# Materials & Processes (M&P) Engineering Internship Projects

## Primary Projects

1. Laboratory Work and Failure Investigations
   - Launch Equipment Test Facility (LETF) Interim Cryogenic Propulsion Stage Umbilical (ICPSU) Ground Plate (Ground Systems Development & Operations (GSDO))
   - Paul Recharger Liquid Oxygen Poppet (spacecraft International Space Station (ISS), GSDO, Space Launch System)
   - Li Ion Battery ORU Spring Blade (ISS)

2. Advanced Plant Habitat Materials & Processing (ISS)

3. Magnesium Alloy Research Project (m2M)

## Failure Investigation Process

- **Background**
- **Non-Destructive Evaluation**
- **Destructive Evaluation**
- **Failure Analysis**
- **Microscopy**
- **Conclusion & Recommendation**

## Other Activities at KSC

- Volunteer at Robotics Mining Competition for STEM activities
- Volunteer for building a community garden in Titusville
- Developing a community garden in Titusville
- Preparing lap shear test specimens
- Finished Growth Chamber
- On-site photo taken of the Lithium Ion Battery with the broken spring blade

## ISS Orbital Replacement Unit (ORU) Lithium Ion Battery Locking Spring Blade Failure Investigation

- 3D SEM image showing severe Fretting Corrosion/Wear effects
- SEM image of Poppet's cross-sections showing evidence of cracking
- SEM image at 100X magnification showing cracks in the Keyence Digital Microscope

## Advanced Plant Habitat M&P Engineering

- Growth Chamber Composite Manufacturing
- Polycarbonate Root Tray Failure Investigation
- Mechanical Testing

## Other Work Tasks

- Commercial Crew Program M&P Engineering Support
- Contamination Control Program Counting Project
- Trained on microscopes and lab equipment
- Mentor for summer interns
- Smaller failure investigations

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- Supervisor: Steve McDanel
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- Contributors for failure investigation projects

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