

CCSU  
DEPARTMENT OF MATHEMATICAL SCIENCES

# COLLOQUIUM

Friday, September 16

3:00 – 4:00 PM

Maria Sanford, Room 101

## **BEST FITTING ELLIPSE FOR TRAJECTORIES OF PLANETS ORBITING THE SUN**

**AMANDA VALENTINE**

**CENTRAL CONNECTICUT STATE UNIVERSITY**

(MA in Mathematics Thesis Presentation)

**Abstract:** In a solar system with only one star and one planet, it is well known from Kepler's First Law that the orbit of the planet follows a trajectory that forms an ellipse. In our solar system the trajectories are not a perfect ellipse due to the gravitational force imposed by the other planets. Since for a particular planet, the gravitational force of the star is much larger than that of the other planets, we know that each of the planet's trajectories are very close to an ellipse. We propose three potential methods of finding the ellipse that best fits these orbits. Besides explaining the three methods, we review the solution of the two-body problem, a procedure to find a plane which best fits a set of points in  $R^3$  and the Circular Shape of the Orbit in the Velocity Space Theorem.

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**For further information:** [gotchevi@ccsu.edu](mailto:gotchevi@ccsu.edu); 860-832-2839; <https://web.ccsu.edu/colloquium/>