# MSCS Mess

## This Week's Colloquium

Title: Observing the Sun and the Moon in Different Parts of the World
Speaker: Helmer Aslaksen
Time: Tuesday, October 5, 1:30 pm
(treats at 1:15)
Place: SC 182

Most astronomy books are written from a 'high-northern-latitude-centric" point of view. In this talk I will talk about some aspects of the motion of the Sun and the Moon from a "hemispherically-correct" point of view.

Some of the questions we will address are: Why do clocks go clockwise? Where in the world will you be able to see the Sun directly overhead at noon? What will the motion of the Sun and the Moon look like on the North Pole
or South Pole? Which day does the Sun rise earliest in San Francisco? When does it rise
earliest in Singapore or Sydney? How do you tell the difference between a waxing crescent Moon and a waning crescent Moon in San Francisco? What if you are in Singapore or Sydney? What does the orbit of the Moon around the Sun look like?

I hope that this talk will make you more conscious of the world around you, and give you knowledge that you will enjoy for the rest of your life, no matter where you live.

Helmer Aslaksen is a mathematics professor at the National University of Singapore who recently won the national Outstanding Educator Award from the government of Singapore.

## Problem of the Week

New to problem solving? Give this one a try. This is a classic problem, no deep mathematics needed, just some clean logic.

In a cross-country run, Sven placed exactly in the middle among all participants. Ole placed lower, in tenth place, and Lena placed sixteenth. Is it possible to figure out how many runners took part in the race?

If you want to get the Mess problems of the week ahead of time, they will be sent out on Thursdays on the math-probsolv email alias. Let Amelia Taylor (ataylor@stolaf.edu) know if you would like to be added to the alias.

*** Please submit all solutions by Wednesday at noon to Amelia Taylor by e-mail (ataylor@stolaf.edu) or by placing them in her box at OMH 201.

## Opportunity for Future Mathematics Teachers

If you are thinking about teaching school or college mathematics, you can get lots of ideas at the National Council of Teachers of Mathematics Conference in Minneapolis on November 11-13. The conference, which will
be attended by a couple of thousand mathematics teachers will include sessions on teaching mathematics from kindergarten through calculus. It also features displays of math games and tools, resource books and
school texts. See more details at http://www.nctm.org/meetings/minneapolis/

Conference registration costs college students $62, but you can attend free if you volunteer to help Martha Wallace with a project she is doing at the conference. Or, you can join NCTM as a student member for $36 (half of the regular membership fee), receive a year's worth of mathematics teaching journals and attend the conference free as a student NCTM member.

Contact Professor Wallace(wallace@stolaf.edu) very soon for more information about how you can take advantage of this opportunity.

## Best Buy Internship/Career Opportunities

Best Buy is visiting St. Olaf. They will be in Buntrock 143 from 7-8 pm on October 5. They want to discuss upcoming career opportunities at Corporate Best Buy, and they want to invite students to connect with Olaf alumni at Best Buy. Olaf alum at Best Buy will be at the meeting to talk about their roles in the company. Best Buy is very interested in building its collaborative partnership with St. Olaf and helping St. Olaf students find rewarding internships and careers at Best Buy. They are particularly interested in speaking with mathematics, computer science, and economics majors.

## Last Week's Problem

After a baseball player gets a hit, his batting average rises by exactly 0.010. Assuming the batter has at least one hit, what is the number of hits the player has made during the season? (The batting average of the player is the number of hits divided by the number of "at bats"). Can you determine the number of at bats?

Good news, **Paul Tveite '07** sent in the correct answer of 18. The possible hit and at bat pairs are 18 hits with 24 at bats and 18 hits with 75 at bats. Now the dirt. Let h and n denote, respectively, the number of hits and "at bats" the player has had so far. Note that n cannot be zero since then the player's average after 1 hit would be 1.000 . From the given information we have $(h+1)/(n+1)=h/n+0.01$, and clearing denominators gives the equation $100(h+1)n=100h(n+1)+n(n+1)=(100h+n)(n+1)$, or $100(n-h)=n(n+1)$. The latter equation implies that 25 must divide n or n+1 and that n must be
less than 100, which leaves only a handful of possibilities for n. Checking these individually, and using the fact that we know there has been at least one hit, we find that the only solutions are the pairs $(h,n)=(18,24)$, $(18,75)$. Establishing that the player has had 18 hits.

## Mathematician Machines

Mathematicians are machines for turning coffee into theorems.

- Paul Erdos

***If you would like to receive a copy of the Math Mess in your P.O. Box weekly, please e-mail Donna Brakke at brakke@stolaf.edu.

Editor-in-Chief: Paul Roback

Associate Editor: Thomas Noah Loome

MM Czar: Donna Brakke

Problems Editor: Amelia Taylor