STEM @SVSU We discover.

NEWSLETTER • FALL 2019

Greetings from STEM@SVSU

Another busy summer is in the books for STEM@SVSU programs! We welcomed almost 400 K-12 students and nearly 70 teachers on campus for STEM camps, professional development, and more! New this year was the AT&T GLBR STEM Innovation and Entrepreneurship Camp, in which students engaged in engineering design and prototype testing, all while developing their entrepreneurial skills. Details with participant names and districts involved in all of our summer programs follow in this newsletter - many thanks to all for making this the best summer of STEM yet!

Continue reading to learn more about our school year opportunities, including Hour of Code, A.H. Nickless Innovation Award Competition, the SVSU Mobile Research Laboratory, and many more. Watch our website www.svsu.edu/stem for the most updated information throughout the year as well.

As always, please contact us with any of your STEM support needs.

Best wishes for a successful 2019-20 school year!

Adrianne Cole
Director of STEM@SVSU

We are excited to announce we are on social media . . .

@STEMatSVSU @STEMatSVSU

In this Issue:

Updates from the MiSTEM Network

In its first year of operation, MiSTEM has:

- **Established 16 regional hubs for STEM education**, each with a strategic plan designed to support and further STEM goals and challenges for the area through collaboration with local education providers, businesses, nonprofits and governmental entities.
- **Dramatically expanded and diversified the network** from 160 participants, primarily from schools and ISDs, to just under 400 participants, including representatives from STEM employers and higher education.
- **Boosted leadership and participation** at STEM-related events, including conferences, task forces and national, state and regional committees, to contribute to continued progress in closing the skills gap.
- **Strengthened relationships with partners** within each region to jointly focus on goals and solutions and increased communication between regions to share successes.
- **Provided grants to support implementation** of K-12 STEM projects with a proven track record of effectiveness and new programs to expand access to work-related experiences and professional training.

For more information on MiSTEM, please contact:

Claire Bunker
MiSTEM Network Director
East Central MI Prosperity Region
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Updates from the SVSU Mobile Research Lab

The SVSU Mobile Research Laboratory had a fun filled summer serving kids of all ages during summer camps, YMCA, year-round school experiences, and the Dow LPGA programming. The fall calendar is filling up quickly and we look forward to visiting many new school sites in the remainder of 2019.

For more information, visit our website **www.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 22. 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 **www.svsu.edu/stem** to apply by October 11.

Summer of STEM!

AT&T GLBR STEM Innovation & Entrepreneurship High School Camp

The AT&T GLBR STEM Innovation and Entrepreneurship HS Camp is focused on bringing STEM education and career awareness to high school students through various engineering activities, entrepreneurship, and stages of product development including technology and design innovations, as well as prototype development and testing. SVSU faculty and students mentored participants in strategies on how to start a new business, guidelines regarding intellectual property, and how to communicate inspiring ideas through a pitch competition. The camp was directed by Dr. Rajani Muraleedharan Sreekumarid.

18 High School Students:

Parker Woodall, Birch Run Area Schools; Mousaab Jafari, Carman-Ainsworth Community Schools; Jaiden Dones, Chesaning Union Schools; Ryleigh Horodoyski, Farwell Area Schools; Tara Estrada, Gavin Mehl, Carolina Mondragon and Casey Qeraxhiu, Freeland Community School District; Jordan Barnum, Saginaw Intermediate School District; Aliyah Beal, Khloe Beal and Emily Kinnicutt, Saginaw City School District; Luke Hanson, Ian Nyutu and David Thomas, Saginaw Township Community Schools; Alexzander Wright, Shepherd Public Schools; Ashley Hoffman and Mitchell Neumann, Valley Lutheran High School

Camp Infinity

SVSU's Gilbertson Hall was the host again for the third year for Camp Infinity. Fifty-two middle school girls attended camp in late June and nineteen high school girls attended in late July. The campers' enthusiasm, passion, and talents in robotics, JAVA, Lego Mindstorm, and SQL was greatly admired by our faculty, staff, and volunteers. We look forward to hosting again in 2020!

Chief Science Officers Program continues to GROW!

Chief Science Officers (CSOs) are middle and high school students who are STEM leaders in their schools and communities. Our local cabinet of CSOs, sponsored by Dow, has grown to include over seventy CSOs this year! These CSOs represent over 18,000 of their peers from twenty-six schools and fourteen districts throughout Bay, Midland, and Saginaw counties. CSOs and their advisors attended a Leadership Training Institute at SVSU in August and will interact with STEM professionals at local businesses, as well as implement a STEM action plan at their schools this year. These young leaders from the Great Lakes Bay Region, along with delegations from throughout the U.S., Mexico, Colombia, and Kuwait, will travel to Washington, D.C. in October for the International CSO Summit. There, they will work as an international cabinet to determine innovative solutions for STEM issues in their regions, as well as discuss STEM education issues with national leaders from the Office of Science and Technology Policy and the National Science Foundation.

Participating School Districts:

Bangor Township School District, Bay City Public Schools, Bridgeport-Spaulding Community Schools, Carrollton Public Schools, Essexville-Hampton Public Schools, Frankenmuth School District, Freeland Community School District, Hemlock Public Schools, Midland Public Schools, Saginaw City School District, Saginaw Intermediate School District, Saginaw Township Community Schools, St. John's Lutheran School, Swan Valley School District, and Valley Lutheran High School.

Dow Corning Foundation-SVSU-Community STEM Partnership

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.

22 K-12 Teachers:

Chasta Langworthy and Cory Woodard, Alma Public Schools; David Barr, Ashley Community Schools; Rebecca Field, Jennifer Jungnitsch, and Sandra Stevens, Bay City Public Schools; Ashley Nicol, Caro Community Schools; Amy Klopf, Coleman Community Schools; Jennifer Brooks and Judy Thomas, Essexville-Hampton Public Schools; Haley Davis, Stephanie Donaldson, and Jackie Dymond, Gladwin Community Schools; Kathy Jenkins, Julie White and Val Boeve, Midland Christian School; Cynthia Coleman, Millington Community Schools; Melissa Nieschulz, Saginaw Intermediate School District; Elizabeth Pufahl and Lori Vacik, Swan Valley School District; Judith Jean, Trinity Lutheran School, Ben Cooper, Valley Lutheran High School.

9 SVSU Mentors:

Dr. Jennifer Chaytor, Michael Coote, Edward Meisel, Dr. Adam Warhausen, Chemistry; Dr. M. Patricia Cavanaugh, English; Dr. Garry Johns, Mathematics; Dr. Robert Tuttle, Mechanical Engineering; Adrianne Cole, STEM@SVSU; Dr. Anne Tapp, Teacher Education.

Dow Science and Sustainability Education Center (SSEC) 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. Teams investigate factors that impact the Saginaw Bay Watershed through hypothesis-driven research and contribute their data to a watershed database. The program is led by Dr. David Karpovich and Dr. Jennifer Chaytor.

4 Research Studies:

- Soils, Agricultural Nutrients, and Water Quality in the Saginaw Bay Watershed
- Measuring Phosphorus Loading and Bacteria in the Saginaw, Tittabawassee, Cass, and Shiawassee Rivers
- Assessing the Impact of Microplastics on Biota in Aquatic Ecosystems
- Functionalization and Utilization of Biochar for the Removal of Metal Ions from Aqueous Solutions

8 Middle and High School Teachers:

Craig Coopersmith, Carrollton Public Schools; Brian Edelbrock, Katherine Spaulding, Midland Public Schools; Jill Moreau, Reese Public Schools; David Allan, Saginaw City School District; Katie Bryant, William Erickson, Trevor Moberly, Saginaw Township Community Schools.

15 High School Students:

Anthony Oswald, Bangor Township School District; Arianna Toth, Bay City Public Schools; Kaliyah Carey, Carrollton Public Schools; Seth Byrne, Hemlock Public Schools; Erica Behnfeldt, Fenton Area Public Schools; Alexander Robins, Freeland Community

(cont.)

School District; Jaime Brooks and Victoria Leiti, Midland Public Schools; Casey Baranski, North Huron Schools; Megan VanOchten, Reese Public Schools; Devlin Wieszczecinski, Saginaw City School District; Benny Cho, Carolyn McEvoy, and Nabil Zaman, Saginaw Township Community Schools; Viktoria Huber, Standish-Sterling Community Schools

4 SVSU Faculty:
Dr. Martin Arford, Geography; Dr. Kyle Cissell and Dr. Adam Warhausen, Chemistry; Dr. Sylvia Fromherz, Biology.

8 SVSU Undergraduate Students:
Shelby Cain, Brendan Ehrlich, Vincent Flores, Joshua Lang, Hayley Lillo, Jakob Schneider, John Searles, Aiden Van Loo

Great Lakes Bay Region Middle School Mathematics 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.

This spring/summer, 15 participants from Cohorts I & II engaged in professional learning:

Mary Andres, Frederick Brissette, and Rebecca Field, Bay City Public Schools; Ann Keipert, Birch Run Area Schools; Shelley Wiederhold, Caro Community Schools; Amy Wilkins, Carrollton Public Schools; Michelle Spayd, Clare-Gladwin RESD; Amy Kolb, Frankenmuth School District; Beverly George, Marlette Community Schools; Katherine Spaulding, Midland Public Schools; Cynthia Briggs, Reese Parochial; Lynn Rogers, Saginaw City School District; Chelsea Almy, Judy Schumann, and Paula Smeltzer, Saginaw Township Community Schools.

Herbert H. and Grace A. Dow Foundation STEM Scholars Network

Coding & Networking STEM Camp

The Coding and Networking STEM Camp allowed students to gain valuable hands-on experience with understanding the basics of flow charts in designing prototypes and solutions, as well as Java programming basics. Dr. Poonam Dharam was the instructor for this camp, with support from Dr. Tamara Barrientos and the SVSU Regional Mathematics and Science Center.

15 High School Students:
Michael Worden III, Chesaning Union Schools; Jackson Eggerd, Jacob Eggerd and Luciano Tanzini, Meridian Public Schools; Andrew Sharp, Alexandra Swanson and Grace Varela, Midland Public Schools; Jordan Barnum, Saginaw Intermediate School District; Joseph Crachiola, Aiden Meddaugh and Ethan Williams, Saginaw City School District; Terry Jiang, Drew Kennedy, Anderson Li and Ian Nyutu, Saginaw Township Community Schools.

Health and Human Services STEM Camp

During this week-long camp, students were introduced to a variety of health professions, including Public Health, Exercise Science, Medical Laboratory Science, Neuroscience, Nursing, and Occupational Therapy. Activities during camp included Simulations in Chronic Care, Nursing, and Neuroscience. Dr. Rachel Darr and Dr. Chris Noller were the instructors for this camp, with support from Dr. Tamara Barrientos and the SVSU Regional Mathematics and Science Center.

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14 High School Students:
Anna Grotelueschen, Cassandra Grotelueschen, Ambria Nagel, Ashlyn Nagel and Morgan Nalazek, Bay City Public Schools; Khaden Letts, Bullock Creek School District; Justin Patrosso, Clio Area Schools; Grace Chae and Anna Kozel, Midland Public Schools; Luciano Cortez, Terry Jiang, Jordon Keahey and Anderson Li, Saginaw Township Community Schools; Amelia Molitor, Homeschool.

UX Design STEM Camp

Students in the UX Design STEM Camp explored the basics of building an app for a smartphone. In addition, they learned about various career paths, including information architect, usability studies specialist, graphic user interface designer, and app programmer. J. Blake Johnson and Dr. George Corser were the instructors for this camp, with support from Dr. Tamara Barrientos and the SVSU Regional Mathematics and Science Center.

17 High School Students:
Aiden Short, Bay City Public Schools; Catherine Anger, Caro Community Schools; Philip Bartley, Clarion Area School District; Thomas Cookenmaster, Grand Blanc Community Schools; Jackson Eggerd, Meridian Community Schools; Tristan Brewer, Emma Carlson, Robert Perry, Andrew Sharp and Grace Varela, Midland Public Schools; Jordan Barnum, Saginaw Intermediate School District; Levi Asiala, Saginaw City School District; Luke Hanson, Terry Jiang, Alec Johnson, Charles Johnson and Anderson Li, Saginaw Township Community Schools.

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

SMEK Jr. campers explored STEM through a variety of activities this summer. Their explorations included creating airdrop packages that could deliver food safely and efficiently, testing rockets of different types including straw rockets and stomp rockets, building and testing rovers, learning about food engineering by inventing their own energy bars, making drop-copters, and testing aircrafts in a wind tunnel. SMEK Sr. campers built rovers and tested them for landing softly and in desired areas, designed and tested parachutes that would ideally give a Barbie-sized doll a smooth drop from the second floor, built lightning rods, and experimented with flood-resistant housing. There were 69 SMEK Jr. campers and 45 SMEK Sr. campers this year. SMEK was coordinated by Dr. Tamara Barrientos and the SVSU Regional Mathematics and Science Center.

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 promoted fundamental math skills, as well as science activities and field trips. The camp is coordinated by Dr. Amy Hlavacek.

Faculty Focus: Dr. Jennifer Chaytor

Jennifer Chaytor is an Associate Professor of Chemistry at Saginaw Valley State University. She earned her B.S. in Biochemistry from Brock University and went on to earn her Ph.D. in Organic Chemistry from the University of Ottawa in Ontario, Canada. Chaytor was the recipient of the SVSU Ruth and Ted Braun Fellowship from 2016-2019 and also received the SVSU Undergraduate Research Program Faculty Mentor Award in 2017. Her passion for education is evident through her engagement as a mentor for SVSU students on independent research projects, high school students in ACS Project SEED and the Dow Science and Sustainability Education Center (SSEC), and K-12 teachers in the Dow Corning Fellows/ SVSU STEM Community Partnership. In addition, Dr. Chaytor volunteers her time with the SVSU Chemistry Club, Cardinal Rhythm/Cardinal Grace, Science Bowl, FIRST Robotics, and as a judge for the A.H. Nickless Innovation Award Competition.

What are your interests in and out of the STEM fields?

I am always interested in learning about innovative teaching methods and how to implement them in my classes. In addition, I love reading, hiking, and spending time with my husband and five-year-old son.

What are the highlights of your STEM projects?

I am currently the co-coordinator of the Dow Science and Sustainability Education Center (SSEC) Summer Research Experience, which brings research groups together for a six-week summer research internship. Each group consists of an SVSU faculty member, 2 middle or high school STEM teachers, 4 high school students, and 2 SVSU undergraduate students. All research has ties to sustainability and water quality, as well as the Saginaw Bay Environmental Science Institute. Everyone gets a chance to learn from and network with each other, and students get hands-on research experience and exposure to academic research and the scientific method.

What connection would you like to enhance with local K-12 educators?

I would like to continue working with them to engage their students in research opportunities and with making meaningful connections to STEM in their classrooms. Also, I would like to expand my work with teachers to incorporate more writing into their curriculum. Students who have strong writing skills are more successful in achieving strong science grades.

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

Encourage your students to get involved and explore all that SVSU has to offer. Getting involved in research as a high school student is an unbelievable opportunity that can help with college admissions and with getting a research position in and after college. SVSU provides opportunities for ground-breaking undergraduate research, which help students learn critical thinking and problem-solving skills. This can lead to internships, assist students with getting into graduate school, and lead to industry jobs after college. Your resume will stand out from the pack when you have research experience on it. Furthermore, SVSU has small class sizes, and teachers who are passionate about their subject matter and invested in student success. Faculty at SVSU are student-centered and focus on using pedagogies that engage students both in and out of the traditional classroom setting.

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

Don't be afraid of organic chemistry! It has a bad reputation for being a challenging course (which it is), but students learn so much about problem solving and critical thinking. Also, learning hands-on in the lab makes the subject much more fun and relevant.

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 4 and the top 20 teams will compete on Saturday, April 18, 2020. For more information – https://ahninnovationaward.com/index.html

CS Fundamentals Deep Dive – September 30. Free – more information at www.mi-coding.com/cs-fundamentals-deep-dive-registration-links.html

CSO International Summit – October 6-12 in Washington, D.C.

Hour of Code for 4th Grade Classes – November 22 at SVSU. Applications due by October 11.

Girls Who Code & We Code Camps – will resume in the winter semester. Watch our website for more information later this fall!

SVSU STEM Teacher Dinner – 2020 date to be announced in the winter edition of our newsletter. Stay tuned!