



# GeoGebra Institute of Southern Connecticut

## The Third Annual GeoGebra Conference of Southern Connecticut

### August 25, 2015

#### Southern Connecticut State University

8:30	Registration <i>(Rotunda - EN A120)</i>	
9:00	Welcome and Opening Remarks <i>(EN A120)</i>	
9:15 - 10:15	<b>Strengthening Teacher Content Knowledge Through Sketch Construction</b> <b>Dr. Michael Todd Edwards - Miami University - Oxford, OH</b> <i>(EN A120)</i> Building on Clement's theoretical framework for model-based learning (2000), we explore ways in which teacher understanding of various topics is strengthened through the construction of interactive applets for students. The mathematical knowledge required to build a sketch is often related, but not identical to, content understanding required to interact with the completed model. We explore these differences through the analysis of several sample sketches.	
10:15 - 10:30	<b>Coffee Break</b> <i>(EN B121)</i>	
10:30 - 10:45	<b>POSTER SESSION</b> <b>(EN D124)</b> <i>Interactive posters will be available all day. You can browse them at any time.</i> P1: <i>Reimann's Sums</i> - Rasha Tarek - Greenwich HS, CT P2: <i>Exploring the laws of Sines and Cosines in a Pre-Calc class</i> - Dr. Jason Hardin - Worcester State University, MA P3: <i>The Ambiguous Case</i> - Rasha Tarek - Greenwich HS, CT P4: <i>Varignon's theorem</i> - Sandra Ollerhead - Mansfield High School, MA P5: <i>Completing the squares</i> - Brian Darrow, Jr. - Southern Connecticut State University, CT P6: <i>The Ferris Wheel</i> - Rasha Tarek - Greenwich HS, CT P7: <i>Taylor Polynomial Exploration</i> - Dr. Len Brin - SCSU/GISCT, CT P8: <i>Level curves</i> - Dr. Braxton Carrigan - SCSU/GISCT, CT P9: <i>Special lines in a triangle</i> - Dr. Marie Nabbout - SCSU/GISCT, CT P10: <i>Sierpinski's Gasket</i> - Dr. Len Brin - SCSU/GISCT, CT P11: <i>Pythagorean Identities</i> - Dr. Albert Navetta - UNH, CT P12: <i>Shikaku Puzzle</i> - Alex Briasco - Brin - Freeport Middle School, ME	
10:50 - 11:20	<b>PRESENTATION A1:</b> <b>(TBA)</b> <b>Using GeoGebra to present kinetic data and ligand binding data to a Biochemistry Class.</b> <b>Dr. George Dombi - University of Rhode Island, RI</b> <b>&amp; Dr. John Golden - Grand Valley State University, MI</b> <i>There are two hyperbolic functions commonly presented in Biochemistry classes. Both of these functions, the Michaelis-Menten enzyme activity curve and the Scatchard ligand binding isotherm are routinely re-expressed using a linear transform in order to determine the rate and binding constants inherent in each model. We will demonstrate how these transforms, when presented in Geogebra, make a useful and interactive teaching tool.</i>	<b>Poster Session</b>
11:25 - 12:55	<b>Initiation Workshop to GeoGebra (TBA)</b> <b>FOR BEGINNERS</b> <b>Dr. James Quinlan -</b> <b>University of New England, ME</b>  <i>Participants will interact with the basic tools and menus of GeoGebra. No pre-requisite knowledge is required.</i>	<b>Tips and tricks with GeoGebra (TBA)</b> <b>FOR ADVANCED USERS</b> <b>Dr. Marie Nabbout - SCSU &amp; GISCT, CT</b> <b>Dr. Len Brin - SCSU &amp; GISCT, CT</b>  <i>Participants will learn how to create buttons, add input bars, modify appearance, create new tools, use interactive spreadsheets ... and more</i>
1:00 - 1:45	<b>Lunch - EN B121</b>	
1:45 - 2:00	<b>Group Picture (TBA)</b>	
2:05 - 2:35	<b>PRESENTATION A2:</b> <b>(TBA)</b> <b>An informal approach to linear Least Squares.</b> <b>Dr. James Quinlan - University of New England - ME</b> <i>Modeling data using the least squares method is used extensively in practice, therefore an essential contemporary topic for students of data science. During the presentation, a GeoGebra applet will be developed that can be used to facilitate understanding of the objective and the underlying mathematics of the least squares method. Additionally, two of the most robust and valuable GeoGebra topics/commands will be highlighted in the applet, in particular Lists and Sequences.</i>	<b>Poster Session</b>

2:40 – 3:10	<p><b>PRESENTATION A3: (TBA)</b>  <b>Graphing solids of revolution in GeoGebra</b>  <b>Dr. Douglas Hoffman - Northwestern CT Community College - CT</b>  <i>The goal of this presentation is to learn how to plot surfaces in GeoGebra. Surfaces can be graphed using either the Surface command, inputting a function of two variables or inputting an equation of at most three variables. Some surfaces can easily graphed using a function of two variables or an equation, but we have more control over the surface if we use the Surface command. We start by graphing solids of revolution encountered in Calculus I/II. We see a solid of revolution can be graphed in GeoGebra provided we can parameterize the circular cross section. And with a little work, we can extend our method of graphing a solid of revolution to a surface consisting of non-circular cross sections. Finally, we examine how this method can be used to model certain objects in GeoGebra, like a Hershey's Kiss, and use GeoGebra to evaluate the integral calculating the volume of the object.</i></p>	<b>Poster Session</b>
3:15 – 4:15	<p><b>SHORT PRESENTATIONS (TBA)</b>  <b>* B1: Measures of Center</b>  <b>Dr. Forest Fisher – Guttman Community College, NY</b>          Using GeoGebra to help students make sense of the mean and median as measures of center. The activity is designed according to APOS theory with the goal of developing an <i>object</i> understanding of the mean and median. In particular, students work with a dot plot in GeoGebra, and drag the dots around to dynamically manipulate the mean and median.</p>	
	<p><b>* B2: Investigating Parametric Equations on GeoGebra</b>  <b>Christa L. Fratto - Greens Farms Academy, CT</b>          This session will focus on using GeoGebra to develop an understanding of parametric functions. We will investigate the topic from a graphical, numerical and symbolic perspective with graphs and spreadsheets. We will then use GeoGebra to model the motion of a swing.</p>	
	<p><b>* B3: Polar Curves using Parametric Equations</b>  <b>Rasha Tarek - Greenwich High School, CT</b>  <i>This presentation will show how to use GeoGebra to investigate the connection between polar and rectangular equations with ease and learn how to utilize parametric equations to create some amazing polar curves.</i></p>	
	<p><b>* B4: Z-scores</b>  <b>Dr. Audrey Nasar - Guttman Community College, NY</b>  <i>The presentation will show how to use GeoGebra to introduce z-scores as linear functions. This approach aims to help students make the connection between the normal distribution and the Cartesian plane in efforts to better understand relative standing and build upon students prior knowledge of linear functions. By visualizing the linear functions for a variety of normal distributions, students can interpret the domain, range, and x-intercepts in a dynamic environment.</i></p>	
4:15 – 4:30	<p><i>Evaluation and Attendance Certificates</i>  <b>EN B121</b></p>	

**PROGRAM ORGANIZERS:** Dr. Marie Nabbout & Dr. Len Brin

**PROCEEDINGS REVIEW COMMITTEE:**

Dr. Len Brin, Math Department – SCSU, CT

Dr. Marie Nabbout, Math Department – SCSU, CT

Dr. Braxton Carrigan, Math Department – SCSU, CT

Dr. Todd Edwards, Teacher Education Department – Miami University, OH

Dr. Todd Ryder, Chemistry Department – SCSU, CT

Dr. JiongDong Pang, Chemistry Department – SCSU, CT

Dr. Terri Bennett, Math Department – SCSU, CT

**FOR REGISTRATION:** <http://www.southernct.edu/gisct/events>