Statistics for 2024 TCRSF

TCRSF was again held at the Minnesota State Fairgrounds in the Lee and Rose Warner Coliseum. Our projects were such high quality that TCRSF was able to send over half our projects to state, held in St. Paul this year.

At TCRSF, 444 students registered for 355 projects & 142 research papers = 426 total student registrations – representing 43 schools. Our area covers the 9 metro counties of Ramsey, Hennepin, Washington, Dakota, Anoka, Chisago, Isanti, Sherburne, and Wright Counties in Minnesota.

The Minnesota State Science and Engineering Fair was held in-person in St. Paul and the tri-state North Central Regional Junior Science and Humanities Symposium was held in Sioux Falls, SD in 2024. TCRSF won 164 of the 263 awards given at state for projects – which is 62.4%! Our students did very well! The top prize at state is to be chosen as a finalist to compete at the International Science and Engineering Fair, this year in Los Angeles, California. State chose four projects/5 students (3 individual projects and 1 team project) and all were from TCRSF. Of the alternates named to ISEF, all 4 were also from TCRSF.

The top 10% of our middle school projects were nominated to enter the national Thermo Fisher Junior Innovators Challenge.

At ISEF (International Science and Engineering Fair – the best in the world!), TCRSF named 11 projects (11 students) to compete and 4 more of our projects (5 more students) were named to ISEF from state for a total of 16 TCRSF students as finalists at ISEF. ISEF was held in-person in Los Angeles, CA in mid-May.

ISEF Finalists 2024:

All finalists have won Wolfram Alpha Mathematica software for finalists (world's most powerful and all-encompassing computational software), finalist medal, and certificate – and the right to compete in the world's largest and most prestigious pre-collegiate scientific competition, which included an all-expense paid trip to ISEF in Los Angeles, CA.

Bora Mandic, grade 11, St. Paul Academy & Summit School, *A Machine Learning Approach to Helping Color Blind Drivers* **won a 4th Grand Award of $500.**

Huxley Westermeier, grade 10, St. Paul Academy & Summit School, *Project Calliope: Quantum Resistant Encryption using Asymmetric Numeral Systems*

Quinn Hughes, grade 11, Minnetonka HS, *Mars or Bust! A Method to Build a Martian Regolith-Based Substrate for Sustainable Agriculture on Mars* **won 1st Place Air Force Award of $750, glass trophy & a USAF medal; and a Long Island University Presidential Scholarship, and an Arizona State University Scholarship (up to $58,000), and a Westlake University Pre-college Summer Program Scholarship** (covering the program fee, lodging, food, insurance, round-trip international airfare, and excursions in Hangzhou & Shanghai, plus priority for full scholarship for undergraduate admissions any major at Westlake University.)

Yash Dagade, grade12, Eden Prairie HS, *SkyWindFarm: Harnessing High Altitude Wind Power in a Scalable Manner;* **won 3rd Grand Award of $1000 and the Ricoh Sustainable Development Award of $10,000.**

Sriram Sureshkumar grade 11, Mahtomedi HS, *The effectiveness of biochar as an amendment on MGS-1 Mars Global Stimulant and its impact on the growth of Raphanus Sativus.*

Riddhi Singhvi, grade 9, Stillwater Area HS, *Beyond Scans: Predicting Alzheimer's Through MRI and Handwriting Analysis*

Alyssa Wang, grade 9, East Ridge HS, *Development of Novel Biodegradable Bioplastics Using Mango Peels Intended for Packaging Film*

Ethan Finch, grade 9, Stillwater Area HS, *Evaluating the Efficiency of Different Machine Learning Models in Locating the /s/ Phoneme*

Georgia Constantin, grade 12, Minnetonka HS, *Using Iron and Graphene Oxide Nanoparticles to Induce Targeted Apoptosis in Cancerous Cells*

Tyler Clair, grade 11, Minnetonka HS, *Microplastics in our Drinking Water: A novel approach utilizing food waste-based biocoagulants to sustainably remove polystyrene microplastics for future alternatives in water treatment*

Anthony Pu, grade11, Minnetonka HS, *Neuroevolution of Spiked Neural Networks with HyperNEAT*

Named finalists from state:

Corinne Moran, grade12, Breck School, *Deciphering DUX4 (Year II): Is transient expression of the DUX4 gene sufficient to cause muscular dystrophy?*

Finn Cairns, grade 11, grade 11, St. Paul Academy & Summit School, *ViABL: Visual Assistant for the Blind with VLMs*

Fernanda Arreola-Lucio, grade 12, Minnetonka HS, *Needles in a blood sac? Polymerization of methacrylic anhydride, fibrinogen, and zeolite coagulation agents into Gelatinous Microneedle Adhesive (Gel MNA) to eliminate axial body frame hemorrhage,* **won 1st Place Air Force Award of $750, glass trophy & a USAF medal.**

Noah Getnick and Evan Johnstone (team project), both grade 12, Breck School, *Collision-Free Commutes: Designing a Blind Spot Detection System for Cyclists Using an Ultrasonic Sensor and Computer Vision*

Thermo Fisher Junior Innovators Challenge National Semi-finalists 2024:

Congratulations to **Lilly Bilek, Dominik Fortin, Aleksander Kokotovich** and **Emaan Moheet**! They are top 300 in the nation in the Thermo Fisher Junior Innovators Challenge! Middle school students who scored in the top 10% of all middle school science projects at their regional or state science fairs were eligible to enter the national competition - and Lilly, Dominik, Aleksander, and Emaan were chosen from a pool of nearly 2,000 entrants who were already top 10% projects!

Lilly Bilek, grade 7, Magnuson Christian School, *Factors Affecting Anode Efficiency in an Algal/Metal/Carbon/FeCl3 Circuit*

Dominik Fortin, grade 6, Hidden Oaks Middle School, *Pickup Game Starter (PUG)*

Aleksander Kokotovich, grade 6, Hidden Oaks Middle School, *Pickup Game Starter (PUG)*

Emaan Moheet grade 8, Al-Amal School, Developing and Testing Permeable Pavement Material To Prevent Urban Flooding