

**Title:** NASA MUREP Aerospace Academy: K1-12 STEM Education Project at York College, New York  
**Institution:** Research Foundation of The City University of New York (York College)  
**City/State:** Jamaica, New York  
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**Summary:** We propose to expand our ongoing K1-12 NASA-supported STEM activities and already developed best practices by using the Saturday model. These STEM activities have been successfully delivered for several years, include rocketry, aerodynamics, flight simulations, star gazing, EV3 Mindstorm robotics, basic coding exercises, space chemistry, wind tunnel, 3D-printing, and more, conducted largely through our present MAA (MUREP Aerospace Academy) Project. MAA targets undeserved and underrepresented K1-2 students in STEM fields. Based on our demonstrated successful STEM offering since 2015 via MAA, we are fairly confident to take our STEM endeavor to the next level to solidify STEM educational component associated with the underlying goals as described in the present solicitation. The overall objective of our proposal is to further refine and devise an attractive, up-to-date, and hands-on program to improve K1-12 students' content knowledge, create K1-12 STEM educational resources, engage MAA Cafe families, provide research mentorship to the K9-12 students, inspire local community members towards STEM education, and connect with professional organizations in using NASA core STEM contents. Piloting of the resources and experiential training for our prospective preservice teacher participants will be facilitated by the extant, highly successful NASA educational program at the York College MAA site. Since 2015, MAA at York has served over 5000 children largely from groups belonging to the undeserved and underrepresented in the sciences. We offer Saturday and summer classes for 1st through 12th grades that engage them in exciting, fun, and instructive NASA activities.

Our experienced staff of over 100 certified public school educators already frequently serves as supervisors to numerous pre-service teachers from the York College Teacher Education program. The MAA classrooms are ready arenas for piloting and developing our proposed resources for a variety of grades, and for providing experiential learning opportunities training for the teacher participants. Apart from offering Climate Change Education (CCE) to grades 7 and above, we are formulating several best practice- based lessons to allow students to get fundamental lessons on engineering design challenge, coding, alternate energy, solar vehicle, and robotics.

Recognizing the importance of parental involvement, the unique MAA Family Cafe offers weekly Saturday workshops for the parents on after school programs, college admissions, NASA STEM K1-12 projects and internships, health, and safety. Our effort toward educating and empowering parents in STEM contents and NASA resources will also be conducted through this project. York's Family Cafe is nationally known to successfully reach out numerous parents, many who are ESL speakers, and provide vital STEM resources that would not have been possible for parents to find on their own. Utilizing NASA resources for training will increase awareness and appreciation of NASA among teachers, students, parents, and the general public. With our high retention rate of around 85%, MAA has already demonstrated a potentially vital opportunity for longitudinal studies based on our limited tracking mechanism. Continuation of this task to gauge the effects of the proposed program on the understanding and attitudes of the participants will remain as one of the core thrusts. Through the forthcoming MAA initiatives, we seek to inspire and captivate student learners and caregivers utilizing NASA's unique assets to expand the availability and coherence of investments that increase program interest and involvement. Finally, our proposal aims to contribute towards future STEM workforce buildup, especially from traditionally undeserved and underrepresented groups.