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On Latin squares and their quantum-theoretical links to mutually unbiased bases

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The history of Latin squares dates back to thousands of years, however their mathematical importance stems from the work conducted by Leonhard Euler. Euler's work of orthogonal Latin squares, more specifically order 6 orthogonal Latin squares, has led to an extensive study of the topic and created links to other open mathematical problems in particular, mutually unbiased bases. Despite many years studying mutually unbiased bases, the problem of finding the maximum set of mutually unbiased bases has only been solved for dimensions which are prime powers. Therefore, being the smallest non-prime power, finding the complete set of dimension 6 mutually unbiased bases is still an open problem. This presentation will explore the history, properties, applications and open quantum-based problems surrounding Latin squares.

Biography

Rachel Shelley is a final year undergraduate mathematics student at Nottingham Trent University. Her interests extend to mathematical aspects of quantum mechanics and applied mathematics.

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