

November 8, 2024

**P-ADIC QUANTUM MECHANICS, INFINITE POTENTIAL WELLS, AND  
CONTINUOUS-TIME QUANTUM WALKS**

***Speaker: Nathaniel Mayes***

**Abstract:** We consider a p-adic version of the infinite potential well in quantum mechanics (QM). This model describes the confinement of a particle in a p-adic ball. We solve the Cauchy problem for the Schrödinger equation and determine the stationary solutions. The p-adic balls are fractal objects. By dividing a p-adic ball into a finite number of sub-balls and using the wavefunctions of the infinite potential well, we construct a continuous-time quantum walk (CTQW) on a fully connected graph, where each vertex corresponds to a sub-ball in the partition of the original ball. In this way, we establish a connection between p-adic QM and quantum computing.

Talk location:

**BLHSB 1.316**

Zoom meeting link:

**[https://utrgv.zoom.us  
/j/85333215080](https://utrgv.zoom.us/j/85333215080)**

Talk time: **2:00-3:00  
pm**

**Coffee and cookies  
will be provided**

For further information or for special accommodations, please contact Dr. Alexey Glazyrin via email [alexey.glazyrin@utrgv.edu](mailto:alexey.glazyrin@utrgv.edu). More information about the seminar talks is available at the website [www.reallygreatsite.com](http://www.reallygreatsite.com).