

# MSCS MESS

Department of Mathematics, Statistics, and Computer Science  
St. Olaf College, Northfield, MN 55057  
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## Today's Research Seminar

Title: A Systems-approach for Understanding the Role of the Microbiome in Colorectal Cancer  
Speaker: Nick Chia  
Time: 3:40 PM  
Date: 6 March  
Place: RNS 204



**About the Talk:** All theoretical models in biology require two main counterparts - a mathematical reflection of a biological hypothesis and the ability to falsify these hypotheses statistically. The feedback between these two aspects determines the ultimate utility of any scientifically useful model. In this talk, I will go over my research contributions which include (1) using dynamic modeling to understand the role of horizontal gene transfer in microbial community evolution, (2) community metabolic modeling of the gut microbiome, (3) un-

derstanding the effect of the microbiome in colorectal cancer (CRC), and (4) creating a Bayesian non-parametric Inverse Reinforcement Learning (IRL) algorithm for gaining interpretable and intuitive insights about colorectal cancer progression from high-dimensional genome, epigenome, and microbiome data.

**About the Speaker:** Nicholas Chia, Ph.D., works in the Center for Individualized Medicine Microbiome Program and with surgery researchers as part of a strategic alliance with university partners to combine bioinformatics and ecological and evolutionary theory with medicine.

## Stats and Data Science Alumni Panel

Next Wednesday the department will be hosting a panel of alumni who are pursuing careers in statistics and data sciences. It will be a great opportunity to learn more about the field of data science! There will be seven alumni currently in a variety of roles talking about their experiences and steps you can take to make yourself more competitive for future internships and jobs.

**Wednesday, March 11**  
**6:30–7:30 PM**  
**RNS 210**

## Woman in STEM Feature: Gladys West

Dr. Gladys West used her skills of mathematical modeling and computer programming to develop what would become the Global Positioning System (GPS).

She worked at the US Naval Weapons Laboratory as a mathematician and computer program-

mer. There, she helped program Project 29V, a path-breaking astronomical study that established the regularity of the motion of Pluto relative to Neptune.

She did additional work on precisely calculating satellite orbits and location accuracy so computers could deliver increasingly refined calculations. This allowed for an extremely accurate geodetic Earth model.

She was then project manager for the Geodynamics Experimental Ocean Satellite, or GEOS-3, which confirmed the potential for satellite radar altimeters to be employed for ocean geodesy measurements.

Last but not least, she worked tirelessly to mentor youngsters and emphasize the importance of learning STEM.

Thank you to the Women in Stem House for providing this bio!

*To submit an article, event, or anything else for publication in the mess, email [jadkow1@stolaf.edu](mailto:jadkow1@stolaf.edu); to receive the Mess digitally each Friday, email [habero1@stolaf.edu](mailto:habero1@stolaf.edu); visit <http://wp.stolaf.edu/mscs/mcs-mess/> for a digital archive of previous MSCS Mess issues.*

## Pi day 5k

There will be a free Pi Day 5k next weekend on March 14th. The course will start at the Tomson West Lantern and weave around campus before finishing with a slice of pie! **Event starts at 10:00 AM. Sign up March 10 or 11 outside Stav during dinner.**

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