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NEWTON KNOWS BEST
Nobel Prize Winner Martin Karplus speaks at Tech
On School, Skiing and "Feeling" the Moment

By Macy Ricketts, Editor-in-Chief

Disclaimer: The opinions expressed in this editorial do not reflect those of Montana Tech or the student body.

ANOTHER DAY, another cup of coffee. It seems like this time of year, Tech students fall into the daily pattern of
sleep, study, eat, repeat (with the third step being optional). Whether you walked out of your recent midterms
thinking "nailed it," or if you definitely "failed it," March is the month where school becomes a struggle. I’ll be honest -
the only reason I’m writing this editorial is because I couldn’t find anything to fill this space. Sure, I’d love to blab about
"life in general" for 350 words, but I’d rather do it on a day when I’m sitting at home with a Frappuccino in hand and
Matt Kearney’s new album blasting through my earbuds. As it is, I am sitting in the Technocrat office with an empty
stomach and a runny nose. I’m a biology student, and Tuesday, the day I am writing this, is the day I have two of my
three labs. Currently, I have the faint smell of Latex gloves on my hands and the scarring memory of dissecting a fetal
pig’s trachea on my mind. At this point in the day, I would love to grab a bite to eat at Pita Pit for dinner in order to
ease my growling - and somewhat conflicted - stomach (the dissection of a pig’s respiratory system isn’t exactly appetiz-
ing). However, for the sake of the masses, I am going to finish writing this editorial.

The past couple of months have been a time of mourning on Montana Tech’s campus. A recent tragedy made a lot
of people stop and think about the things that matter most to them. As a young college student, I know that I’m often
guilty of wishing the days away. Man, I wish I could just fast forward through tomorrow so my tests could just be over. I
wish this class would be over. I wish winter would be over. I wish this year would be over. The evening of the sudden death
of a Montana Tech student, a large group of Tech students got together in the Mill building on campus and prayed.

Whether you consider yourself to be of faith or not, many students present noted the gathering provided some sense of
peace in the midst of turmoil.

During a yoga class I took (I like to pretend that I do yoga), my instructor told us that meditation is about focusing
all of your senses on the here and now. She told us to take in the sights, sounds, smells and textures around us, and just
really feel everything - even if that sight is of the person’s butt in front of you and if that smell is of sweaty socks. When
was the last time you stopped and truly felt the moment?

The last time I really felt the moment was when I was skiing at Discovery mountain. It was a perfectly clear morning,
and delicate surface hoar glittered atop mounds of untouched snow. At the top of the mountain, the Pintler mountains
were framed against a perfect blue backdrop. The air was cold and fresh, the sound of fresh powder under my skis cut
the silence, and my boots were cinched just a bit too tight on my calves. It was perfect.

The trick, I think, is to remember the not-so-good moments as well as the perfect ones - they’re what make you feel alive. Right
now, I am breathing in the dusty smell of old furniture, blinking away tears as my contacts dry out from staring at the computer
monitor for too long, and listening to the sound of my stomach grumble. But you know what? It’s a good day. I’m alive, breathing
and healthy. Yes, I’m a flat broke college student with way too many bad hair days. On the flip side, though, I’m able to breathe in the
cool Montana air, enjoy a good cup o’ Joe, and take my best stab at Dr. Katie Hailer’s weekly organic chemistry quizzes (sometimes
those quizzes classify as “not-so-good moments,” but hey, there’s always next week).

Here’s my message to all of you: don’t take any moment for granted, because you never know when it will be your last. Do your
very best to really live out your time at Montana Tech, in Montana, and on this earth.

On that note, I am signing off. There’s a hummus pita on wheat that’s calling my name, and I’m sure not going to take that for
granted.
The Future of Education: Free Community College?
Obama pitches free college during 2015 State of the Union address

By Emmy Keenan

As THE NEW YEAR ROLLS AROUND, President Barack Obama has us thinking about the future of the United States with his recent State of the Union Address. In his speech, he has sparked the prospect of eliminated tuition for community college, a plan that he says may benefit millions of students.

So what's the catch? President Obama says that this plan, as part of his tax reform, would cost about $60 billion over a period of 10 years. These expenses would be covered mostly by federal funding with participating states making up for the rest.

Students who are enrolled in this free two-year plan would have to be at least part-time students, graduate when expected, and maintain a minimum GPA of 2.5. If a student meets this criteria, they would be on their way to earning an associate's degree, half of a bachelor's degree, or technical and trade certification. If successful, this plan is estimated to benefit up to 9 million students and save them an average of $3,800 in tuition each year.

As for participating community colleges, they would be required to have academic programs that fully transfer credits to local and public four-year institutions. They would also be required to have training programs that effectively prepare students for in-demand jobs.

In theory, this plan sounds as if the only downside is that it hasn't happened already. After all, several other countries have already adopted the idea of free higher education. But for some students currently enrolled at Montana Tech, they suggest that there is more to consider. The first two years of college may be considered as higher education now, but what about as time goes on? Nearly everyone would be obligated to go to college, and many students say that it would just seem like a continuation of high school. As the standards for education rise, the value of knowledge has the potential to decline.

"If you make higher education available for everyone, eventually lower degrees will become pretty much useless," said Becca Casazza, a junior at Tech. Casazza pointed out that a master's degree or a Ph.D. would be required for nearly any professional job in the future, as a bachelor's degree is currently recommended for even most entry-level jobs. Students would have to stay in school for even longer in order to achieve a credible degree, which may end up costing more money in the long run.

Additionally, what would happen to the quality of education and the institutions providing it? It can be speculated that enrollment would dramatically increase, raising the issue of resource availability. The influx of students would require more attention from professors and instructors. As a school with a smaller population, Montana Tech is known for students being able to receive one-on-one help and individual instruction from professors, but much of that could be lost with a greater number of students, which would have an impact on the quality of education both at Highlands College and the North Campus.

The idea of paying no tuition for the first two years of college sounds like a good idea at first, but it's difficult to say exactly how students would take advantage of it, if at all.

"I agree and think it has potential as long as we still qualify for financial aid later," said Tech junior Craig Smith. Students at Montana Tech want to get the most out of their education, but would President Obama's proposal help this cause? Whether this idea could come to benefit future students or just seem like another two years of high school has yet to be determined.

For more on President Obama's 2015 State of the Union address, visit www.whitehouse.gov.
Newton Knows Best

Nobel laureate Martin Karplus speaks at Tech on motion, marsupials and how he proved Issac Newton right

By Macy Ricketts

Upon first glance, Dr. Martin Karplus is quiet, stoic and unassuming. After a few minutes of conversation, however, Karplus's genius begins to shine through.

The 2013 Nobel-prize winning Karplus spoke in the Montana Tech HPER on Wednesday, February 23 with a lecture entitled "Motion: Hallmark of Life. From Marsupials to Molecules" in which he discussed his research on how motion is essential to the function of the animal’s cellular components.

Although Karplus is a professor of Chemistry at Harvard University, he came from humble roots. After his Jewish family was driven out of Nazi Austria during World War II, Karplus's parents worked menial jobs to support him and his older brother. After receiving a full academic scholarship to Harvard University, Karplus set to work studying physics and chemistry, taking the most challenging chemistry courses the university had to offer. Upon graduating with honors, Karplus did his doctoral research under the legendary chemist Linus Pauling at the California Technical Institute, during which time he was inspired by the natural world around him, leading him to do research in the integrated fields of biological sciences and theoretical chemistry.

"You have to have faith in yourself. Your parents and teachers can help you realize you have something to offer."

- Dr. Martin Karplus, 2013 Nobel Prize winner

Karplus's groundbreaking research has even paved the way for curriculum taught at Montana Tech—his studies on the protein kinesin are presented in the Principles of Living Systems course, and discoveries from his research on Nuclear...
Magnetic Resonance Spectroscopy are taught in organic chemistry courses at Tech.

"I am thrilled about his visit and talk," Montana Tech Vice Chancellor for Research and Dean of Graduate Studies Dr. Beverly Hartline said the week prior to Karplus's visit. "I hope that many Tech students, faculty and staff choose to attend."

Hartline also stated that after extending numerous invitations for Karplus to speak at Tech, the date finally lined up with his busy schedule and he accepted.

"He likes to speak with and inspire young people," Hartline said, "so I guess he found the combination of Tech students with the high school participants in the science fair and the Intermountain Junior Science and Humanities Society meeting irresistible."

In 2013, Karplus was awarded the Nobel Prize in Chemistry for his studies on the development of multiscale models for complex chemical systems. In essence, Karplus's groundbreaking research has even paved the way for curriculum taught at Montana Tech--his studies on the protein kinesin are taught in the Principles of Living Systems course, and discoveries from his research on Nuclear Magnetic Resonance Spectroscopy are taught in organic chemistry courses at Tech.

Karplus's award-winning research proved that Isaac Newton's classical chemistry approaches to atomic orbital and valence bond theory were just as effective—and more simplistic—than the quantum mechanics approaches that many chemists were using in their research.

"To me, what is most exciting is the theoretical modeling approach that allows the structure of complicated biomolecules to be calculated," Hartline said of Karplus's research.

Karplus's model extended past the standard two-atom molecule calculations and brought a third molecule into the equation—a concept that was unheard of at the time of its conception in the late 1970s.

Although the details of Karplus's highly anticipated Wednesday night lecture were not available by press time, Montana Tech students were given the opportunity to have lunch with Karplus Tuesday February 24. During that time, the students engaged in a roundtable discussion with Karplus, asking questions about his upbringing, his research and what it is like to be a Nobel prize winner.

"Getting to meet Martin Karplus was a great experience," sophomore business student Kimi Heng said. "He was a very kind, humble man who exuded wisdom and confidence."

During the luncheon, Karplus noted that while he does get many invitations to give lectures at universities, he only accepts a few.

"I only accept (the invitations) I think will stimulate students (from under-represented groups) to realize they have a chance to go on in chemistry to good universities. That is the sort of thing I try to do," he said.

Karplus also discussed his inspiration for his groundbreaking research.

"I sort of feel like I know the answer through intuition, and I have faith that my intuition will lead to something that's worthwhile," he explained.

Karplus also noted that persistence is key in his scientific studies.

"You have to have faith in yourself," he said. "Your parents and teachers can help you realize you have something to offer."

If you missed Karplus's lecture, don't worry—Montana Tech has another Nobel Prize winner coming to town. On April 23, physicist Dr. Bill Phillips of the National Institute of Standards and Technology will be lecturing on "Time, Einstein, and the Coolest Stuff in the Universe." Martin Karplus may have proved that Isaac Newton really does know best, but will Bill Phillips prove that Einstein is just as smart?
The Evolution of the Cell Phone

From Motorola’s “brick” to the iPhone 6+, handheld technology has come a long way since 1976

By Blake Nellis

In 1973, on the streets of New York City outside the Hilton Hotel, head of Motorola’s communications division Martin Cooper made the first phone call ever made from a mobile phone. He was calling one of his competitors at Bell Systems to inform him that Motorola was the first company to develop a truly portable personal telephone. In 1983 the phone that Cooper used would be made available to the general public. Though hardly portable by today’s standards, the DynaTAC cellular phone, nicknamed the “brick”, was a technical marvel in its day. Martin Cooper shared the story of the phone’s development with the British Broadcasting Corporation (BBC).

“We had to virtually shut down all engineering at our company and have everybody working on the phone and the infrastructure to make the phone work.” Cooper explained in his interview with BBC News. “The team that actually put the phone together did an extraordinary job. They had to squeeze many thousands of parts into this thing. By the time the engineers got done we ended up with two and a half pounds. We had a battery that weighed four or five times more than an entire cell phone does today, and even then the battery life time was twenty minutes.”

“We had to virtually shut down all engineering at our company and have everybody working on the phone and the infrastructure to make the phone work,” Martin Cooper, head of Motorola’s communications division, said of the “brick” in an interview with BBC News.

If those figures didn’t make you shudder, maybe the DynaTAC’s price tag of $3,995 will, which is nearly $10,000 today if you adjust for inflation.

“We didn’t design them for teenagers” clarified chief designer Rudy Krolopp when asked about the DynaTAC’s price. “But we couldn’t build them fast enough. Businesses started taking them on and it became something else, a part of business – not a convenience, but a necessity. We didn’t expect those kinds of volumes.”

Though the earliest cell phones were big serious tools for serious businessmen, the market naturally expanded into more mainstream areas as the technology grew cheaper. In the mid 90’s Nokia helped usher in a new era for cell phone use with their 55100 series of phones, which retailed for less than $200 and started packaging in features not necessarily related to telephony, like a calculator, a calendar, and even a few basic games, all in a package that weighed less than 300 grams. Interestingly enough, 1994 was the year that the computer company IBM released the first smart phone, the IBM Simon, though the term “smartphone” wouldn’t be adopted until much later. It retailed for $1,100 and featured a monochrome touch screen, as well as a suite of built in apps like fax and email, though it had to be wired into a router.

By the early 2000’s we were beginning to see phones with text-messaging capability, color LCD displays, and a space-saving clamshell design. This was also the time that some phones were dabbling with the inclusion of digital cameras, like Sanyo’s SCP-5300 or Nokia’s 7650. This feature, though it cost an extra $100 on average, proved wildly popular and quickly became standard for cell phones of the new century, despite the low resolution of early phone cameras and the absence of mobile photo-sharing sites like Facebook and Instagram. Some ambitious pieces like 2005’s Blackberry 7520 featured a full keyboard and wi-fi connectivity.

In 2007 the face of the mobile phone market was changed forever when Apple (at that time known as “Apple Computer Inc.”) announced the release of the very first iPhone. The late Apple CEO Steve Jobs spoke with CNBC about his company’s push towards the cell phone market.

“One of your biggest motivations for working to make a great product is that you want one yourself. We use all the handsets out there and boy is it frustrating,” he remarked in an interview with CNBC. “It’s a category that needs to be made more powerful and much easier to use. Now you can have the internet in your pocket with real email, with a real browser, along with the best iPod we’ve ever made integrated into it. I think this is where the world is going.”

It seems that Steve Jobs was correct, as the iPhone brand is still going strong today and has set the standard for the modern smartphone. The minimalist, touch-screen focused design made for a visually striking product, and is now the de facto design for modern phones. It was also the first cell phone to feature its own operating system, and later in 2008, a digital storefront with downloadable apps. This allowed consumers a level of personalization that they hadn’t seen before then.
ON JANUARY 6, the Consumer Electronics Show (CES) in Las Vegas opened its doors to business owners and the press for three days in order to show off the latest advancements in consumer technology. In the past, CES has showcased the next big thing for consumers such as the VCR, CD’s, the Xbox, Blu-Ray discs, and smart devices. This year’s show was the largest in history featuring 3,600 exhibitors and over 170,000 attendees. Among the exhibitors this year was Samsung, LG, Intel, Google, Sharp, Sony, and Mercedes-Benz each showcasing what they considered to be “the next big thing.” Common themes at this year’s show were wearables, smart phones, 3-D printers, 4k displays, and self-driving cars.

Smart technology has become more powerful and smaller over the past few years, which has given way to wearable technology. Nearly every smart phone manufacturer this year displayed a different version of smart watch. However, this year the GPS company, Garmin, released a smart watch that doesn’t require a phone but functions as both a GPS and fitness tracker. Their goal is to create a watch that is within the average consumer’s budget, but also offers tools an active person would need on their adventures.

“It is impressive it has these features without a smartphone but I would be interested once the price goes down to the $50 range, or if they offer even more features,” Tech student Nathan Burke said.

Every year people are amazed by the capabilities of the next generation of 3-D printers. From what started as a nozzle placing heated up plastic wire on a plate, we have printers capable of printing in plastic, metal, sugar, stone, and now wood. The largest 3-D printing company, Makerbot, revealed several items made from composite material, including a functional hammer, ceramic bowl, and metal gears. This is done by mixing powders from actual wood, stone, and metal together with filaments of PLA plastic. The Makerbot Company is hoping that the next generation of printers will be able to create functional tools and models for hobbyists or even manufacturers.

“The self-driving car may catch on in the future when technology advances enough,” Tech sophomore Seth Grinde said. “But we can eventually integrate that into society when we are ready.”

Unfortunately, the concept of the self-driving car still features a steering wheel. However, Mercedes promises that the vehicle will fully autonomous.

The CES expo not only shows us what the world has now, but also what we get to look forward to. The general public often look upon promises of autonomous cars, wearable technology, and virtual reality with a hint of skepticism. However, we can look at what companies have to offer us consumers and know that very soon the dreams of science fiction will be in our driveways, on our workbenches, and on our wrists. Now the world can only wait and see what will be next.
SMAA (Social Media Addicts Anonymous)
Twitter, Facebook and Instagram changing the way our generation interacts

By Kerry Lombard

As you read this article, look around the room. How many people do you see using their cell phones? Of these individuals, how many are with a friend or group of people but still engaged with their phones? Albert Einstein once said, “I fear the day technology will surpass our human interaction. The world will have a generation of idiots.” The idea that social media is beginning to replace a large aspect of our day to day social lives is becoming an issue in society.

Social media and networking has its benefits. It allows us to quickly and easily communicate with people. This can come in handy when you need to give or receive information in a short period of time.

Social media also allows us to talk to friends and family afar without having to make special plans around everyone’s busy schedules. Social media and networking also provides us with the opportunity to share important data with anyone in the world.

The problem arising with social media is that it differs greatly from the way we communicate face-to-face with others. When using social media apps and devices to talk to people, we are able to say things we perhaps wouldn’t say in person. Using a cell phone or an app to talk to someone provides a safety guard where you don’t have to see the person’s reaction to what you are saying, and therefore avoid confrontation about your actions. This safety guard also offers ample opportunity for bullying.

Cyber bullying continues to be a problem because it has instilled feelings of depression, anxiety, and feelings of detachment from society in people. Ultimately, the worry about the increasing popularity of different social media apps is that people, including children, will lose the ability to communicate face-to-face. Will the comfort of talking to others via texts, instant messages, Facebook posts, and tweets inhibit our capability to have real life conversations? Will children and adolescents gain the social skills necessary to be successful in school and in their future careers? It’s all about moderation. Using social media is fun and is not a problem in and of itself. However, it shouldn’t replace the relationships we have with people face-to-face. Establishing relationships with our peers and making memories are things that Twitter and Instagram cannot replace. USA Today provides some tips on how to prevent social media from taking over your social life:

- Share your location and check in with your social networks before attending a social event instead of interrupting your social time by using your phone.
- If you are hanging out with a group of friends who are all using their phones, make bets to see who can go the rest of the time without picking up the cell phone. Provide some sort of incentive to the person who goes the longest without using their phone.

The problem arising with social media is that it differs greatly from the way we communicate face-to-face with others. When using social media apps and devices to talk to people, we are able to say things we perhaps wouldn’t say in person.

We all love to post pictures on Instagram with clever hashtags that describe the moment. Instead of taking the time to post during a party or gathering, wait until the event is over. This way, you are engaged in the activities going on the whole time so you won’t miss out on another potential photo op. and you will have even more awesome pictures to choose from at the end.

When spending time with your loved ones, make a special effort to put the phone aside and only use it when absolutely necessary. No phone or media app can provide the same satisfaction as making memories and spending quality time with the people who mean the most to you.

The next issue of the Technocrat will be published on April 9, 2015.