Session I 3:55-4:15 p.m.

Presenter: Mr. Shiven Ramji, Eckerd College
Title: "Practical Applications of Spectral Analysis to Hydrologic Time Series"
Abstract: Fourier-transform-based spectral analysis and filtering techniques are very useful but have seen little application in hydrology. We will have an overview of the Fourier transform and spectral analysis and present examples of how these methods can be applied to determine the travel time of water through a catchment i.e. the time it takes for rainwater to travel to the stream.
Room: Polk Science 200

Presenter: Ms. Cynthia Gangi, Eckerd College
Title: "Finding Defects in Designs by "X-Ray Vision""
Abstract: The heat equation describes the flow of heat through a medium. One practical application of this equation is in thermal imaging. This is a technique which uses controlled heat flow to assess internal properties of an object without penetrating the exterior. The main application is that defects can be pinpointed in engineering projects, such as space shuttles, without destroying the design.
Room: Polk Science 201

Presenter: Ms. Christina Marnell, Florida Southern College
Title: "Using Pokemon to Teach Elementary Probability in Secondary Eduactaion"
Abstract: "We will discuss using Pokemon as a lesson in the classroom. The lesson will cover simple probability and compound probability"
Room: Polk Science 202

Presenter: Ms. Julie Everett, Florida Southern College
Title: "Telling Secrets: Using Coded Messages"
Abstract: I will be talking about the history behind the morse code and the mathematics of communication. We will be encoding and decoding messages!
Room: Polk Science 204

Presenter: Ms. Cathalain "Cat" Tobin, Florida Southern College,
Title: "The Fuzzy Traffic Light
Abstract: An application using fuzzy logic techniques.
Room: Polk Science 205

Session II 4:20-4:50 p.m.

Presenter: Dr. Wen-Xiu Ma, University of South Florida,
Title: "Solitons, Positons, and Complexitons of the KdV Equation"
Abstract: Bilinear form is a powerful tool in solving a class of nonlinear partial differential equations – integrable equations. It is used to construct exact solutions to the Korteweg -- de Vries (KdV) equation $u_t + u_{xxx} - 6uu_x = 0$. Soliton, positon, and complexiton solutions to the KdV are exhibited through the Wronskian determinants which solve the Bilinear form.
Room: Polk Science 200

Presenter: Mr. J. Villanueva, Florida Memorial College
Title: "The Cubic and Quartic Equations in Intermediate Algebra Courses
Abstract: Patterned after the quadratic formula, solutions to the cubic and quartics equations will be presented, as introduced by Renaissance mathematicians. This should be a satisfying exercise in elementary analysis and show our students the need for higher study, such as in abstract algebra. Examples will be given, time permitting.
Room: Polk Science 201

Presenter: Dr. Milé Krajcevski, University of South Florida,
Title: Hyperbolic groups : Basic definitions and examples
Abstract: As the title suggests, we will give definition and a set of very basic examples of this relatively new class of groups, its connections with geometry and indicate some of the open problems in this active area of research.
Room: Polk Science 202

Presenter: Dr. David Rose, Florida Southern College
Title: "When Does Continuity Imply Differentiability?"
Abstract: For each real-valued function *f* of a real variable *x*, differentiability of *f* at *x* = *a* is equivalent to continuity of a related function $j(x)$, called the Caratheodory function of *f*, at *x* = *a.* Rules for differentiating products, compositions, and inverse functions are then easily derived from known properties of continuity.
Room: Polk Science 203

Presenter: Dr. Carlton Lane, Hillsborough Community College
Title: "The TI-89 and/or DERIVE in Intermediate Algebra."
Abstract: Use of the TI-89 and or DERIVE in Intermediate Algebra allows students (and mathematics teachers) to see the difference between essential and trivial mathematics. If the computer can do it, then it is SUBHUMAN and we no longer need to subject humans (students) to subhuman tasks (such as factoring quadratic trinomials, the mathematically accursed FOIL, and solving intermediate algebra equations).
Room: Polk Science 204

Presenter: Dr Mossayeb Jamshid, Florida Southern College
Presentation: Planetarium Show
Room: Polk Science Planetarium

Session III 4:55-5:25 p.m.

Presenter: Ms. Kalpana Mahalingam, University of South Florida
Title: "Languages of DNA based code words."
Abstract: We introduce a theoretical approach of designing code words that may be useful in biomolecular computations. The code words are considered to be a language over alphabet l = {A,G,C,T} and an involution f :A->T,G->C which is an antimorphism of l^* describes the Watson-Crick hydrogen bonds. We discuss the closure properties of these languages such that their words do not form undesirable bonds. We also provide methods to obtain such languages.
Room: Polk Science 200

Presenter: Mr. Li Zhou, Polk Community College
Title: "It's the bicentennial of Abel's birth, so why do I care?"
Abstract: While solving a *Monthly* problem (10928) on series convergence, I had a brief encounter of the elegance and simplicity of Abel's mathematics. I'll tell you the story.
Room: Polk Science 201

Presenter: Dr. Greg McColm, University of South Florida
Title: "Logics of Many Worlds"
Abstract: The logics of time and alternate realities, once an exotic domain of philosophers and mathematicians, is being invaded by computer scientists trying to understand the "processes" that must or might be going on inside their machines.
Room: Polk Science 202

Presenter: Dr. Carlton Lane, Hillsborough Community College
Title: "Special Relativity Clock "Paradox" Revisited"
Abstract: Using a clone or surrogate (clock), one can predict (prove) what will be true about the aging of a traveler compared to the "stay-at-home" should a round trip be imagined, without the need to consider the complicating effects produced by the acceleration required for an actual round trip of the traveler. All done in a way that can be understood by the least sophisticated mind along with a strong message for tolerance taught by Special Relativity.
Room: Polk Science 204

Presenters: Dr. Kenneth D. Henderson, Jr., Mr. Alex I. Okounev, and Ms. Michelle Ishihara, Florida Southern College
Title: "On-line Math Tutor Lab"
Abstract: We will demonstrate the hardware and software that might be used in an On-line Mathematics Tutor Laboratory. Possibilities and difficulties will be explored.
Room: Polk Science 205

Presenter: Dr Mossayeb Jamshid, Florida Southern College
Presentation: Planetarium Show
Room: Polk Science Planetarium

Session IV 5:30-6:00 p.m.

Presenter: Dr. Susan Serrano, Florida Southern College
Title: "Abstract Math for People Who Don't Like Abstract Math"
Abstract: I will discuss graph theory and other discrete structures at all academic levels.
Room: Polk Science 200

Presenter: Ms. Marina Appiou Nikiforou, University of South Florida,
Title: "Extending colorings of knots by quandles"
Abstract: A quandle is a set with a vertain binary operation. In this talk, first we describe a construction of larger quandles from smaller ones, called extensions of quandles. Then we study when a coloring of a knot by a quandle can be extended to that by an extension of the quandle. This will gave us a way of distinguishing different knots.
Room: Polk Science 201

Presenter: Ms. Daniela Genova, University of South Florida
Title: "Forbidding and Enforcing Systems"
Abstract: We present a new way of defining classes of formal languages through a set of forbidden subwords and a set of enforced words. Forbidding and enforcing systems were inspired by chemical properties of DNA and actions of restriction enzymes. These systems will be presented through description of several graph theoretical problems and some topological observations will be mentioned.
Room: Polk Science 202

Presenter: Mr. Alexander Ambrioso
Title: "Teaching Mathematics with a Computer Algebra System"
Abstract: Can you image rolling a die 100,000 times? Computer algebra systems make this possible. We present various ideas for using a computer algebra system (Maple 8) to enrich lectures in Algebra, Statistics, and Liberal Arts mathematics courses. Some of the topics discussed are the Law of Large Numbers, the Normal Distribution, and 3D Graphics for the Liberal Arts majors.
Room: Polk Science 203

Presenter: Dr. Fredric Zerla, University of South Florida
Title: "Incidents of Trigonometry"
Abstract: Four incidents in the history of mathematics are shown in which trigonometric techniques were used to solve a problem. These are: finding the distance between two stars, multiplying large numbers, the "irreducible case of the cubic", and, finally, the sum of the reciprocals of the squares of the natural numbers.
Room: Polk Science 204

Presenter: Dr. Shawn Hedman, Florida Southern College
Title: "Computations, Time, and Logic"
Abstract: Time complexity categorizes math problems according to how long it takes a computer to solve them. The resulting complexity classes, it turns out, have natural logical descriptions. We give an overview of this growing area of research. We discuss the P=NP problem and show how it can be reformulated as a question of formal logic. No prior knowledge of complexity or logic is assumed.
Room: Polk Science 205

Plenary Session 6:10-7:00 p.m.

Presenter: Dr. Peter Bias, Florida Southern College, Economics Deprtment
Title: "A Beautiful Lecture"
Abstract: John Nash's Nobel prize-winning contributions to economics.
Room: Polk Science 152

Note: *Rooms 200-202 are regular classrooms, 203 is a Mac Lab, 204 and 205 are PC Labs. 152 is an 150 seat lecture hall.*