Theme 3 Plenary Lecture

Historical Tangents! Original Sources from Trigonometry Texts throughout History

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Professor Clemency Montelle is the Tumuaki Kura | Head of School: Pāngarau | Mathematics and Statistics at the University of Canterbury, a leadership role she has held since 2020.

She is an internationally recognised research leader in the History and Philosophy of Mathematics. Author of seven books and over one hundred research outputs, her research excellence has been recognised by various awards including the Indian Satish Bhatnagar prize and the New Zealand Mathematics Society Research Prize.

Her research examines the mathematical achievements of early cultures and is carried out by the examination and analysis of primary source material in Sanskrit, Arabic, Greek, Latin, and Cuneiform. She has authored several books in her field including *Sanskrit Astronomical Tables* (2019), *The Sanskrit Astronomical Table Text Brahmatulyasāraṇī Numerical Tables in Textual Scholarship* (2020), and *Bloomsbury's A Cultural History of Mathematics: The Medieval Age* (2024).

She is passionate about educating people in the mathematical sciences, and creating a technically literate society able to address the needs of communities, fostering advances in science, technology and the social sciences. She is deeply invested in championing diversity and inclusivity in the mathematical sciences and uses her expertise in historical sources and periods to further this aim.

Abstract

Trigonometry, as we understand it today, carries a rich and intricate backstory that spans across various civilizations over more than two thousand years. Despite its neat presentation in modern mathematics curricula, it is often a challenging topic for students who meet it as a set of abstract analytic functions ultimately deriving from ratios of quantities. However, the history of trigonometry reveals a mathematical concept that, originally conceived of to address the demands of ancient astronomy, has undergone profound transformations and was central to numerous groundbreaking scientific endeavours in a wide variety of contexts. We will consider various original historical sources which testify to a more creative and geometric approach to this field, offering new perspectives to appeal to the imagination of learners to deepen their grasp of the topic.