

# Pistons in the space

## Canstar

*Project presentation*



ÉCOLE  
CENTRALE LYON





# Plan

- I. Club presentation
- II. Chosen missions
- III. CanSat presentation
- IV. Conclusion



# Club presentation



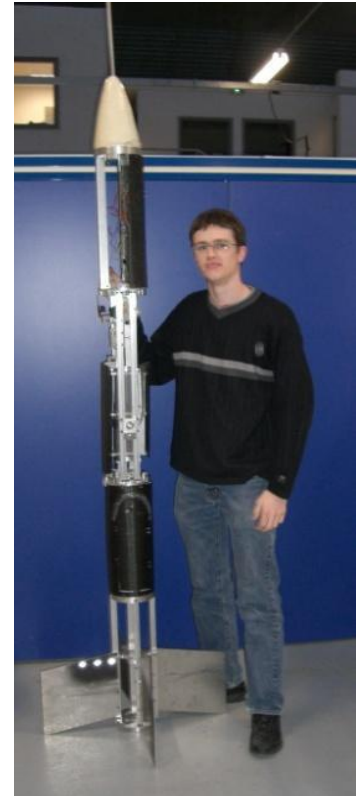
# Our club

- Centrale Lyon Cosmos



- Created in 1993

- Several realisations :
  - Mac 1 rocket
  - Experimental rockets
  - Mini-rockets
  - 1st CanSat this year





# Previous projects

**2006 : CanSat Ejector Project**  
Elected promo '09 best project

**2007 : Experimental rocket**  
The takeoff does not take place

**2008 : Léviathan rocket**  
Two different projects

**2009 : CanSat**

**Electronic part**

**Mecanichal part**

**3 projects working together on the Hermes rocket**



# Protagonists of the project

With the help of teachers and other members of the CLC...

Hugo LHACHEMI

Sophie MOREL

Nicolas ORIOL

Sébastien TOUZE    Maxime LADEVEZ



# Chosen missions

# Goals

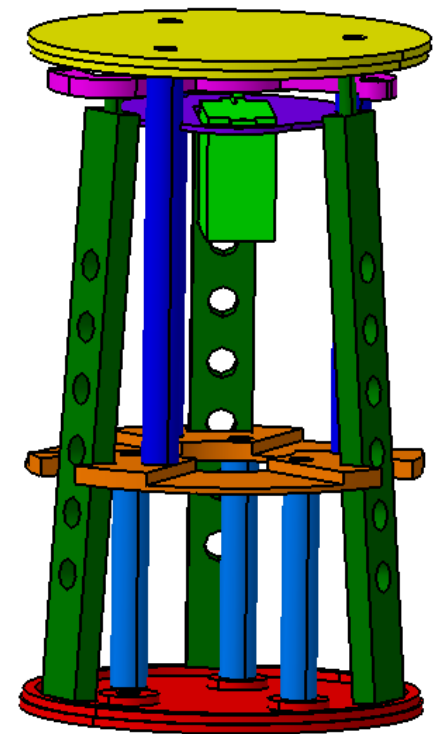
- **Participate in two launches of the CanSat**
  - CanSat competition, from a meteorological balloon, "International Class" category
  - From an experimental rocket
- **Free mission**
  - Deployment of 3 legs to raise the CanSat
- **Compulsory mission**
  - Taking photos of the immediate environment around the landing zone



# CanSat presentation

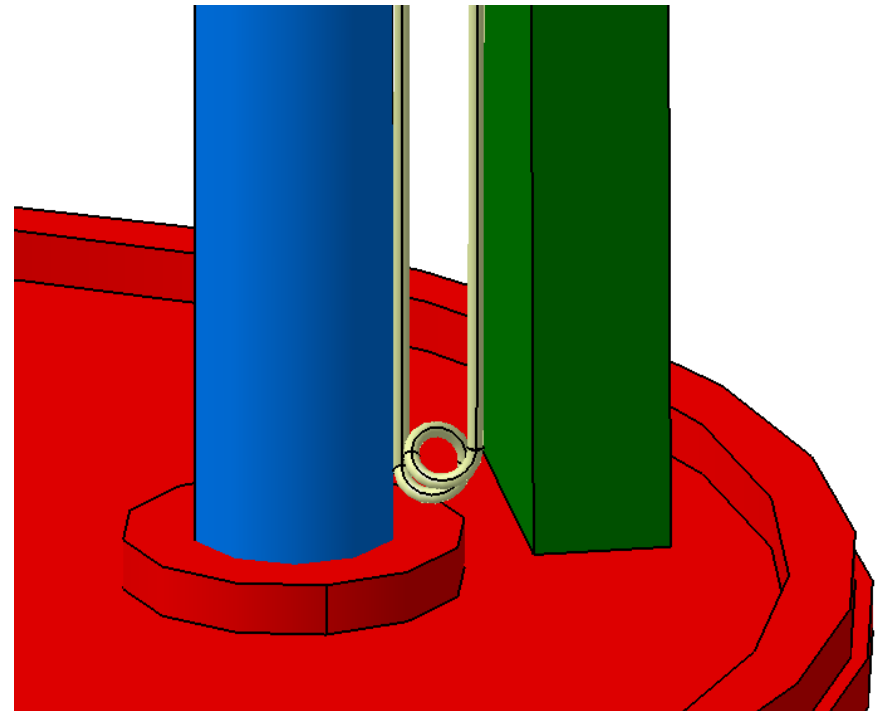
# Mechanical architecture

- **Internal structure**
  - Floored architecture
  - { Servomotor + cam torsion springs }  
made to spread 3 legs one after the other
- **External structure**
  - Skin realized in flexible material



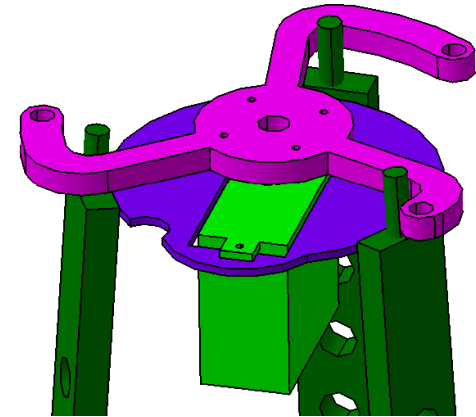
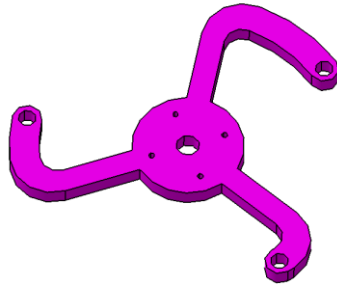
# Legs & torsion springs

- 3 identical legs freed by torsion springs fixed to the pillars of the structure
- Goal : no electrical consumption

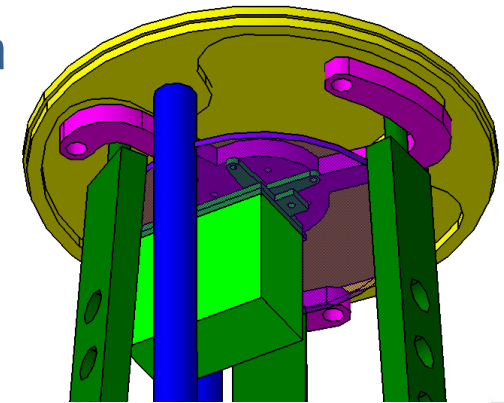


# Servomotor/cam system

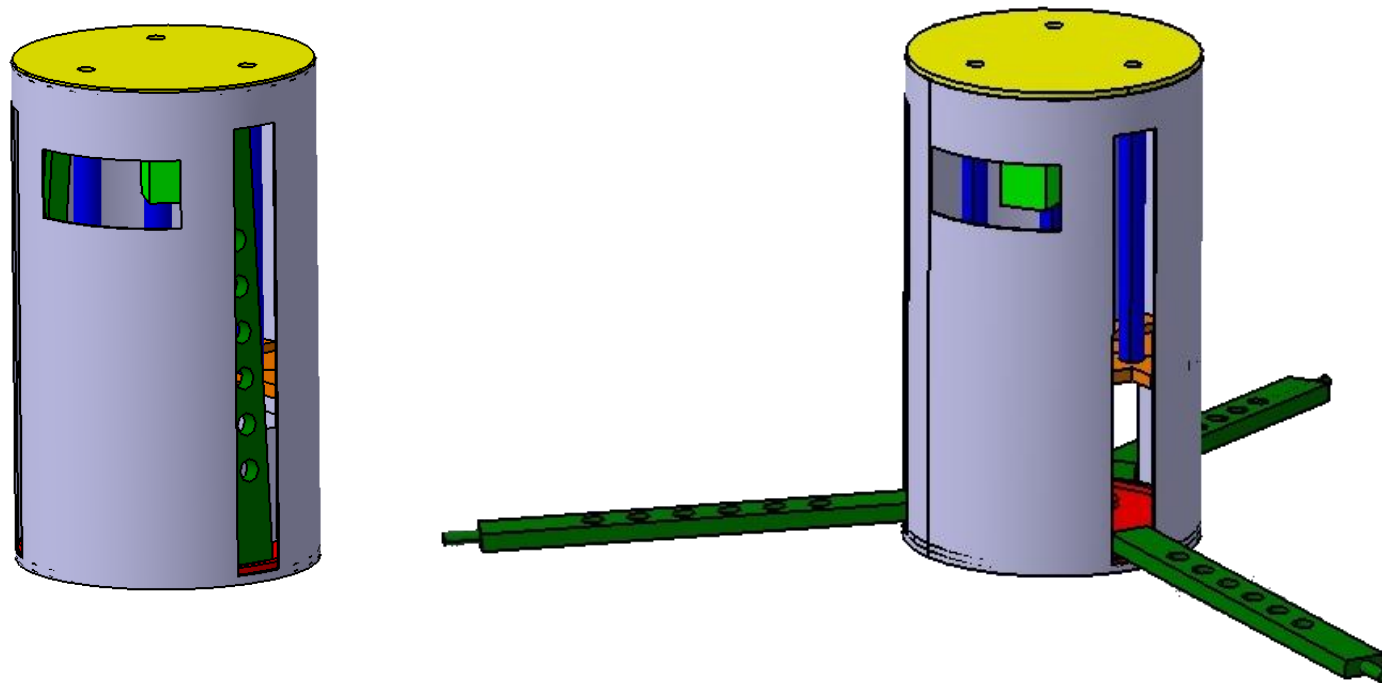
- Avoid a blocking system for each leg



- Cam shaped like a three branches star with a different length for each branche
  - ⇒ Successive deployment of legs
  - ⇒ Opening whatever is the position on the ground



# Closed / deployed CanSat

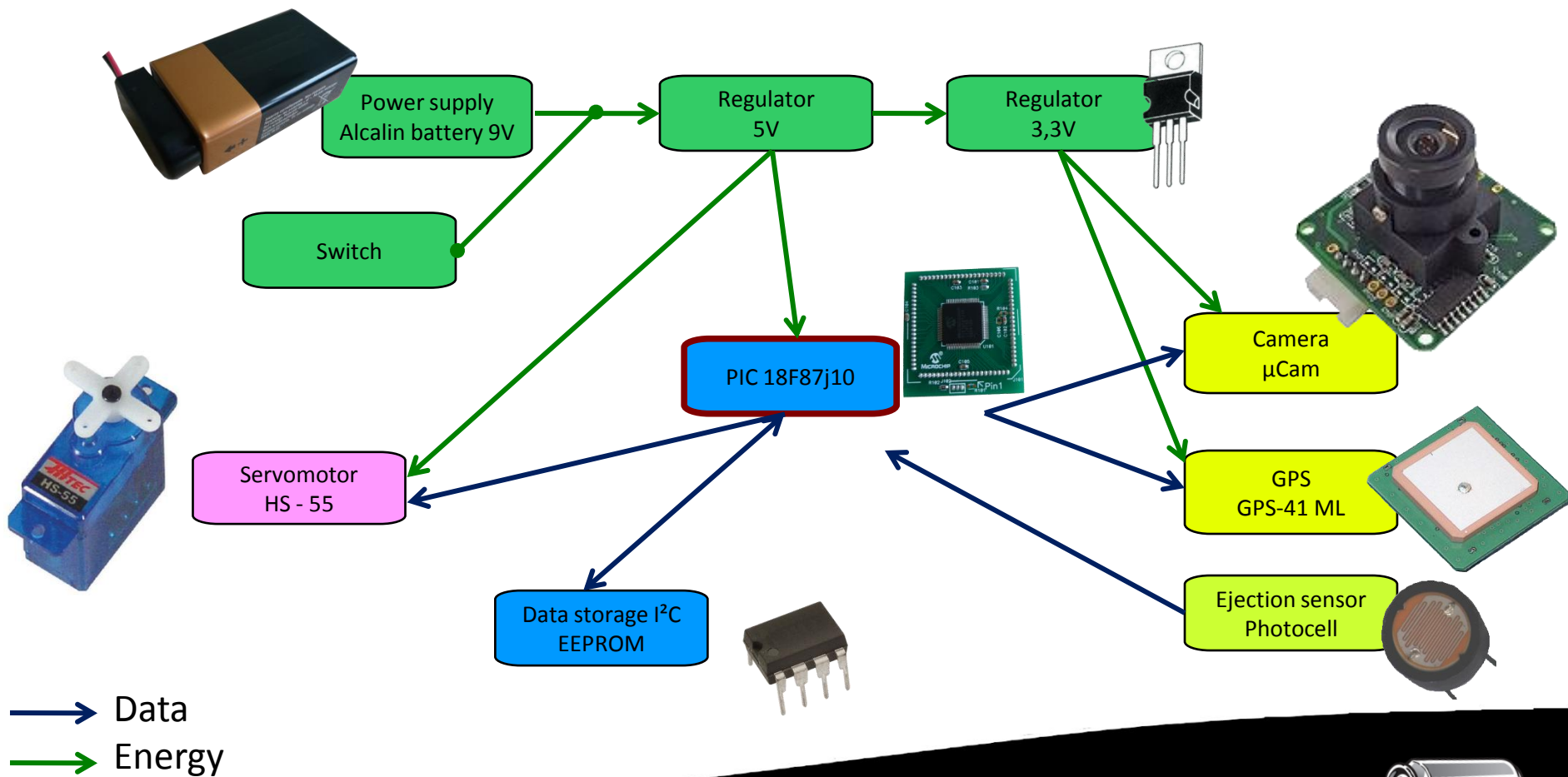


# Parachute

- Custom made
- Surface of veil : 1125 cm<sup>2</sup>
- Cross-shaped



# Electronic structure



# Mass balance sheet

	Mass in grams
Electronic sub-total	100,22
Mecanical sub-total	143,01
<b>TOTAL</b>	<b>243,23</b>

**Specifications respected !**





# Conclusion

# Conclusion

- **Mecanichal construction finished**
  - Original deployment system to simulate a planet exploration landing
- **Electronic conception finished but not construction**
  - 2 people in the team => absent today
  - Be aware of all the work : don't let anyone know everything about a specific task
- **Test phase very important**
  - Not to be neglected : it's very long and random
- **First CanSat => too ambitious**
- **Experience acquired for next years**

A satellite with two large blue solar panel arrays is shown in space. The Earth's blue and white horizon is visible in the lower-left corner. The background is a dark field of stars.

**Thank you for listening**

**Any questions ?**