Mandelstam Institute for Theoretical Physics

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S E M I N A R

Zero-energy quasiparticles in an interacting nanowire containing a topological Josephson junction

Prof Izak Snyman

University of the Witwatersrand

Date:
Tuesday, 5 March 2024

Time:
13h15-14h15 SAST

***Venue*:**
- P213, Physics Building, East Campus, WITS
- Online

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ABSTRACT

We study a Josephson junction in a Kitaev chain with particle-hole symmetric nearest-neighbor interactions. When the phase difference across the junction is π, we show analytically that the full spectrum is fourfold degenerate up to corrections that vanish exponentially in the system size. The Majorana bound states at the ends of the chain are known to survive interactions. Our result proves that the same is true for the zero-energy quasiparticle localized at the junction. We further study finite-size corrections numerically and show how repulsive interactions lead to stronger end-to-end correlations than in a noninteracting system with the same bulk gap.

WHO SHOULD ATTEND?

This talk is intended to be accessible to honors and other postgraduate students, however, all are welcome.

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