Allegheny Mountain

Colloquium

Speaker: Dr. Stephen Deterding
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Date: 7 February 2022, 4PM–5PM

Zoom link: `https://bit.ly/3qgbZNg`

Title: Pell's equation and the Chakravala method

Abstract:
In 1657 Pierre de Fermat issued a challenge to European mathematicians to find a positive integer solution to the equation $61x^2 + 1 = y^2$. However, unknown to him, this problem had been solved over 500 years earlier by an Indian mathematician named Bhaskara II using the Chakravala method. Fermat's challenge problem is an example of a type of equation known as Pell's equation, which is an equation of the form $nx^2 + 1 = y^2$, where integer solutions are sought for x and y. Pell's equation has important applications in approximating square roots because if x_1 and y_1 are a solution pair for Pell's equation then $\frac{y_1}{x_1}$ is a very accurate approximation to $\sqrt{n}$. The Chakravala method was developed by Bhaskara II and others as a way to solve Pell's equation for all values of n. In this talk we will describe how the Chakravala method works and demonstrate its use in solving different forms of Pell's equation.

Speaker's webpage: `https://westliberty.edu/physical-sciences-math/faculty-and-staff/stephen-deterding/`
`https://www.alleghenymtn.maa.org/colloquium`