



College of Science and Mathematics
Department of Mathematics

MATH TALKS 2013-2014

The Department of Mathematics weekly seminar series. Math Talks is open to all KSU faculty, students, and invited visitors to present any math or math-related topic. Seminars typically require little or no advanced mathematical knowledge are open to anyone.

**Unless specified otherwise, seminars are held Thursdays 12:30-1:45 pm in MS 109.*

Thursday, April 24, 2014

- Speaker: **Todd Mize**, Senior Manager at Lockheed Martin
- Title: *Careers at Lockheed Martin Aeronautics and Needed Skills*

*Thursday, April 17, 2014

- Panel: **Dr. Tad Watanabe**, Kennesaw State University; **Dr. Catherine Lewis**, Mills College; **Dr. Blake Peterson**, Brigham Young University
- Title: *Year of Japan – Math and Science Education in Japan*
- *Time/Location: 12:30-2:00 pm in SO 1019

Thursday, April 10, 2014

- Speaker: **Dr. Kim Gardner**, Kennesaw State University
- Title: *Mathematical Tasks and Student Learning*
- Abstract: The facilitation of a task sequence on teaching mathematical induction, and its impact on student learning will be presented. The sequence design methodology will be discussed, along with findings on how the sequence “closed the gap” on student performance among mathematics, secondary mathematics education and middle grades mathematics education majors.

Thursday, March 27, 2014

- Speaker: **Dr. Tad Watanabe**, Kennesaw State University
- Title: *Mathematics in Japan before 1872*

Thursday, March 20, 2014

- Speaker: **Dr. Lewis VanBrackle**, Kennesaw State University
- Title: *March Madness – What is an Upset?*

Thursday, March 13, 2014

- Speaker: **Dr. Flor A. Espinoza**, Kennesaw State University
- Title: *A Triangle of Love, Understanding How Evil Algebra is Ruining my Relationship with Calculus*
- Abstract: Calculus is a very scary word for some students, and they consider it a very intimidating subject. Most students take Calculus classes because they are required to do so. Therefore, many students taking Calculus start the semester with a tremendously negative attitude towards the subject, and sadly are not well-prepared to take Calculus. From previous and current experience teaching Calculus, I have found that one of their biggest weaknesses is having poor algebra skills. There is also a lack of understanding of the basic trigonometry and geometry. This type of knowledge is essential for success in Calculus. Here is a list of the most common questions that my Calculus students have been asking:
 - Why is Calculus so hard?
 - What skills do I need to be able to understand Calculus and solve problems?
 - Even though I understand the concepts explained in class, why do I still get wrong answers when solving problems?
 - Do I have difficulty in Calculus for reasons other than the professor's teaching style, accent, etc.?
 - How important are algebra skills for success in Calculus?
 - Why do we need to take Calculus classes when calculators and computers can do the work?
 - After I graduate, will I ever use calculus in my life?

In this talk, we are going to give answers to these questions, reasons to enjoy your Calculus classes, and help you understand how your poor algebra skills, or “evil algebra”, can help you fail Calculus or, better said, can ruin your relationship with Calculus. As in real life, you can't have a good, new relationship when your previous one has not been terminated. Mathematically speaking, you can't have a good relationship with Calculus when your relationship with Algebra has not been completed.

Thursday, March 6, 2014

- Speaker: Video: The Music of the Primes by Professor Marcus du Sautoy, University of Oxford
- Abstract: Why did Beckham choose the number 23 shirt? How is 17 the key to the evolutionary survival of a strange species of cicada? Prime numbers are the atoms of arithmetic – the hydrogen and oxygen of the world of numbers. Despite their fundamental importance to mathematics, they represent one of the most tantalizing enigmas in the pursuit of human knowledge. In 1859, the German mathematician Bernhard Riemann put forward an idea – a hypothesis – that seemed to reveal a magical harmony at work in the numerical landscape. A million dollars now awaits the person who can unravel the mystery of the hidden music that might explain the cacophony of the primes.

Thursday, February 27, 2014

- Speaker: **Dr. Gene Ray**, Kennesaw State University
- Title: *Who teaches science and mathematics – an examination of high school teachers using SASS*
- Abstract: A summary of research conducted over the past 18 months examining the demographics of the teachers responsible for STEM subjects in high schools. The demographics of interest include topics such as the age, years of experience, education, teaching responsibilities, and race. We also examine specific subjects that comprise STEM such as chemistry, biology, physics, and mathematics. The primary data source is the Schools and Staffing Survey (SASS) conducted by the National Center for Education Statistics (NCES). The analysis covers 20 years of survey data ranging from 1987 to 2007 with some preliminary information from the 2010-2011 survey. The discussion will also include information about the intradisciplinary research team as well as future research we plan to conduct.

Thursday, February 20, 2014

- Speaker: BBC show: The Story of Math, Part IV: To Infinity and Beyond
- Description: Dr. Marcus Du Sautoy presents his story of math. It is the 4th episode of his BBC show The Story of Math (<http://www.bbc.co.uk/programmes/b00dxjls>). This episode talks about development of modern mathematics in 19 century and 20 century.

Thursday, February 6, 2014

- Speaker: **Dr. Josip Derado**, Kennesaw State University
- Title: *General Viète Formulas*

Thursday, November 14, 2013

- Speaker: **Dr. Louise Lawson**, Kennesaw State University
- Title: *ADVENTURES IN CLINICAL RESEARCH: How 10 thousand cardiac patients turned into half a million babies!*
- Abstract: Learn about the trials, tribulations and rewards of being a clinical epidemiologist, and a little about cardiology and neonatology.

Thursday, November 7, 2013

- Speaker: **Dr. Necibe Tuncer**, University of Tulsa
- Title: *Seasonality in Avian Influenza H5N1*
- Abstract: Avian influenza H5N1 has been infecting poultry and humans in many countries since 2003. The cases follow a seasonal pattern with peaks in the winter months. This pattern is puzzling as most of the human cases occur in equatorial countries where even the seasonal human influenza occurs with different pattern. We hypothesize three different mechanisms that may be responsible for the seasonality in H5N1 cases:
 - (1) seasonality in direct transmission in domestic birds;
 - (2) seasonality introduced by migratory patterns in wild birds;
 - (3) seasonality introduced by environmental transmission of H5N1.We incorporate all these types of seasonality one by one or in combination in 7 different models. We fit each of the models to the cumulative number of human cases reported by the World Health Organization for the period January 2005-December 2009. We compare the models based on their Akaike Information Criterion (AIC) score. We found that the model that incorporates seasonality in the direct transmission in domestic birds best explains the data. Furthermore, we use the best fitted model to project the cumulative number of human cases of H5N1 through 2011 and compare it with the incoming data. The best fitted model shows good agreement with future data. I will also present the results of the research conducted by my undergraduate student. She studied the effects of air travel to the spread of hypothetical avian influenza pandemic originated in Asia.

Thursday, October 31, 2013

- Speaker: **Dr. Virginia Watson**, Kennesaw State University
- Title: *History of Department Involvement in the MAA and Undergraduate Research*
 - [Link to Presentation Slides](#) >>

Thursday, October 24, 2013

- Speaker: **Dr. Lewis VanBrackle**, Kennesaw State University
- Title: *The Power of Best-of-Seven Playoffs*
- Abstract: Best-of-Seven game playoffs (like the World Series) can be considered as statistical tests whose object is to determine which of the two teams is the better team. We will examine how good the best-of-seven playoff system is at determining which team is better. We will also examine how many games should be played to give a “good” chance of determining which team is better. We will apply the results to the World Series, the NBA Final Playoff Series and the Stanley Cup final playoff series.

Thursday, October 17, 2013

- Speaker: **Dr. Sherry Ni**, Kennesaw State University
- Title: *The students who participated in the SAS Data Mining Shootout this year will present their work*

Thursday, October 10, 2013

- Speaker: **Dr. Michele DiPietro**, Kennesaw State University
- Title: *Randomized Response Methods*
- Abstract: Estimating the percentage of people who possess a particular trait is a pretty straightforward statistical task – unless people are lying. If that is the case, then we have bias in the data, and more interesting statistical questions arise: How can we estimate the size of the bias? How can we eliminate it or at least reduce it? How can we predict it? and so on. Randomized response is a class of techniques invented in the 60's to deal with some of these issues. In this Math Talk, I will give an overview of the technique and some of its variations, the pros and cons of using it, the tradeoff between bias and standard deviation, the issues with some limit situations, and some solutions. We will illustrate the technique with audience participation.

Thursday, October 3, 2013

- Speaker: **Dr. Mishko Mitkovski**, Clemson University
- Title: *Basis Properties of Complex Exponentials*
- Abstract: Basis properties of complex exponentials: Questions about various types of expansion properties of the sequence of complex exponentials $\{e^{i\lambda_n t}\}$ have a very long history, with origins in the work of Paley, Wiener, and Levinson. In this talk I will present a characterization of the basis properties of this sequence in terms of the invertibility properties of a certain naturally associated Toeplitz operator. Using this characterization one can describe the radius of l^2 -dependence of $\{e^{i\lambda_n t}\}$, i.e., the supremum of all $c > 0$ for which $\{e^{i\lambda_n t}\}$ is l^2 -dependent in $L^2[0, c]$. Namely, this radius is equal to the interior Beurling-Malliavin density of the frequency sequence $\{\lambda_n\}_{n \in \mathbb{Z}}$. I will also show how the Toeplitz operator method can be used to solve other classical problems in function theory.

Thursday, September 26, 2013

- Speaker: **Dr. Sean Ellermeyer**, Kennesaw State University
- Title: *Crime in the Animal Kingdom: Two Mathematical Models of Kleptoparasitism*
- Abstract: Kleptoparasitism is a foraging strategy by which some animals obtain food by stealing it from other animals. Seagulls are known for this. They steal from other birds and also from humans having a picnic at the beach. Some kleptoparasites are very clever. When they spot another animal who has some food that they want to steal, they sound an alarm call warning of a predator in the area. The animal handling the food abandons it and runs and hides and the kleptoparasite swoops in for a free meal. Turns out the kleptoparasite was lying. There was no predator. An example of this “false alarm” type of foraging strategy that has been observed in nature is in fork-tailed drongos (*Dicrurus adsimilis*) which give false alarm calls to steal food from meerkats (*Suricata suricatta*) and pied babblers (*Turdoides bicolor*).

The use of deceptive alarm calls to steal food can be viewed as a game between the parasite (thief) and the host (victim). False alarm calls are probably costly to drongos: they may need to invest time and energy into following meerkats waiting for chances to attempt to steal food, or the behavior may distract them from finding food by other means, or from actually looking out for predators. Furthermore, if they cry wolf too often then meerkats are going to get wise to them and start ignoring them. On the other hand, if you are a meerkat, dare you ignore an alarm? What if there really is a predator nearby who likes to eat meerkats? In this talk, we will consider two mathematical models of kleptoparasite-host interaction in which the parasite species can fall into two categories, honest and deceptive, and the host species can also fall into two categories, trusting and ignoring. In both models, we examine the evolution over time of frequencies of the honest vs. deceptive and trusting vs. ignoring traits in the species. The first model that we present is a linear system of difference equations that predicts cycling between traits. The second model, which is work in progress, is nonlinear and seems to admit a wider array of possibilities in the species dynamics depending on model parameters. This work is in collaboration with Tony Golubski, Nathan O'Connell and Jesse Schwartz.

Thursday, September 19, 2013

- Speakers: **Dr. Mari Castle, Dr. Philippe Laval, Dr. Anda Gadidov, Dr. Erik Westlund, and Dr. Yuliya Babenko**; Sponsored by KWIM
- Title: *Research Opportunities at KSU and beyond*
- Abstract: Join our research panelists: Dr. Mari Castle, Dr. Philippe Laval, Dr. Anda Gadidov, Dr. Erik Westlund, and Dr. Yuliya Babenko as they discuss: What research in Mathematics could be; Why do research?; Current research in the Department of Mathematics and Statistics; Expectations and requirements for student research; Other opportunities.

Thursday, September 12, 2013

- Speaker: **Dr. Josip Derado**, Kennesaw State University
- Title: *TM21 Initiative and Vi Hart*

Thursday, September 5, 2013

- Speaker: **Dr. Josip Derado**, Kennesaw State University
- Title: *Teaching Mathematics in the 21st Century*
- Abstract: Recent events have put teaching back in the focus at the University. The new challenges like assessing the value of the college education and the development of open on-line courses make us rethink the main teaching paradigm. In this talk we will discuss challenges the college instructors face and we will suggest possible solutions.

Thursday, August 29, 2013

- Speakers: KWIM, **Dr. Yuliya Babenko, Dr. Kimberly Gardner, Dr. Jennifer Priestley**
- Title: *KWIM intro + NOW & LATER: Career Advice for Mathematics, Mathematics Education, and Statistics*
- Abstract: MATH, MATH ED and STAT Career Advice: A three person panel of experts in the fields of Mathematics (Dr. Yuliya Babenko), Mathematics Education (Dr. Kimberly Gardner), and Statistics (Sr. Jennifer Priestley) will share advice for what to think about and plan for now regarding how to use your degree after graduating.