MSCS Mess

Department of Mathematics, Statistics and Computer Science
St. Olaf College
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This Week's Colloquium

Title:	Factors associated with social connectedness in rural Ecuador: implications for disease transmission
Speaker:	Jim Scott
Time:	1:30 pm Tuesday, November 28 (Treats at 1:15)
Place:	SC 182

Abstract: Contact between individuals is an important factor for transmission of infectious diseases. Social networks represent potential pathways through which transmission may occur. Jim Scott examined social networks in 21 villages in rural Ecuador to identify characteristics that are associated with having social connections. These data may be used to inform potential public health intervention strategies.

Jim Scott is from the University of California Berkeley.

St. Olaf rocks the NCS Team Competition!

On Saturday November 11, the tenth annual North Central Section Mathematical Association of America Team Problem Solving Competition was held. 58 teams from 27 different colleges and universities in the region entered the competition. St. Olaf entered three teams, Team Koala Magick: Paul Tveite, Joey Paulsen, and Matt Moynihan; Team Pi: Thomas McConville, Dan Endean, and Charles McEachern; and Team Philip Gipson: Philip Gipson. Team Koala Magick tied for first place with Macalester team MAC A, scoring a perfect 100 points, and Team Pi came in a close third with 97 points! So St. Olaf took 2 of the top three spots! Even with only one team member, Team Philip Gipson still came in 28th, scoring above the median score of 43.5. Congratulations to all our outstanding competitors! If you'd like to compete in a team problem-solving competition and missed the NCS and the Carlson, there's still the Konhauser competition to look forward to in February. Contact Josh Laison if you're interested.

Congrats to Fellow Oles...

Paul Tveite, class of 2007, presented a paper entitled "Luzin's Theorem is Best Possible" at the 21st Annual Pi Mu Epsilon regional undergraduate mathematics conference on Friday, November 3 in DePere, Wisconsin. Paul's paper was co-authored with Joey Paulsen, also class of 2007, and was written under the direction of Wladyslaw

Wilczynski of Lodz University in Poland. Paul and Joey were named International Research Scholars last fall as part of a three-year grant from the National Science Foundation. In that capacity, they spent last summer at Lodz University researching problems in real analysis.

Our third International Intern, Joe Anderson, class of 2007 spent his research summer doing research in dynamical systems at Selesian University in Opava, Czech Republic. Joe and Joey will present their results in January at the annual meeting of the American Mathematical Society held this year in New Orleans.

One interesting side note concerning last weeks Pi Mu Epsilon conference is that the conference organizers sponsored a game of Mathematical Jeopardy Friday evening. When one member of the team from the University of Wisconsin at Oshkosh was unable to attend, the team asked Paul to substitute, which he did. The result was that the Big "O" team, as they were known, ran away with the contest, easily doubling the score of the second place squad. Although Paul was by far the most active and accurate member of the team, Oshkosh kept the trophy.

Jokes for Geeks

Math is everywhere: "My life is all arithmetic," the young woman explains. "I try to add to my income, subtract from my weight, divide my time, and avoid multiplying."

Question: What is a topologist?

Answer: A person who cannot tell a donut from a coffee mug.

Problem of the Week (POW)

Not Equal Rectangles: Somewhere in the world, Alice owns a plot of land bounded by four fences, two of which run in an exact north-south direction and are exactly 10 miles long, and two of which run in an exact east-west direction and are exactly 20 miles long. Bob also owns a plot of land, similarly bounded by four fences, but his north-south fences are 20 miles long and his east-west fences are 10 miles long. Whose plot of land has the greater area?

Submit all solutions before the appearance of the next problem to Josh Laison in person, by e-mail (laison@stolaf.edu), or by quipu. The first correct solution gets a prize; all correct solutions get fame and glory. Preference for the prize goes to problem-solvers who haven't won one yet.

Solution to The Old Switcheroo: Three prisoners are given an unusual jail sentence. They are taken to three different jail cells, far enough away from each other so that they can't see or hear each other. At random times and in random order, the jailor comes to each of their cells, and takes them into an empty room with a switch on the wall. The switch controls nothing, and has two positions, up or down. At the beginning of their sentence, the switch is in an unknown position. When a prisoner is in the room, he may choose to switch the switch or leave it the way it is, after which he is returned to his cell. This continues indefinitely, with the jailor visiting each prisoner many times, possibly visiting one of them many times in succession, or each in turn. At any time, a prisoner may bang on the bars of her cell, and announce to the jailor that all three prisoners have been in the room. If she is right, all three are released. If she is wrong, all three are executed. At the beginning of this sentence, the prisoners are explained the rules and have some time to confer on a strategy before they get taken to their cells. What strategy can they use to ensure their eventual release?

Congratulations yet again to Reid Price, who was the only one to submit a solution and won yet another as yet unnamed prize. The strategy goes as follows. One prisoner (the "Counter") always moves the switch down if it's up, and does nothing if it's already down. The other two prisoners (the "Switchers") move the switch up the first two times they see it down, and otherwise leave it alone. Even if the switch starts up, after the Counter sees the switch up four times, he knows both Switchers have been in the room at least once, he announces this to the jailor, and they go free.

Note that this strategy works just as well with n Switchers, if the Counter counts to 2n. Also, Reid simulated this strategy in action to see how long the prisoners would have to wait to be released. With 16 million tests, he got 15.332480 as the average number of jailhouse summons, with a standard deviation of 5.819527.

If you would like to submit an article or math event to be published in the Math Mess, e-mail meyerm@stolaf.edu or dolank@stolaf.edu.

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