Statistics for 2019 TCRSF

At TCRSF, 488 students registered for projects & 274 for papers = 762 student registrations
(620 unique students)

TCRSF projects, 381 students presented 195 HS projects,
239 students presented 219 middle school projects,
488 total students presented 414 total projects

TCRSF papers: 28 middle school students competed with 26 middle school papers (2 team papers) and
246 high school students competed with 227 high school papers (18 team papers: one 3-person team and 17 2-person teams).
274 total students competed with 253 total research papers (total of 19 2-person papers & 1 3-person paper).

Competing at state from TCRSF: (projects, not students; team project counts as one)
Middle school: 76/219 projects = 34.7% of middle school projects from TCRSF to state
High School: 117/195 projects = 60.0% of high school projects from TCRSF to state
Total of 193 /414 total projects = 46.6% sent to state overall

State canceled the middle school research paper competition in 2019, TCRSF recognized 10/26 as state worthy research papers

Competing at Tri-State JSHS for high school papers: 56/227 papers = 24.7% of all HS papers to advance

Our TCRSF students competed extremely well at the Minnesota State Science and Engineering Fair. TCRSF students earned many awards at state. 4 of the 5 HS students sent to ISEF from state were from TCRSF (and an alternate team to ISEF from state was from TCRSF). 9 HS students on 8 projects advanced to ISEF from TCRSF and another 4 HS students on 3 HS projects advanced to ISEF from state! That means 13 students from our 4-county metro area compete at the 2019 International Science and Engineering Fair (ISEF).

25 students middle school students advanced from TCRSF (top 10% of each affiliation) and **8 TCRSF students** advanced from the state science fair to compete in the **National Broadcom MASTERS** (grades 6-8) competition, with national winners announced in the fall. We had **2 students** earn **national semifinalist** status in Broadcom MASTERS **(two of the top 300 in the nation) in 2018**. **2019 results will be announced in September.**

Rikhil Seshadri (8th Grade), Woodbury, Minnesota; nominated by both TCRSF & state Math and Science Academy
Low Cost, Non-Aqueous Electrolyte Based Supercapacitors for Energy Storage

Margaret Banks (6th Grade), Woodbury, Minnesota; nominated by both TCRSF & state Stillwater Junior High School
Fruity Power: Creating a Biodegradable Battery

At the Tri-state (MN, ND, & SD) North Central Regional Jr. Science & Humanities Symposium (JSHS, research paper competition), TCRSF students earned several awards, including **2nd. 3rd, & 4th. place. 3 out of the 5 research paper winners that advanced to National JSHS this year are from TCRSF.**

Manashree Padiyath, Woodbury HS, with her presentation of her paper entitled *Thyme and Thyme again: Investigation of synergistic antimicrobial activity of Thymus vulgaris Essential Oil in combination with 'superfood' Essential Oils (2nd place, competed national oral presentation)*

Haley Jostes, Stillwater Area HS, with her presentation of her paper entitled *Combating Undernutrition in Developing Countries with a Compact Aeroponics System Utilizing Contaminated Water (3rd place, competed national poster presentation)*

At ISEF (International Science and Engineering Fair – the best in the world!), TCRSF named 8 projects (9 students) to compete and 3 more of our projects (4 more students) were named to ISEF from state for a total of 13 TCRSF students competing. Eight alternates also attended ISEF in Phoenix.

Six of our Twin Cities students had the privilege of **representing our USA** at the 2019 Shout Out in which every country selects representatives to represent their nation at the Opening Ceremonies – much like the Olympics has each nation select an Olympian to carry their national flag in their opening ceremonies. This is

an experience that none of these 6 Twin Cities will ever forget, representing the entire United States at the International Science and Engineering Fair!

Awards won by TCRSF students who competed at ISEF:

A project entitled "*Combating Undernutrition in Developing Countries with a Compact Aeroponics System Utilizing Contaminated Water"* in the Plant Sciences category, by Haley Jostes (Stillwater Area High School) won:

*Intel ISEF **Third Grand Award of $1,000** in Plant Sciences

***Air Force Research Laboratory** on behalf of the United States Air Force
First Award of $750 and an engraved glass trophy In Plant Sciences

A project entitled "*Applying Thermopile Array Sensors and Machine Learning to Detect Falls of Older Adults"* in Biomedical Engineering by Melissa Nie (St. Paul Academy and Summit School) won:

*Intel ISEF **Third Grand Award of $1,000** in Biomedical Engineering

A project entitled "*Robust Autonomous Micro Aerial Vehicle (MAV) Navigation with Onboard, Environment-Agnostic, Multi-Sensor SLAM"* in Robotics and Intelligent Machines category by Parthiv Krishna (Minnetonka High School) won:

*Certificate of Honorable Mention: International Council on Systems Engineering - INCOSE
The International Council on Systems Engineering (INCOSE) is a not-for-profit membership organization founded to develop and disseminate the interdisciplinary principles and practices that enable the realization of successful systems. The INCOSE Best Use of Systems Engineering award is awarded to the best interdisciplinary project that can produce technologically appropriate solutions that meet societal needs.

*Certificate of Honorable Mention: National Aeronautics and Space Administration
The National Aeronautics and Space Administration (NASA) is the United States government agency responsible for the nation's civilian space program and for aeronautics and aerospace research. Founded in 1958, NASA drives advances in science, technology, aeronautics, and space exploration to enhance knowledge, education, innovation, economic vitality, and stewardship of Earth.

All ISEF finalists who competed won the all-expense paid trip to compete in Phoenix, Arizona, and a finalist medal & certificate.

All ISEF finalists and alternates attending ISEF won Mathematica Pro software by Wolfram Alpha Research.