Congratulations to:

- Jeanette Kimyagarov (T-14) on her wedding on June 9, 2015
- Nancy Strbik (T-14) on her wedding on August 30, 2015
- Kristin Tucker (T-14) on her engagement to Brendan
- Violetta Pinkhasova (T-11) on the birth of her son Elijah on August 14, 2015
- Sylvia Omega (T-5) on the birth of her daughter Mackenzie on October 15, 2015
- Anil Sookhoo (T-12) and Dwaina Scren (T-12) on their engagement
- Jessica Hannon (T-16), Antolnette Koskinas (T-17), and Sam John (T-17) on being honored as Presidential Achievers on November 4, 2015

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Dr. Tim Chartier, an Associate Professor of Mathematics and Computer Science at Davidson College in North Carolina, will be the keynote speaker on November 13, 2015, at the 14th annual TIME 2000 event, Celebrating Mathematics Teaching. His specialty is data analytics, including bracketology. He has been featured on ESPN, NPR, the CBS Evening News, USA Today and The New York Times. He is the author of several books, including Math Bytes: Google Bombs, Chocolate-Covered Pi, and Other Cool Bits in Computing. In 2014, he was named a Math Ambassador for the Mathematical Association of America and received a national teaching award. Dr. Chartier was recently interviewed by Zean Khan (T-16) about mathematics, computer science, and the joys of teaching.

1. What inspired you to study mathematics and computer science? I originally turned to math and computer science as a backup to my performing career and interests. I flew through Calculus and decided to take more math courses. When I took a course in proofs and studied infinity, everything changed. I remember where I was sitting the day I learned that there are two sizes of infinity. It simply astounded me that such a thing could be derived. I understood the derivation. The creativity associated with such a result drew me to math. I saw the innovation possible in the field.

2. You incorporate mathematical concepts in your mime performance, which you call "mime-mathematics." What inspired you to use mime to explain math? I was performing nationally and internationally since college. For years, I never blended mime and math. The first time I did was at the request of someone who'd seen me perform. The Boulder Public Library in Colorado had a grant for a math exhibit that would include mathematical performances. My wife Tanya and I were asked to perform. I was stunned. I never saw how mathematics overlapped with our show. When I told Tanya, she quickly agreed with the insight. This was all the more stunning. After listening to her, I saw the connections and began designing pieces specifically on mathematical content. When I started at Davidson College, I expanded the show and began performing nationally and now internationally. Last summer, Tanya and I performed our mime and math show in Tokyo and Seoul.

3. What are the benefits of teaching mathematics in entertaining ways such as using mime, juggling, or sketches? Sometimes, I use my performing background to keep a class’ attention. However, I largely use performing as a visual aid to my teaching. For example, I balance a chair on my chin when I’m teaching a certain topic of Calculus that uses integration. I refer to that example throughout the lecture. Yes, it’s fun to watch, but I use the example to help students learn mathematics. There is the entertaining side but, for me, the goal is to engage my students in broader and deeper ways.

4. A goal of the TIME 2000 event is to inspire high school students to learn more about mathematics. However, this subject does not always come easily to all. What advice do you have for those who try hard, yet fail? First, let me comment on failing. A former CEO of IBM, Thomas J. Watson said, "If you want to increase your success rate, double your failure rate." I work a lot in sports analytics, and many of our attempts to discover insight fail. Each step moves us closer to success. Speaking more broadly about mathematical study, keep in mind that math is much broader than any of us have studied. It’s a very, very broad field. Don’t like algebra or geometry? There are other forms of math. If you take a class and aren’t fond of it, it doesn’t mean you’ll dislike all of math. That’s like going to a huge buffet, sampling the first item and deciding you’ll hate everything — even the dessert bar! Math includes many skills which incorporate visual, philosophical, and computational components. I often comment that if you don’t like math, it’s highly, highly likely that you simply haven’t encountered the area that fits your skills.

5. How would you suggest that high school teachers motivate students to learn mathematics, as well as preparing them for college-level mathematics and computer science? Many students want to know why they learn something. As an applied mathematician, I often point to applications. When I teach about the equations of lines, I connect them to fonts on
a computer. When you tell a program to make a font 6 point versus 70 point in size, how does it instantly create a perfect, scaled version? Surprisingly, this question can be answered using basic algebraic concepts. Sports analytics can be folded into many areas and sports can be broadened to games like chess and athletic pursuits like cheerleading. Learning math and computer science really opens one’s options. Pixar uses math. A fundamental part of what led to Google’s success was their mathematical algorithm. There are active fields of digital humanities where computing allows new discoveries in history and English. Learning such things can help students connect to the topics of their course and motivate the effort it takes to learn.

6. How long have you been studying and working with bracketology? What makes the subject so fascinating? [see article below]

I began working in sports ranking, which is the area that led to my work in bracketology in 2008. Bracketology is a fun topic. Students can quickly gain an understanding of the field and can use math and/or computing to make contributions to the work. I enjoy seeing students be independent creators and push the field forward.

7. Money notwithstanding, what are the implications of finding the perfect bracket in sports? If you did it once, you are using skill and luck, frankly. However, if you could design an algorithm that could be perfect every time or even once out of every 5 or 10 times, you just found an algorithm that is better than anyone’s in the world! Sports involves skill and luck. If you could find a way to better predict those elements, you’d make a fundamental contribution that would be fun in brackets but could most certainly be extended to many other fields.

8. Lastly, do you have any words of wisdom to those aspiring to become math teachers?

To me, life is about making a difference in the world. Teaching is a field where you undeniably do this. Our world needs mathematicians, especially those who have more positive views of math. I often tell college students interested in teaching that they can be like the teachers who they still remember. Throughout life, there are those teachers students remember even decades later. Not every student has such an experience, but dedicated teachers have those students and making that difference is real and important. However, teaching isn’t just “giving.” Teaching always involves learning. It’s a wonderful profession. It isn’t always easy, but many important things aren’t. It can offer great rewards that enrich the lives of others, even your own.

For more information on Tim Chartier, visit http://academics.davidson.edu/math/chartier/
Or follow him on Twitter @timchartier

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**Survey Says!**

TIME 2000 students were surveyed about the teachers they had in high school. They were asked:

Were any of your teachers a TIME2000 graduate? If so, who, and at which high school?

And the survey says*:

Gina Chen (T-18): Ms. Eng - Bayside High School
Ellen Huynh (T-17): Ms. Liu - Townsend Harris High School
Rimmy Sharma (T-17): Mr. Chiu, Ms. Kato-Liu – Francis Lewis High School
Daniel De Sousa (T-16): Ms. Anderson – Queens High School of Teaching
Razana Khan (T-16): Mr. Penagos, Mr. London, Ms. Omega – Queens School of Inquiry
Crystal Purpura (T-15): Ms. Saborido – Oceanside High School

*These responses represent only a portion of the current TIME 2000 student body.

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**Breaking the Bracket**

Did you ever have a difficult time deciding what your favorite movie was? Which college to attend? In which stocks to invest? The process of pitting objects or people against each other in a number of one-on-one matchups assists in the decision-making process. By using bracketology, you can make definite choices for anything, ranging from favorite movies to college choices to investments. Bracketology originated as the process in which college basketball teams are placed within a bracket for NCAA Basketball Tournaments. Those who are familiar with sports may have created their own brackets for these participants, or may have created brackets for other sports, such as football or baseball. Sports network ESPN hosts a website that allows sports fans to create their own brackets. In recent years, the website received over eight million brackets, none of which were completely correct. So it appears that finding the perfect bracket is incredibly difficult. It happens to be so “shy of impossible,” that business magnate and investor Warren Buffet has offered a one billion dollar prize to whoever can find the perfect bracket. Yes, that does not say one million, but one BILLION dollars. Think about that. Some of the math involved in figuring out which teams would win and which ones would lose is quite complicated. One has to first figure out how to rank the teams, but since there is no definitive way to rank them, some people choose to rank them based on the number of wins a team has, while others base their ranks on the team’s mascot. This is where Linear Algebra can help. In a hypothetical matchup between teams where rank is based on wins, a matrix can be set up representing the results that the teams have had between each other. Using a matrix to solve the problem would result in the ranking of the teams. However, since there are a large number of games to predict, computer code lends itself to determine the rankings using large matrices for big matchups.

**What would you do with the billion dollars?**

To see what Tim Chartier would do, visit https://www.youtube.com/watch?v=SAu2Cp-TCnU

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**Blank bracket used for the NCAA Tournament**

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**Having fun at a TIME 2000 event? Use #TIME2000**

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Voices From the Field: Shari Eng (T-5)

People achieve many goals throughout their lifetime. These goals range from teaching their grandchild how to tie his or her shoe laces to training for a marathon in hopes of breaking a record. As an educator, my goal is to make sure that my students are getting the best education possible so they may be successful on any path they choose.

When people ask me why I became a teacher, I often tell them that there are multiple reasons. Both of my parents are educators, which influenced my decision. I always admired how they love teaching others. Growing up, I always enjoyed helping other students and was fond of learning. I liked the idea of becoming a teacher. I didn’t know what subject or grade I wanted to teach, but I knew I wanted to be a teacher. I realized in my senior year of high school, during my AP Calculus class, that I wanted to become a mathematics teacher.

My inspiration was my mathematics teacher, Ms. Susan Sladowski. Her ability to make mathematics fun and interesting while connecting the content to real–life situations was refreshing, and a change of pace from the traditional “chalk and talk” that too many teachers use in the classroom. She truly loves mathematics and was able to demonstrate this love in her lessons, as well as her overall presence in the classroom.

I currently teach at Bayside High School, my alma mater. I was fortunate to also student teach at Bayside High School. Ms. Sladowski, as mathematics chairperson, gave me the opportunity to work at Bayside High School, and I have been teaching there ever since. I am currently in my 10th year of teaching and have taught all levels of mathematics through Pre–Calculus. I am also dually–licensed in mathematics and special education. Having both licenses offers greater job security because I can be employed through either certification, which is beneficial when the teacher staff shrinks due to budget cuts or decreased enrollment. Having both licenses also exposes me to students at different levels. This is a challenge that I love. I recommend that new teachers get both licenses because the population of students with special needs is increasing every year. Schools are looking for teachers who are dually licensed because teachers with both licenses are more valuable to schools.

For the last five years, I have been working with student teachers as a cooperating teacher, and always enjoy this experience. I like that they bring innovative ideas to lessons and are eager to learn. The job of a cooperating teacher is hands on. In addition to reviewing and editing lesson plans, teaching how to grade assessments, and refining essential questioning skills, a cooperating teacher must also teach student teachers the little things that allow the class to be more productive. For example, where you stand in the classroom, how you write on the chalkboard/SmartBoard, and your organizational skills influence student learning.

Teaching requires hard work, dedication, and an understanding that every student is a unique learner. I am happy to say that I love teaching and cannot see myself in any other profession.

Where’s the Math? In my Tattoo! By: Alicia Bharat (T-16)

This past March, after careful consideration, I finally decided on my tattoo: The Eye of Horus or Wadjet (meaning “whole one”). The symbol can be thought of as a beacon of protection, but it also has a deeper meaning and served a greater purpose during ancient times. The symbol is comprised of six components, which are all associated with fractions and our senses (note: the ancient Egyptians considered the ability to think as one of our senses). The symbol was used for measuring, often when creating color pigments or medicine. The Ancient Egyptians used different components of the Eye of Horus to represent the fractions of one divided by the first six powers of two (see the illustration on the right). The sum of the fractions is 63/64, just 1/64 short of 1 whole. This is to represent that nothing is perfect. I chose this symbol because it intertwines math with the rich culture of ancient Egypt, two things that I love.

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\begin{align*}
\text{1/2} & = \text{Spleen} \\
\text{1/4} & = \text{Sight} \\
\text{1/8} & = \text{Thought} \\
\text{1/16} & = \text{Hearing} \\
\text{1/32} & = \text{Taste} \\
\text{1/64} & = \text{Touch} \\
\end{align*}
\]
TIME 2000 alumni celebrate the engagement of Dwaina Screen (T-12) and Anil Sookhoo (T-12), top row, second and third from left.

Get Involved! Contact Racheal at rachealsingh@gmail.com if you would like to contribute to the newsletter.

#TIME2000

Field Day 2015

T-18 at field observations at LAMS.

MT4 Officers
Sam, Ignacio, Alicia, Razana, and Victor

Q: What are TIME 2000 alumni Trisha Hurtares (T-10) and Despina Kaneris (T-11) dressed as for Halloween (above)?

A: Apart, we are points... Together, we form a line segment!

Professor Seifman joins T-16 for Plaid Wednesday!