

## Chairman's Award - Team 125

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2019 - Team 125

### Team Number

125

### Team Name, Corporate/University Sponsors

Northeastern University/Sonos Inc./United Technologies/Markforged/PTC/BAE Systems/West Coast Products LLC/NASA&Revere High&Brookline High&Boston Latin&Greater Boston 4-H Robotics

### Briefly describe the impact of the *FIRST* program on team participants with special emphasis on the 2018/2019 year and the preceding two to five years

The NUTRONS family includes 120 students with 2 FIRST and 2 STEM feeder programs in Greater Boston, uniting cultures and providing opportunities for all. Our FRC team has 79 students from 7 high schools and of these students, 13 different languages are spoken. With HS graduation rates of 64%, 100% of 125 students graduate and enter college or the military and 85% pursue STEM majors. 8 students have received FIRST scholarships and 10 received STEM internships at local companies and universities.

### Describe the impact of the *FIRST* program on your community with special emphasis on the 2018/2019 year and the preceding two to five years

125 founded after-school robotics programs at 3 elementary schools and 3 middle schools in Revere, and continue to support them by mentoring weekly. In 2015 we advocated to create a robotics class at Revere High School and developed curriculum for it; there are now 3 robotics classes offered. In total, our Revere programs impact 91 students annually. We support the Latino STEM Alliance by training 20 teachers, mentoring 36 teams reaching over 340 students and run annual competition since 2011.

### Team's innovative or creative method to spread the *FIRST* message

125 focuses on collaboration with teams and sharing technical and non-technical knowledge. We bring 79 students from 7 high schools to collaborate together with 20 mentors from 4 companies and 7 universities. We provide in person technical assistance to 16 teams annually, in addition to twice a year workshops. Remote international assistance is done through The Compass Alliance (TCA), providing 16 pathways to run and expand programs and provide guides to run Hear for You Quiet Rooms at events.

### Describe examples of how your team members act as role models and inspire other *FIRST* team members to emulate

Being a NUTRON means providing opportunities to help others learn, succeed, and grow. We give our time to others by hosting 2 official FIRST competitions, running 3 annual seminars and workshops, and running an annual off season FRC event. We also help create live streams and archive seminars that've provided 10% of the current published resources on The Compass Alliance website. Through these platforms we show the power in sharing knowledge and helping others by developing partnerships.

**Describe the team's initiatives to help start or form other FRC teams**

NUTRONS has hosted Quick Build since 2008, working one-on-one with rookie teams. In the past 5 years, we've impacted 35 teams. We gave rookie teams strong foundations to start them on the right track. Over 180 teams have attended our annual University Day since 2006 where we host seminars to provide teams with new technical and non technical skills. We helped form TCA in 2017 and lead TCA's partnership with FIRST HQ in 2019, giving any team in the world access to instant help.

**Describe the team's initiatives to help start or form other FIRST teams (including Jr.FLL, FLL, & FTC)**

In 2016 NUTRONS students founded and funded for 2 FLL teams in Brookline, which have over 50% female participants. In 2018 we grew our family of programs to 7 FTC teams, with 3 being integrated into Revere HS curriculum. Our annual FLL Qualifier has hosted 30 teams since 2015. This year we hosted our first FTC scrimmage, which we plan to turn into a qualifier next year for 10 FTC teams, creating an engaging experience for FTC and FLL teams to see future avenues in FIRST.

**Describe the team's initiatives on assisting other FIRST teams (including Jr.FLL, FLL, FTC, & FRC) with progressing through the FIRST program**

Providing FIRST opportunities in the Boston Area is a priority of our team. Through after school robotics programs in Revere and the Latino STEM Alliance we introduce over 120 students to FIRST opportunities annually. In 2018 we hosted an FTC scrimmage alongside our 4th FLL qualifier, enabling teams from both programs to network and interact. Since starting our FTC program and integrating it into the Revere curriculum, 80 students have progressed to participate in FRC and mentor STEM programs.

**Describe how your team works with other FIRST teams to serve as mentors to younger or less experienced FIRST teams (includes Jr.FLL, FLL, FTC, & FRC teams)**

This past year alone, TCA has had over 17,500 site visits and 3,100 TCA Pathways viewed in over 20 countries. 125 works with the other 9 TCA founding teams and 55 alliance partners to maintain TCA's website, social media platforms, and Hear For You. 125 helps lead the TCA Tag Teams and has contributed resources and TCA Pathways. New in 2019, we've worked with FIRST HQ to curate and publish specific FRC resources along with Hear For You resources for Official FIRST Events.

**Describe your Corporate/University Sponsors**

Since 2015, we have secured grant funding from BAE, PTC, and UTC. This year we were fortunate to be recipients of a NASA grant. These grants specifically fund our FIRST team expenses. Since 2016, SONOS has been our largest corporate sponsor providing us with funding, resources, space, and one of our 3 lead mentors. New in the 2019 season, we are proud to be a 4H group, and re-homed at Revere High School through our growing partnership with Revere Public Schools.

**Describe the strength of your partnership with your sponsors with special emphasis on the 2018/2019 year and the preceding two to five years**

After operating out of Northeastern University (NU) for 21 years, 125 rehomed to Revere High School (RHS) in November of 2018. RHS transformed a locker room into a machine shop, and NU donated machinery. Since 2015, RHS has allowed us to host FIRST competitions, and supported integrating FTC into the curriculum in 2016. Our partnership with SONOS provides access to 3D printing, practice space, and an inspirational environment to host our annual Career Day and Year End Banquet.

**Describe how your team would explain what FIRST is to someone who has never heard of it**

FIRST is a global STEM program, a platform for students of all ages to work alongside peers and mentors to learn skills, explore new interests and make life changing friendships. Every year is different because of the experiences, skills and ideas students and mentors bring. It's a unique community where students work alongside professionals put their technical and non technical ideas into action. FIRST is a community that instills confidence and passion to solve problems and help others.

**Briefly describe other matters of interest to the FIRST judges, if any**

In 2017 we founded the collaborative platform "Hear For You" (HFY) to promote mental health awareness in the FIRST community. Our goal is to provide students, mentors and volunteers an avenue to learn from each other, help one another and help end the stigma around mental health. During the 2018 season, 12 HFY Quiet Rooms were held at 2 regionals and 10 district events in 2 countries. Following the 2018 season, we partnered with FIRST HQ to curate resources for hosting Quiet Rooms.

**Team Captain/Student Representative that has double-checked this submission.**

Tatiana Roman

## Essay

Great STEM pioneers like Daly, Fried, Pao, and Leon overcame adversity through their own persistence and the support of someone believing in them. Their work resonated beyond achievements, it created opportunity for others. Team 125, the NUTRONS, follows the footsteps of these impactful pioneers by emulating key characteristics and embedding them into the core values of our team.

Persistence like Daly

"Successful people are those who failed and kept going" - Marie Maynard Daly

We began with only 15 students in 1997, grew rapidly in 2001 with 75 students and 30 mentors, and won the World Championship. In 2005 our team had diminished to 5 students and 1 mentor, prompting us to recruit members from any high school or university in the Greater Boston Area. Since then, our team has persisted through the many obstacles of being an inner city FRC team and learning that progress is born through hardship.

In May of 2018, a new challenge emerged to find a new and better home. Through persistent networking and planning, 125 established Greater Boston 4H Robotics as the first step to sustainability. Our partnership with Revere Public Schools (RPS) led to our new home, and in just two months, half of a locker room was transformed into a machine shop.

Inclusion and Lasting Change like Pao

We need to understand that if we all work on inclusion together, it's going to be faster, broader, better, and more thorough than anything we can do on our own- Ellen Pao

Many of our students come from school districts and communities where over 60% face economic hardship. The diversity of our students is remarkable: 70% are minorities, 25% are female, and we collectively speak 13 different languages. Our diversity helps us better understand and connect with the communities we serve.

We started after school robotics programs with 3 Revere elementary schools in 2014 and 3 middle schools in 2015. 11 of our FRC students currently mentor 45 students annually. NUTRONS students create FLL and FTC inspired game challenges for these students. Once these students reach high school, they have the opportunity to take Robotics 1&2, where students compete in FTC with the NUTRONS.

With our move to RPS, we saw the potential to expand our programs to reach more students, especially the growing English language learner population. We collaborated with RPS to submit a FIRST STEM Equity Community Innovation grant to provide funding for a mobile robotics center. This project will be used to start and mentor 15 new FTC teams in Revere, adding to our existing 7.

To engage a broad range of community members with FIRST and STEM; our team participates in 12 demos annually. In 2016 and 2017, we demoed our robot at the International Sand Sculpting Festival in Revere, which attracts over 1 million people annually. For 2 years we've attended HUBweek, having over 50,000 visitors and connecting with local tech companies.

Progressive like Fried

"Amazing things can happen when we work together to solve problems" -Limor Fried

Limor Fried made her mark by leading the open source software movement that encouraged collaboration. A common thread woven into Team 125's endeavors is the power of people working together to promote progress for everyone.

Our team makes information and knowledge accessible to others by providing workshops to other teams. Since 2006, we've hosted University Day, where our students and mentors give seminars on technical and non-technical skills, reaching over 180 teams since its inception.

Since 2007, we've hosted a Quick Build to assist teams in starting their build season off strong. Our students help assemble, wire, and program drive bases, serving as a way to get teams on track and develop relationships. Quick Build has assisted 88 teams since its inception.

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An extension of our FIRST outreach efforts on a global scale is The Compass Alliance (TCA). In August of 2017, Team 3132 recruited 125 and 8 other teams to collaborate on a global project to promote team sustainability and growth. After months of research and collaboration, TCA teams developed the 'One-Stop-Shop' for team sustainability. TCA's website is a location for FRC resources, acquiring remote help, local facility availability, and a 24/7 Call Center. 125 developed and maintains the website, TCA Facebook page, Twitter, and Instagram that collectively have over 2,081 followers. We've provided over 10% of the resources on the TCA website and curate 3 social media posts a week.

In the early stages of TCA, 125 worked with Team 503 to develop Tag Teams: a help system connecting experienced teams with another team anywhere in the world and currently involves 20 teams. A key resource TCA provides that our team has led and contributed to are Pathways, step-by-step guides to help teams navigate major areas of being a successful team. This past year, there were over 3,100 Pathways visits and 17,500 visits to the TCA website. This year alone, the TCA website has reached over 20 different countries, with 55 teams assisting in different facets.

In August of 2018, 125 spearheaded a partnership between FIRST HQ and TCA to create officially endorsed resources published on the FIRST Inspires website. These resources include step-by-step guides for new FIRST members, "101" technical deep dives and How To guides. These resources are distributed throughout the global FIRST community via FRC Blog posts, email blasts and social media platforms, reaching 26,000 people on Facebook and 25,600 people on Twitter.

TCA founder Team 3132 said this about our contributions: "Having worked with 125 for the past 18 months has been an absolute honor. Their passion, commitment, dedication, and follow through are incredible. They are a true role model team."

In addition to TCA, 125 is a consistent resource to the FIRST community. We contribute as guests and content curators for FIRST Updates Now and the FIRST Inspires Twitch channels, in addition to live streaming our seminars on our YouTube page, totaling over 90,500 views.

Influential like Julian

"I have had one goal in my life, that of playing some role in making life a little easier for the persons who come after me" - Percy Julian

Similar to Percy Julian, the NUTRONS aspire to create opportunities for our community and make the FIRST experience easily accessible for all. With the majority our team demographic coming from underrepresented communities, our objective is to break down barriers not just for ourselves now, but for generations to come.

Since 2011 we've allied with The Latino STEM Alliance (LSA), a Boston based nonprofit, to empower youth and educators in marginalized communities. NUTRON students design game challenges, build competition fields, provide 80% of the volunteers at the annual competition and train LSA facilitators.

We're fortunate to have 20 mentors supporting students, all of them being FIRST Alumni coming from 7 different universities in the Greater Boston Area and 7 of the mentors are working professionals with careers in STEM. With this deep well of guidance, there are many professional opportunities for the students on 125 to attain internships from companies like SONOS and Digital Lumens.

Our mentors influence students beyond robotics with Career Day, our annual workshop where professionals teach students about resume writing, interviewing skills, college application tips, and general advice for the next step. This workshop was created in 2017 as a way to build confidence for a difficult process for young adults. In 2017, we had the opportunity to hold our Career Day at SONOS, giving us the chance to ask engineers questions directly.

Caring like Leon

"It's not enough" - Mark Leon

Mark Leon's brilliance coupled with his unparalleled enthusiasm to make every student see themselves as a capable contributing member of their community is something 125 strives to emulate. Our mentors see the promise in every NUTRONS student, and believe in us when we can't believe in ourselves. This infectious compassion and support allows 125 students to bravely lead new movements to help others.

In 2017, NUTRONS students wanted to make mental health as common as safety practices in FIRST. Hear For You (HYF) was founded as a collaborative platform to provide students, mentors, and volunteers an avenue help each other and create a culture of awareness, understanding, and empathy. NUTRONS students developed, planned and successfully implemented safe spaces for people to decompress at competitions called Quiet Rooms, providing resources and de-stressing activities. In 2018, there were 12 quiet rooms held at 9 district events and 3 regionals spanning 2 countries.

It wasn't enough. New for the 2019 season, NUTRONS students spearheaded a partnership with FIRST HQ to create a Quiet Room Guide for the official Regional and District Planning Guide. HFY members from 4 different teams in 3 countries created these published resources to allow events to have thorough instructions on how to implement Quiet

Rooms.

Our team works hard to provide reliable fun competitions for teams in every FIRST program. Since 2015, we've hosted an FLL Qualifier, and in 2018 ran an FTC scrimmage alongside it for 20 FTC teams, allowing both programs to network. Since 2004, we've hosted our off season Beantown Blitz and for 6 years, our mentors have run 13 NEFIRST FRC events throughout New England. 125 will always continue to give back and support our community in new and meaningful ways. Mark Leon was right, it's never enough.

Like great STEM pioneers, when faced with adversity and obstacles, we believe something better is possible through hard work, collaboration, and determination. Through our endeavors, the NUTRONS hope to inspire others to persevere, share knowledge, develop partnerships, take risks and above all promote a culture of compassion.