GeoGebra Institute of Southern Connecticut

Second Annual Southern Connecticut GeoGebra Conference

August 20, 2014

Southern Connecticut State University

8:30	Registration *EN B121*	
9:00	Welcome and Opening Remarks *M. Steven Breese (Dean - School of Arts & Sciences)* *EN A115*	
9: 15 – 10: 15	**Uncommon Representations of Common Mathematical Objects & A "Heresy" or Two** **Prof. Judah Schwartz - MIT& Harvard University [Retired Professor]** ***(EN A115)*** In this talk we will explore $mx + b$ in {m, b} space, $x^2 + px + q$ in {p, q} space, rectangles and triangles in {area, perimeter} space as well as other mathematical objects in other parameter spaces. We will also explore two "heresies" – "Was Pythagoras wrong?" and "UNsolving equations - Who says you have to do the same thing to both sides?" We will draw heavily on the GeoGebra applets that can be found on the mathMINDhabits website. These applets are primarily designed for teachers of mathematics who want to deepen their understanding of the mathematics they teach and that their students are expected to learn.	
10:15 – 10:30	**Coffee Break** ***EN A121***	
10:30 – 11:30	**Mathematics in Motion: Modelling Poi Flowers with Parametric Equations and GeoGebra** **Dr. Eleanor Farrington (Massachusetts Maritime Academy)** **(EN A 115)** Poi spinning is a performance art, related to juggling, involving two weights on the ends of short chains, which are swung around making visually interesting patterns. We will consider a certain class of technical moves for poi, where the patterns created are centered trochoids, which are closely related to the cycloid. Like all curves in the cycloid family, they are best expressed using parametric equations. We will be helped in making our mathematical models, and considering the possible variations in patterns and transitions between them by building the patterns in GeoGebra.	
11: 40 – 1: 10	**Workshop 1 – Algebra with GeoGebra** ***Beginner Level*** ***Dr. Marie Nabbout - EN B221*** *Participants will interact with the basic tools and menus of GeoGebra while creating worksheets that can be used in Algebra classes.*	**Presentation A1: (EN D125)** **Exploring Parametric equations** ***M. Fred Borne - Ansonia High School*** *An introductory activity to parametric equations where students will explore the motion of two points and use calculus to determine the velocity and acceleration.* **Presentation A2: (EN D125)** **Designing a solar pizza cooker with GeoGebra** ***Dr. Joe Fields - SCSU*** *Parabolic mirrors can be used to focus the Sun's light onto a very small area producing intense heat. In a so-called trough solar cooker the focused light all comes at the food from below. I used GeoGebra to design a trough cooker that includes secondary mirrors which focus their energy from above -- thus properly melting the cheese atop my pizza.* **Presentation A3: (EN D125)** **Transformations and Congruence under the Common Core through GeoGebra-based explorations** ***Dr. Tim Craine – CCSU [Retired]*** *With the CCSS transformational approach, two triangles are congruent if one is the image of the other under a sequence of isometries (translations, rotations, and reflections). Students are given a Geogebra file with two congruent triangles. Their task is to find the sequence of transformations that maps one triangle onto the other. An extension of this task is to prove Proposition 4 from Book I of Euclid's Elements.*
1:15 – 2:15	**Lunch** ***EN B121***	

2:15 – 3:15	**Workshop 2 -** ***Statistics With GeoGebra*** ***Pre-requisite: Basic knowledge of GeoGebra*** ***Dr. Ray Mugno – EN B221*** *Participants will explore the menus and tools of GeoGebra that can be used for the teaching of Statistics in High School and early College.*	**Session B1: Math Lab** ***Exploring Vertical Asymptotes*** ***M. Fred Borne - Ansonia High School*** *Participants will explore (in a lab just as students would do) rational functions to determine the domain, vertical asymptotes, removable discontinuities, and their graphs. The activity is designed for the teaching of Algebra 1 & Algebra 2.* **Session B2: Math Lab** **Explore and Discuss: Geometry and Algebra Connections** ***M. Hunter Smith – ESUMS*** *Participants will explore (in a lab just as students would do) some worksheets in High School Geometry and Algebra, where they visualize simple rules to difficult concepts to counterexamples.*
3:20 – 4:20	***Workshop 3 – CAS with GeoGebra*** ***Pre-requisite: Basic knowledge of GeoGebra*** ***Dr. Len Brin – EN B221*** *Participants will explore the menus and tools of GeoGebra that can be used in CAS. Activities can be used in High School and in College.*	**Session C: EN C134** ***Geometry activities with Ipads and Smart Board*** ***Dr. Marie Nabbout – SCSU*** *Participants will explore (as students would do) in a classroom setup using ipads and smart board, geometric transformations (translation, reflection, rotation and dilation). Participants will learn how create and upload similar worksheets to be used on ipads.*