3D printed Medical Instruments

In Microgravity Environment

What is the issue?

- Instead of bringing a large amount of medical instruments that may not get used often, NASA Human Research Performance teams are interested in being able to 3D print a medical instrument, understand a process for sanitizing that instrument and then find a way to recycle that instrument to make another one.

Made in Space 3D printer

What filament can be used?

- any polymer compatible with wire/spooled feedstock
- Most common is ABS and Ultem that is used on Space Station.
- Something that has non-flammable components
- Composite material potentially
  - Example: Onyx-FR (carbon fiber material)

- **Recycling process** : Need to look at the separate components of the filament
- Consider temperatues needed to recycle different types of materials.
- Some filament may have characteristics you need to consider
  - Example: Onyx is highly hygroscopic and abrasive

Tips for this project

- Research different kinds of 3D print material. (yes we know some 3D printers can print in metal but we are looking for lighter, and easier to recycle material).
- Look into different kinds of sanitization processes and how that can affect the material you are considering
- What kinds of simple surgical/medical procedures could be accomplished with your instrument.
- Look into standards of sanitization for an operating room and ER rooms for medical procedures.
- Are there any medical procedures that are done on an ambulance that could support a 3D printed medical instrument?
- Consider that major surgery is not something being considered currently but any medical procedure that would need to be medically sanitized to perform.