



# LAB IN A CUBE



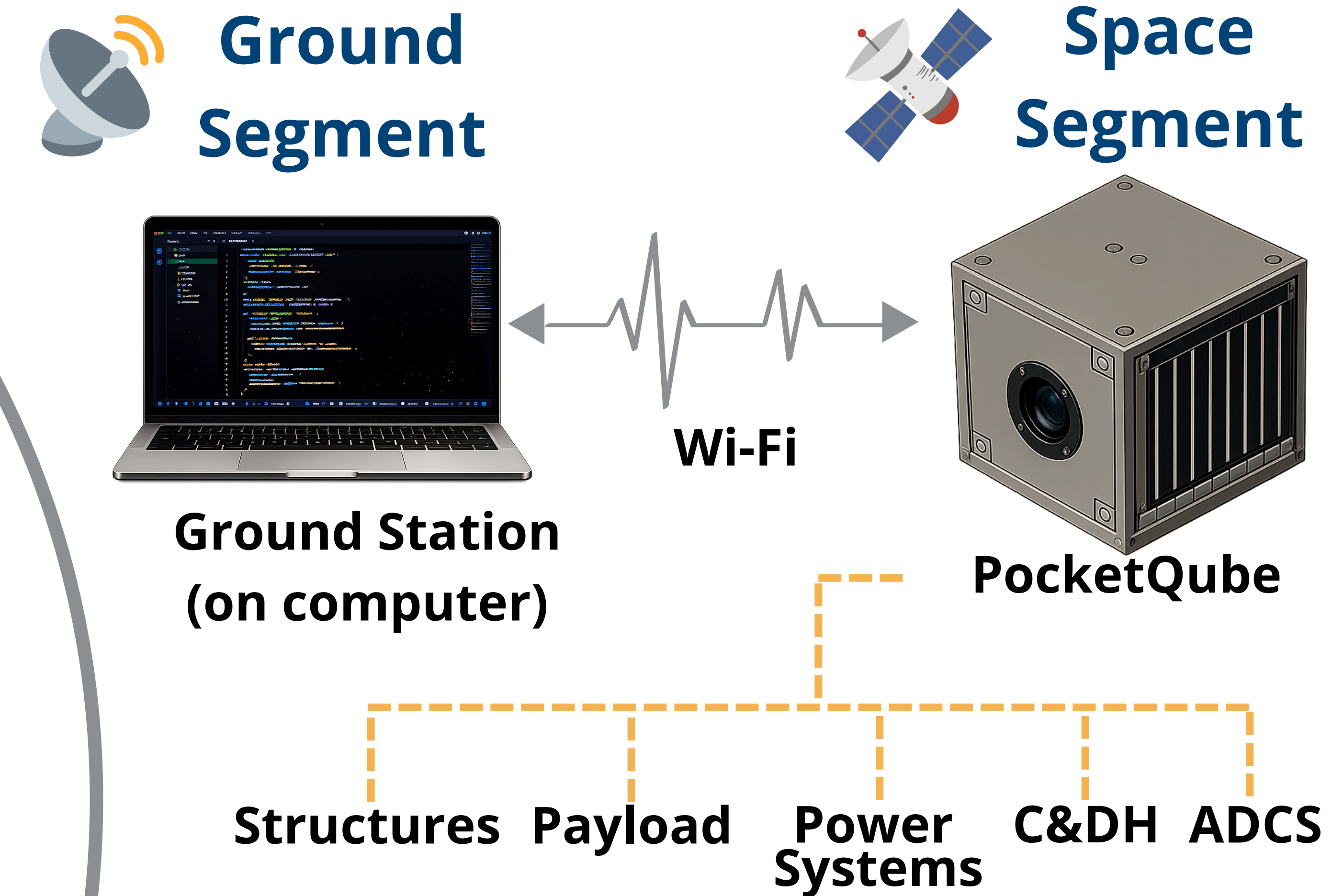
Our Website

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## 1. MOTIVATION

## 3. SOLUTION

## 4. SYSTEM ARCHITECTURE



## 5. FEATURES

- ATTITUDE CONTROL**: Magnetic actuation with coils (magnetorquer)
- EARTH IMAGING**: Camera captures images of the Earth
- COMMUNICATION**: Send & receive data via Wi-Fi
- POWER SYSTEMS**: Solar panels charge the battery



Low cost and hands-on satellite for lab activities

## 2. PROBLEM

Limited access to real satellites

Hard to understand how components work together

Few opportunities to design and experiment

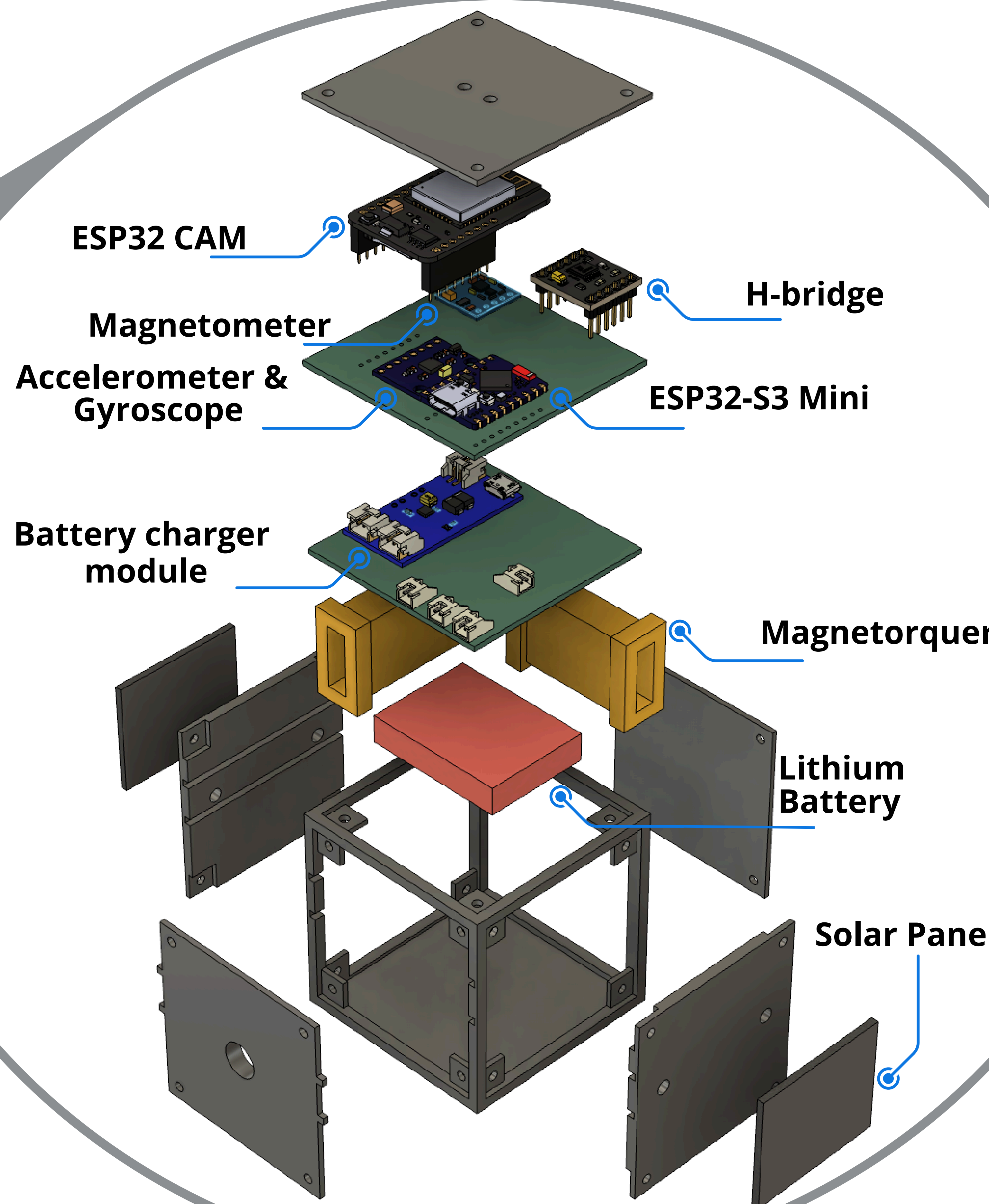
Options on the market are too expensive

**Microcontrollers:** Uses an ESP32-S3 Mini for processing and an ESP32-CAM to handle image processing without overloading the main system

**Sensors:** An IMU for acceleration and angular velocity. A Magnetometer to measure the strength and direction of magnetic fields

**Modular Architecture:** The design allows for the easy removal and integration of different subsystems

**Payload:** An integrated camera captures video, simulating how a real satellite photographs the Earth's surface



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