

Team Neutrino (TN) makes a splash in our community, creating ripples of impact that reach far past us. Each integral skill shared with team members or outreach event we lead in the community is a droplet in the ocean of our impact. Our team is structured to foster accountability and collaboration, ensuring that every member develops essential skills to succeed academically and professionally. Understanding the power of a strong community, we are dedicated to cultivating a sense of connection among youth through FIRST and STEM outreach.

### **Droplets: Building A Community of Student Leaders**

Through our team structure, we foster an inclusive environment with an efficient spread of knowledge and skills. Our Leadership Core (LC) comprises 11 students, driving a culture of trust and responsibility and ensuring team cohesion and sustainability. By planning team meetings and bonding events, LC supports the integration of new team members. Lily, a freshman, shared, “Everyone on the team is super encouraging and cool; they make me feel reassured when trying out new things and are the main reason why I joined!”

Our 8 subteams collaborate across technical and non-technical areas. Each group completes specialized tasks from programming to writing, developing student’s hard and soft skills. Returning members lead 11 subteam-specific summer advanced projects and training camps, enhancing members’ leadership skills and encouraging a sustainable transfer of knowledge to incoming students. Subteam leads ensure effective communication through Slack channels and daily subteam updates during the Build Season.

Our associate role accommodates interested students with less availability than full team members. In the 2024 season, dedicated associates edited the build season wrap video and led a local elementary STEAM night to share our team’s mission and exciting FIRST opportunities.

Our members share their leadership skills beyond FRC, creating a sizable impact on individuals locally and statewide. Our Fundraising Manager, Meabh, leads Math Club, taking inspiration from our team’s organization, documentation system, and consistent leader

communication to help the club run smoothly. LC member Adam applied his leadership skills to the State Science Technology Fair of Iowa student advisory board, giving him a voice in planning and judging the event. LC member Grace led the effort to present at the Iowa Technology and Educators Connection (ITEC) conference, where we met with 45 educators and provided them with integral resources to start and sustain FIRST teams. Grace was awarded the ITEC Sympersma Leadership Award for her work and dedication, becoming the first student in a line of educators to win the award.

Our members' passion for leadership, creativity, and STEM is reflected by our alumni. 88% of Team Neutrino alumni since 2022 have followed careers in STEM. Our graduates work for team sponsors such as Workiva and John Deere. 2013 alumnus Bojun started a 3-D printing Etsy business, Ludicrous Creations, and has sponsored TN annually since 2019. Our alumni also return to mentor the team, demonstrating a continued commitment that is at the heart of our values. Since 2018, Dagney, a 2016 TN alumna, has mentored the team and coordinated mentors for 84 total FLL Challenge and Explore teams. As Grace, Dagney, and all our members and alumni demonstrate, TN develops leaders and STEM ambassadors who create ripples in the community.

### **Ripples: Reaching The Community Through FIRST Outreach**

To address a lack of local youth robotics summer programs, we created our own. This outreach initiative engaged 30/33 members of our team, who contributed to curriculum, logistics, finance, and advertising by consistently attending weekly planning meetings and/or volunteering for a week of camp. We promoted the camp at our local public library, farmers' market, a STEM festival, and 4 elementary schools, boosting our registration numbers from 22 to 75 within 1 month. We crafted our camp, FLL Blastoff, to directly impact the students in our community by equipping them with essential communication, confidence, and technical skills over four week-long sessions.

FLL Blastoff isn't just about teaching robotics; it is also about cultivating a community for local youth. We emphasized FIRST core values and created an environment that valued everyone's contribution. While some had prior coding experience, by the end of camp, all attendees knew how to pseudocode, prototype, adapt to challenges, and work within a team. Seeing individuals grow through the camp and the following FLL season was gratifying. At the beginning of our week one session, one of the kids was quite reserved and shy. However, throughout the week, their engagement and excitement flourished. We even received a note from their parent- "[I've] never seen them so excited about anything before!" That student joined a Neutrino-mentored FLL team in the fall, and their growth is a perfect example of why we started the camp.

This year, our team set a specific goal to increase our support to FIRST teams and strengthen our relationships with them. Empowered by our goal, we spent 506 hours mentoring 12 teams across 7 schools, a 124-hour increase from last year. As our FLL teams thrive, the number of TN student mentors has surged to 25, a 33% increase from 2022. Along with mentoring, one of our longest-running FIRST initiatives is our annual FLL Scrimmage. Having hosted it since 2011, this event simulates a competition environment for local FLL teams before their regionals, also giving them an opportunity to practice FIRST's core values. At the event, we encourage younger students to continue their FIRST journey into FRC. At our team booth, an excited student said, "Neutrino is my dream job!" and asked for a member's autograph. This kind of excitement pushes us to continue engaging youth in STEM and ignite their passions for exploration.

Beyond FLL, we bond with other FRC teams at our annual Impact Exchanges. We hosted 5 exchanges at regionals and scrimmages since 2022, giving teams the opportunity to share their presentations and receive constructive feedback and encouragement from others.

In the Fall of 2024, our team supported the inaugural Iowa FRC off-season competition, Clash in the Corn. While our team competed at the event, our members were volunteers on and

off the field. We created relationships with other FRC students from 6 teams by selling concessions, pit-judging, queuing, and meal-prepping. This event also trained new field volunteers, such as emcees, referees, and scorekeepers, fostering camaraderie between volunteers from 7 states. Our FIRST outreach changes culture: we inspire FIRST students to become STEM leaders and make waves.

### **Waves: Fostering Relationships and Accessibility through STEM Outreach**

Since 2012, we've developed STEM curricula for a local elementary summer school program with 60% free and reduced lunch participants, Enrich, Empower, Excel (EEE). Through race car competitions, making oobleck, and launching bottle rockets, we teach students hands-on STEM concepts, and our impact stays with them. After camp in 2023, an attendee ran into Sarah, an EEE leader, and exclaimed, "You're from that one robot club!" The attendee proceeded to tell her mom about the race car competition at camp and how it sparked her excitement for EEE the next year.

At the Des Moines Mini Maker Faire at the Science Center of Iowa (SCI), we expand our impact to the state level, showcasing our robot and teaching kids how to solder, stitch, and crochet at STEAM booths. Since 2019, we have sent 20+ volunteers to assist the event every year, filling the majority of their volunteer slots. Along with our impact on local youth, the intra-team bonding and diverse volunteer opportunities make it many members' favorite event. Through this event, we have created and strengthened many relationships, especially with Jolie, the event organizer, who told us, "We would not have been able to put on this event without [your] help." Our longstanding relationship with SCI allowed us to present to 290 visitors at Robotics Day, a new event for K-12 students to explore the future of technology. There, our team gave attendees a glimpse into FLL by helping them test a black-line sensing code on Spike PRIME robots.

We value the relationships we've made through our outreach, and they have helped us elevate our community presence. We welcomed 178 bikers into Ames at RAGBRAI (a bike race

across the state), reached 500 people at the Iowa State Fair, and sustained 12-year relationships through the 4th of July Parade and Story County Fair. In 2022, our TV show Full STEAM Ahead premiered on the Ames Public Access Television channel. This educational children's show showcased STEM activities and 7 local businesses, reaching hundreds of viewers. In 2024, through our partnership with Iowa 4-H, four team members recorded questions for a NASA Broadcast interview with the International Space Station, bringing our logo to national and interstellar audiences!

We extended STEM accessibility across the globe in 2023 by donating a 20-gallon tub of LEGOs to Life-to-Life Africa's Critical Care Center in Zimbabwe. This gave 23 preschool orphans access to hands-on activities and sparked their creativity.

### **Ocean of Impact**

Our team structure, FIRST involvement, and STEM outreach ripple far beyond our team's efforts. Our TN students grow as leaders, initiating our flagship FIRST programs of FLL Blastoff and mentoring to cultivate a community of STEM leaders. In the past 3 years, we have directly reached 37,000+ people, sharing our team's values, teaching integral skills, and igniting passions for STEM exploration. As Co-Captain Anika reminisces, "TN has given me endless opportunities and instilled my personal core values of persistence and leadership. Our reach in the community will shape the STEM innovators of tomorrow, just like it has done for me."