# EUV Source Module Metrology Tool

Team: DEEP PURPLE

San Diego State University

## Project Overview

ASML focuses on developing and manufacturing Extreme Ultraviolet (EUV) lithography machines essential for producing computer chips. This process uses liquid tin ablated by a CO2 laser, including approximately 2,000 gas holes that guide tin to the proper disposal. Currently, ASML inspects these holes by hand which is inefficient and dangerous. Team Deep Purple has been tasked with designing a dual-axis robotic camera system to check which holes are blocked by tin debris. This increases the efficiency and safety of the cleaning process.

## Meet the Team

**Hayden Keyser**
Structural Design Lead

**Charles Taylor**
Mechatronics Lead

**Brian Henry**
Team / Motion System Design Lead

**Andre Hozi**
Manufacturing Lead

**Matthew Steinmetz**
Software Lead

## Meet the Sponsor

ASML designs and manufactures advanced photolithography machines used in semiconductor chip production. Their extreme ultraviolet (EUV) lithography technology enables the creation of smaller, more powerful, and energy-efficient microchips for computing, AI, and mobile devices.

## Acknowledgements


Our team sincerely appreciates the support and contributions of the following individuals in the development of our EUV Source Module Metrology Tool.

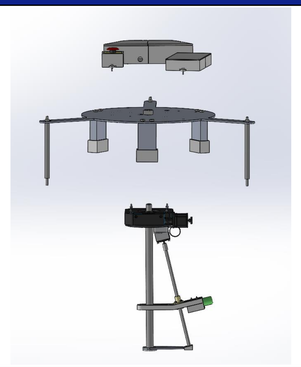
**San Diego State University**

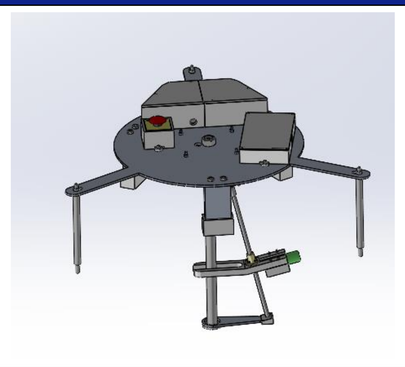
- Dr. Scott Shaffar
- Mr. Mike Lester

**ASML**

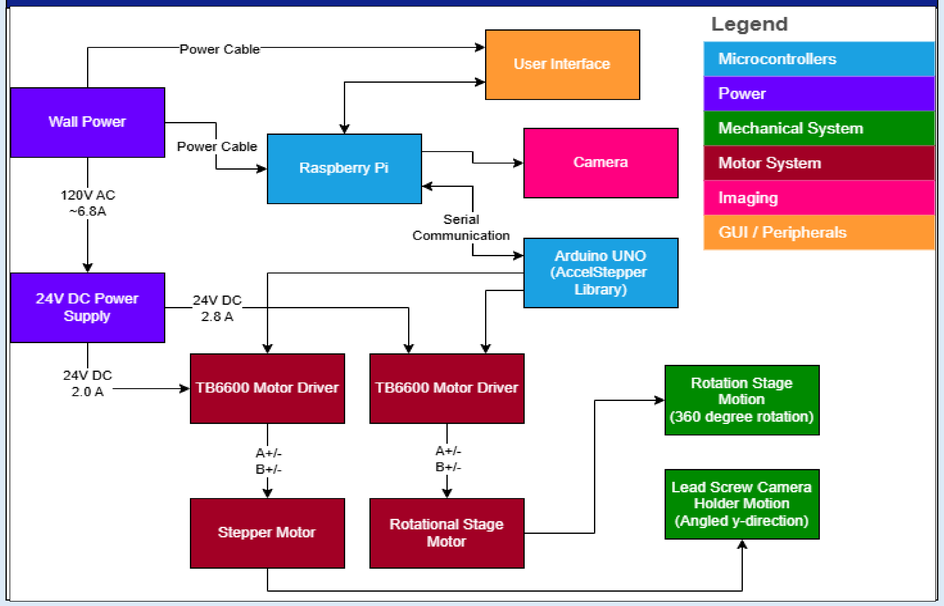
- Kent Bruzzone
- Taylor Hartung
- Mark Mitry


## CAD Exploded View



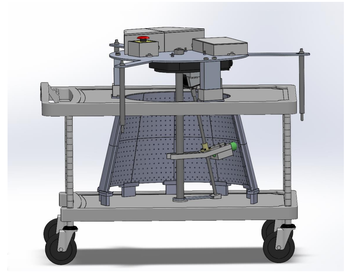


## System Level Diagram

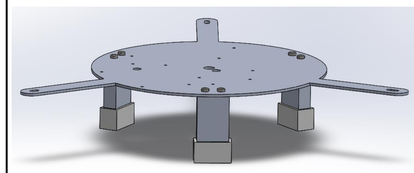



## CAD Assembly

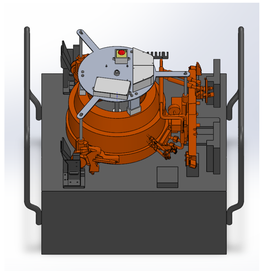
**Testing Full Assembly**



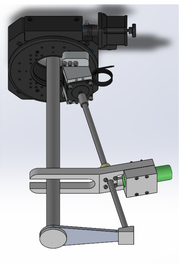
**Platform Assembly**



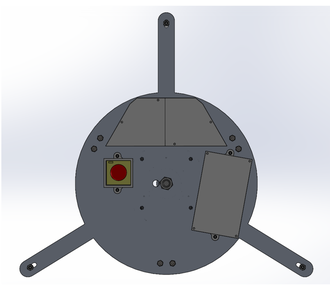
**ASML Full Assembly**

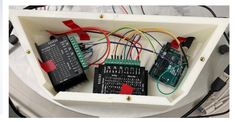


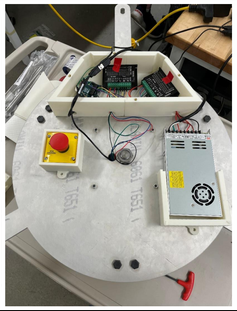
**Motion System Assembly**



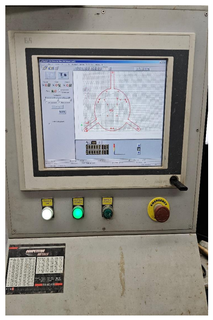
## Electrical Setup

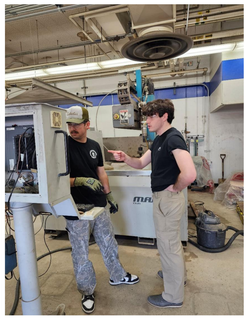






## Machining Methods

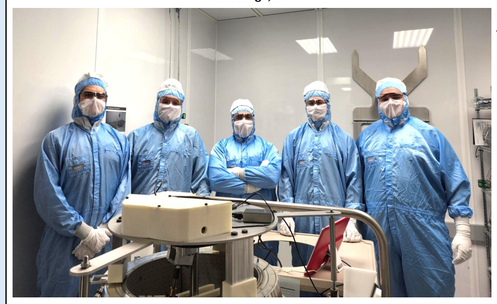




Water jetting for base platform (pictured left) CNC Mill setup for motor mount and spacers (pictured right)

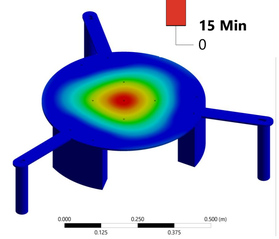
## Testing & Analysis

**Test Day at ASML's Cleanroom**
April 9th, 2025
San Diego, CA



**A: Static Structural**
Total Deformation
Type: Total Deformation
Unit: m
Time: 1 s
12/5/2024 7:22 PM

Safety Factor
Type: Safety Factor
Time: 1
12/5/2024 7:21 PM
1
15 Max
15 Min
0



Spring 2025