



Team
Neutrino
Annual Report 2015-2016

Mission Statement

The mission of Team Neutrino is to provide students with hands on STEM (Science, Technology, Engineering, and Math) experiences at the high school level that would not exist otherwise. The team acts as a real world application to supplement material learned in the classroom. Team Neutrino strives to create a robot that is competitive in the FIRST Robotics Competition and to maintain a positive and recognizable impact in the local community.





Chairman's Essay

Born from violent astrophysical events like exploding stars and gamma ray bursts, neutrinos are tiny, nearly massless particles that travel close to the speed of light. They're fantastically abundant in the universe and move as easily through lead as humans move through air. The man who confirmed the existence of neutrinos, Enrico Fermi, once said, "It is no good to stop knowledge from going forward. Ignorance is never better than knowledge." Fermi's quote resonates with FRC 3928 Team Neutrino, motivating us to broaden our reach, establish and intensify our impact, and cultivate success.

BROADEN OUR REACH

Our reach is spreading rapidly in our community. We promote FIRST through countless channels to a myriad of audiences: students, professionals, senior citizens, and everyone in between. Paving the way for the new generation of STEM is imperative to the team's success.

We meet the need for STEM education by maximizing all of our available resources. At the Edwards Elementary MakerSpace, we run a maker camp for 36 kids, which is a new approach to giving them hands-on experiences. It's also a successful fundraiser to maintain and update the MakerSpace facilities—we raised \$3,600 in 2015. Most importantly, we seize the chance to work with the kids and inspire the next generation of STEM students.

To broaden our impact, we collaborate with other teams at the Science Center of Iowa to bring FIRST to Des Moines. From the Girls in Science Festival to the Mini Maker Faire, our outreach efforts are varied and successful: each February we introduce girls to circuitry basics; each August we represent FRC on Robotics Day; each September we demo with other FIRST teams at the Iowa Mini Maker Faire.

We showcase our team at events to increase FIRST recognition: the 4-H Gala, Ames 4th of July Parade, Iowa State Fair, and 23 others in 2015. At the Iowa State Fair, our recognition grew when we partnered with the Governor's STEM Council, allowing us to reach 100,000+ people. We also demoed at the 2014 American Solar Car Challenge, which raced through Ames. Reaching 14,000+ people in one day, our visibility skyrocketed; Lane, who hadn't heard about FRC, couldn't believe we built the robot in six weeks. He joined the team in 2015, reinforcing 3928's beneficial effect beyond FIRST. Events like these are a great way

for our team to network and present FIRST to a new audience who otherwise wouldn't have been reached.

Since 2012, 3928 has volunteered for the Ames Super Summer program, guiding students on a STEM path. It doubled in size in 2013 because of our involvement. In 2015, the coordinator stepped down and we stepped up to teach the classes, creating lesson plans and providing hands-on challenges, which are now public on our website. Team members volunteered for two other classes and demoed the robot for all three. Through these classes, we reach out to the community and recruit future members. Lucas, a current member, found 3928 through the camp. He says, "The camp introduced me to FIRST and made me realize that computer programming and engineering are interesting to pursue." Connections like these are a key reason for our outreach.


We know the importance of educating everyone about FIRST through programs like our maker camp—we see firsthand how it changes lives. We also understand the importance of a professional image and reaching out to the business world to recruit support. 3928 maintains robust standards to contact and work with supporters through monthly newsletters, thank you visits, and other recognition. The team operates like a small business, knowing we can't produce a well-developed product (robot) without sufficient funding. Our sponsors appreciate our business plan, which records our structure, goals, finances, SWOT analysis, and action plans. It provides integral documentation for internal use to ensure sustainability and for external use as a resource for sponsors. This allows businesses like Danfoss to see what their generosity enables us to accomplish.

Our sponsor relationships have matured over the past year. In 2015, Interstate Batteries became a new sponsor. What began with a battery donation grew as we kept in contact through visits and newsletters. They were so impressed that Michael, an employee, became a mentor.

For the past three years, 3928 has sold FIRST e-Watt saver light bulbs at the City of Ames Eco Fair. Since this event falls during Minnesota North Star each year, we set up a livestream so community members can see us compete. In 2013, a former parent mentor who ran the booth said, "You had Girl Scout Troops, firefighters, farmers, retired folks, City of Ames employees and LOTS of others all cheering for you. The community is VERY proud!"

ESTABLISH AND INTENSIFY OUR FIRST IMPACT

A major contribution to both team 3928's success and stimulation of FIRST growth is the progression of programs we've implemented in Ames. To in-



crease our reach, we publish lesson plans on our website to organize new teams and give them ideas for projects. We personally mentor 22 FIRST teams across Iowa to teach problem-solving and instill a passion for learning.

After the success of our pilot FLL Jr. program, Club Proton, 3928 started 11 FLL Jr. teams in three locations. Teaching these kids is a learning experience for all involved—mentor of three teams, co-captain Dagney, loves “seeing the kids’ creativity and how they express this in their models.” As these kids transition from elementary to middle school, we encourage them to join FLL.

The Ames Middle School (AMS) FLL Scrimmage is our oldest outreach event. We assisted with the event from 2011 to 2014 and ran it in 2015. We ref robot matches, give feedback on teams’ projects, and present our robot and team. To become more involved with AMS FLL, we started a mentoring program and try-out system for each team in 2014.

The Story County FLL program is incredibly valuable to 3928—many FLLers later join FRC, creating a circle of inspiration and keeping their passion for STEM alive. Through mentoring, we influence younger generations and give back to the program.

In 2013, 3928 alumna Sarah mentored Tiffany’s FLL team. Now a member, Tiffany was inspired to give back; she mentored Joel’s FLL team. “New-trino” Joel is mentoring FLL Jr., completing our circle of inspiration. Joel says his favorite part of mentoring is “getting to know the kids and helping them get excited about STEM.”

CULTIVATE SUCCESS

“I will let you fail,” is one of the first things lead mentor Tony Milosch tells new team members. From there, they quickly learn that 3928 is entirely student-driven. Students do the work and mentors ensure it’s constructive.

We cultivate success by laying a foundation for others to pursue STEM. Over 50% of 3928’s students are FLL alumni, 80% of the team’s mentors participated on FIRST teams, and 100% will continue in FIRST. This exemplifies the continuation of our circle of inspiration, ensuring sustainability.

More than anything, we value developing a reputation as an approachable, cohesive unit. We emphasize teamwork and Gracious Professionalism in all we do and this attitude of care and respect is vital in and out of FIRST. 3928 is well-regarded in the local and FIRST communities, and because of this positive reputation we are better able to overcome challenges.

Team 3928 was founded in 2011 at Ames High by nine high schoolers

and seven FRC alumni. The team gained valuable insight into FRC and won Highest Rookie Seed at the Midwest Regional. In 2012, our resilience was put to the test when we lost our high school build space, but with our drive and passion, we found new partners in Iowa State University and 4-H and expanded to three Story County high schools. Last year, with the growth of our team, we moved our build space to the new Biorenewables Complex at ISU.

Our primary recruiting event is the fall Ames High Club Fest. At this event, we set up a booth to inform and answer questions from potential “New-Trinos.” Our Club Fest event has been growing in effectiveness: our conversion rate of interested students to team members was 70% this year—up from 40% in 2013.

All members work to make sure the “New-Trinos” find their place on the team. To improve the sustainability of 3928, the captain and co-captain appoint students to manage non-technical and technical aspects to pass down knowledge and experience. Our success is based on our team improvements, discoveries, and accomplishments, tying together individual strengths.

Not technically inclined, member Tiffany surprised herself by finding her niche. She “realized that the team was fabulous at integrating new members” and found her social media skills were relevant to FRC. Similarly, when alumna Rachael first heard about the team, she was only attracted to the non-technical aspects of FIRST. After joining, she found her passion in engineering instead.

Team 3928 creates a gateway to a path in STEM for present and future generations through FIRST. As 2015 alumnus Jeremy said, “FIRST has allowed me to better my life in more than one way and I don’t know why I would ever stop. I will continue to be involved with FIRST for the rest of my life, even if it’s only to see how else it changes and helps me one, five, ten, or even 20 years down the road.”

From huge events to bonding with individual FIRST teams, our influence is far-reaching and significantly enhances the community. Expansion of knowledge and passion for learning reflect both physicist Enrico Fermi’s statement and FRC 3928 Team Neutrino’s mission: expressing the impact we create by transforming separate individuals into a team of students and supporters dedicated to ensuring the success, sustainability, and education of STEM through FIRST.

2014-2015 By the Numbers

Iowa FRC Teams

167 Children of the Corn
Iowa City

525 Swartdogs
Cedar Falls

967 Iron Lions
Marion

3928 Team Neutrino
Ames

4646 Team ASAP
Des Moines Metro

5041 CyBears
West Branch

5576 Team Terminator
Spirit Lake

#Volunteer
EVENTS

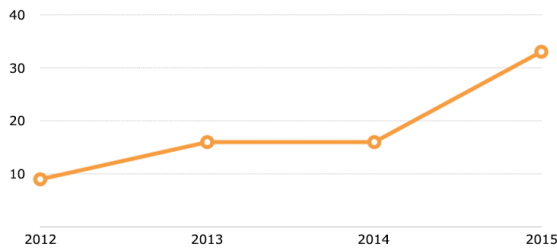
25

#Volunteer
HOURS

1573



Team Neutrino Membership



Award History

2012 Rebound Rumble
Highest Rookie Seed
@ Midwest

2013 Ultimate Ascent
Regional Finalists
Excellence in Engineering
@ Greater Kansas City

Regional Finalists
Innovation in Control
@ Minnesota North Star

2014 Aerial Assist
Engineering Inspiration
@ Minnesota North Star

2015 Recycle Rush
Dean's List Finalist
@ Minnesota North Star

Alumni Stats



FIRST post Neutrino (64%)
No FIRST post Neutrino (36%)



STEM major (79%)
Other major (21%)



Graduate high school (100%)
Don't graduate (0%)

2015-2016 Events and Programs

SEPTEMBER 2015

FLL Try-Outs Event*

Science Center of Iowa's Mini Maker Faire*

Ames High Club Fest*

New-Trino Informational Meeting

FLL Mission Model Kit Building*

OCTOBER 2015

FLL Mentoring Program*

Cow Town ThrowDown

NOVEMBER 2015

FLL Mentoring Program*

FLL Jr. Mentoring Program*

Quality Manufacturing Sponsor Visit*

Interstate Batteries Sponsor Visit*

DECEMBER 2015

FLL Mentoring Program*

FLL Jr. Mentoring Program*

Emerson Process Management Sponsor Visit*

FLL Scrimmage and Presentation at Ames Middle School*

Marshalltown FLL Regional Volunteering*

Science Center of Iowa FLL Regional Volunteering*



JANUARY 2016

FLL Jr. Mentoring Program*

City of Ames Electric Services Sponsor Visit*

FRC Kickoff

Iowa State FLL Championship Volunteering and Demonstration*

FEBRUARY 2016

FLL Jr. Mentoring Program*

SCI's Girls in Science Festival*

Edwards Elementary Science Night*

Iowa FRC Scrimmage

Robot Reveal*

Iowa 4-H Gala*

MARCH 2016

FLL Jr. Mentoring Program*

Iowa Regional

Edwards Elementary Maker Faire and FLL Jr. Expo*

APRIL 2016

FLL Jr. Mentoring Program*

Minnesota North Star Regional

Sawyer Elementary FLL Jr. Expo*

* *signifies outreach event*

FIRST Mentoring

FIRST LEGO LEAGUE JR.

- 3386 The Brickers
- 3463 Lego Minds
- 4076 Lego Champions
- 4267 The Extreme Mega Lego Builders
- 4651 Purple Icebreathing Dragons
- 4652 Lego Magic
- 4653 Lego Masters
- 4654 Creative Crew
- 5748 Recycling Lego Monsters
- 6395 Jedi Masters
- 6396 The 5 L-Awesome Lego Ladies



FIRST LEGO LEAGUE

- 2042 Clash of Trash
- 18243 [insert team name here]
- 19379 The Joyful Olives
- 19382 The Textile Turtlez
- 19421 Bricky Mouse
- 19658 The Trash Talkers
- 19764 The Cleanup Crew
- 20337 Trash Busters



FIRST TECH CHALLENGE

- 7491 The Robot Corps

FIRST ROBOTICS COMPETITION

- 5935 Tech Tigers



Summer Camps

LEGO MINDSTORMS ROBOTICS

This class introduces students to the NXT and EV3 robots and helps to prepare students for FIRST Lego League. It begins with an introduction to programming and goes through building the basic robot. By the end of the class, students are able to build and program a robot to complete a chosen mission.

ENGINEERING 0.101

This class teaches students basic engineering concepts and techniques. Students start with a safety training day and then move on to take apart various electronic devices such as computers, VCRs, cameras, and cell phones. By the end of the class, students have learned more about what makes these devices work.

BEYOND AN HOUR OF CODE

In this class, students learn how computer science run everything around us, and explore ways that kids are using coding skills to do amazing things.

MAKER TECH CAMP

Students learn about circuits, coding, robots, and 3D drafting and printing through projects developed by Team Neutrino. The class inspired students to join FLL and FLL Jr. in the fall.

All lesson plans and curriculum are posted on www.teamneutrino.org/resources/camps.





Team Roster

LEADERSHIP

Tony Milosch	Lead Mentor
Timothy Steward	Captain
Dagney Paskach	Co-Captain
Conor Albinger	Electrical Manager
Tifany Chu	Social Media Manager
Nicole Essner	Safety Captain
Woo Young Joo	CAD and Scouting Manager
Rucha Kelkar	Fundraising Manager
Lucas McLeod	Videography and Photography Manager
Logan Peters	Programming and Graphics Manager
Benjamin Steward	Mechanical Manager
Takeshi Suzuki	Scouting Manager
Tianxin Xu	Outreach Manager

MEMBERS

Moriah ConnerFR
Helen HuFR
Hana LeeFR
Daren McKellarFR
Joel NeppelFR
Jacob PrestonFR
Nick SulzbergerFR
Angela ZhengFR
Obi AgbaSO
Nicole EssnerSO
Ryan JeongSO
Rucha KelkarSO
GaJin KimSO
Hallie LartiusSO
Philip MaSO
Lucas McLeodSO
Sam PackardSO
Jason ParkSO
Sang Won ParkSO
Nathan PaskachSO
Nathan SchmidtSO
Benjamin StewardSO
Tianxin XuSO
Jason ZhengSO
James BeethamJR
Tiffany ChuJR
Woo Young JooJR
Andrew KimJR
Zhi LiJR
Logan PetersJR

Bekah StammerJR
Takeshi SuzukiJR
Farhen SyedJR
Evan WilliamsJR
Conor AlbingerSR
Antonio AlvarezSR
Matt DevigSR
Kyle GassSR
Dagney PaskachSR
Isaac StahrSR
Timothy StewardSR

MENTORS

Evan Derse ISU Sophomore
John Gass Parent
Alex Grant ISU Senior
Nick Hasto ISU Junior
Tony Milosch John Deere
Erin Mitchell ISU Sophomore
Michael Olson Interstate Batteries
Jeanne Paskach Parent
Sarah Pinkerton ISU Junior
David Runneals ISU Junior
Rose Stammer Parent
Taylor Tuel ISU Senior
David Williams Parent

2015-2016 Sponsors

DIAMOND SPONSORS

John Deere
Danfoss
Monsanto Fund

PLATINUM SPONSORS

CIT Signature Transportation
3M
Quality Manufacturing Corporation

GOLD SPONSORS

Theisen's
City of Ames Electric Services

OPERATIONS PARTNERS

Story County 4-H
Iowa State University College of Engineering
Iowa State University Robotics Club
Boyd Lab

SILVER SPONSORS

Iowa 4-H Foundation
Emerson Process Management
Interstate All-Battery Center

HONORABLE MENTION SPONSORS

Jimmy John's
Panera Bread