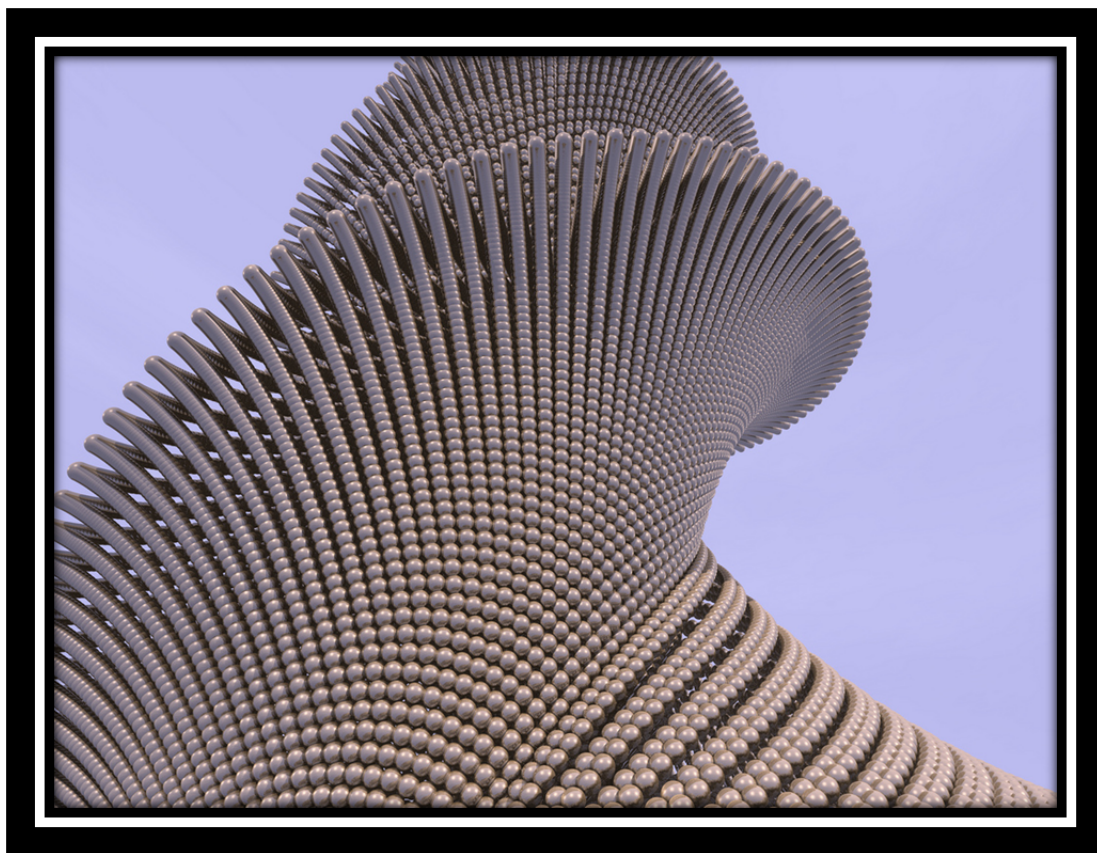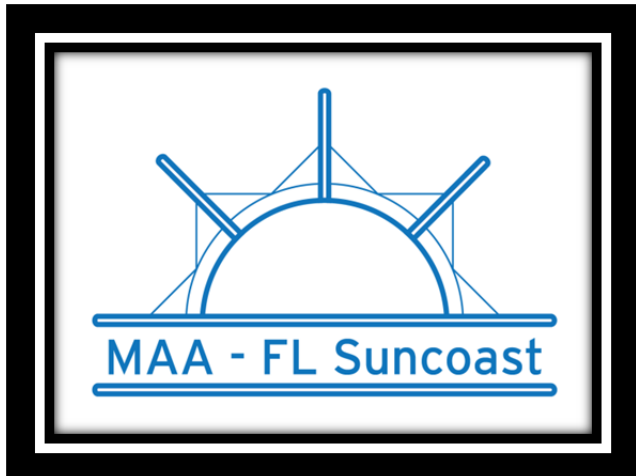# MAA-SUNCOAST REGIONAL MEETING XXXVII

PROGRAM AND ABSTRACTS

STATE COLLEGE OF FLORIDA
MANATEE-SARASOTA
BRADENTON CAMPUS
DECEMBER 7, 2012

Dini's surface/MAA2012

PROGRAM

2:00 – 3:00	**Registration**	27-134
	Publishers/MAA Books Browse the displays from several publishing representatives	27-133 27-150
	Hospitality room	27-124
2:45 – 3:10	**WELCOME** **Mike Mears** – Governor MAA-FL Bradenton Campus Provost, VP Baccalaureate Programs	29-106
3:20 – 3:45	**Session I**	
Green Room	**Jacci White** – Saint Leo University *MAA-FL Suncoast Region – Stories and history*	27-105
Pink Room	**Joni Pirnot** – State College of Florida *"Tracking the Credit Crisis: A Timeline"*	27-123
Blue Room	**Greg McColm** – University of South Florida *The Academically Adrift Controversy*	27-132
Lime Room	**Devon Raemisch** – McGraw-Hill Higher Education *ALEKS and Course Redesign*	27-137
Yellow Room	**Thomas W. Hair** – Florida Gulf Coast University *Temporal dispersion of the emergence intelligence: an inter-arrival time analysis*	27-140
Orange Room	**Emre Özgener (ZΞ-Math Club)** – State College of Florida *"The Derivative vs. The Integral: The Final Smackdown- Part I"*	27-149
3:50 – 4:15	**Session II**	
Green Room	**Jianqiang Zhao** – Eckerd College *Multiple Zeta Functions and Their Special Values I*	27-105
Pink Room	**Jim Condor & C. Altay Özgener** – State College of Florida *Constructing Visual Interpretations of Vertical and Horizontal* *Components Using a Graphic Design Approach*	27-123
Blue Room	**Marshall Whittlesey** – California State University San Marcos *A course in spherical geometry for undergraduates*	27-132
Lime Room	**Lisa De Castro** – University of South Florida *Peer Mentoring and Guided Inquiry*	27-137
Yellow Room	**Thomas W. Hair & Andrew D. Hedman** – FGCU *Spatial dispersion of interstellar civilizations: a probabilistic site* *percolation model in three dimensions*	27-140
Orange Room	**Emre Özgener (ZΞ-Math Club)** – State College of Florida *"The Derivative vs. The Integral: The Final Smackdown- Part II"*	27-149

4:20 - 4:45   **Session III**

Green Room   **Jianqiang Zhao** – Eckerd College   27-105
Multiple Zeta Functions and Their Special Values II

Pink Room   **Nathaniel P Stambaugh** – FSC   27-123
Attracting Non-Majors to take more Mathematics

Blue Room   **Daniel Jelsovsky & Kenneth D. Henderson Jr.** – FSC   27-132
Speak Out: Talking as Learning

Lime Room   **Olivia Buzzell** – FSC   27-137
The RSA Cryptosystem and Privacy Issues

Yellow Room   **Paul Stevenson** – VP, McCormick Stevenson Corporation   27-140
Application of Math in Mechanical Engineering and Design

Orange Room   **Monika Kiss** – Saint Leo University   27-149
Math Jeopardy I

4:50 - 5:15   **Session IV**

Green Room   **Paul Nolting & Fitzroy Farqueson** – SCF & Valencia College   27-105
How to Improve the Success of Web Based Math Course

Pink Room   **Ken Jukes** – Pine View HS   27-123
From University to Pine View (a school for the gifted)

Blue Room   **Susan Serrano** – FSC   27-132
Math Anxiety and the Non-traditional Student

Lime Room   **Caroline Celano** – McGraw-Hill Higher Education   27-137
Behind the Scenes: Developing an Online Learning System, not just Online Homework

Yellow Room   **Fred Zerla** – University of South Florida   27-140
*The First Apportionment of the United States House of Representatives
November 1791 – April 1792*

Orange Room   **Monika Kiss** – Saint Leo University   27-149
Math Jeopardy II

5:30 - 6:25   **Plenary Session**   29-106
Donal O'Shea – New College of Florida

Singularities: The Next Generation (aka: When is a Cone not a Cone?)

6:35 - 8:15   **Dinner**   ARC
By Reservation Only

8:17   **Closing remarks**   ARC
Mike Mears – Governor MAA-FL
Bradenton Campus Provost, VP Baccalaureate Programs

ABSTRACTS

3:20 – 3:45   Session I

Jacci White – Saint Leo University   27-105
MAA-FL Suncoast Region – Stories and history

This session is a chance to share stories of past meetings and memories of our dynamic region of the Florida MAA. I will be recording these stories to use in the history of our section for the 100th Anniversary Celebration of the National MAA. This is an opportunity to share a story or to bring back the memories as you listen to others. Please bring any historical documents or other items you think might be interesting or useful in constructing our history. Also come by if you are interested in participating in the construction of our history document.

Joni Pirnot –State College of Florida   27-123
"Tracking the Credit Crisis: A Timeline"

Project Get$mart is a multi-faceted interactive learning community utilizing a variety of forums to enhance financial literacy. In conjunction with the program, the SCF Fine Art Gallery is featuring "Tracking the Credit Crisis: A Timeline" on loan from the Museum of American Finance in New York City. Come browse this monumental graphical timeline and learn more about the Financial Literacy Program at SCF.

Greg McColm – University of South Florida   27-132
The Academically Adrift Controversy

In 2011, Richard Arum and Josipa Roksa published a survey, Academically Adrift, suggesting that many students fail to develop higher-level cognitive and conceptual skills in college. In 2012, they published a follow-up survey suggesting that those students who fail to develop those skills also do not benefit as much as expected or hoped during their first post-college years. We review the studies, the reactions, and consider the implications for STEM areas in general, and mathematics in particular.

Devon Raemisch – McGraw-Hill Higher Education   27-137
ALEKS and Course Redesign

ALEKS is a learning and assessment system that has been successfully used by millions of students in the U.S. and abroad. It was developed over several decades by researchers at New York University and University of California, Irvine and derived from Learning Space Theory and uses artificial intelligence to map the details of each student's knowledge. ALEKS knows at each moment, with respect to each individual topic, whether each individual student has mastered that topic and, if not, whether he or she is ready to learn the topic at that moment. ALEKS uses this knowledge to make learning more efficient and effective by continuously offering the student a selection of only the topics he or she is ready to learn at the current time. This builds student confidence and learning momentum. ALEKS achieves better learning outcomes by utilizing artificially-intelligent, individualized assessments, combined with a learning process that meets the exact needs of each student, targets and fills gaps in knowledge, and provides a completely individualized and optimized learning path.

Thomas W. Hair – Florida Gulf Coast University   27-140
Temporal dispersion of the emergence intelligence: an inter-arrival time analysis

Many reasons for why extraterrestrial intelligences might avoid communications with our civilization have been proposed. If we are not alone in the Galaxy, one possible scenario is that all civilizations follow the lead of some particularly distinguished civilization. This paper will examine the impact the first successful civilization could have on all other subsequent civilizations within its sphere of influence and the ramifications of this as it relates to the Fermi Paradox. Monte Carlo simulation is used to map the inter-arrival times of early civilizations and to highlight the immense epochs of time that the earliest civilizations could have had the Galaxy to themselves.

Emre Özgener (ΖΞ-Math Club) – State College of Florida   27-149
"The Derivative vs. The Integral: The Final Smackdown- Part I"

We will show an MAA DVD titled: *The Derivative vs. The Integral: The Final Smackdown*. If you put the derivative and the integral in a cage and had them fight to the death, which would win? Although this question makes no sense, as concepts don't know the first thing about hand-to-hand combat, a version of this question has plagued mathematics for centuries. Which is the better concept? In this, dare we say educational, but at the very least entertaining debate, Professors Colin Adams and Tom Garrity do their utmost to defend respectively the derivative and the integral, while embarrassing each other publicly, in an attempt to settle this question once and for all. Hear the arguments, watch the nonsense, and then you decide which of these two fundamental concepts in calculus should be crowned the victor. Appropriate for students, teachers, and lovers of calculus everywhere." This will run into the next session!

3:50 - 4:15   Session II

Jianqiang Zhao – Eckerd College   27-105
Multiple Zeta Functions and Their Special Values I

In the first part of the talk we briefly outline the analytic theory of multiple zeta functions. Then we turn to the special values of these functions at positive integers which are called multiple zeta values (MZVs). We will describe an important connection between MZVs and the Drinfeld associator and its motivic origin. We will consider also generalization of the above to special values of multiple polylogarithms at N-roots of unity (i.e., level N cases).

Jim Condor & C. Altay Özgener – State College of Florida   27-123
Constructing Visual Interpretations of Vertical and Horizontal Components Using a Graphic Design Approach

The presentation will discuss ideas for activities that can help student understanding of merging multiple components to create solution sets in varied grid systems.

Marshall Whittlesey – California State University San Marcos   27-132
A course in spherical geometry for undergraduates

A century ago, spherical geometry (the study of geometric objects on the surface of a 3-dimensional ball) was a standard part of the mathematics curriculum. Its applications were needed by many people: anyone who wanted to navigate on the surface of the earth by using the stars needed to know something about the subject. However, it has slowly disappeared from the curriculum. In this talk we survey some of the standard theorems of spherical geometry and compare them to those of plane geometry. These include: (1) the spherical law of cosines and how to use it easily to determine the distance between two cities, (2) the spherical Pythagorean theorem, (3) the AAA congruence theorem for spherical triangles, and (4) the area theorem for triangles which states how to calculate the area of a spherical triangle from its angles. We also will discuss some of the interesting applications of spherical geometry in astronomy, mainly how to determine the time of sunrise and sunset and briefly mention applications of spherical geometry to crystallography and the study of the regular polyhedra (e.g., how explicitly to construct them and how to determine the angles between faces.)

Lisa De Castro – University of South Florida   27-137
Peer Mentoring and Guided Inquiry

The peer mentoring aspect of the STEP grant at the University of South Florida has several components which include peer leading in calculus I and access to undergraduate tutors in the STEM Mart center. In the peer leading portion of the curriculum at USF, students in Calculus I work in groups on guided inquiry activities that are led by more advanced and trained undergraduate students (the "peer leaders"). The activities are based on the POGIL (Process Oriented Guided Inquiry Learning) approach to teaching (http://www.pogil.org/). This is an introduction to the POGIL instructional method of teaching. I will also talk about the guided inquiry activities for calculus I that have been developed according to the POGIL model.

Thomas W. Hair & Andrew D. Hedman – Florida Gulf Coast University   27-140
Spatial dispersion of interstellar civilizations: a probabilistic site percolation model in three dimensions

A model of the spatial emergence of an interstellar civilization into a uniform distribution of habitable systems is presented. The process of emigration is modeled as a three-dimensional probabilistic cellular automaton. An algorithm is presented which defines both the daughter colonies of the original seed vertex and all subsequent connected vertices, and the probability of a connection between any two vertices. The automaton is analyzed over a wide set of parameters for iterations that represent up to 250 thousand years within the model's assumptions. Emigration patterns are characterized and used to evaluate two hypotheses that aim to explain the Fermi Paradox. The first states that interstellar emigration takes too long for any civilization to have yet come within a detectable distance, the second states that large volumes of habitable space may be left uninhabited by an interstellar civilization and Earth is located in one of these voids.

Emre Özgener (ZΞ-Math Club) – State College of Florida   27-149
"The Derivative vs. The Integral: The Final Smackdown- Part II"

See above.

4:20 - 4:45   Session III

Jianqiang Zhao – Eckerd College   27-105
Multiple Zeta Functions and Their Special Values II

In the second part of the talk we consider the double shuffle relations of MZVs which are conjectured to generate all the possible rational linear relations between MZVs. We review Hoffman's method of using the algebras of words to study MZVs and their regularizations adopted first by Ihara, Kaneko and Zagier. At the end we survey some important families of identities between MZVs and consider some generalizations to higher levels.

Nathaniel P Stambaugh – Florida Southern College   27-123
Attracting Non-Majors to take more Mathematics

Many talented high school mathematics students stop taking math classes soon after they get to college; yet it is hard to imagine a major where a student would not benefit from having a math minor. How can we entice these strong math students, who have chosen another major, to at least minor in mathematics? In this talk, I will give descriptions of projects I have developed for Calc 1 to entice them to take more courses and outline the topics of a 2-hour course I am teaching in Math Methods in Chemistry & Physics.

Daniel Jelsovsky & Kenneth D. Henderson Jr. – Florida Southern College   27-132
Speak Out: Talking as Learning

College students are encouraged to develop written and oral communication skills. Having students explain difficult concepts can be one way to meet this challenge. For example, creating narrated, one-slide PowerPoint presentations gives students practice in both. This technique, and various other assignments and student work will be discussed.

Olivia Buzzell – Florida Southern College   27-137
The RSA Cryptosystem and Privacy Issues

The privacy of messaging is an extremely important issue in today's world of computers. I will be discussing issues of privacy and messaging with the RSA cryptosystem. We will also be discussing the different kinds of attacks made against a message encoded with the RSA cryptosystem.

Paul Stevenson – VP, McCormick Stevenson Corporation   27-140
Application of Math in Mechanical Engineering and Design

With the advancements of computer-aided engineering (CAE) software tools it is easy to assume that a strong math background has become less critical to the success of individual engineers. However, that could not be farther from the truth. While the tools have improved significantly and now perform many if not all of the calculations for the user, it is still critical when using them that the engineer gauge the validity of the results. The old adage is true, "Garbage in, garbage out." The most successful engineers reduce risk through simple calculations that substantiate their CAE results and ensure the proper interpretation. Engineering economics often dictate whether tools are developed for a common problem. When industry standard tools are not available, industrious engineers often take the initiative to develop their own tools. These programs or spreadsheets require a firm grasp of the calculations required and the appropriate application of the science. Once developed, validated, and put into use, they can significantly improve the effectiveness and efficiency of an engineering team.

Monika Kiss – Saint Leo University   27-149
Math Jeopardy I

Round 1 – Come out and play! We are looking to have three teams of 3 people to participate in this very exciting Math Jeopardy. Come and show your brilliance! We will have questions ranging from Algebra to Abstract Algebra. All are welcome to play in this new and exciting part of the annual Suncoast Conference of the Florida Section of the MAA.

4:50 – 5:15   Session IV

Paul Nolting & Dr. Fitzroy Farqueson – SCF & Valencia College   27-105
How to Improve the Success of Web Based Math Course

This workshop will explore the rapid growth, prevalence, concerns, student demands and solutions to the success rates of Web based math courses. The workshop will explore the characteristics of successful online math students and strategies to improve online math course success. Some of the strategies are assessing students for online math courses readiness and academic support learning modules. The workshop will conclude will additional suggestions from the participants.

Ken Jukes – Pine View HS   27-123
From University to Pine View (a school for the gifted)

Dr Jukes' career has been mainly in the university sector in the UK and in 1972-73 at the University of Illinois, Champaign-Urbana. He has carried out a wide range of industrial, commercial and government projects and has published in pure and applied math, math modeling, control theory, the teaching of math, genetic algorithms and computing. Ken was also a quasi-government Inspector for the quality of teaching of computing and mathematics in UK universities. Moving to the States on retirement as Dean of Faculty at UWE, Bristol, Ken has taught Dual Enrollment and Calculus courses at Pine View, Osprey, for the last three years. Pine View is a school for the gifted, the 2300 students ranging from grades 2 to 12. In this talk, Ken reflects on variations in the teaching of math, and the motivation of students, between Pine View and University. He explores some fertilization between the two.

Susan Serrano – Florida Southern College   27-132
Math Anxiety and the Non-traditional Student

This talk will be a discussion of the special issues that are presented by the non-traditional student. Many of these students have not had a math course for many years and the level of their anxiety is an issue that must be considered when teaching a class that is primarily made up of the non-traditional student. We will be discussing some of the issues and some data that I have been collecting for the last year in a general education elementary statistics course.

Caroline Celano – McGraw-Hill Higher Education   27-137
Behind the Scenes: Developing an Online Learning System, not just Online Homework

Have you ever wondered what goes on behind the scenes with the creation of all those exercises in an online learning system for Math? How can you ensure that students are actually learning while working on exercises in an online homework system? This workshop will focus on the Content Development process for *Connect Math Hosted by ALEKS.* In this session, we will take us behind the scenes to demonstrate our commitment to accurate, consistent, and author-vetted content which maintains the intent and integrity of the original textbook exercise.

Fred Zerla – University of South Florida   27-140
The First Apportionment of the United States House of Representatives: November 1791 – April 1792

The new Constitution required a census every ten years followed by a congressional reapportionment of the seats assigned to the states in the House of Representatives. The members of the House were to be "apportioned among the several States … according to their respective numbers (population)". This and the requirement that each congressman represent at least 30,000 people were the only directions given. This talk explores the mathematical gymnastics used by the Second Congress in fulfilling this obligation.

Monika Kiss – Saint Leo University   27-149
Math Jeopardy II

Round 2 – This session will be the second round of Math Jeopardy. The questions will get harder and the prizes will be grand! Come and support your friends!

5:30 – 6:25   Plenary Talk   29-106

Donal O'Shea – New College of Florida

Singularities: The Next Generation (aka: When is a Cone not a Cone?)

I will provide a non-technical account of what I regard to be one of the most exciting mathematical advances of the last two decades. It has been known for over a half a century that near an isolated singular point, the set of solutions of a polynomial in several variables can be complicated (it often fails to be a manifold), but not so complicated as to be inaccessible (it looks like, in the topological sense, a cone over a lower dimensional manifold, called the link of the singularity). The associated theorem, and the study of manifolds that occur as links produced a flowering of deep insights into the structure of singularities, and is closely related to some of the greatest achievements of twentieth century mathematics. Until recently, no one thought to ask whether the set of solutions looks a cone in any geometrical sense. A few years ago, two Brazilian mathematicians showed that the answer is no, once the number of variables is greater than two. Attempts to understand the phenomenon point to a beautiful new theory that is transforming our understanding of the topology and geometry of complex algebraic singularities. I explain through two examples, accessible to undergraduate mathematics majors, what is at stake and what the excitement is about.

Time	2:00–3:00	2:50–3:10
	REGISTRATION 27-134	WELCOME 29-106

Rooms	27-105	27-123	27-132	27-137	27-140	27-149
3:20 - 3:45	**Jacci White** Saint Leo University MAA-FL Suncoast Region Stories and history	**Joni Pirnot** State College of Florida "Tracking the Credit Crisis: A Timeline"	**Greg McColm** University of South Florida The Academically Adrift Controversy	**Devon Raemisch** McGraw-Hill Higher Education ALEKS and Course Redesign	**Thomas W. Hair** Florida Gulf Coast University Temporal dispersion of the emergence intelligence: an inter-arrival time analysis	**Emre Özgener (Z≡-Math Club)** State College of Florida "The Derivative vs. The Integral: The Final Smackdown"
3:50–4:15	**Jianqiang Zhao** Eckerd College Multiple Zeta Functions and Their Special Values I	**Jim Condor C. Altay Özgener** State College of Florida Constructing Visual Interpretations of Vertical and Horizontal Components Using a Graphic Design Approach	**Marshall Whittlesey** California State University San Marcos A course in spherical geometry for undergraduates	**Lisa De Castro** University of South Florida Peer Mentoring and Guided Inquiry	**Thomas W. Hair Andrew D. Hedman** Florida Gulf Coast University Spatial dispersion of interstellar civilizations: a probabilistic site percolation model in three dimensions	**Emre Özgener (Z≡-Math Club)** State College of Florida "The Derivative vs. The Integral: The Final Smackdown"
4:20–4:45	**Jianqiang Zhao** Eckerd College Multiple Zeta Functions and Their Special Values II	**Nathaniel P Stambaugh** FSC Attracting Non-Majors to take more Mathematics	**Daniel Jelsovsky Kenneth D. Henderson Jr.** FSC Speak Out: Talking as Learning	**Olivia Buzzell** FSC The RSA Cryptosystem and Privacy Issues	**Paul Stevenson** VP, McCormick Stevenson Corporation Application of Math in Mechanical Engineering and Design	**Monika Kiss** Saint Leo University Math Jeopardy I
4:50–5:15	**Paul Nolting Fitzroy Farqueson** SCF & Valencia College How to Improve the Success of Web Based Math Course	**Ken Jukes** Pine View HS From University to Pine View (a school for the gifted)	**Susan Serrano** FSC Math Anxiety and the Non-traditional Student	**Caroline Celano** McGraw-Hill Higher Education Behind the Scenes: Developing an Online Learning System, not just Online Homework	**Fred Zerla** University of South Florida The First Apportionment of the United States House of Representatives November 1791 - April 1792	**Monika Kiss** Saint Leo University Math Jeopardy II

Time	
5:30–6:25	29-106/Plenary Talk Donal O'Shea, New College of Florida *Singularities: The Next Generation (aka: When is a Cone not a Cone?)*
6:35–8:15	Dinner