Presented by











March 18 — 20, 2016 University of Scranton Scranton, PA



Welcome to the FIRST® Tech Challenge United States Super-Regional Championship Tournaments Sponsored by Rockwell Collins and the Center for Energy Workforce Development. Teams in the United States advance to one of four Super-Regional Championship Tournaments through high achievement at a state or regional Championship event. FIRST congratulates all the teams at this event for outstanding performance this season.



North Super-Regional Championship Presented by Rockwell Collins March 17-19, 2016 US Cellular Center Cedar Rapids, IA



East Super-Regional Championship March 18-20, 2016 University of Scranton Scranton, PA



West Super-Regional Championship
Presented by Google
March 24-26, 2016
Oakland Convention Center
at City Center
Oakland, CA



South Super-Regional Championship March 9-11, 2016 Henry B. Gonzalez Center San Antonio, TX

An estimated 4,500 teams will compete at more than 400 Qualifying and Championship Tournaments taking place in the United States, Australia, Canada, China, Czech Republic, France, Germany, India, Mexico, Netherlands, New Zealand, Russia, South Korea, and Taiwan during the 2015-2016 season. Top teams from the Super-Regional Championships advance to the *FIRST* Tech Challenge World Championship in St. Louis, Missouri in April. *FIRST* Tech Challenge Sponsors include Official Program Sponsor for the *FIRST* Tech Challenge, Rockwell Collins, and our CAD and Collaboration Sponsor PTC.



FIRST LEGO LEAGUE JR

FIRST LEGO LEAGUE **FIRST** TECH HALLENGE FIRST ROBOTICS COMPETITION

Grades K-3

Grades 4-8

Grades 7-12

Grades 9-12

WELCOME TO FIRST® TECH CHALLENGE

FIRST® Tech Challenge is designed for students in grades 7-12 to compete head to head, using a sports model. Teams are responsible for designing, building, and programming their robots to compete in an alliance format against other teams. The robot kit is powered by Android technology, reusable from year-to-year and is programmed using Java. Teams, including Coaches, Mentors and Volunteers, are required to develop strategy and build robots based on sound engineering principles. Awards are given for the competition as well as for community outreach, design, and other real-world accomplishments.

"...to create a world where science and technology are celebrated... where young people dream of becoming science and technology leaders."

- FIRST Founder, Dean Kamen



ABOUT FIRST TECH CHALLENGE

FIRST Tech Challenge is an exciting and fun global robotics program that ignites an enthusiasm for science, technology and discovery in young people and teaches them STEM skills and concepts, principles of leadership, and how to work as a team.

The competitions are the result of focused brainstorming, dedicated mentoring, project timelines and teamwork. Paired with technical mentors, teams learn from and play with the "pros" to experience engineering problem solving first-hand.

- Entices kids to think like scientists and engineers
- Provides a fun, creative, hands-on learning experience
- Teaches kids to experiment and overcome obstacles
- The skills they learn make math and science tangible, accessible and real
- Endorsed by the National Association of Secondary School Principals
- Teams learn to document their design ideas and discoveries
- · Builds self-esteem and confidence
- 90% of participating students report learning how STEM can solve real-world problems

TOURNAMENT SCHEDULE

Friday, March 18

12:00 pm	Team Pits Open
1:00 - 6:00 pm	Judging & Robot Inspection
7:00 pm	Team Pits Close

Saturday, March 19

7:00 am	Orivers Meeting Opening Ceremony
	Lunch Break, Hopper Di ∟unch Break, Tesla Div.

Lunch - 5:30 pm	Qualifying Matches
6:00 pm	Team Pits Close
7:30 - 10:30 pm	Team Social, Offsite

Sunday, March 20

7:30 am Team Pits Open	
8:30 - 10:00 am Qualifying Matches	
10:00 am Alliance Selection	
10:45 - 11:45 am Division Semi-Finals	
11:45 am - 12:45 pm Lunch Break, Hopper Di 12:15 - 1:15 pm Lunch Break, Tesla Div.	٧
1:15 pm - 2:15 pm Division Finals 2:15 pm - 3:15 pm Championship Finals	
3:30 pm Closing Awards Ceremony 5:30 pm Team Pits Close	,

MATCH PLAY

During the **Qualifying Matches**, teams are randomly assigned into alliances of 2 teams. A team's alliance partner in one match may be their opponent in the next match.

Teams will be ranked from first through last on the basis of their total Qualifying Points (QPs). If

multiple teams have the same QP total, then teams will be ranked on the basis of their Ranking Points (RPs). If multiple teams have the same RP total as well, then teams will be ranked on the basis of their highest match score. If still tied, the next highest match score will be used until the tie is broken.

Qualifying Points: Teams receive 2 points for a Win, 1 point for a Tie and 0 points for a loss or disqualification (DQ).

Ranking Points: All teams receive the score of the losing alliance before penalties unless they have a DQ (which gives the team 0 RP).

Alliance Selections are held after all of the qualifying matches take place. Four alliance captains are selected based on the team rankings. These captains then pick one or two (depending on the size of the event) additional teams to be their alliance partners for the Elimination Matches.

During the **Elimination Matches**, Alliances compete to be the first to win two matches in a standard best two out of three elimination round.





The Game:
FIRST® RES-QSM is played on a 12 ft. x 12 ft. square field with approximately 1 ft. high walls and a soft foam mat floor. Mountains

consisting of alliance-specific climbing areas and goals are located in two corners of the playing field. Alliance-designated Zip Lines extend from the top of the Mountains to the playing field wall. Two alliance-specific Rescue Beacons in need of "repair" by autonomous robots are located on the playing field perimeter wall.

Scoring elements are 14 Climber figurines and 80 Debris in the shape of blocks and spheres. At the start of a match, Debris are randomly located throughout the playing field floor. Each team starts with up to two Climbers that can be pre-loaded onto their robot.

Two randomly selected teams are paired together as an alliance to play one match against a second alliance. Alliances are designated as either "red," or "blue."

Matches have two distinct periods of play: a 30-second Autonomous period followed by a two minute Driver-Controlled period which includes a 30 second End Game.

Autonomous Period:

The game starts with a 30-second Autonomous period where robots are operated via pre-programmed instructions only. Robots gain points by: "resetting" Rescue Beacons, delivering Climbers to a Shelter, parking on the Mountain, and parking in the Rescue Beacon Repair Zone or Floor Goal.

Driver-Controlled Period:

During the Driver-Controlled period, teams retrieve up to five Debris at a time from the playing field and place them in Mountain Goals or Floor Goals. Debris may not be de-scored from the Mountain Goals but may be descored from the Floor Goals. Robots also scale the Mountains to release Climbers that slide down a Zip Line to safety.

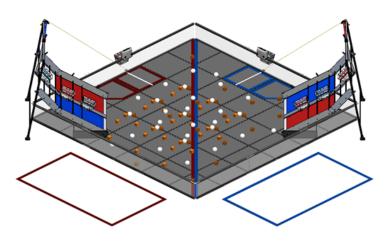
End Game:

The final 30-seconds of the Driver-Controlled period is called the End Game. In addition to the Driver-Controlled period tasks, robots earn bonus points in the End Game by hanging from the Pull-up Bar on the topmost vertical section of the Mountain and claiming an All Clear Signal for their alliance.

Autonomous Period Scoring:	
Robot Parked in a Rescue Beacon Repair Zone	5 points
Robot Parked in a Floor Goal	5 points
Robot on the Mountain and Touching the Floor	5 points
Robot Parked on the Mountain Low Zone	10 points
Robot Parked on the Mountain Mid Zone	20 points
Robot Parked on the Mountain High Zone	40 points
Rescue Beacon Illuminated for an Alliance	20 points per side
Climber in a Shelter	10 points per Climber

Driver-Controlled Period Scoring:	
Debris Scored in a Floor Goal	1 point each
Debris Scored in a Mountain Low Zone Goal	5 points each
Debris Scored in a Mountain Mid Zone Goal	10 points each
Debris Scored in a Mountain High Zone Goal	15 points each
Robot on the Mountain and Touching the Floor	5 points
Robot Parked on the Mountain Low Zone	10 points
Robot Parked on the Mountain Mid Zone	20 points
Robot Parked on the Mountain High Zone	40 points
Climber Released/Slid Down the Zip Line	20 points each
Climber in a Shelter	10 points per Climber

End Game Scoring:	
Robot Completely Supported by the Pull-up Bar	80 points
Claim an All Clear Signal	20 points per Signal



PARTICIPATING TEAMS — HOPPER DIVISION

Team #	Team Name	School / Organization	Location
18	The Techno Chix	Girl Scouts Heart of the Hudson	Pleasantville, NY
248	Fatal Error	Pope John XXIII Regional High School	Sparta, NJ
3371	Bötley Crüe	Midwood High School	Brooklyn, NY
3415	Lancers	Livingston High School	Livingston, NJ
4029	2 Bits and a Byte	Lexington High School	Lexington, MA
4096	T-10 ("T minus 10")	Needham High School	Needham, MA
4137	Islandbots	Islandbots Robotics	Setauket, NY
4286	Dragonoids	Greens Farms Academy	Greens Farms, CT
4347	NanoGurus	NanoGurus Robotics	Morris Plains, NJ
4486	Mad Science	Madison High School	Madison, NJ
5017	RoboEpic	Greenwich Academy	Greenwich, CT
5163	Flying Dragon	Lower East Side Prep. High School	New York, NY
5421	RM'd and Dangerous	Richard Montgomery High School	Rockville, MD
5485	GorillaBots	Corning Incorporated	Corning, NY
6029	TEAM ROBOWIZ	TEAM ROBOWIZ	Fairfax, VA
6040	Canton Robodogs	Canton High School	Canton, MA
6055	GearTicks	Lincoln-Sudbury Regional High School	Lincoln, MA
6341	IBEX	Flint Hill School	Oakton, VA
6527	North Robotics	North Kingstown High School	North Kingstown, RI
6899	Blue Bots	JCOBA-NY & Jamaica College	Bronx, NY
7117	The Blockheads	Friends & Family	Burke, VA
7164	Falcon Bots	Locust Valley Central School District	Locust Valley, NY
7314	Sab-BOT-age	Downingtown Area Robotics	Downingtown, PA
7393	electron Volts	Gearbox 4-H Club	Colesville, MD
7486	Suffern's Team Erebor	Suffern High School	Suffern, NY
8221	Cubix ³	ETC Robotics	Hampstead, MD
8390	Nerd Herd	Henley Middle School	Crozet, VA
8509	STEEL Serpents	STEEL Corp.	Pittsburgh, PA
8528	Rhyme Know Reason	First State Robotics	Wilmington, DE
8619	Cerebrum Bellatorum	Grundy High School	Grundy, VA
8645	Robotic Doges	Laurel Highlands Education and Robotics	Hollsopple, PA
8702	Grey Jedi	Nova Labs	Reston, VA
9372	Standard Model	The Dalton School	New York, NY
9845	Robominions	Neighborhood	Fairfax, VA
9927	The MidKnight Magic Too!	West Windsor-Plainsboro Regional	West Windsor- Plainsboro, NJ
		Midwood High School	Brooklyn, NY

PARTICIPATING TEAMS — TESLA DIVISION

Team #	Team Name	School / Organization	Location
121	Rhode Rage	Aquidneck Island Robotics - 4H	Newport, RI
2818	G-FORCE	GEARS & 4-H	McHenry, MD
3397	Essex Robotics	Essex High School / Center for Technology Essex	Essex Junction, VT
3737	Hank's Tanks	Natick High School	Natick, MA
4082	RoboSpartans	RoboSpartans Robotics	New Hartford, NY
4107	MohonBots	Mohonasen High School	Schenectady, NY
4244	Big Bertha	Putnam / Northern Westchester BOCES	Yorktown Heights, NY
4318	Green Machine Reloaded	Horizons 4-H Club	Ellicott City, MD
4419	Pokebots	Virginia Episcopal School	Lynchburg, 0
4924	Tuxedo Pandas	New River Robotics Association	Christiansburg, VA
5069	Robogamers	Robogamers Robotics Club	New York, NY
5169	Watt's Up?	Say Watt Robotics	Edison, NJ
5484	Enderbots	Corning	Corning, NY
5916	BoBots	Bohemia Manor - home team	Chesapeake City, MD
6037	WAGS	Girl Scouts of West Windsor-Plainsboro	Princeton Junction, NJ
6051	Quantum Mechanics	The Dalton School	New York, NY
6081	i²r robotics	i ² r robotics	Westport, CT
6347	Geared Up	Geared Up Robotics	Rome, NY
6700	X-BOTS	X-BOTS	Fairfax, VA
6955	Robovines	Saratoga County 4-H	Ballston Spa, NY
7149	EHTPAL ENFORCERS	Egg Harbor Township Police Athletic League	Egg Harbor Township, NJ
7182	Mechanical Paradox	Horizons 4H Robotics Club	Ellicott City, MD
7350	Watt's NXT?	Say Watt Robotics	Edison, NJ
7423	Flaming Phoenix	Unionville-Chadds Ford School District	Kennett Square, PA
7988	hound bots II	Gilman School	Baltimore, MD
8297	Geared UP!	Ashburn Robotics	Ashburn, VA
8498	The Evil Purple Sox	Lebanon High School	Lebanon, VA
8526	Aluminum Avian Antics	4-H	Grand Isle, VT
8574	WeByte	ChathamSTEM	Chatham, NJ
8644	The Brainstormers	Family/Friends	Lexington, MA
8681	A Few Loose Screws	Neighborhood Group / CSP Associates	Ashland, MA
9371	General Relativity	The Dalton School	New York, NY
9794	Wizards.exe	Rockville Robotics	Rockville, MD
9901	Techie Titans	Nova Labs Robotics	Reston, VA
10358	Squatch Watch	Ridgeview High School	Clintwood, VA
10815	Westerly Bulldogs	Westerly High School	Westerly, RI

FIRST® TECH CHALLENGE AWARDS

INSPIRE

The highest award that a team can be given.

This judged award is given to the team that truly embodied the "challenge" of the program. The team that receives this award is a strong ambassador for *FIRST* programs and a role model team. This team is a top contender for many other judged awards and is a gracious competitor. The Inspire Award winner is an inspiration to other teams, acting with Gracious Professionalism[®] both on and off the Playing Field.

ROCKWELL COLLINS INNOVATE

Bringing great ideas from concept to reality.

This judged award celebrates a team that not only thinks outside the box, but also has the ingenuity and inventiveness to make its designs come to life. This judged award is given to the team that has the most innovative and creative robot design solution to any or all specific field elements or components in the game.

PTC DESIGN

Industrial design at its best...

This judged award recognizes design elements of the robot that are both functional and aesthetic. All successful robots have innovative design aspects; however, the PTC Design Award is presented to teams that incorporate industrial design elements into their solution.

MOTIVATE

More than Robots!SM

This judged award celebrates the team that exemplifies the essence of team building, team spirit and exhibited enthusiasm.

CONNECT

Connecting the dots between community, FIRST, and the business world.

This judged award is given to the team that most connects with their local science, technology, engineering and math (STEM) community.



THINK

Removing engineering obstacles through creative thinking.

This judged award is given to the team that best reflects the journey the team took as they experienced the engineering design process during the build season. The Engineering Section of the notebook is the key reference for judges to help identify the most deserving team.

CONTROL

Mastering robot intelligence.

This judged award celebrates a team that uses sensors and software to enhance the robot's functionality on the field.

PROMOTE (Optional Award)

Many decisions, but choosing FIRST was easy!

This judged award is given to the team that is most successful in creating a compelling video message designed to change our culture and celebrate STEM.

COMPASS (Optional Award)

A beacon and leader in the iteam's ourney.

This judged award recognizes an adult Coach or Mentor who has provided outstanding guidance and support for a team.

ELIMINATION TOURNAMENT AWARDS

The winning alliance and finalist alliance are both recognized for their achievement in robot game performance.







FIRST® SCHOLARSHIPS

FIRST® participants have access to over \$25 FIRST Scholarships are offered, funded, and million in scholarships. Find out how you are administered by the Scholarship Providers. Scholarships vary in value from one-time awards

OUR MISSION is to inspire an appreciation of science and technology in young people. Colleges, universities, corporations, and associations support this mission by making available more than \$25 million in *FIRST*[®] Scholarships to students who want to take their *FIRST* experience to the next level.

The FIRST Scholarship Program puts FIRST® Tech Challenge and FIRST® Robotics Competition participants in direct contact with colleges, universities, corporations, and associations offering hundreds of scholarship opportunities exclusively for FIRST participants.

administered by the Scholarship Providers. Scholarships vary in value from one-time awards of \$500 to full tuition for four years estimated at \$160,000, and most awards are renewable annually if an acceptable academic average is maintained. Although most scholarships are merit-based, others are for a broad range of scholastic abilities. Some are for specific majors such as engineering, math, science, computer science, or technology (60%); still others are available for any course of study (40%). The majority of scholarships are for specific colleges and universities; however, a few can be used at any school. Eligibility is different for each of the scholarships, so you will need to view each one's criteria carefully. You may be surprised by the variety and value of opportunities available!

How it works:

- FIRST Scholarships are offered and administered by the Scholarship Providers.
- FIRST Tech Challenge and FIRST® Robotics Competition participants are eligible to apply as noted.
- Most applications are due between December and April, but be sure to pay close attention to individual submission deadline dates.
- Find opportunities, details, and applications at: www.firstinspires.org/scholarships

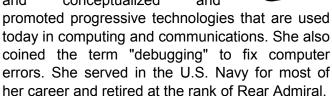
HONORING EAST COAST TECHNOLOGY PIONEERS

Our two competition divisions are named after these science and technology leaders who lived and worked on the East Coast of the United States and contributed greatly to our society.

Grace Murray Hopper

(1906 - 1992)

"Amazing Grace" Hopper created modern programming languages and conceptualized and



Nikola Tesla

(1856 - 1943)

Nikola Tesla was an electrical and mechanical engineer as well as a prodigious inventor. He developed

alternating current (AC), built the first hydroelectric dam with George Westinghouse, invented the induction motor, the rotating magnetic field, the Tesla coil, and the radio remote control for torpedoes among many other achievements.

ABOUT FIRST®

FIRST® (For Inspiration and Recognition of Science and Technology) was founded in 1989 to inspire young people's interest and participation in science and technology. Based in Manchester, NH, the 501(c)(3) not-for-profit public charity designs accessible, innovative programs that motivate young people to pursue education and career opportunities in science, technology, engineering, and math, while building self-confidence, knowledge, and life skills.

FIRST is **More Than Robots.** FIRST participation is proven to encourage students to pursue education and careers in STEM-related fields, inspire them to become leaders and innovators, and enhance their 21st century work-life skills.



FIRST® Founder, Dean Kamen



FIRST [®] Distinguished Advisor, Dr. Woodie Flowers

FIRST VALUES

Gracious Professionalism®

Dr. Woodie Flowers, *FIRST* Distinguished Advisor and Pappalardo Professor Emeritus of Mechanical Engineering, Massachusetts Institute of Technology, coined the term "Gracious Professionalism®."

Gracious Professionalism is part of the ethos of *FIRST*. It's a way of doing things that encourages high-quality work, emphasizes the value of others, and respects individuals and the community.

With Gracious Professionalism, fierce competition and mutual gain are not separate notions. Gracious professionals learn and compete like crazy, but treat one another with respect and kindness in the process. They avoid treating anyone like losers. No chest thumping tough talk, but no sticky-sweet platitudes either. Knowledge, competition, and empathy are comfortably blended.

In the long run, Gracious Professionalism is part of pursuing a meaningful life. One can add to society and enjoy the satisfaction of knowing one has acted with integrity and sensitivity.

Coopertition®

Coopertition® produces innovation. At *FIRST*, Coopertition is displaying unqualified kindness and respect in the face of fierce competition. Coopertition is founded on the concept and a philosophy that teams can and should help and cooperate with each other even as they compete.

Coopertition involves learning from teammates. It is teaching teammates. It is learning from Mentors. And it is managing and being managed. Coopertition means competing always, but assisting and enabling others when you can.

THANK YOU TOURNAMENT VOLUNTEERS!

East Super-Regional Planning Committee

Tom Zawislak, Dave Hackett, Pennsylvania FIRST Robotics - Co-Chairs

FIRST - Carol Edelman (VA), Pat Frascella (NJ), Vince Frascella (NJ), Lise Hackett (PA), Lena Kang (DE), Rick Kline (NY), Rita Wall (PA), Bob Debes (PA); Production Express - Matt Demascolo; University of Scranton - Joe Boyd, Julie Shumacher Cohen, Frani Mancuso, and Stan Zygmunt

Event Volunteers

Volunteer Coordinators: Vince and Pat Frascella

Emcees: David Price, Jack Kentfield Game Announcers: Spencer Gray, Nick Pilaitis

Judge Advisors: Bill Brownlowe, Lisa Evans

Judges: Patty Acree, Inga Aleman, Denise Arruda, Jerry Beauchamp, Soumya Chirra, Juliet Christopher, Marshall Coyle, Nikki Dietrich, Jason Falconio, Alan Gronlund, Harald Guenther, Swami Gurusami, Pearl Hwang, Kavita Kanwar, Marissa Lucas, Marlene Lynn, Art Nilson, David Onstad, Mike Piliatis, Dave Pochily, Ron Prettyman, Anil Saxena, Rick Spear, Mark Stults, David Wall, Cliff Warner, Sathya Yalvigi

Match Observers: Eric Cheek, Bob Debes, Jyoti Mehta, Robert Russell

Judge Assistants: Jeanette Beauchamp, Vijeta Makkar

Head Referees: Jeff Lucas (Event), Noah Dillard, Chris Fogwell, Simon Gray

Referees: John Bradley, Jeevana Chirra, Rob Elkins, Adria Garhart, Wren Hensgen, Yan Juras, Miranda Juras,

Steph Merkel, Dominic Pirrochi, Jon Stanley

Field Technical Advisors: Venkat Chirra, Austin Frownfelter, Jim Rumbaugh, John Yeh Control System Advisors: Tilman Guenther, Arnav Prasad, Rob Sokolov, Andrew Szeto

FTA Assistants: Ethan Garrison, Henrik zu Jeddeloh, Isaac Lynn, Karlin Yeh Web Tech Manager: Rick Kline

Field Managers: Joe Perrotto, Brian Hildebrandt

Pit Admin: Pat Frascella (Lead), Karina Yeh Event Support: Lena Kang, Rita Wall, Lyn Benonis

Scorekeeping: George Marchant (Lead), Loretta Bessette, Lise Hackett, Roslyn Nilson, Victor Terpstra, Kara

Hensgen

Queueing Leads: Carl Budrecki, Mark Elliott, Linda Higham, Jim Hutchinson, Terry LaMarche, Arun Malhotra, Hema Malhotra, Lisa Pilaitis, Barry Price, Jennifer Price

Queueing: Alex DiMino, Adam Frownfelter, Zack Gronlund, Ethan Price, Sarah Pungitore, Josh Beauchamp, Gaby Alfaro, John Capone, Priscilla Melesco (Dahl), Yan Yuan

Field Crew: Lexie Bates, Keisha Casey, Keertana Chirra, Cameron Cole, Kirsten Crim, Destiny Goodson, Janessa Harris, Sdyney Harris, Brandon Honaker, Jasmine Johnson, Madison Jones, Jordaon Lester, Jordon Lloyd, Sandra Maggard, Aadil Makkar, Numya Menon, Makayla Mitchell, Val Pirocchi, Darius Pirocchi, Sean Simmons, Daniel Vogel, Chastity White, Sean Yost

Student Ambassador Coordinators: Carol Edelman, Erin Flynn
Photography: Nemi Agrawal, Daphne Frownfelter, George Marchant

Thanks to all additional volunteers whose names did not make it into the printed program!

Special Thanks

Volunteer Shirts: Bobby Crusco, Bobbys Graphics Shirt Design, Event DJ, Entertainment: Tommy Leana America's Super Magician: John Graham Sponsor Banners: Ashley Kuback, Lackawanna

County Visitors Bureau

Program Booklet Editing: Rick Kline Program Printing: Pace University, NY

Lodging and Reservation Planning: Susan Lowrance, HelmsBriscoe

SUPER-REGIONAL CHAMPIONSHIP

EAST

Event Banners: Joe Perrotto, Diamond State FTC Robot Inspection Aids: Wren Hensgen & Cliff Warner Field Improvement and Transport: Jim Rumbaugh Audio Visual and Facilities: Production Express Crew

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FIRST® Tech Challenge
Official IoT, CAD and Collaboration
Software Sponsor

FIRST® Tech Challenge Official Control System Sponsor





FIRST® Tech Challenge East Super-Regional Sponsor



FIRST® Tech Challenge East Super-Regional Event Supporters







Thank you to all who help make this program possible for our youth. FIRST could not exist without the support of the army of mentors, parents, teachers and volunteers who step up to provide their time and expertise to inspire our young people to get excited about science, technology, engineering and math.