Greetings from STEM @ SVSU

It was another STEMazing summer at SVSU! Over 350 K-12 students and nearly 175 teachers were on campus for a wide variety of STEM camps, professional development, hands-on research programs, and more! Students had a blast at the SMEK Jr. and SMEK Sr. camps, leadership skills were a key component of the Chief Science Officers Summer Institute, and girls were rocking it out at Camp Infinity again this summer! In addition, high school students had a chance to get their feet wet as interns with the Dow Science and Sustainability Education Center (SSEC) Summer Research program, while others participated in the Coding and Networking Bootcamp and the Health and Human Services STEM camp.

Many teachers were also on campus for professional development opportunities through the SVSU Regional Mathematics and Science Center, the Dow Corning Foundation-SVSU-STEM Community Partnership, and the Middle School Mathematics Specialist Program. Teachers were also leaders in the Dow SSEC program, helping high school students feel at home in our research labs. Details with participant names and districts involved in all our summer programs follow in this newsletter.

Looking ahead to a busy fall semester… there are many opportunities to engage in STEM activities and programs throughout our region! Our Girls Who Code fall session is already full but be sure to watch for information on our We Code Camps for middle school students and parents coming soon! Families can check out the Dow Great Lakes Bay STEM Festival at Delta College on October 12 and 13, with a regional launch of the WE are Innovators program on October 13 as well. High school student teams can also register for the A.H. Nickless Innovation Competition now through the end of October. Keep an eye on our website www.svsu.edu/stem for up to date information on all our programs. STEM@SVSU is constantly adapting to meet the needs of our regional students and educators – we hope you will contact us with any needs that you have in the coming year.

Best wishes for a successful 2018-19 school year!

Adrianne Cole
Director of STEM@SVSU

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Updates from the MiSTEM Network

Claire Bunker, Director
MiSTEM Network

To make Michigan a world leader in STEM education, the MiSTEM Network was created as a collaboration of business, education, and community partners throughout the state. The work of the MiSTEM Network is to build on existing STEM networks and create a STEM ecosystem that supports and implements the components outlined in four STEM pillars: create a STEM culture, empower STEM teachers, integrate business and education, and ensure high quality STEM experiences.

Goals of the MiSTEM Network East Central Michigan Prosperity Region include:

• Build collaborative partnerships that align GLBR activities to the state STEM vision.
• Support the creation of a common understanding of what STEM means.
• Lead and oversee the progress of STEM education activities.
• Coordinate the development and implementation of common goals among the region's stakeholders.
• Identify and coordinate resources to support regional STEM stakeholders and activities.

SVSU will serve as the fiscal agent for the MiSTEM Network Region on behalf of the East Central Michigan Prosperity Region that includes collaborative partners in Arenac, Bay, Clare, Gladwin, Gratiot, Isabella, Midland and Saginaw Counties, as well as STEM@SVSU and the Great Lakes Bay Regional Alliance.

For more information on MiSTEM, please contact:
Claire Bunker
MiSTEM Network Director
East Central MI Prosperity Region
cbunker@svsu.edu
Saginaw Valley State University
Gilbertson Hall – GN 112

SVSU Mobile Research Lab is on the Road Again!

The SVSU Mobile Research Laboratory is on the road again for the 2018-19 school year. The lab can visit elementary, middle and high schools throughout the Great Lakes Bay Region and focuses on water quality studies, including organism diversity, water quality parameters, aquatic ecosystems and more. There is no cost for the visits – those interested should complete a request on our website **svsu.edu/stem**

Apply Now for the Hour of Code!

Fourth grade classes are once again invited to apply for the Hour of Code event, held at SVSU on Friday, November 30. This event is part of a national initiative to increase diversity in computer science and introduce coding to students at a young age. Up to four classes will be selected to participate in this FREE program, which includes a coding workshop with SVSU Computer Science faculty and students, lunch at the Marketplace at Doan, and a STEAM activity in the Marshall M. Fredericks Sculpture Museum. Schools must provide transportation to campus for this event. Please visit our website **svsu.edu/stem** to apply by October 12.

A STEMazing Summer!

Chief Science Officers Elevate the Voices of Students in STEM

Participants of the CSO Summer Leadership Institute

Chief Science Officers (CSOs) are middle and high school students who are the STEM voice for their schools and in their communities. Locally sponsored by The Dow Chemical Company, sixty-two CSOs from twenty-three schools and thirteen districts attended the CSO Summer Leadership Institute at SVSU on August 14 and 15. During the school year, CSOs and advisors will interact with STEM professionals at local businesses, as well as implement a STEM action plan at their schools. CSOs from the Great Lakes Bay Region, along with delegations from Arizona, Oregon, Georgia, Florida, New York, Mexico, and Kuwait, will travel to Washington, D.C. in October for the CSO International Summit. These student leaders will work as an international cabinet to determine innovative solutions for STEM issues in their regions, as well as work with and impact national leadership.

Participating School Districts:
Bangor Township School District, Bay City Public Schools, Bridgeport-Spaulding Community Schools, Carrollton Public Schools, Frankenmuth School District, Freeland Community Schools, Great Lakes Bay Early College, Midland Public Schools, Saginaw City School District, Saginaw Township Community Schools, St. John's Lutheran School, Swan Valley School District, and Valley Lutheran High School.

Camp Infinity

SVSU served as the host site again for Camp Infinity, technology camps for middle and high school aged girls, that was coordinated by Dr. Betsy Diegel. Located inside Gilbertson Hall, fifty-one middle schoolers and eighteen high schoolers learned mobile app development, HTML web design, JAVA and robotics. Each week-long camp ended with presentations where campers showcased their hard work to parents, friends, and community members. SVSU instructors, Dow volunteers, and high school Chief Science Officers shared their expertise and served as role models for the campers. The high school camp was the first ever for Camp Infinity and SVSU was proud to pioneer this new endeavor with the Michigan Council of Women in Technology and the Dow Chemical Company. We look forward to offering Camp Infinity again in 2019!

Dow Science and Sustainability Education Center (SSEC) Summer Research Experience

Participants of the Summer Research Experience

The Dow SSEC Summer Research Experience promotes collaboration between high school students, middle and high school teachers, SVSU students, and SVSU faculty mentors. The program is led by Dr. David Karpovich and Dr. Jennifer Chaytor.

5 Research Studies:

"Using UAV (drone)-Acquired Imagery to Map Phragmites australis", "Measuring Water Quality and Phosphorus Migration in the Saginaw, Tittabawassee, Cass, and Shiawassee Rivers", "Soil Conservation Practices", "Investigating Nutrient Utilization Efficiency in Native and Invasive Phragmites", and "Synthesis of New Analogues of Rhodium Catalysts/Removing Metals from Water Utilizing Biochar".

10 Middle and High School Teachers:

Danielle Niergarth, Bay City Public Schools; Craig Coopersmith, Carrollton Public Schools; Robert Peterson, Freeland Community Schools; Brian Edelbrock, Katherine Spaulding, Midland Public Schools; David Allan, Saginaw Public Schools; Tricia Benkert, Katie Bryant, Jesse Place, Saginaw Township Community Schools; Ryan Stokoszynski, Standish-Sterling Community Schools.

20 High School Students:

Madison King, Au-Gres Sims School District; Austin West, Zachary West, Bullock Creek School District; Steven Jacovitch, Emily Jaremba, Carrollton Public Schools; Jacob Nielsen, Frankenmuth School District; Liam Pan, Freeland Community Schools; Hannah Gill, Goodrich Area Schools; Anish Middha, McKenzie Moe, Quoc-Dai (Joey) Le, Midland Public Schools; Taylor Yaros, New Lothrop Area Public Schools; Hannah Moody, Nouvel Catholic Central High School; Tommy Papesh, Reese Public Schools; Zarria Atkins, Ny'Kisha Banks, Sierra Cleland, Saginaw Public Schools; Chloe Kubacki, Zyk Hlavacek, Saginaw Township Community Schools; Warren Jacobs, Valley Lutheran High School.

5 SVSU Faculty:

Dr. Martin Arford, Geography; Dr. Kyle Cissell, Chemistry; Dr. Dennis Gray, Biology; Dr. Rhett Mohler, Geography; Dr. Adam Warhausen, Chemistry.

10 SVSU Undergraduate Students:

Shammah Honour Bosah, Bijaya Dhungana, Nathanael Gentle, Brianna Kosecki, Rachel Laskowski, Hayley Lillo, Garrett Richardson, Justin Royer, Shrijesh Siwakoti, Aiden Van Loo.

Dow Corning Foundation-SVSU-Community STEM Partnership

Dow Corning Foundation

The Dow Corning Foundation-SVSU-Community STEM Partnership takes STEM teachers and students out of a textbook approach to learning and into a world of hands-on discovery and exploration, both in the classroom and in the community. The program is led by Dr. Stephanie Brouet and Dr. M. Patricia Cavanaugh.

22 K-12 Teachers:
Erin Martin, Bullock Creek Schools; Sara Forbing, Amy Kuntz, Caro Community Schools; Shari Fresorger, Carrollton Public Schools; Thomas Pashak, Coleman Community Schools; Jennifer Brooks, Judy Thomas, Essexville-Hampton Public Schools; Jessi Koehler, Freeland Community Schools; Melinda Freeland, Kingston Community Schools; Paula McElroy, Marlette Community Schools; Carin Daly, Tania Lex, Alicia O'Rourke, Meridian Public Schools; Rachel Papas, Merrill Community Schools; Mark Ratza, Melissa Trato, Millington Community Schools; Mary Koboldt, Peace Lutheran School; Rachel Eschenbacher, Melissa Nieschulz, Saginaw Intermediate School District; Beth Pufahl, Lori Vacik, Swan Valley School District; Adrianne Dittenbir, Tawas Area Schools.

10 Faculty Mentors:
Dr. Jennifer Chaytor, Dr. Kyle Cissell, Michael Coote, Edward Meisel, Dr. Adam Warhausen, Chemistry; Dr. M. Patricia Cavanaugh, English; Dr. Garry Johns, Mathematics; Dr. Robert Tuttle, Mechanical Engineering; Dr. Chris Nakamura, Physics; Dr. Anne Tapp, Teacher Education.

Great Lakes Bay Region Middle School Mathematics Specialist Program

Participants in the Middle School Math Specialist program

The GLBR Mathematics Specialist program was designed to increase student achievement by creating a cadre of Mathematics Specialists throughout the region. Modeled after The Virginia Mathematics Specialist Program, it addressed multiple aspects of teacher preparedness: content knowledge, pedagogical knowledge, and leadership skills. A cohort model was used so teachers could collaborate with their colleagues across school and district lines, as well as support one another through their coursework. Dr. Tamara Barrientos is the coordinator for this program.

13 Middle School Teachers:
Danielle Richard, Bay City Public Schools; Ann Keipert, Birch Run Area Schools; Shelley Wiederhold, Caro Community Schools; Amy Wilkins, Carrollton Public Schools; Amy Kolb, Frankenmuth School District; Carrie DeShone, Freeland Community Schools; Beverly George, Marlette Community Schools; Chelsea Johnson, Merrill Community Schools; Katherine Spaulding, Bernadette Wood, Midland Public Schools; Peri Raushi, Pinconning Area Schools; Cynthia Briggs, Reese Parochial; Paula Smeltzer, Saginaw Township Community Schools.

Herbert H. and Grace A. Dow Foundation STEM Scholars Network
Coding & Networking Bootcamp for High School Students

The Coding and Networking Bootcamp allowed students to gain valuable hands-on experience with Java programming language and setting up a small Local Area Network (LAN). Dr. Poonam Dharam was the instructor for this camp, with support from Dr. Tamara Barrientos and the SVSU Regional Mathematics and Science Center.

20 High School Students:
Capri Kloha, MaKayla Maggart, Ashlyn Nagel, Amanda Pickelman, Samantha Pickelman, Caroline Roberts, Bay City Public Schools; Joseph Wittke, Bullock Creek School District; Madolyn Glocksine, Essexville-Hampton Public Schools; Abagail Johnson, Freeland Community Schools; Robert Perry, Meghana Reddy, Midland Public Schools; Benjamin Matuszak, Reese Public Schools; Pierce Force, Sterling Force, Saginaw Parochial; Emily Kinnicut, Sarah Kleinfeld, Saginaw Public Schools; Jordan Barnum, Matthew Krease, Ian Nyutu, Saginaw Township Community Schools; Jack Raines, Swan Valley School District.

Health and Human Services STEM Camp

The primary objective of the Health and Human Services STEM Camp was to promote health, wellness, nutrition, and public health awareness through a variety of hands-on activities, including SVSU's Plot to Plate Program, Nursing Simulation Activities, and Human Performance Testing. Instructors for the camp were Dr. Rachel Darr and Dr. Christine Noller, with support from Dr. Tamara Barrientos and the SVSU Regional Mathematics and Science Center.

20 High School Students:
Cassandra Grotelueschen, Amanda Pickelman, Matthew Przepiora, Bay City Public Schools; Cassidy Larkin, Carrollton Public Schools; Savanah Hoornstra, Chesaning Union Schools; Megan Christensen, Essexville-Hampton Public Schools; Benjamin Storms, Frankenmuth School District; Cong Li, Midland Public Schools; Garrett Webb, Saginaw Parochial; Akshanth Bandla, Ny'Kisha Banks, Katie McCarthy, Saginaw Public Schools; Jordan Barnum, Joshua Krease, Justin Li, Aubrey Schultz, Kelsey Schultz, Saginaw Township Community Schools; Kate Sullivan, Kelly Sullivan, Standish-Sterling Community Schools; Peyton Rundell, Swan Valley School District.

Summer STEM Opportunities Camp

The goals of the Summer STEM Opportunities Camp are to build fundamental and advanced skills in math, build self-esteem through the rigorous study of math, and to show students some of the career possibilities that are available to them. Daily activities promote fundamental math skills, as well as science activities and field trips. The camp is coordinated by Dr. Amy Hlavacek.

Science and Mathematics Extravaganza for Kids (SMEK Jr. and SMEK Sr.)

SMEK Jr. campers made their own flashlights with LED bulbs and button batteries, launched film canister rockets, created chromatography butterflies, explored how lungs work, and battled in a bit of balloon jousting. SMEK Sr. campers competed in Barbie bungee-jumping, worked with 3-D printing, made magnetic slime, and completed survivalist challenges such as creating shelters that could hold up against wind and making bridges to get past a swarm of alligators. Over fifty elementary and middle school students participated in each camp, coordinated by Dr. Tamara Barrientos and the SVSU Regional Mathematics and Science Center.

Faculty Focus: Dr. Poonam Dharam

Dr. Poonam Dharam

Poonam Dharam is an Assistant Professor of Computer Science and Information Systems at Saginaw Valley State University. Dharam earned her B.S. in Computer Engineering from Visveswaraya Technological University in India, her M.S. in Computer Science from Santa Clara University in California, and her Ph.D. in Computer Science from the University of Memphis, TN. She has been a professor at SVSU for two years. During that time, Dr. Dharam has been an integral part of STEM@SVSU programs. She is the advisor for both the Girls Who Code Club at SVSU and the Google Ignite CS Club, as well as the instructor for the CS Explore and Coding and Networking Bootcamp for high school students. Dharam has also served as a counselor for Camp Infinity, a judge for the FIRST Robotics State Competition, and a volunteer at the Science Bowl Competition and Math Olympics at SVSU.

What are your interests in STEM fields?

My main interests in STEM fields include computer programming and networks. Since my childhood, I always wondered how computer networks work. I was fascinated by the way Internet works. Also, the first time I programmed a hello world program, I was super excited with the outputs. I then wrote a simple program that interacted with a user. I wanted to learn more about programming. Also, the coding camps that I attended during my school days helped me a lot to understand the field. My curiosity for both programming and networks encouraged me to pursue my career in Computer Science.

My research involves transferring terabytes of data from one location to another in a minimal amount of time. Also, I work on network security that includes monitoring computer networks for possible attacks and preventing them for disrupting organizations' resources.

(cont.)

What are the highlights of your STEM projects?

I am looking forward to the Girls Who Code Club again this Fall. The focus of the camp is to encourage middle school girls in the field of computing to try out programming using Scratch and Spheros, to close the gender gap in technology. I am also looking forward to the We Code project this Fall that includes one-day camps for both parents and kids to learn programming using Scratch and Spheros. We are also planning on hosting a few camps for teachers to help them explore programming basics.

I recently completed my research work on big-data transfer, sponsored by an SVSU unit grant, and published my work in a top-tier conference. I am currently looking forward to my ongoing research on Network Security.

What should local educators share with their students about opportunities in STEM studies at SVSU?

At SVSU, we have awesome programs, faculty members, and staff. Every department has amazing research projects going on. I would request our K-12 educators to encourage their students to apply for the camps that would help kids learn more about the STEM fields. Also, the SVSU campus tour (individual/group) that can be scheduled throughout the year helps students explore various departments and lets them realize their interests. When students visit our campus, they get an opportunity to interact with SVSU faculty and mentors and learn about the various research groups, departments, and career opportunities. In my opinion, nurturing students' interests and guiding them in the right path shapes their future towards a successful career.

What advice do you have for teachers or students who are interested in learning more about your field?

Participating in programming camps and taking online tutorials such as Code.org would be a great starting point to learn programming. Logical thinking is one of the important skills required for coding and trying out more programming challenges and examples can help improve logical thinking. Start with a simple programming language like Scratch and explore all the basic concepts such as conditionals (if, if-else) and loops (while, for). Once you get a good understanding of the concepts, it's very easy to learn advanced programming languages such as Java. And, for more information on upcoming STEM programs, including Girls Who Code club and We Code camps, please visit our STEM@SVSU website.

Upcoming STEM Events!

Mark Your Calendars for Upcoming STEM Events:

The **A.H. Nickless Innovation Award** is an annual award for high school student teams competing to present innovative projects, products, ideas, problems or opportunities. Get in the running to win a share of up to $77,500 in scholarships for students and technology grants for schools. Registration opened September 5 and the top 20 teams will compete on Saturday, April 6, 2019. For more information – https://ahninnovationaward.com/index.html

Girls Who Code – September 19–December 5. Registration is now closed for fall but watch for the announcement for our winter session.

CS Fundamentals – September 29. Free – register at https://studio.code.org/pd/workshops/4908/enroll

CSO International Summit – October 7–11 in Washington, D.C.

Dow Great Lakes Bay STEM Festival – October 12 and 13 at Delta College

We are Innovators – October 13 at Delta College

We Code Camp – October 20 at SVSU. This camp is intended for 5 – 8 grade students interested in learning Scratch programming. Future dates (to be determined) will include sessions for advanced Scratch programming, Introduction to Scratch for parents, and programming using Spheros. Check out our website www.svsu.edu/stem for more details in the coming weeks!

Hour of Code for 4th Grade Classes – November 30 at SVSU. Applications due by October 12.

SVSU STEM Teacher Dinner – 2019 date to be announced in the winter edition of our newsletter. Stay tuned!