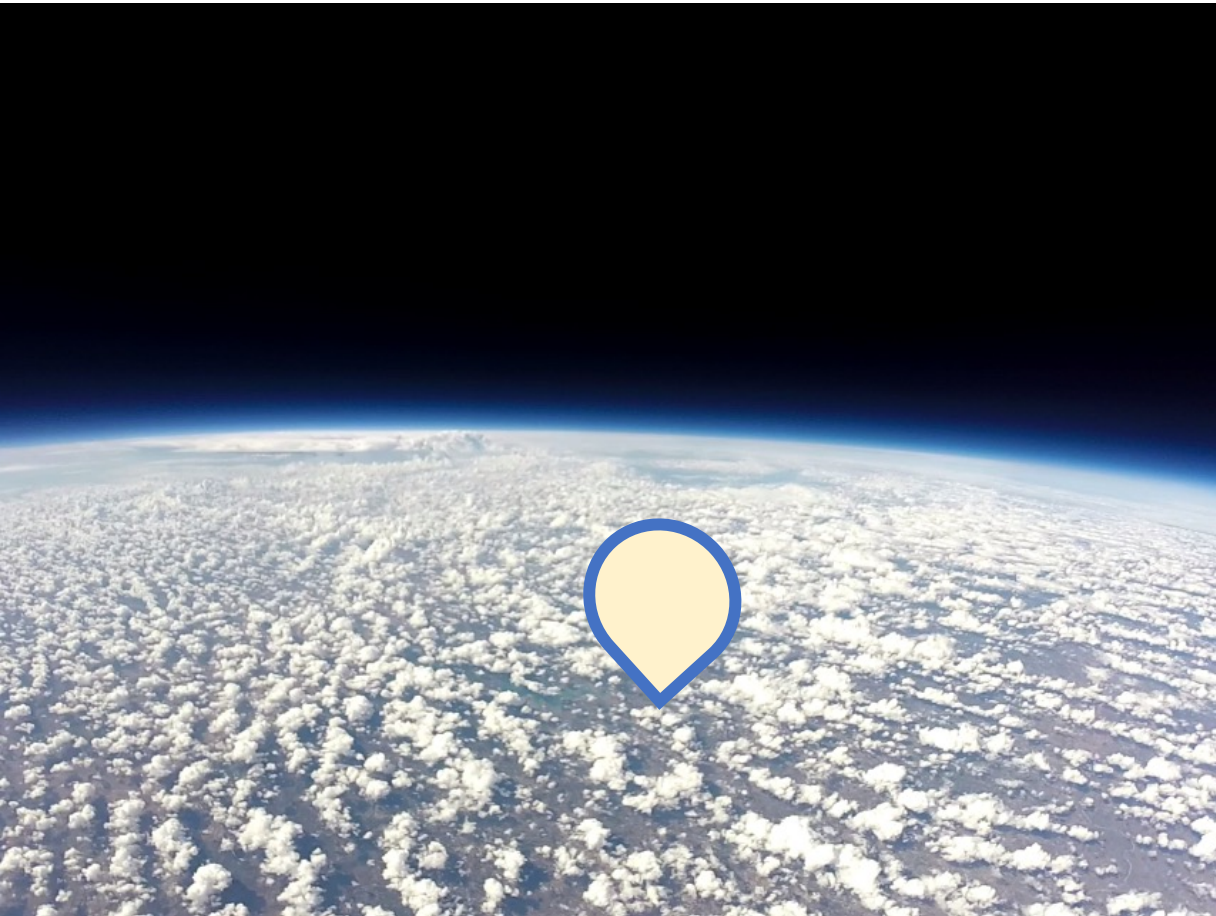
Regular high-altitude balloon



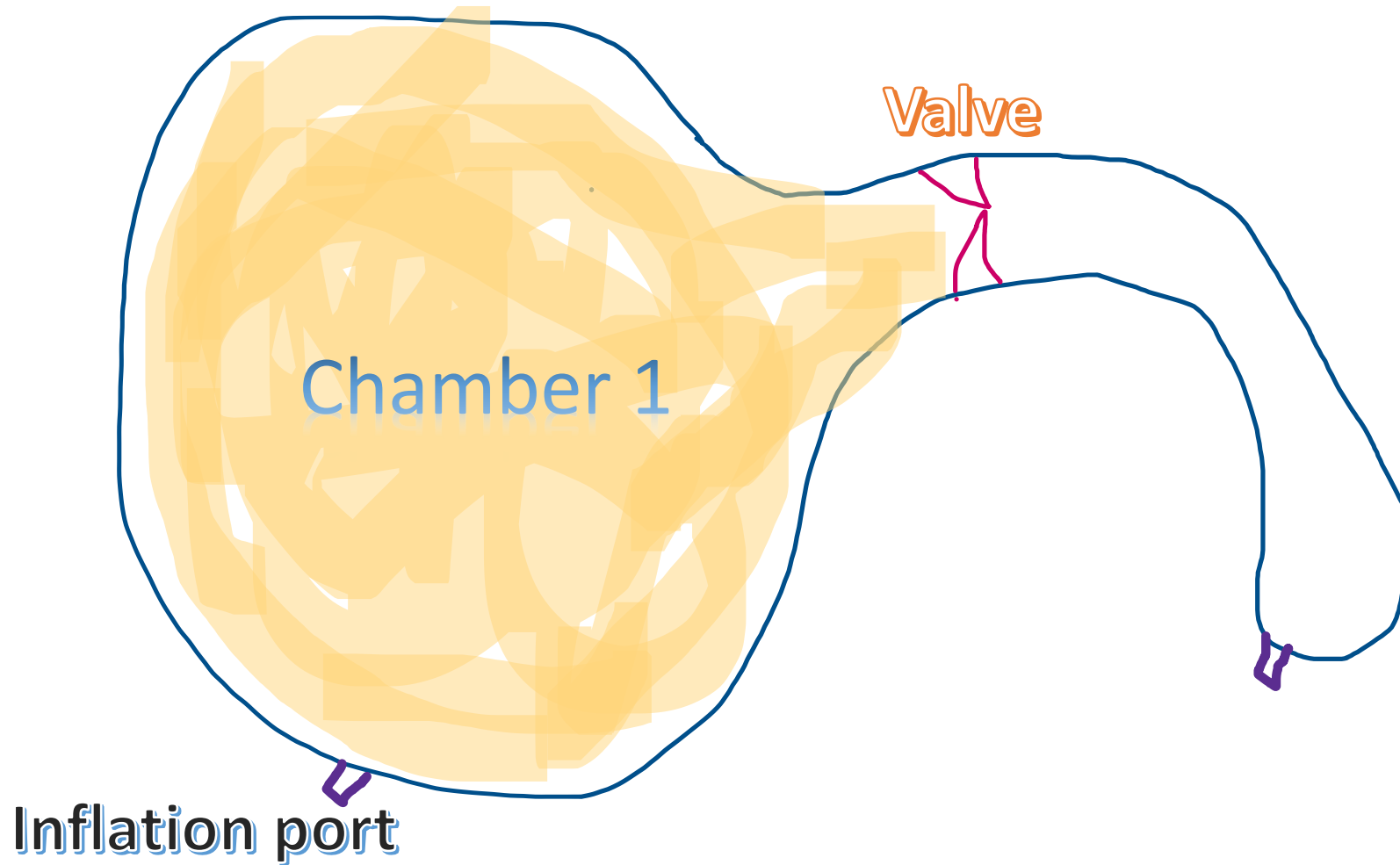
Normal High-altitude balloon
with fixed volume of
Hydrogen or Helium at
pressure 'P'

High altitude balloon behavior at Near space

External pressure \ll Internal pressure



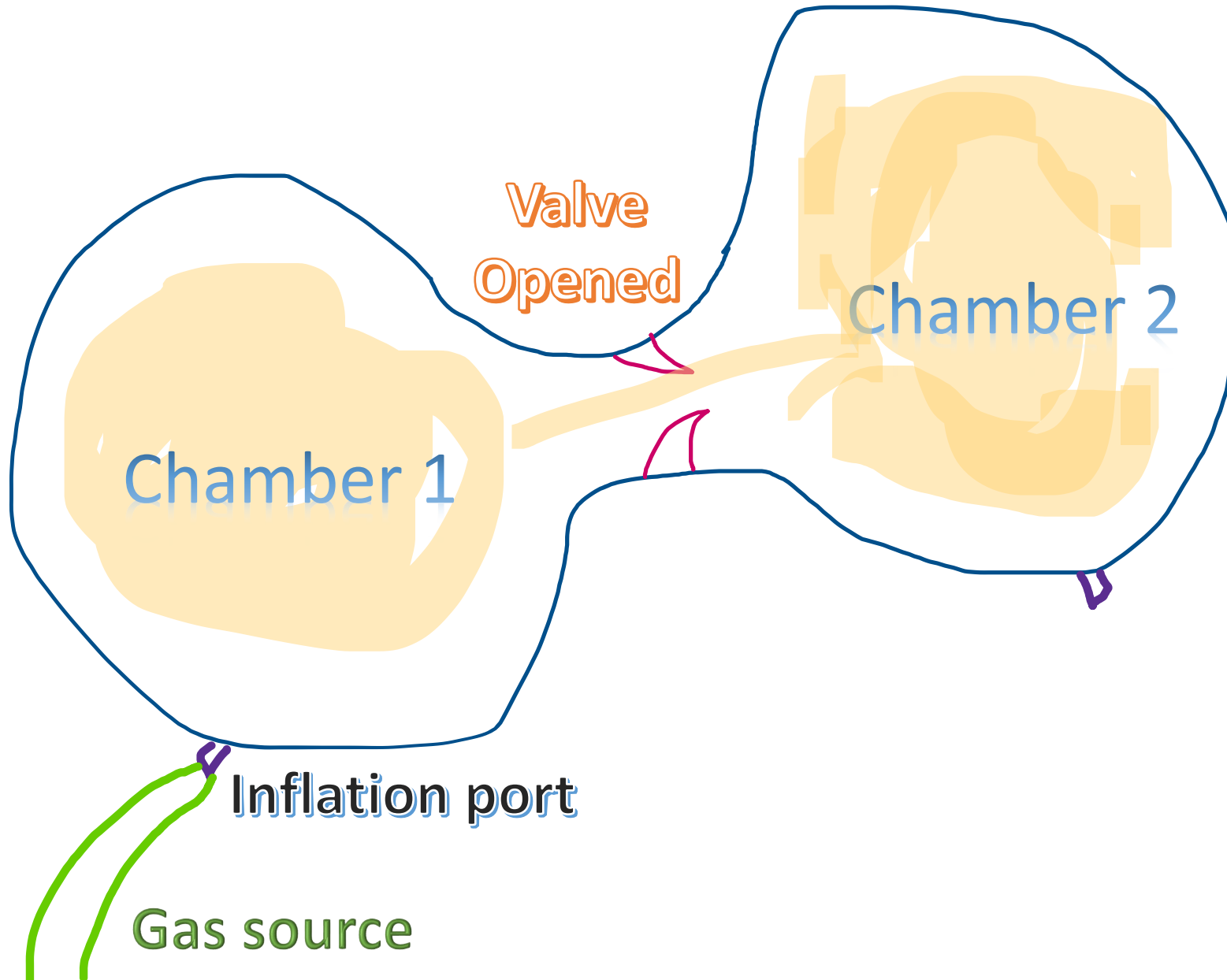
Dumbbell shaped balloon- 1 chamber inflation



❖ Characteristics

- 2 chambered balloon design
- Equal volume
- Separated by a valved bridge
- Filled with Hydrogen or Helium
- Maximum tolerance of pressure '2P'

Dumbbell shaped balloon- 2 chamber inflation

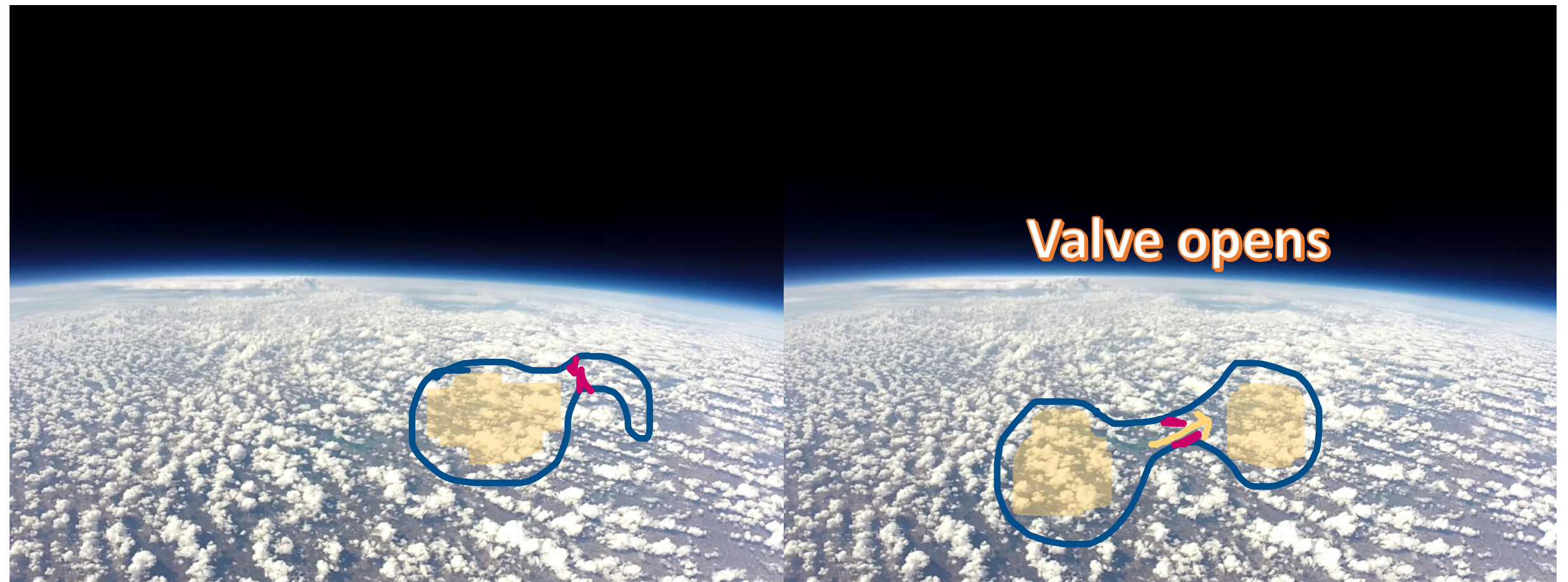


❖ Fully inflated Characteristics

- Pressure Max- $2P$
- Volume Max - $2V$
- Valve opens only at a pressure beyond 'P'

Dumbbell balloon at Near space

Rise in Internal pressure-> Opens valve



Dumbbell balloon at Near space

External pressure \approx Internal pressure

Volume and pressure shared between chambers



Dumbbell balloon at Near space

External pressure \approx Internal pressure

How high can it go??



Dumbbell balloon at Near space

Using some gas as a thruster mechanic

