



Pacific Institute for the  
Mathematical Sciences



## DR. STEVEN RAYAN

Professor:

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Mathematics & Statistics

Director: Center for Quantum Topology  
& Its Applications (quanTA)



### Title: Quantum Matter Inspired By Geometry & Art

**Abstract:** The exciting and rapidly-growing field of topological materials has brought with it unexpected new connections between physics and pure mathematics. As the name suggests, topology has played a significant role in understanding and classifying these materials. In this talk, I will offer a brief look at another emerging chapter in this story in which exotic geometries – of the kind found in the woodcuts of M.C. Escher! – and ultimately algebra geometry are used to anticipate new models of quantum matter. There will be lots of pictures and the talk is intended to be enjoyed by individuals from multiple disciplines.

**Bio:** Dr. Rayan is a pure mathematician influenced in a large part by physics. His primary areas of research are algebraic geometry, topology and representation theory of moduli spaces geometric and topological techniques in mathematical physics and quantum theory. Dr. Rayan received his PH.D. from Oxford in 2011 and then was a postdoc at the University of Toronto from 2011-2016. He is now a Professor (Mathematics & Statistics) at the University of Saskatchewan and the Director, Centre for Quantum Topology and Its Applications (quanTA). He holds numerous grants including a PIMS Collaborative Research Group Award and a CFI John R. Evans Leaders Fund.

**FRIDAY, MARCH 17<sup>TH</sup>, 2023**  
**NOON – 1:00 PM**  
**ROOM: M1040**  
**SNACKS & COFFEE PROVIDED**