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News Release

MAMARONECK HIGH SCHOOL STUDENT NAMED SEMIFINALIST IN 2016 INTEL SCIENCE TALENT SEARCH:

Recognized for Original Science Research in the Chemical Engineering Category

MAMARONECK, NY, January 8, 2016 -- MHS's Griffin Williamson is a semifinalist in the 2016 Intel Science Talent Search, one of the country's most prestigious high school science competitions. Williamson was selected from more than 1,750 entrants among 500+ high schools for his project in the area of chemical engineering. His project is titled *A Study of the Effects of Magnetic and Electric Fields on Expanding Janus Particle Chains*, and he'll be in the running later this month to become a finalist.

"I was shocked to find out that I was an Intel Semifinalist. I've always been interested in science, and it was great to be able to participate firsthand in the development of new technologies. Research has taught me to not just passively accept information, but rather to work to create and test ideas and make sure they are correct. I think this award is a validation of that," Williamson said.

The Intel Science Talent Search provides an important forum for original research that is recognized and reviewed by a national jury of professional scientists. The competition overall awards $1.6 million to provide opportunities and resources for students to become the next generation of inventors, entrepreneurs, and STEM professionals. Semifinalists receive a $1,000 award from the Intel Foundation plus $1,000 for their school.

"I'm incredibly proud of Griffin for this well-deserved honor. His project involved precise manipulation of microscopic particles and required great care and perseverance," said Original Science Research Teacher Guido Garbarino.

Abstract from Griffin's project

"Janus Particles are small particles with a diameter of 4 micrometers and a wide range of potential applications. With two patterned halves with different properties, they can perform double the functions of a normal nanoparticle. This study aims to focus on the usage of Janus particle chains as devices that can expand and contract on demand, acting similar to a biological muscle. Through using both a magnetic field an alternating current (AC) electric field, Fe_3O_4 capped silica particles were assembled into straight, condensed double chains, and then expanded into longer staggered chains. By testing different waveforms, voltages and frequencies of the AC field used to expand the chains, we recorded data on chain expansion length, the effects of metal cap composition, and the effects of different waveforms used on the particles. It was found that

saw and triangle waves, with harsher peaks, acted as if they were emitted at higher voltages, causing the chains to behave erratically. Sin and square waveforms caused the chains to expand by 15% to 30%, based on cap composition. Depending on whether the metal particle caps were made of pure Fe_3O_4, or whether the edges were made of an iron oxide closer to Fe_2O_3, the potential energy minima formed on the caps were at different angles relative to the cap edge, and the chains expanded to different lengths."

About OSR at Mamaroneck High School

The Mamaroneck High School Original Science Research (OSR) program is thriving, with record levels of involvement and multiple student awards at the Siemens Competition, Intel, Westchester Science and Engineering Fair (WESEF), and Junior Science and Humanities Symposium. The program fosters curiosity and interest in science and also gives students an opportunity to develop and build confidence in their research and presentation skills. Students choose an area of science and conduct a research project in collaboration with a professional mentor. The program has grown from 39 students (gr 10-12) in 2006 to 80 students this school year.

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