

BENDER AUTONOMOUS ROBOTIC SYSTEMS

PREPARING STUDENTS FOR INDUSTRY
THROUGH PRACTICAL APPLICATION



ABOUT THE TEAM

The Bender Autonomous Robotics Systems (ARS) Team is a cross-disciplinary VIP (Vertically Integrated Project) class & team at Boise State University competing in the annual NASA Lunabotics Challenge.

Our mission is to teach students how to design, build, and operate an autonomous robot capable of mining and transporting simulated lunar regolith.



2019

Year Class/Team Started

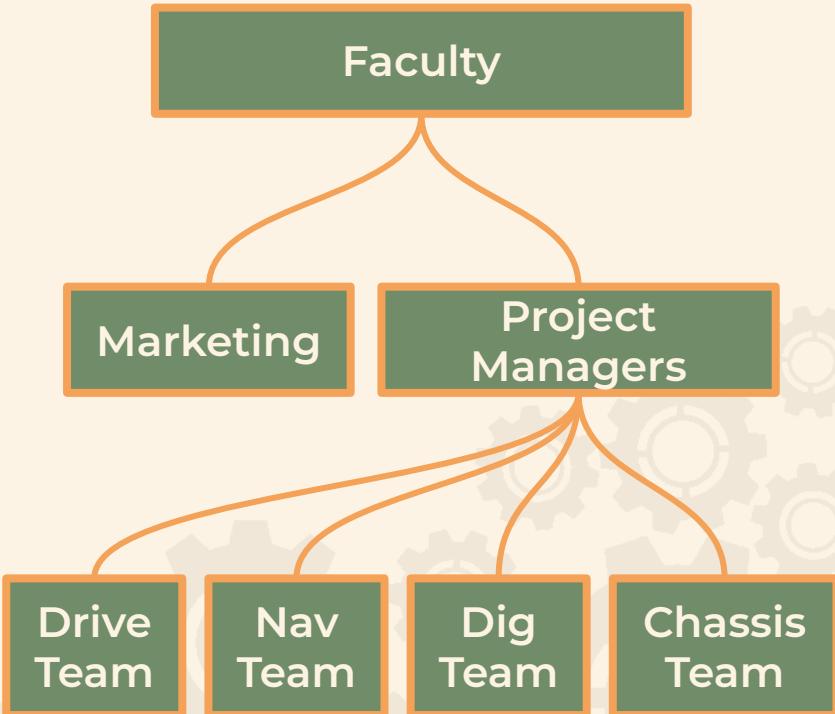
30

Number of Students
(2024-2025)

15

Number of New Students
(2024-2025)

TEAM STRUCTURE



The Team is structured like a real engineering company, with:

- Students leading as project managers
- Subsystem leads
- Marketing coordinators

Faculty act as advisors, while students drive all design, testing, and coordination efforts.

This simulates real-world experience in technical development, team collaboration, and project leadership.



NASA LUNABOTICS

- Annual NASA-hosted robotics competition simulating lunar excavation. 2024-2025 was the first year that the Bender team competed.
- The goal is to design, build, and operate a robot to autonomously mine and transport regolith
- The competition is held at the Kennedy Space Center in Florida after the Spring Semester

1st

*Idaho
Team*

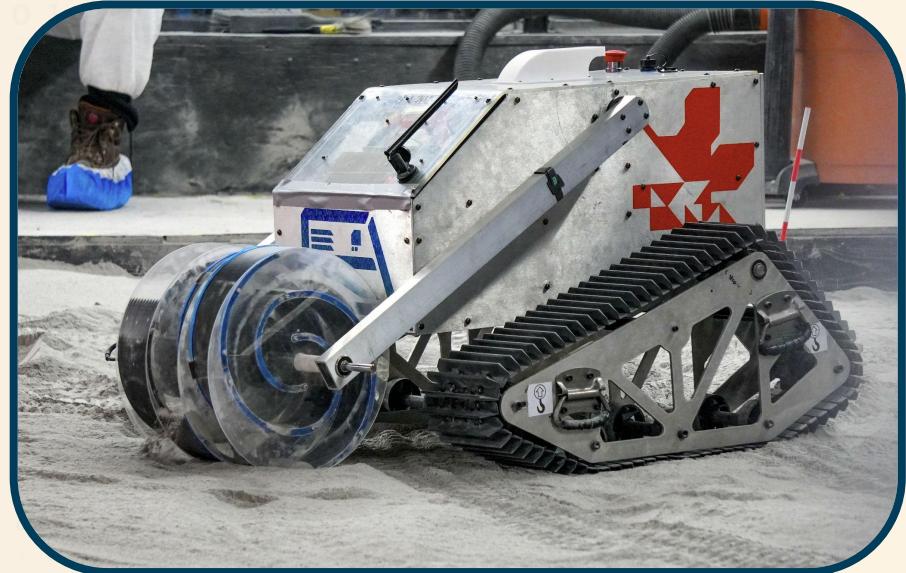
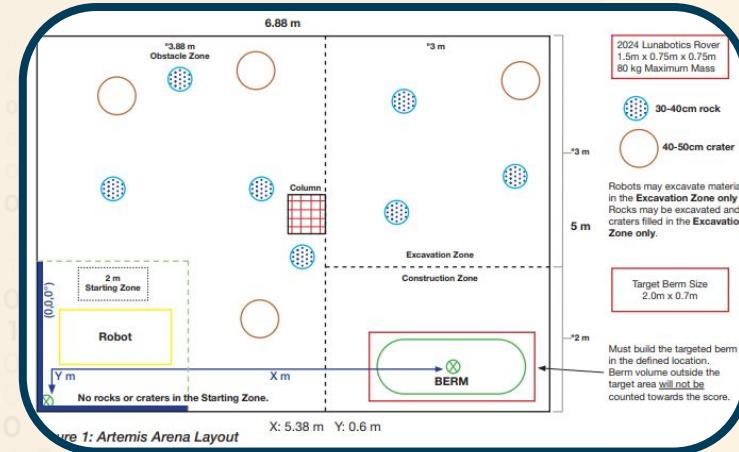
1st

*NOVA
Award*

16th

*Overall
Place*

2024-2025 Results



OUTREACH & ACHIEVEMENTS

1st

NOVA Award
2025
Lunabotics
Competition

250

Students
Reached (K-12
Outreach)

75%

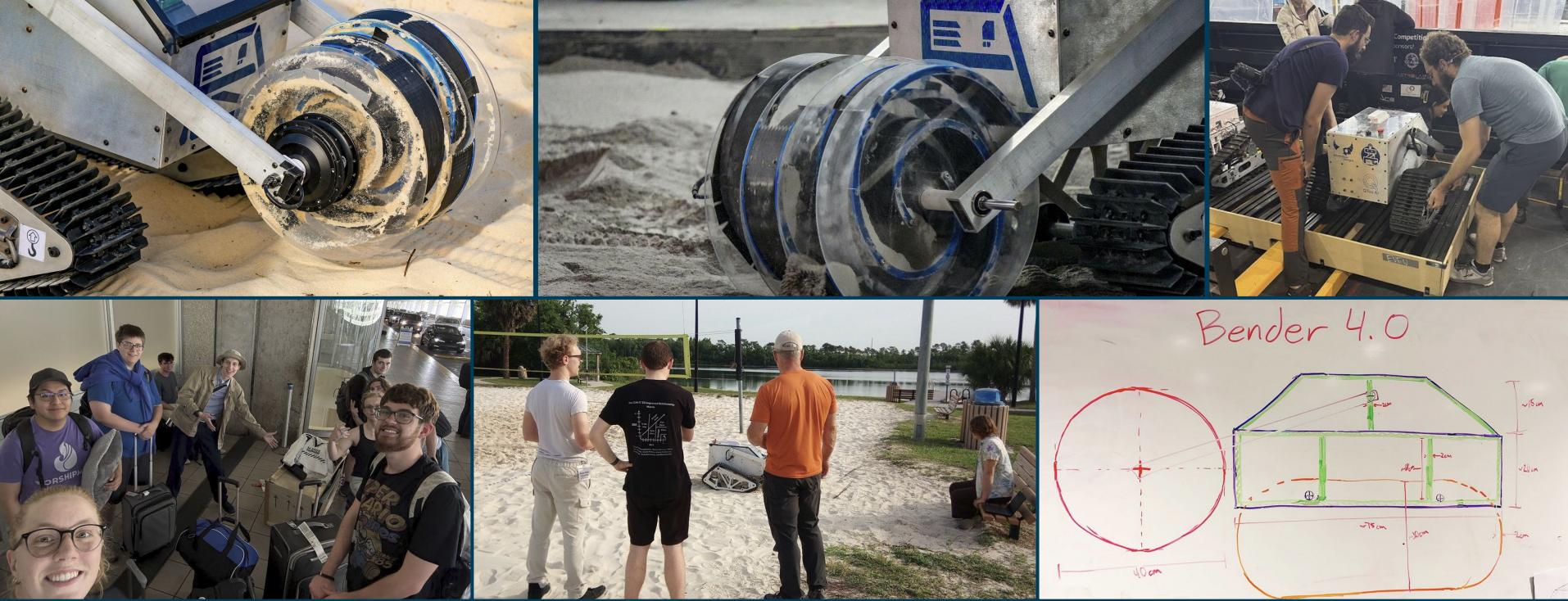
Retention Rate
(Fall 2024 -
Spring 2025)

33%

Increase in
students
(2023-2024)



BENDER



The **Bender Robotics Team** exists to give students the **opportunity to experience the full lifecycle of engineering a complex system, just like a professional company**. From concept to prototype, testing to delivery, and outreach to impact, we empower students to take ownership of real responsibilities across design, leadership, operations, and innovation.

Our goal is to cultivate the next generation of curious, confident, and capable engineers, project managers, technical marketers, leaders, and visionaries, all while tackling one of the most ambitious challenges in student robotics.

SUB-TEAM BREAKDOWN

The Bender Robotics Team is divided into four core subteams, each focused on a critical aspect of the robot's functionality. These subteams operate semi-independently under project management but collaborate frequently to ensure seamless system integration.

Nav

—

Ensure obstacle detection and real-time route adjustments

Integrate LiDAR, stereo cameras, IMUs, and beacon tracking



Dig

—

Engineer the excavation and material handling system

Ensure reliable actuation and mechanical



Drivetrain

—

Design and build the vehicle's mobility system

Integrate motor controllers and power systems



Chassis

—

Design the structural frame to support all subsystems

Ensure ease of assembly and maintenance

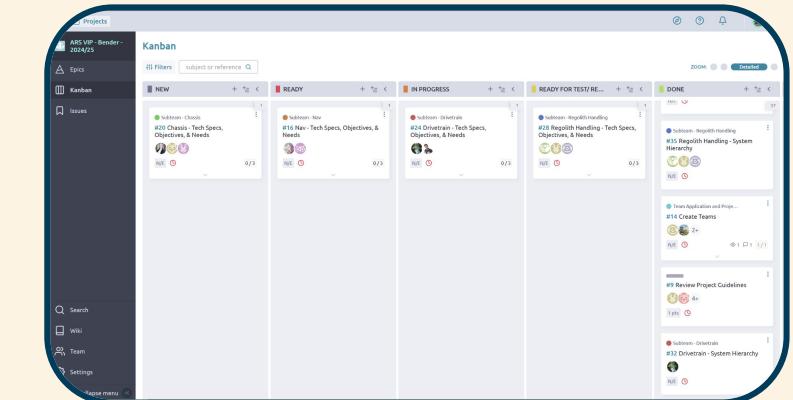
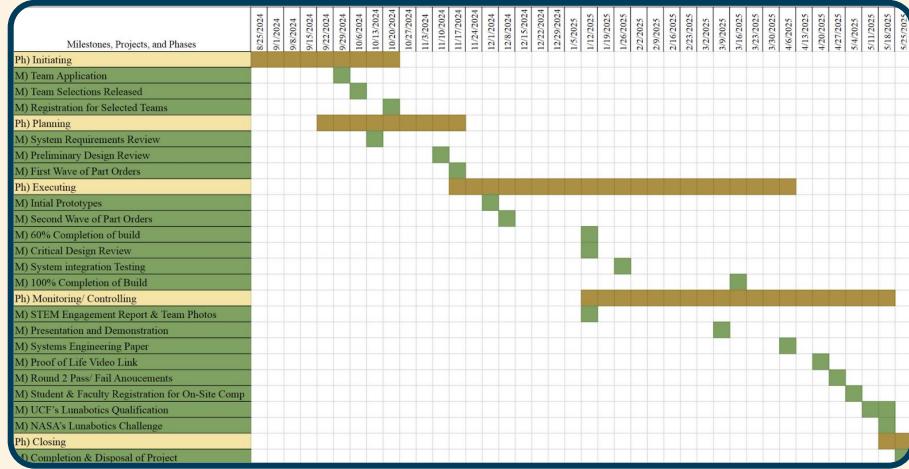


PROJECT MANAGEMENT

Our project managers coordinate all technical and non-technical aspects of the team, ensuring that deadlines are met, subsystems stay aligned, and every team member has the support they need to succeed. They bridge communication between faculty, advisors, sponsors, and student teams.

Key Responsibilities:

- Oversee timelines, goals, and deliverables across all subteams
- Run weekly milestone reviews
- Coordinate design reviews (SRR, PDR, CDR, Demo)
- Manage risks, testing schedules, and internal documentation
- Maintain communication with faculty advisors and NASA competition officials



TECHNICAL MARKETING

The Technical Marketing team ensures that the innovation happening within Bender Robotics is clearly communicated to the public, sponsors, and BSU community. This subteam blends engineering understanding with storytelling, design, and outreach, offering a unique opportunity for students interested in technical communication, media, or branding.

Key Responsibilities:

- Maintain brand identity across shirts, robot decals, and online presence
- Produce photos, videos, and graphics to showcase progress and team culture
- Manage social media, website updates, and newsletters
- Lead community outreach events



Technical Marketing bridges the gap between engineering and the outside world. It gives students a chance to develop portfolios in communication, design, and campaign strategy, while helping the team secure funding, grow visibility, and celebrate its work.

KEY STATS

66kg

Weight
(145 lbs)

30.3

Power
Consumption
(W/hr)

60/60

Dust Tolerance
Score

71W

155L

63H

Final Robot
Dimensions
(mm)

STUDENT TESTIMONIALS



Brady Ward
Computer
Science

Everyone here has been very nice and supportive.

Having someone's guidance on how to start learning about the robots nav was immensely helpful



Hunter Gregory
Mechanical Engr.

This team provided an opportunity like no other to work in a semi-professional setting on autonomous robotics at BSU.

It encompassed all major aspects, including electrical, mechanical, and software related portions, as well as a large focus on proper team dynamics and systems engineering...



Ethan Varao
EngineeringPlus

It was fun learning experience! I enjoyed expanding my skillset and learning to work with other aspiring professionals!

ALUMNI TESTIMONIALS & IMPACT



Nardos Ashenafi, PhD
Robotics Software
Engineer
Bastian Solutions

"The first summer after working on the Bender project, I had the opportunity to get interviewed at a robotics start up company. For most of the technical skills they asked of me, I was able to reference a time when I solved a similar problem in Bender. In the end, I found out that the company actually sponsored the IGVC competition, where Bender was one of the competitors. It's safe to say, Bender tipped the scale in my favor"



Chris Dagher
CEO
QTex AI Inc.

"Being a project manager on the Bender Team was an incredible experience. I loved mentoring students on PCB design and contributing to full system reviews. Programs like this are vital for preparing students to tackle real-world engineering challenges and make them more competitive as they enter the industry or launch their own startups"



Wankun Sirichotiyakul, PhD
Robotics Software Engineer
Bastian Solutions

"The practical knowledge I gained from the Bender project laid a strong foundation for my professional growth and significantly contributed to my development as a robotics engineer. It equipped me with essential hands-on skills for integrating hardware and software components within a robotic system. This experience enabled me to complete one of my internship projects ahead of schedule, leaving a positive impression on my fellow engineers and ultimately leading to a job offer from the team."

WHY SPONSOR THE TEAM

Sponsoring Bender Robotics means empowering students with real-world engineering experience. Every dollar helps us give students access to meaningful hands-on learning and leadership opportunities they can't get in a classroom alone.

Your sponsorship helps us:

- **Purchase build materials** and advanced sensors/tools
- **Improve testing facilities** and workspaces
- **Cover travel** to the NASA competition
- **Expand STEM outreach** to K-12 students and the Boise community



Pipeline for recruiting skilled grads

Work directly with highly motivated, job-ready students across disciplines



STEM Engagement

Support outreach programs that inspire the next generation of engineers



Support local students in National-level competition

Invest in real opportunity and growth for Boise-area talent



Positive Visibility for your brand

Logo placement on robot, shirts, outreach materials, and social media

SPONSORSHIP TIERS

Tier Name	Amount	Benefits
Orbiter	\$250 – \$999	<ul style="list-style-type: none">- Logo on website & team sponsor board- Social media thank you shoutout
Lander	\$1,000 – \$2,499	<ul style="list-style-type: none">- All Orbiter benefits- Logo on team t-shirts and robot- Tagged in event recaps
Rover	\$2,500 – \$4,999	<ul style="list-style-type: none">- All Silver benefits- Larger logo placement on robot and outreach banners- Option to provide student guest speaker/company visit
Mission Partner	\$5,000+	<ul style="list-style-type: none">- All Gold benefits- Featured sponsor in presentations and events- Dinner W/ Bender team- Logo on front page of team site and slide decks

Custom Sponsorships Available

Got tools, parts, or equipment instead of cash? We're happy to work with in-kind sponsors (e.g., CNC access, sensors, gearboxes) and provide equivalent recognition.

2025-2026 FUNDING GOALS

New Facility

\$60,000

Regolith Tank

\$40,000

New Tools

\$35,000

Team Travel

\$30,000

Robot Built

\$10,000

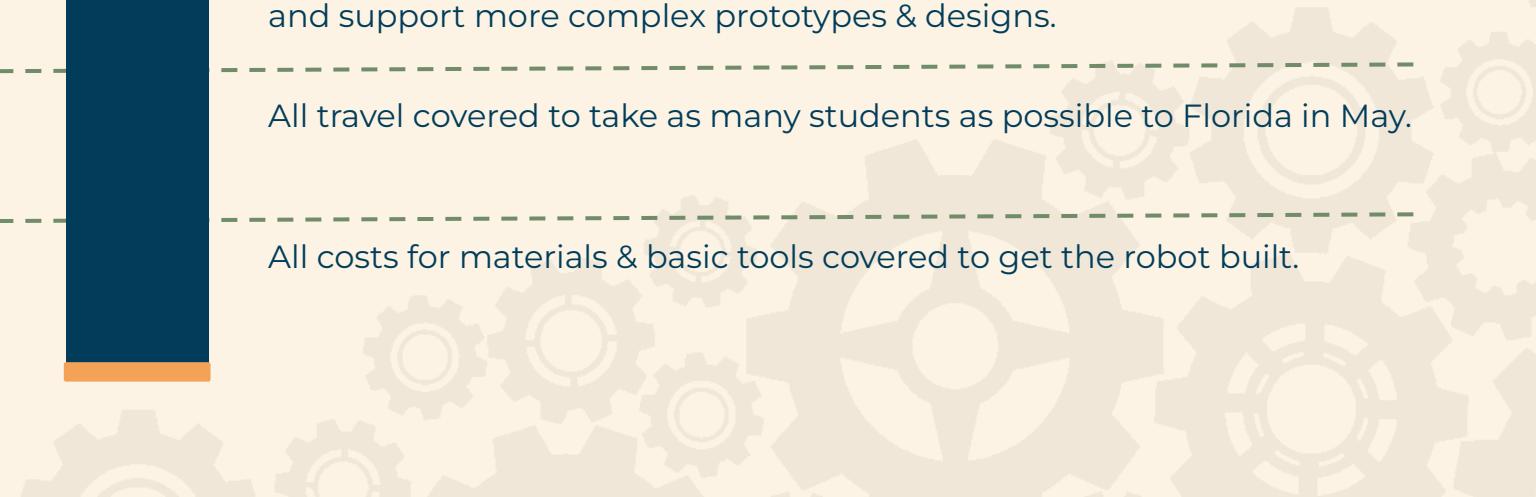
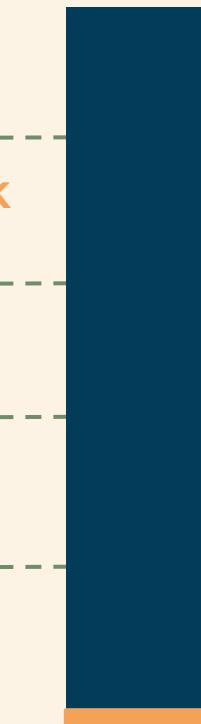
Dedicated testing facility for the team to support further testing allowing students to use their work to write and publish research papers.

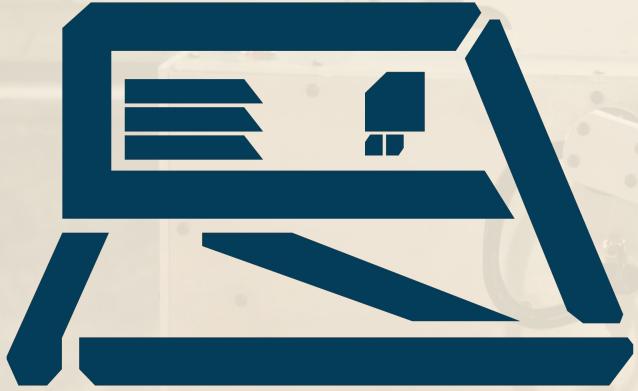
Small regolith testing environment for improved system testing prior to Florida competition.

New tools and improvements to team workspace to help promote safety and support more complex prototypes & designs.

All travel covered to take as many students as possible to Florida in May.

All costs for materials & basic tools covered to get the robot built.





THANK YOU

*Reach out to explore
partnership opportunities!*

Steve Swanson

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