

**M.A.A.  
SUNCOAST REGION  
XXIX**

**PROGRAM AND ABSTRACTS**

**St. Petersburg College  
Tarpon Springs Campus  
December 3, 2004**

# **PROGRAM**

**2:45-3:15**

## **Registration**

Sign in

Meet with the publisher's reps

**3:20-3:30**

## **Welcome**

Dr. Robert Ramsay, Provost

St. Petersburg College, Tarpon Springs Campus

Beth Goodbread, Program Director-Mathematics & Science

St. Petersburg College, Tarpon Springs Campus

**3:40 – 4:10**

## **Presentations – Session I**

Fernando Burgos

University of South Florida

“Rainfall Rates and Retrospective Testing”

Mark Hardies

St. Petersburg College, Tarpon Springs Campus

“Multivariable Calculus using Maple”

Val Mohanakumar

Jorge Romero

Hillsborough Community College

“Internationalizing Mathematics in Our Curriculum”

Ana Staninska

University of South Florida

“Building Structures with DNA”

John Williams

St. Petersburg College, Clearwater Campus

“The 800-lb Gorilla Invades the Traditional Classroom”

**4:20 – 4:50**

**Presentations – Session II**

Mile Krajcevski

University of South Florida

“Yet, Another Tale of the Three Circles”

Pat McDonald

New College of Florida

“Determinants and Their Many Uses”

Mike Mears

Dennis Runde

Manatee Community College

“How to Develop a “Perfect” Distance Learning Program”

Aaron O’Connell

Eckerd College

“Fabrication of Devices for Qubits Using Electrons on Liquid Helium”

Monika Vo

St. Leo University

“Using Derive to Enhance Calculus”

June White (Moderator)

Students :

Dan Chesery, Pam Geisler,

Amber Hall, Roseann Montalban, Katherine

Rocheleau, Karen St. Louis, Steve Sarang,

Elizabeth Shackton, Patricia Suiters, Gianna Uchrin

St. Petersburg College – College of Education

“Who Wants to be a Math Teacher”

**5:00 – 5:30**

**Presentations – Session III**

David Bell

Florida Community College at Jacksonville  
“Improving Student Placement in  
College Preparatory Mathematics”

Greg McColm

University of South Florida  
“The Problems with Reality”

Susan Serrano

Dan Jelsovsky

Ken Henderson

Florida Southern College  
“Technology in the Classroom: Different Perspectives and How  
Do We Know It Works in Follow-On Courses”

Jacci White

Siamack Bondari

St. Leo University  
“Mathematics Online: The Good, The Bad, The Ugly”

Matthew Williamson

University of South Florida – Undergraduate Student  
“Inversion and Geometry: An Interesting Technique Not Usually  
Taught in Geometry Classes”

**5:40 – 6:00**

**Plenary Session**

Elizabeth Indianos

Linda Berghoff

St. Petersburg College  
“Utopian Dreams  
Paradigm Parallels in Mathematics and Art”

**6:00 – 7:00**

**Docent Tours of the Leepa-Rattner Museum**

**7:00 – 8:30**

**Dinner**

By Reservation Only  
(Dinner reservation of \$15 due by November 24<sup>th</sup>)

# ABSTRACTS

## SESSION I

**Fernando Burgos – University of South Florida**

**Rainfall Rates and Retrospective Testing**

This presentation will show how a certain test in statistical selection can be interpreted as doing “retrospective testing”. A possible application to comparing rain rates will be discussed.

**Mark Hardies – St. Petersburg College**

**Multivariable Calculus Using Maple**

We will discuss the use of Maple to teach visualization skills, to help illuminate theory, clarify the abstract, and give form and substance to general principles in the multivariable calculus course (i.e. Calculus III). Many of the concepts that we will discuss can also be applied to other mathematics courses.

**Val Mohanakumar & Jorges Romero – Hillsborough Community College**

**Internationalizing Mathematics in Our Curriculum**

Introducing some lesson plans in College Algebra and Business Calculus to internationalize the curriculum.

**Ana Staninska – University of South Florida**

**Building Structures with DNA**

I will describe a theoretical model of self-assembly inspired by DNA nanotechnology and DNA computing, and introduce related mathematical problems. This model consists of tiles that assemble into graph-like complexes, some of which represent solutions to given problems. The computational power of the model is equivalent to solving NP complete problems.

**John Williams – St. Petersburg College**

**The 800-lb Gorilla Invades the Traditional Classroom**

The pros and cons of online learning are discussed. Since some institutions are growing so rapidly that student demand cannot be met by campus-based instruction alone, a “bricks to clicks” strategy is emerging. Grade inflation or the absence of grades may be the result.

## SESSION II

**Mile Krajcevski – University of South Florida**

**Yet, Another Tale of the Three Circles**

We will comment on a recent article by Delamn and Galperin in Mathematics Magazine, giving another unified approach to the three classical geometries: spherical, Euclidian, and hyperbolic.

**Pat McDonald – New College of Florida**

**Determinants and Their Many Uses**

This talk concerns uses and extensions of the notion of a determinant of a square matrix. In particular we will review how determinants arise in geometry, in analysis, in partial differential equations, and in physics.

**Mike Mears & Dennis Runde – Manatee Community College**

**How to Develop a “Perfect” Distance Learning Program**

Manatee Community College has recently participated in its SACS Re-accreditation process, where its Quality Enhancement Plan (QEP) was found to be exemplary. The focus of the QEP was on the improvement of student learning in distance learning (including a full array of mathematics courses). The presenters (who have dozens of years of experience on the topic and are not shy to share their opinions) will share tips on how to make this happen at your institution.

**Aaron O’Connell – Eckerd College**

**Fabrication of Devices for Qubits Using Electrons on Liquid Helium**

It is theoretically possible to construct a quantum computer using electrons bound to the surface of liquid helium. By trapping individual electrons in electric fields above a post microstructure, hydrogenic energy levels can be created. A quantum computer would utilize the ground and the first excited states as the 0 and 1 states for computation. The theory behind this process is well understood. However, the physical realization of a system capable of performing such calculations is less apparent. The process and fabrication of such devices shall be discussed with a specific focus on the mathematical formulation of the system.

**Monica Vo – St. Leo University**

**Using Derive to Enhance Calculus**

Many calculus concepts can be taught more efficiently with the visual aid of C.A.S., such as Derive can provide. We will investigate tangent lines, secant lines, and numerical integration using Derive and some utility functions.

**June White (moderator)**

**Students :Dan Chesery, Pam Geisler, Amber Hall, Roseann Montalban, Katherine Rocheleau, Karen St. Louis, Steve Sarang, Elizabeth Shackton, Patricia Suiters, Gianna Uchrin**

**St. Petersburg College – College of Education**

**Who Wants to be a Math Teacher**

Concerns exist about the need for more certified mathematics teachers in our secondary programs. This presentation is a panel of junior and senior students planning for careers in mathematics education. The students will discuss why they chose this profession and share some of their experiences in preparing to become teachers of mathematics.

## SESSION III

**David Bell – Florida Community College at Jacksonville**

**Improving Student Placement in College Preparatory Mathematics**

FCCJ initiated a study of student placement in college preparatory mathematics classes; an outgrowth of faculty concerns, supported by student success data. This effort incorporates a supplementary test to the standard College Placement Test (CPT). Initial results indicate high error in placement. Discussion of placement and assessment will be opened.

**Greg McColm – University of South Florida**

**The Problems with Reality**

Most mathematicians believe that objects like The Number Seven really exist because observable phenomena follow mathematical laws. But what is it that “exists”? The Number Seven? The “pattern” of integers where The Number Seven lives? Something else? We look in this thorny thicket for something stranger than we can know.

**Susan Serrano & Dan Jelsovsky & Ken Henderson – Florida Southern College**

**Technology in the Classroom: Different Perspectives and How Do We Know it Works in Follow-On Courses**

We will discuss using Minitab in statistics, Maple in analytical calculus and beyond, and graphing calculators in applied calculus. A research plan will be introduced for a service statistics course to evaluate how well the technology helps students in follow-on courses.

**Jacci White & Simack Bondari – St. Leo University**

**Mathematics Online: The Good, The Bad, The Ugly**

The presenters will summarize differences between teaching mathematics online compared to a traditional setting. Some topics will include: time requirements; grading and giving feedback on assignments; course preparation before, during, and after the term; pay; accountability; student attitudes, student participation; course materials; student and peer evaluations; and course requirements.

**Matthew Williamson – University of South Florida**

**Inversion and Geometry: An Interesting Technique Not Usually Taught in Geometry Classes**

We are all familiar with the geometric process of reflection across a line. If we replace the line with a circle, we call it a geometrical inversion with respect to a circle, or simply “inversion”. SOME helpful properties of inversion will be investigated in order to solve a few problems in other areas of geometry that would otherwise be quite difficult.

## PLENARY SESSION

**Elizabeth Indianos & Linda Burgoff – St. Petersburg College**

**Utopian Dreams: Paradigm Parallels in Mathematics and Art**