

Chairman's Award - Team 3504

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2018 - Team 3504

Team Number

3504

Team Name, Corporate/University Sponsors

Field Robotics Center, Carnegie Mellon University/American Eagle Outfitters & Fox Chapel Area Hs & Oakland Catholic High School & Pittsburgh Brashear Hs & Pittsburgh Science and Technology Academy 6-12 & Avonworth Hs & Pittsburgh Capa 6-12 & Bishop Canevin High School & Dorseyville Ms & Plum Shs & Winchester Thurston School & Pine-Richland Hs & Seneca Valley Shs & Upper Saint Clair Hs & The Ellis School & PA Cyber Charter School & Aquinas Academy & Penn Hills Shs & Harrold Middle School & Sacred Heart Elementary School & Pittsburgh Obama 6-12 & Hampton Middle School & Hampton Hs & Franklin Regional Ms & Canon-Mcmillan Shs & South Fayette Ms & Community College Allegheny County & Home School & Home School & Home School

Briefly describe the impact of the *FIRST* program on team participants with special emphasis on the 2017/2018 year and the preceding two to five years

All alumnae attend college, 84% major in STEM. Girls are introduced to STEM careers with panels (Chatham Forum, SWE, Uber) and female leaders (Hillary Clinton, Megan Smith). 3504 has 4 national and 22 regional NCWIT awardees, 2 Dean's list winners (Naoka Gunawardena 2013 & Simran Parwani 2014) and 2 finalists (Jaden Barney 2011 & Sylvie Lee 2014). 3504 develops a close team culture with triads (pairing of new, junior, & returning girl), CPR training, self defense classes, and laser tag.

Describe the impact of the *FIRST* program on your community with special emphasis on the 2017/2018 year and the preceding two to five years

In 5 years, we completed 10000+ outreach hours and hosted 275+ events like 93 robot demos, presentations for CMU TechNights, STEM Girlz, and Girl Scouts, workspace tours, and Maker Faires. We host practice areas, workshops, and scrimmages for other FLL, FTC & FRC Teams (FLL Jr Demo Day, FTC Drive It workshop, FLL Summer Camps) at our practice field. We are members of Steel City Robotics Alliance, a union of Pittsburgh FRC teams who host events like The Steel City showdown we co-hosted.

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

To help spread the message that anyone "Can do it!", in 2013 Girls of Steel created the chassis project: a portable chassis kit able to be assembled into a drivable robot by 5-7 people, even amateurs, in a few hours. This kit was used at 20+ workshops since its creation. After events, participants see that building robots is not intimidating, even for kids under 8 years old. The chassis project has met President Obama and countless children, and acts as a far-reaching educational tool.

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

3504 has a leadership council consisting of student leaders, each with a unique job, who meet weekly to discuss goals, priorities, and agendas. They lead "all-hands" meetings on Tuesdays and act as role models to other team members. FRC members serve as role models for FTC girls with a shadowing program. Our members volunteer by visiting Bethlehem Haven women's shelter, gift wrapping at Barnes & Noble, donating clothes and having food drives. Girls mentor FLL Jr, FLL, FTC, & FRC teams and camps.

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

3504 has advised teams 4467, 4150, 5871, and 7274 during their rookie year. We reach others with media like our Rookie FIRSTs blog, Facebook, Twitter and Instagram. We present on fundraising, starting a team pipeline, plate & standoff chassis and creating STEM summer camps. Globally, we hosted team members from Dominican Republic, Israel, and Australia. Chinese and Taiwanese students have participated in our Feiyue Summer Program, inspiring the creation of FRC Teams 5449, 6707, 6414, and 6947.

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

GoS started 2 FTC teams in our Jr. Member Program, 5 FLL Jr., 4 FLL teams mentored by 3504, and 4 GoS girls have started external FLL teams. We have online resources on how to recruit girls with outreach and engage them in STEM at a young age. We educate people about FIRST robotics at outreach events to promote interest in robotics. GoS spoke at SWAT and the World Championship about our pipeline of girls in STEM, including how to form FLL teams. FTC members shadow FRC members in build season.

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

We host 2 FRC and 2 FLL scrimmages yearly and FLL & FLL Jr. Demo Day at our FRC practice field and 2 FLL fields. Our fields are open to local FRC teams. We skype with teams globally to give advice and run a RookieFIRSTS Tumblr blog for rookie teams to learn about FRC robotics. GoS hosts summer camps: 4 FLL, 3 FTC, 1 STEMGirlz, and 5 Feiyues. We've held Drive It! Workshops twice for local FTC teams at our field, and hosted 2 and presented 11 sessions in the Steel City Robotics Alliance Workshops.

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)

3504 shares tips internationally through workshops, symposiums, and presentations. Nearly every year 3504 attends 771's SWATposium and presents topics ranging from creating STEM summer camps to designing a chassis using plates and standoffs. We held CAD classes with Team 3260 hosting participants from 8 teams. We attend the Steel City Robotics Alliance Workshops (2011-17) to give presentations to different teams from the Pittsburgh area. We presented at the FIRST World Championships (2015).

Describe your Corporate/University Sponsors

Our generous sponsors are: Carnegie Mellon University (Robotics Institute, Field Robotics Center, National Robotics Engineering Center), The Grable Foundation, The Pittsburgh Foundation, The Buhl Foundation, Heinz Endowments, EQT, Eaton, Bosch, Grambindi Davis Fund, Carnegie Robotics, Sprout Fund, Comcast NBCUniversal, Ellis School, American Eagle Outfitters, First National Bank, Leonard Gelfand Center, TechShop, Drexel University, QinetiQ-NA, CloudDesktopOnline, Wombat, and Printex.

Describe the strength of your partnership with your sponsors with special emphasis on the 2017/2018 year and the preceding two to five years

NCWIT, Verizon, Comcast, Sprout Fund, Benedum Foundation, and Heinz Endowments sponsored grants for our camps and workshops to reach underrepresented demographics and communities. GoS has demoed at sponsor events: Rec2Tech, Westinghouse Demo Day, WH Frontiers, and Maker Faire. We preserve relations through presentations, letters, and invitations to regionals, and 4+ 3504 girls interned for sponsors. In return, CMU supports our mission with donations of workspaces, a practice field, and mentors.

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

FIRST is a robotics organization inspiring kids to explore STEM and teaching them core values to use throughout their life; and also having core values align with 3504's. Creating an environment of fellowship, FIRST allows for learning the skills needed to become a successful professional. FIRST changes the culture of STEM fields and provides the basis for one of 3504's most valuable assets: the pipeline. Through FIRST programs, 3504 gives girls a path that steadily nurtures love for STEM.

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

Our team aims to combat the gender disparity in STEM fields, empower young women by teaching them technical and business skills, and serve as a role model for future generations. Our FLL camp has reached girls from St. Louis (2015) and Guatemala (2017). We focus on face-to-face contact to have a larger impact on a greater number of girls. We value gracious professionalism greatly and prepare team members to effectively connect with audiences of all ages, creating modern day Rosie the Riveters.

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

Emilia Bianchini

Essay

Pittsburgh based, FRC Team 3504 sustains a broad network celebrating female involvement in STEM. Girls of Steel (GOS) activities encompass many groups with efforts to engage children in the local community, include all levels of FIRST programs, maintain positive relations with our alumnae and sponsors, cultivate a global media presence, and spread our mission to national leaders. Our 52 FRC team members come from 20+ public, private, cyber and home schools. In 7 years, we've attended 200+ outreach events meeting 21000+ people. Our different media outlets have reached over 20,000 people. In addition to broad social media interactions, we emphasize activities involving hands-on events with members of our community. We had 4191 face-to-face interactions with people in 2017, and set a goal of reaching 5000 in 2018. The Chairman's Award recognizes a team acting as an advocate for FIRST's mission and a role model for other teams. Our broad and deep network of STEM activities is a model proven to successfully promote FIRST ideals, especially for women, and can be emulated by others.

Engaging the younger levels of FIRST with a pipeline of STEM-focused programs is a GOS priority. We mentor 4 co-ed FLL with 27 members and 5 co-ed FLL Jr. teams with 30 members, each team having at least a 50:50 gender ratio, and host 2 annual scrimmages in a pipeline of FIRST activities. FTC Team 9820 was formed in 2015, and FTC Team 9981 was added to our program this year. With 19 8th and 9th grade girls, these teams host outreach events and work on the CMU campus. Our summer FLL and FTC summer camps expose students to robotics. We provide online resources for creating FLL teams, and in 2014 and 2015, co-hosted events with FLL Team 51. This collaborative spirit resulted in 4 GOS girls creating their own school FLL teams to spread the FIRST's message.

Our pipeline is successful as all alumnae have attended a college or university. More impressive, 84% pursued a STEM major. We are proud of our alumnae who have attended schools such as Massachusetts Institute of Technology, Yale University, Carnegie Mellon University, and New York University Abu Dhabi. 3504 continues to contact its alumnae and invite them to events like the annual Holiday Party. Also, all team members report being more confident in their STEM skills since joining GOS.

GOS is fortunate to be sponsored by Carnegie Mellon University. Every year, the team uses CMU's machine shop and classrooms. We create a mutually beneficial relationship with CMU by attending many of its events and helping to promote the school. This year, GOS took part in CMU's crowdfunding campaign. The funds from this effort will make attending competitions more affordable for team members. This October, we hosted a booth at the CMU Board of Directors meeting, spreading our message to key CMU decision makers, including the president, deans, and trustees. Through our CMU connections, we were invited to speak at Pittsburgh's new Advanced Robotics for Manufacturing Institute kickoff meeting. Our team presented to 200+ robotics executives from all over North America and organized robot demo sessions with 3 local teams. Three GOS alumnae have gone on to attend CMU in both undergraduate and graduate programs. Three different CMU departments helped find space and funding for our program. CMU is tremendously generous to the team, and we try to give back however we can.

With our pipeline of STEM activities, our mission grows through Pittsburgh. In 2013, we made our outreach events more effective by designing and building our chassis kit. The kit is a small robot chassis that fits into the trunk of a car. An inexperienced group of 3-5 can build a chassis in 2-3 hours. Traveling to Canada, 3504 members presented at a STEM symposium discussing our message and efforts. GOS partakes in a variety of outreach events including hands-on and one-on-one interactions, robot demos at events like Rec2Tech, American Association for University Women's Tech Savvy, SciTech Festival, Three Rivers Arts Festival, startup incubator AlphaLab Gear's Fair, CMU's Society of Women Engineers Carnival, the Cooper Seigel Library, and Propel Charter schools. We offer interactive events to the public, such as workspace tours, FRC-oriented lectures (like the Univ. of Pittsburgh's Investing Now camp), CMU Technights workshops for middle-grade girls, and booths at the Jr. Achievement Career Fair (displays career opportunities to elementary & secondary school students) and a regional Pennsylvania teacher conference (PETE&C).

Connecting with peers is an invaluable part of FIRST, 3504, and Pittsburgh. The FRC community thrives with our practice field open to local teams. In the past 5 years, 21 FRC, 6 FTC, 20+ FLL and 5 Jr FLL teams have visited our practice field. We host events for local teams throughout the year, including Week Zero scrimmages prior to Bag & Tag, Post-season scrimmages, and FLL and FTC events. This fall, we hosted two FLL scrimmages and a Drive It FTC workshop with 200+ attendees. Our annual FLL scrimmage recently occurred at the practice field, followed by a FTC Drive It Workshop hosted by our 2 FTC Teams. Our all-female status has also provided us the opportunity to host three FIRST Ladies events, as interacting and showing support for other girls in FRC is one of our top priorities.

Independent of our contributions with the practice field, 3504 was the primary host of multiple CAD classes in collaboration with 3260 for 32 students from 8 FIRST teams in 2016. As part of our mission, we recognize the importance of cultivating relationships with co-ed teams and other all-girls FRC teams such as Teams 2399, 677, and 771.

This year, we strived to strengthen the organization of the Steel City Robotics Alliance, effectively collaborating with SHARP, Titanium Titans, and Quasics in executing the Steel City Showdown, Pittsburgh's first-ever off-season FRC event. We hosted the event and created the merchandise. We played a large role in securing funding and space for the event from CMU, recruiting SCS dean Andrew Moore to speak, and organizing tours of the CMU robotics lab.

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Alongside contributions to the Pittsburgh FIRST community, 3504 has a global impact. Since 2013, 3504 has hosted Robotics Feiyue, a 2 week summer STEM camp that gives Chinese high school students exposure to FIRST. This camp, which has grown to host 35 students in 2017, models an FRC season, starting with a mock kickoff and ending with off-season competition WVROX in 2016 and Steel City showdown in 2017. Feiyue inspired the formation of multiple FRC teams in China. Team 6414 was founded by former Feiyue participants, and jump-started through the efforts of a 3504 mentor and student, who provided hands-on support in a trip to China, and then continued to help through weekly video calls and messages. We helped the team ship its robot and hosted them in our work space. Former Feiyue participants went on to establish FRC teams 5297 and 6947. Additionally, we provided training to students and mentors of team 5449 in their rookie years. We look forward to being reunited with our international friends when 6414 and 6947 attend nearby regionals this year.

Team 3504 has established a strong global media presence, having 22,000+ followers worldwide and being cited in 135+ news articles, videos and speeches in the history of the team, including a mention about our Rookie FIRSTS Tumblr page in the recently published FRC Survival Guide. 115 of these occurred in the past five years, including Pittsburgh Today Live, CBS Local, the Smithsonian, and WESA radio. One of our most effective methods of communication with other FRC teams is through social media. We have posted team updates on 7 media outlets, including our YouTube collaboration channel fiveawesomerobots to share build season progress, our RookieFirsts Tumblr, an advice blog dedicated to rookie teams and our Twitter, Facebook, Instagram, team website, and monthly newsletter. GOS has served as inspiration for a number of media works - in an interview with Google, Don Hall, director of Big Hero 6, cited GOS team members as the inspiration for characters "Honey Lemon" and "Go-Go Tomago". An article about GOS has appeared in a British magazine called 404 Ink, and we appeared in the Mighty Women of Science ABC Comic Book. Even our FTC Team was featured in American Girl's "Like a Girl" segment.

We spread our message with interactions with policy makers at the local, state, and national level. Locally, Pittsburgh Mayor Bill Peduto visited our practice field and saw first-hand how GOS is shaping Pittsburgh. Awarded for our pursuit of equality, we've been mentioned in the US congressional record 7 times. To extend our impact widely, we've contacted many prominent political figures and had the opportunity to speak to many in person about our goals. We met Former Secretary of State Hillary Clinton and discussed the prevalent gender gap in STEM. During the 2015 Back to School Bus Tour, we demoed our robot for then Secretary of Education, Arne Duncan, and NASA Deputy Admin, Dava Newman. Alongside CMU Robotics Institute researchers, we demoed our 2015 robot, and discussed implementing our mission through FIRST ideals. Due to our strong presence in the community and media, GOS was invited to the 2016 White House Frontiers conference attended by Dean Kamen, U.S. CTO Megan Smith, and President Obama. Excitingly, President Obama cited GOS as an after school program improving Pittsburgh. This summer, 4 3504 members traveled to D.C. for FIRST NAC to discuss our goals and achievements as a team. At this event, we learned about the Every Student Succeeds Act and other efforts for equal educational opportunities.

GOS embodies the mission of FIRST with our dedication to engaging students in STEM activities. Our many outreach events, social media accounts, and FIRST activities piece together our mission of inspiring women in STEM.