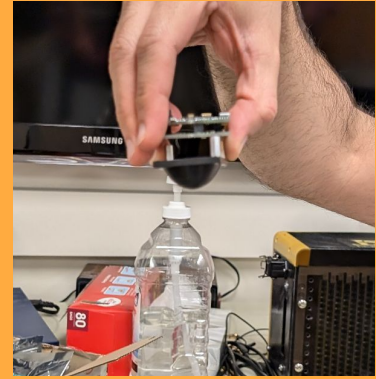


# Lightning Talk 3

User Needs and Requirements  
SDMay25-15

# Project Overview

- Millimeter wavelength **Armed Voron (MAVinator)** scanner
  - Voron 3D printer platform
- 3D Scanner design
  - Stepper motor
  - Belt driven gantry
- User interface
  - Web enabled application
  - Python
- Predetermined path to cover the scan bed



# Problem Statement

- Time consuming process
- Not enough scanners
- Expensive
  
- Build cheaper scanner
  - Large scan volume
- Simple user interface
  - Remotely accessed
- Better than ever



# Primary User Needs - CNDE Researchers

- It needs to be able to do millimeter wave scanning
- It needs to fit within the existing lab environment
- Sensor needs to be attached to a Voron Fusion 3D printer
- Needs to be able to be controlled through a web application
- Needs to be cheap



# Secondary User Needs - CNDE Client

- Would not be directly using the MAVinator
  - Researchers would use it on a product from the client
- May want a general understanding of the MAVinator
- Need documentation for the MAVinator
- Need to be able to trust the MAVinator will make a reliably good scan



# Project Requirements from User Needs

- MAVinator needs to be able to make millimeter wave scans
- MAVinator needs to be built within a Voron 2.4 printer
- Documentation needs to be created for the MAVinator
- Needs to be controlled through a web application
- Needs to be relatively cheap



# Engineering Standards

- **IEEE 149: Standard Test Procedure for Antennas**
  - This standard is applicable to our project because we will be using an antenna to transmit and receive millimeter waves.
- **IEEE C95.3: Recommended Practice for Measurements and Computations of Electric, Magnetic, and Electromagnetic Fields with Respect to Human Exposure to Such Fields, 0Hz to 300 GHz**
  - This is applicable to our project because we will be using millimeter waves between 119 and 134 GHz
- **IEEE 26514: Standard for Adoption of ISO/IEC 26514:2008 Systems and Software Engineering--Requirements for Designers and Developers of User Documentation**
  - This standard applies to our project for the documentation we create on how to interface with our finished product and maintain it.
- **P3397: Standard for Synthetic Aperture Radar (SAR) Image Quality Metrics**
  - This standard applies to our project because we will use SAR to process the data and display the results of the scanner

# Conclusion

The Millimeter Wavelength Voron scanner needs to be simple in operation, easy to maintain and build from both a technical and cost standpoint, and reliably accurate. Users need a scanning platform that is both accurate and capable of seamless integration with millimeter-wave imaging systems. By focusing on user-friendly interfaces, high accuracy and integration with Voron hardware, this system will provide a solution for applications where millimeter-wave scanning is needed.





The background features a dark blue gradient with two prominent, glowing particle trails that curve from the top corners towards the center. These trails are composed of numerous small, bright blue and white dots, creating a sense of motion and depth. Interspersed with these trails are several bright orange and yellow lens flares, which add a dynamic and energetic feel to the overall composition.

**Thank you**