

Greetings!

At SVSU, our fall semester is coming to a close and it has been a busy “STEM” time on campus and in the Great Lakes Bay Region. In this edition, please check out the short story and photos on our first Hour of Code event for elementary students held just last week.

Note the incredible activity happening with the Dow STEM Science Ambassadors — Adrienne Cole is ready to assist you!

STEM@SVSU is an active website to update you on our programming. Also check out the website of the Great Lakes Bay Regional Alliance for more STEM updates: stempipeline.com.

Happy Holidays from SVSU!



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STEM Teacher Dinner Thursday, Feb. 11, 2016, 5 p.m.

Sign up now for the STEM Teacher Dinner to be held for interested K-12 teachers. The evening will highlight all upcoming summer activities for teachers and students. Additionally, the program will include a short presentation related to the newly adopted Next Generation Science Standards, with a focus on engineering. RSVP to Adrienne Cole at acole@svsu.edu or call 989-964-4058.

Expect a great raffle drawing and be the first to know about great opportunities for your summer!

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Hour of Code Celebrated with Elementary Students

Sixty fourth graders participated in the first Hour of Code/Marshall Fredericks Sculpture Museum STEM Experience on Thursday, Dec. 3.

Teachers Carolynn Collard, from Chesaning’s Big Rock Elementary, and Amy Rankey, from Bay City Public School’s Washington Elementary, applied and were selected for the recent experience. Coding opportunities were led by George Corser, SVSU faculty member, and students from the Computer Machinery User student club. Students also toured the Marshall Fredericks Sculpture Museum and were the first elementary students to experience a STEM extension to their tour. Lunch on campus in the Marketplace was a special time as well. We were excited to host this STEM opportunity.



Dow STEM Ambassadors Visit Area Classrooms

This fall has been a whirlwind of “STEMazing” activities throughout the Great Lakes Bay Region! The Dow STEM Ambassadors visited more than 50 classrooms in Bay City, Saginaw and Midland counties. Ambassadors have wowed some 2,000 students with STEM activities in Bay City Public Schools (Auburn, Kolb, and Washington elementary schools; T.L. Handy and Western middle schools; and Central High School); Bullock Creek Schools (Pine River Elementary); Carrollton Public Schools (Carrollton Elementary); Freeland Community Schools (Freeland Learning Center and Freeland Elementary); Midland Public Schools (Chestnut Hill Elementary); and Saginaw Township Community Schools (White Pine Middle School and Heritage High School).

In addition to classroom visits, the ambassadors have impacted more than 8,000 K-12 students at community events such as the Dow Great Lakes Bay STEM Festival at Delta College, the Great Lakes Bay Regional Youth Leadership Conference at Saginaw Valley State University, the Saginaw Spirit Education Game Day, the Bot Bash kick-off for FIRST Robotics and the American Girl Fashion Show at the Midland Center for the Arts.

For more information about the Dow STEM Ambassador Program, please visit svsu.edu/stem, or contact Adrienne Cole, STEM program manager, at 989-964-4058 or acole@svsu.edu.

Michigan Space Grant Consortium Offers K-12 Educator Incentive Program

The K-12 Educator Incentive Program is designed to support teachers in two ways. Science, technology and mathematics teachers may apply for a grant of up to \$400 to attend professional conferences and workshops. Teachers may also apply for up to \$200 in funding to purchase materials and supplies for innovative instructional activities related to aerospace, aeronautics, space science and Earth system science. Any K-12 teacher in the state of Michigan may apply; applications are processed on a rolling basis throughout the year. For more information, please visit <http://mi.spacegrant.org/index.php?page=k-12-educator-guidelines>.

SVSU Focus on Faculty Who are Making STEM Happen

SVSU has received nearly \$8 million in recent months for STEM projects on campus and for outreach in the Great Lakes Bay Region. Talented faculty are involved — here is your chance to meet them.



David Karpovich
H.H. Dow Endowed Chair
in Chemistry
and Director of the
Saginaw Bay
Environmental Science
Institute at SVSU

Dr. Karpovich earned his B.S. in chemistry from SVSU and his Ph. D. in analytical chemistry from Michigan State University. He spent two years at the Environmental Molecular Sciences Laboratory at Pacific Northwest National Laboratory in Richland, Washington, before joining SVSU's faculty.

Why did you decide to propose and ultimately gain funding for your specific STEM Project?

I firmly believe that hands-on experiences add so much value to an education. The Dow Science and Sustainability Education Center enables me and several other faculty to provide hands-on experiences to many high school students, teachers and SVSU undergraduate students. It also fits nicely with the research of the Saginaw Bay Environmental Science Institute at SVSU. The student participants in the institute work on actual research in teams under the mentorship of faculty. This gives the students a wealth of personal knowledge that will help them as they determine their path forward in a STEM career.

What are the highlights of your current STEM project?

The Dow Science and Sustainability Education Center features a wonderful summer internship program that brings together research faculty, high school teachers, undergraduate students and high school students in research groups each summer.

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The approximately five research groups each consists of one professor, two high school teachers, two undergraduate students and four high school students. Their paid internships are seven weeks long during the summer during which time they focus intensely on issues important to Saginaw Bay. Their results are very important and have been presented to state, and even binational, audiences!

The other highlight of the Dow Science and Sustainability Education Center is the mobile laboratory, which is expected to arrive at SVSU in December. This will be a 38-foot-long, fully-functional, mobile water quality research lab. It will take technology into area schools so that the students can actually use it, not just look at it. When not serving school science classes, it will help the Saginaw Bay Environmental Science Institute with on-site analysis capabilities for water research.

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

The Dow Science and Sustainability Education Center makes a connection with K-12 educators by including them in research along with their students. They actually become practitioners of science along with their students, which means they are actually discoverers and explorers of new knowledge. It excites people to be in that role. I'd like to make connections with an even greater number of K-12 educators.

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

At SVSU, all students have the opportunity to participate in research projects through our many programs. In addition to the Dow Science and Sustainability Education Center, students may apply for many other internship positions through the Saginaw Bay ESI, and they may also join a project for college credit or even as a volunteer. At large research institutions (that I've spent time at), only a few select undergraduate students have the opportunity to do research with graduate student mentors, and fewer yet will interact directly with the professors. SVSU faculty provide these opportunities to many students.

And in conclusion...

As a student at SVSU (a few) years ago, I was very impressed by the personal attention and many opportunities that were made available to me. The mentorship I received from professors was crucial to my success and strongly influenced my decision to pursue science as a career. As a result, I decided to pursue a STEM career that now enables me to provide the same for my students. So, ultimately I chose to come back to SVSU to do just that — and it's been everything I anticipated. The greatest joy in my job is helping students find their way to a STEM career that excites them. Well, that and sometimes fishing is a necessary part of the Saginaw Bay ESI research, which is about as good as any career gets!



Dave Karpovich demonstrates equipment used to collect and analyze water samples to SVSU student researchers.



Stephanie Brouet
Associate Professor of
Chemistry
and Director of the
Dow Corning/SVSU STEM
Community Partnership

Dr. Brouet holds an undergraduate degree from the University of Michigan

and a Ph.D from Wayne State University. She taught at Providence College in Providence, Rhode Island, and the College of Holy Cross in Worcester, Massachusetts, before joining SVSU in 2010.

Why did you decide to propose and ultimately gain funding for your specific STEM Project?

While I am formally trained as an organic chemist, I have always had a fascination with psychology, which was my minor at U of M. When the opportunity arose to investigate and develop methods to impact attitudes about STEM in the region, I felt fortunate and was intrigued by the challenge.

Working with K-12 teachers as a team to tackle this problem seemed to be the most logical path forward. It has proved to be the most likely option to have far-reaching impact on attitudes about STEM in the region. The teachers have been a pleasure to work with and have expressed excitement about the approach.

They obviously care a great deal about the future of their students. They have developed innovative projects to model how STEM really works and how STEM knowledge will directly benefit the future of those children. This is important to the Dow Corning Foundation, and they have generously supported the program financially. Dow Corning and the Dow Corning Foundation have devoted manpower to the projects, with professionals working directly with teachers in the classroom to facilitate project work, provide tours or serve as speakers.

Finally, a team of SVSU faculty and staff have contributed greatly to the program as speakers and mentors, providing expert guidance to ensure the projects have relevance to current problems facing society and creatively adapt sophisticated technologies and procedures for K-12 environments.

This trifecta of teacher, professional and academic

has generated measurable impacts on student attitudes and resulted in the design of significant STEM projects in our local schools. It is very exciting to me that the program has been so well received and, more importantly, has evidence of working for the students. All of this was possible because of a substantial investment and trust in SVSU.

What are the highlights of your current STEM project?

The projects are exciting! Teachers are conducting real science with students that is relevant to the curriculum, the school and the community. Many of the projects are exploring important regional and societal concerns that the STEM fields can help address. Some examples include water quality testing of local bodies of water, measuring storm water runoff pollutants, health concerns about the amount of time students sit during the school day, best renewable energy to help power their school, the effectiveness of energy savings measures that have been taken at their school and an outdoor learning lab for an elementary classroom.

An amazing aspect is that teachers at all levels have developed completely original projects that are specifically tailored to their students. In most cases the projects are exciting topics for the teachers as well, since the teacher developed it with freedom to choose. The passion the teachers have for their projects has the potential to inspire the students and foster positive attitudes about STEM. So the real highlight of the Dow Corning Foundation/SVSU STEM Community Partnership is the direct impact this program is having on children in our local schools.

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

It is important that we serve the schools that are local, so I would love to see a number of teachers from the surrounding schools benefit from the program. SVSU is available to be partners to help address problems educators face.

They directly impact us as well. Middle school math has been identified as a very important factor to predicting future success in STEM for children. Math teachers often express reservations because they aren't sure how projects could fit into their classroom. We have excellent examples for them and we can help them to develop exciting projects. One middle school math teacher's project addressed renewable energy. The math component came from collecting weather data

from a weather station bought from the program for graphing and the applications of other calculations that fit in perfectly with her curriculum.

A second middle school math teacher bought fitness trackers for her entire class and will use the data to tie in content from her class. The possibilities for application to math are endless.

Finally, this year we have second grade teachers that have developed projects with rigorous concepts in science that address STEM creatively with engagement a priority. They have designed an outdoor learning lab that is incredible and a technically-g geared maker space for an engaging indoor learning environment. While students at this age often have positive attitudes about STEM, their parents have a great influence on the future outlook of those same children. This program has the potential to impact parents as well by engaging elementary teachers.

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

SVSU is a great place for STEM and can be the doorway to amazing opportunities that most students (or their parents) would have a difficult time envisioning without guidance from faculty. Our faculty take a personal interest in the future of our students. We know the pathway to careers in STEM and can help students, from day one, design their college experience to meet those goals. We are conducting exciting research with our students. Several of my research students are now attending eminent institutions of higher learning to obtain a Ph.D. in chemistry as a direct result of the advising and experience they received at SVSU.

I would also ask our local educators to encourage students to investigate our institution. We place a high value on mentoring and developing personal relationships between the faculty and the student that lead to academic, career and personal success.

And in conclusion...

STEM@SVSU rocks! I love SVSU!



Stephanie Brouet enjoys the personal interaction with promising young researchers.



Tamara Barrientos
Director, SVSU Regional
Mathematics and Science
Center

Ms. Barrientos has a B.A. in elementary education from SVSU with mathematics and science endorsements. She received her master's degree in natural science from SVSU and is completing a Ed.D. at Central Michigan University.

Why did you decide to propose and ultimately gain funding for your specific STEM Project?

To offer high school students the opportunity to come to our campus (at no cost to them!) and work directly with faculty. It was also a natural next step to the 2nd-8th grade summer camps currently offered.

What are the highlights of your current STEM project?

The Herbert H. and Grace A. Dow Foundation STEM Scholars Network High School Summer Camps are for academically talented high school students. Students spend two weeks on campus working directly with STEM faculty. Last year, three camps were held:

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- SVSU Summer Science, taught by Dr. Christopher Nakamura, assistant professor of physics
- SVSU Robotics and Beyond, taught by Dr. Rajani Muralcedharan and Dr. Yu Zou, assistant professors of electrical and computer engineering
- SVSU High School Mathematics Camp, taught by Dr. Olivier Heubo-Kwegna, associate professor of mathematical sciences, and Dr. Emmanuel Kengni Ncheuguim, assistant professor of mathematical sciences

Three camps emphasizing STEM through hands-on applications and collaboration with fellow students will be offered in summer 2016.

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

I would like local educators to know that SVSU has much to offer in terms of supporting them and their students in many aspects of STEM.



Tamara Barrientos encourages students participating in summer STEM camps at SVSU.

Great Lakes Bay Regional Alliance STEM Impact Initiative Gains National Recognition

The Great Lakes Bay Regional Alliance STEM Impact Initiative has been in place for just one year, commencing with the STEM Summit held in November 2014.

Since that time, four networks have been formed to address the recommendations of the study. The networks are housed at CMU, Delta College, Mid Michigan Community College and SVSU.

The Program Management Office for the project is housed at SVSU.

Additionally, the alliance was notified in early September that the STEM Impact Initiative has been recognized as one of 27 communities in the United States to develop a STEM Ecosystem. The alliance is one of 10 applicants that were awarded grant funds.

In early November, representatives from the region — including Matt Felan, CEO, Great Lakes Bay Regional Alliance; Nancy Lamb, The Dow Chemical Company; Linda Engelhardt, Principal, Bay Arenac Career Center; and Carolyn Wierda, Executive Director of STEM@SVSU — traveled to Washington, D.C., to attend a meeting with the other communities and also had the opportunity to meet with representatives of President Obama’s administration at the Executive Office Building of the White House.

The networks recently presented proposals for consideration to the STEM Steering Council at the alliance and will await input from regional funders as to ideas for improvement and/or revision.

The networks will continue working in 2016.

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