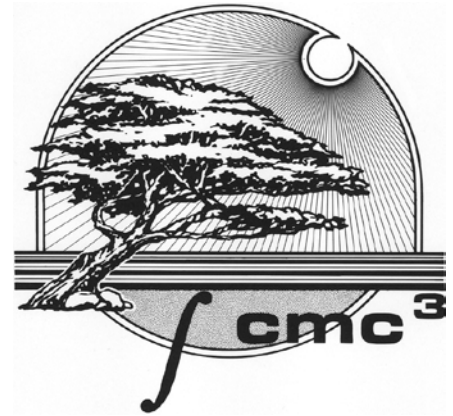The California Mathematics Council,
Community Colleges

19th Annual Recreational
Mathematics Conference

April 17 – April 18, 2015
MontBleu Hotel and Casino
Stateline, Nevada

OFFICIAL CONFERENCE PROGRAM

FRIDAY CONFERENCE PROGRAM

REGISTRATION   5:30-7:00 p.m.   HOTEL LOBBY

WELCOME AND FRIDAY KEYNOTE

7:30-9:00 p.m.   COSMO B

Michael McGinnis

Santa Rosa Junior College

Perplexus Puzzle

mmcginnis@santarosa.edu

Michael McGinnis will reveal his 35-year odyssey in the conceptualizing and development of his award-winning 3-dimensional labyrinth games known as Perplexus. What does it take to make an abstract idea a physical reality? When is it important to let others in on your secrets, and to rely on them to find success?

Join Us for the CMC³ Foundation Gala
Immediately After the Friday Keynote Talk
$20 Suggested Donation
Room 1707

SATURDAY CONFERENCE AT-A—GLANCE

	Session 1 9:00 – 10:00	Session 2 10:30 – 11:30	Session 3 2:30 – 3:30	Session 4 4:00 – 5:00
Metro A	**Angela Moore** *Beal's Conjecture vs. "Positive Zero" Fight*	**Chris Goff** *Euler's Multiple Solutions to a Diophantine Problem*	**Steve Blasberg** *Gems from the Student Math League Contest*	**Chuck Barnett** *You Go First. No, You Go First!*
Metro B	**James Lee** *McDonald's Happy Meal Toys- The Real Cost of Trying to Collect Them All*	**Tuyetdong Phan-Yamada and Ely Gwin** *Hypocycloids, Hypotrochoids and Polar Curves*	**No Session**	**No Session**
Metro C	**Linda Hoang** *Using Desmos Graphing Calculator to Integrate Math Concepts and Art*	**Lori Maloney** *Teaching Statistics with Wo/Man's Best Friend*	**Mark Webster** *Increasing Mathematics Awareness*	**Jeff Anderson** *The Linear Systems Problem Electrified*

SATURDAY CONFERENCE PROGRAM

SESSION ONE: 9:00 a.m. to 10:00 a.m.

Angela Moore, Yale University   angela.moore@yale.edu   **Metro A**

"Beal's Conjecture vs. "Positive Zero" Fight"

This seminar seeks to encourage a mathematical dialog regarding a possible solution to Beal's Conjecture. It breaks down one of the world's most difficult math problems into layman's terms and encourages people to question some of the most fundamental rules of mathematics.

James Lee, College of Southern Nevada   james.lee@csn.edu   **Metro B**

### *"McDonald's Happy Meal Toys – The Real Cost of Trying to Collect Them All"*

McDonald's Happy Meal Toys usually come in sets of anywhere from 5-10 toys. If you buy one Happy Meal at a time, how many Happy Meals will you need to buy to have a complete set of toys? More importantly, how much will it cost you? In this session, I apply the coupon collecting problem to collecting Happy Meal Toys and also to the McDonald's Monopoly game.

Linda Hoang, Cosumnes River College   hoangl@crc.losrios.edu   **Metro C**

"Using the Desmos Graphing Calculator to Integrate Math Concepts and Arts"

Participants will learn the power of Desmos graphing calculator (free online) to encourage creativity in students as they design an artwork using only mathematical functions. Participants will learn the power of Desmos graphing calculator (free online) to encourage creativity in students as they design an artwork using only mathematical functions. Bring your own laptop (B.Y.O.L.) or smartphone to participate.
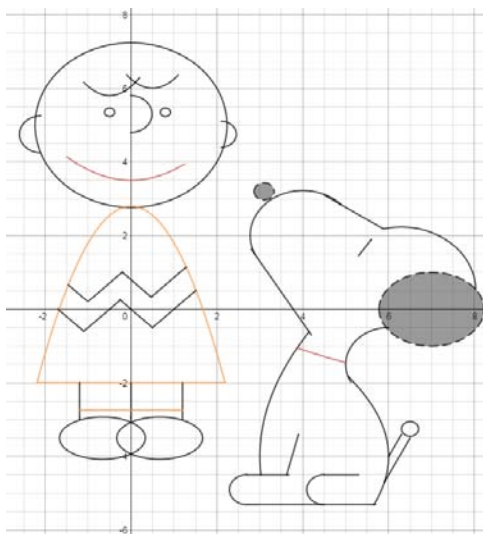
SESSION TWO: 10:30 a.m. to 11:30 a.m.

Chris Goff, University of the Pacific   cgoff@pacific.edu   **Metro A**

"Euler's Multiple Solutions to a Diophantine Problem"

Leonhard Euler (1707-1783) is one of the mathematical greats. We will explore how he generalized a problem of Diophantus and then solved it using "creative" algebraic skills. We'll then look at how he solved it again and again, utilizing ever more general techniques, but still within the scope of high school algebra.

Tuyetdong Phan-Yamada & Ely Gwin   tphanyamada@yahoo.com   **Metro B**

Glendale Community College

*"Hypocycloids, Hypotrochoids and Polar Curves"*

This talk compiles several theorems relating to Hypocycloids and Epicycloids with the aim of providing a project for calculus students interested in a further understanding of polar curves. Relationships with circulant graphs and ancient Greek models of planetary orbits are also described.

Lori Maloney, Sacramento City College   malonel@scc.losrios.eud   **Metro C**

"Teaching Statistics with Wo/man's Best Friend"

This talk explores real life applications for the introductory statistics course using dog - and maybe even cat-related data sets. Statistical topics include teaching students about variation, comparison of groups, measures of center and spread, observational studies versus randomized experiments, confounding variables, and the investigatory process.
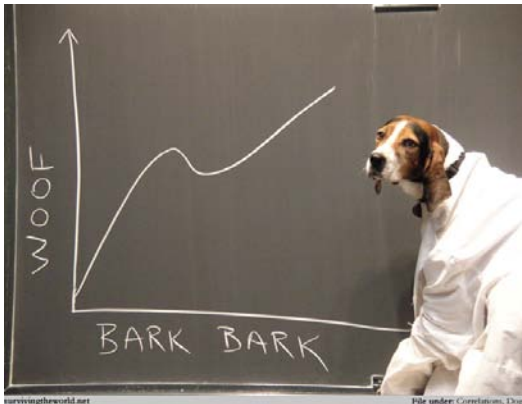
Lunch Break: 11:30 a.m. to 1:00 p.m.
Your voucher is good at any time, Friday through Sunday, April 17 - April 19, 2015
at any of the MontBleu eating establishments

Keynote Presentation

1:00 p.m. - 2:15 p.m.

COSMO A

Frank Farris

Santa Clara University

ffarris@scu.edu

"Creating Symmetry Wallpaper Waves"

You create symmetry whenever you choose to graph a sine curve. The surprise is that every symmetric pattern can be created, or at least approximated, by similar choices. Some know this as a maxim: "Everything is a superposition of waves." In this talk, I'll explain how rosettes, friezes, and wallpaper patterns can be constructed by superimposing waves. Combined with a dash of complex variables, this approach leads to a style of mathematical art that constructs patterns from photographs. The "before" and "after" images below show an example of something that can be appreciated either for its use of groups, function spaces, and eigenvalues of the Laplacian - or appreciated simply as art.
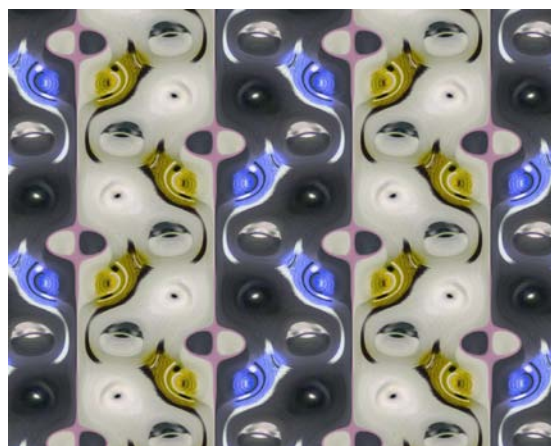
SESSION THREE: 2:30 p.m. to 3:30 p.m.

Steve Blasberg, West Valley College   steve_blasberg@westvalley.edu   **Metro A**

" *Gems from the Student Math League Contest*"

The Student Math League, sponsored by AMATYC, is the only national mathematics competition intended for community college students. In this talk, The AMATYC Test Developer will be presenting some of his favorite/most creative/most interesting/most challenging problems from the 2014-15 Student Math League.

Mark Webster, Sacramento City College   webstem@scc.losrios.edu   **Metro C**

"*Increasing Mathematics Awareness*"

Many students avoid mathematics or think it is not useful or because they are not aware math can be used in activities they enjoy like art, music, poetry, or sports. The national event every April called Mathematics Awareness Month promotes awareness that mathematics plays a role in all human activities. At Sacramento City College we have been sponsoring events and putting up displays around campus to celebrate mathematics each April. This talk will describe how faculty, students and other departments can become involved in increasing mathematics awareness.

Chuck Barnett   cjbarnett2@comcast.net   **Metro A**

Las Positas College

"You go first. No, you go first!"

The coin-flip process (Bernoulli process) is the simplest non-trivial stochastic process, but it is unreasonably important in probability theory and yields many counter-intuitive results. I will discuss some of those results that entail the interaction between finite-length patterns. Members of the audience will be able to calculate odds for first occurrence for some simple patterns via aids distributed at the talk and will thereby, perhaps, get some ideas for student exercises.

Jeff Anderson, Foothill College andersonjeff@fhda.edu   **Metro C**

"The Linear Systems Problem Electrified"

By teaching linear algebra in the context of solving problems in STEM, we can ignite our students' curiosity and tell stories using mathematics. This talk reviews some modern applications of linear algebra to the analysis of electronic circuits. We will consider linear circuits modeled using only ideal resistors, capacitors, inductors, voltage sources and current sources. Included in this talk will be a classroom-ready demonstration of how to use linear systems theory to analyze a rudimentary analog-to-digital converter. We also introduce a much broader class of electric circuits used in modeling and simulation of very large-scale integrated circuits.

SPECIAL STUDENT SPEAKER

COSMO A 5:15 P.M.

JoeAnna McDonald
Sacramento City College

Elliptic Curves

This lecture would explain how to add points on an elliptic curve using both an algebraic and graphical approaches. This discussion would also include an exploration of patterns that occur when working with elliptic curves and modulos and prime numbers. If time allows, the applications of elliptic curves to cryptography may be discussed.

Join us for the CMC^3 43nd Annual Fall Conference!

Hyatt Regency Monterey Hotel and Spa
Friday December 11 – Saturday December 12, 2015
Visit cmc3.org for information

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Registration	Jenny Freidenreich	Diablo Valley College
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**Thanks to XYZ Textbooks and Pearson Publishing for their sponsorship.
CMC^3 wishes to express a Special "Thank You" to
Anna Vopalensky and the entire staff of the MontBleu Hotel and Casino!**