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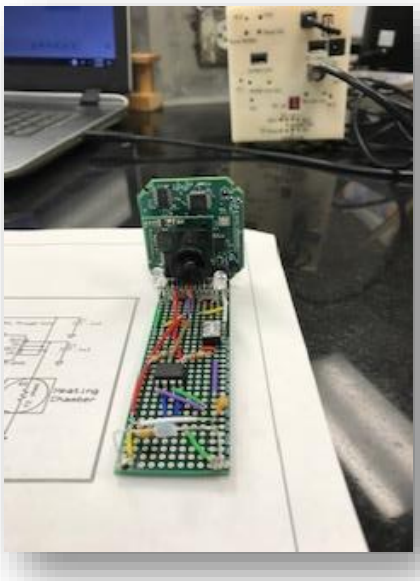
CONTACT: Becky Young
Communications and Marketing Specialist
beckyyoung@calvaryknights.com
706.323.0467, ext. 238
www.CalvaryKnights.com

Jim Koan, Headmaster

CALVARY PESS STUDENTS' CUSTOM EXPERIMENT READY TO LAUNCH INTO SPACE

COLUMBUS, GEORGIA, April 4, 2019—Calvary Christian School (CCS) is pleased to announce the completion of their custom experiment, "The Effect of Microgravity on the Crystallinity of Polycaprolactone Annealed from the Melt." The experiment was conducted by students in the Pre-Engineering and Space Science class (PESS). Their experiment is now ready to launch into space. Students will present their custom experiment at the NASA Flight Center on April 17, 2019, and watch the launch of the Cygnus NG-11 from Wallops Island, Virginia. The launch will transport the experiment to the International Space Station (ISS) and will take place at approximately 4:45 p.m. EDT.



Calvary PESS students were challenged to design, construct, and evaluate their experiment for flight aboard the ISS. Students participated in all engineering phases of the project. Students started by discussing a topic of interest for the experiment. A hypothesis was generated, and students were divided into three groups responsible for science, design, electrical engineering and evaluation of the experimental project. Students studied the BasicStamp2 microcontroller and learned the basics of circuitry and coding. Additionally, students listened to guest lectures on polymer chemistry provided by Dr. Daniel Holley, Columbus State University polymer chemistry professor. Team members researched the composition, properties, and structure of polycaprolactone (PCL) and various polymers. Students will conduct a post evaluation of the annealed polymer after flight using differential scanning calorimetry (DSC) in a laboratory at Columbus State University. The design team also collaborated with Mr. Kenneth Rodriguez, aerospace engineer, from Pratt Whitney, and Dr. Floyd Jackson, chemistry department chair, from Columbus State University. Calvary is excited that PESS students are actively learning important concepts applied in the real word of engineering. Calvary's goal in the PESS class is to foster a desire to pursue STEM careers.

The research for the custom experiment primarily involves heating the polycaprolactone to its melting point and allowing the polymer to crystallize upon cooling. A comparison of the results from the microgravity environment aboard the ISS and earth's surface will be conducted to analyze the difference in the degree of crystallinity. The microlab research project will allow team members to study and apply scientific principles in design and construction of an experiment in the microgravity environment of the ISS. The learning experience for students and teachers is remarkable. This project fulfills the goal of NASA in increasing scientific discovery and exploration for humankind. The major objectives and reasons for our research include the following:

- The experimental study is needed to improve our understanding of the crystallization mechanisms of polymers.
- The research will provide experimental data that can potentially be used to produce polymers having desired properties and enhanced biodegradable capability.
- The impact of the research can assist in the application of polycaprolactone in the field of medicine.
- High school students will be able to conduct research in an exciting STEM project and gain a better understanding of engineering.

"Participating as principal investigator in the Quest for Space Custom Experiment has been the most rewarding experience in my forty-year career in education. I am thankful to God for the opportunity to lead a project that only few can experience. In our PESS class truly 'The Sky is Not the Limit'."
- Edward Tymes, Ed.S (Siemens Master Teacher-Science), CCS Pre-engineering and Space Science Teacher

About Calvary's Pre-engineering and Space Science Class and Partnership with Quest for Space:
This PESS class is uniquely designed with the incorporation of pre-engineering studies and the partnership with CCS, NASA, and the Quest Institute of Valley Christian School in San Jose, California. This partnership ultimately gives CCS students the opportunity to create and send into orbit an experiment they have created in the classroom at CCS. Calvary Christian School is one of only five schools worldwide in the 2019 launch.

Pre-Engineering and Space Science (PESS) Course Description:
Calvary's pre-engineering and space science class is a rigorous college preparatory course that actively engages students in laboratory based experiments, and student led research. This course is sanctioned by the Quest for Space Institute in San Jose, California. Students study heat transfer systems and the fundamental physics of space exploration (astronomy).

Calvary Christian School is a K3-12th grade school and offers the following: Biblical instruction; challenging, academics; AP and Honor classes; dual enrollment; fine arts; a full athletic program; extra-curricular activities; weekly chapel; and before and after school care. CCS has a full-time onsite school nurse. Our family environment includes faculty with a love for Christ and teaching.

Since 1975, Calvary Christian School has been *Teaching the Whole Child, the Whole Truth*. An ACSI and AdvancED accredited K3-12th grade school, CCS's faculty and staff are dedicated to providing real resources for spiritual, academic, social and physical growth for our students in a nurturing and supportive environment. As our school facilities grow, we continue to offer unparalleled opportunities. For more information about Calvary Christian School, visit CalvaryKnights.com, call 706.323.0467 or visit during Open House held each Thursday from 9:00 a.m. to 1:00 p.m. with guided tours at 9:30 a.m. and 11:00 a.m.

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