Space is an absolute vacuum, what can we measure from this?

General Measurement Topics:

* **Earth’s atmosphere**
* **Infrared Space Stuff**
* **Signals sent off Earth**

Could make a map of the Earth out of Radio Emissions

* **Energized Particles and Solar Storms**
* **The effects of microgravity on protein crystallization: evidence for concentration gradients around growing crystals**
  + [**https://www.sciencedirect.com/science/article/pii/S0022024898008537**](https://www.sciencedirect.com/science/article/pii/S0022024898008537)
* **Effectiveness/Degradation of Lubricants in Space**
  + Under radiation in a microgravity environment
* **Fiber-Optic Cables in Space** 
  + No gravitational pull, photons have no dropoff, faster speeds?
  + Fiber might break, loss of photons
* **Magnetic Fields Impacting Electrical Conductors**
  + High accuracy sensors surrounding an electrical conductor, earth’s magnetic field affects conduction?
  + Might impact other experiments, shielding?
* **Degradation of Solids in Space**
  + With virtually zero-g (and radiation), some solids may start to break apart or deteriorate. The rate could be useful for future space materials.
  + Our first ideas involved the study of materials such as plastics and microwires
  + Our secondary ideas include the study of the degradation of certain pharmaceuticals and their potency in space.
    - How to measure potency?

See what kinds of energized particles are affecting the ISS

Cosmic Background Radiation

Remnants of Gamma Ray Bursts (Not likely but maybe)

Compare data with other observation tools to see if ratios match, as the signals will be dimmer inside of the capsule

Potential Secondary Missions:

* **Recording Sounds on ISS, e.g. space noises**

New Ideas:

* Osmosis
* Cement
  + On earth, when cement forms, the denser materials settle to the bottom of the mixture.
  + In a microgravity condition, the denser materials should be distributed uniformly, creating a stronger material
* Insulin
  + How the potency/chemical structure of insulin is affected by any radiation from space and/or the ISS
* Structural Integrity of 3d printed plastics (And maybe microplastics)
  + Degradation of additive materials in microgravity conditions
* Tin whiskers?
  + Under extreme gravity conditions, wires produce thin whiskerlike metal strips
* Protein Crystallization
* Oscillation of the station through normal everyday activities.
* Wear and tear of different electronic devices in microgravity
* Time dialation between surface of earth and ISS
* Degredation of adhesive strength in microgravity

**Even More Ideas**

* Capillary Transport Systems
  + Certain materials, such as plants are capable of transporting nutrients and fluids against gravity via capillary tissues such as xylem and phloem,