

Physics  
AT QUEENS COLLEGE

# Colloquium Notice

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### *What happened before the big bang?*

The big bang is often presented as the beginning of the universe. However, this statement, based on general relativity, follows from an extrapolation of the theory beyond its range of validity because it implies that the density and temperature of matter are infinite at the big bang. Modern attempts to amend the theory by quantum space-time effects have led to alternative scenarios in which the universe may bounce back after a phase of collapse before the big bang. The physics involved, combining ultra-high density with abstract space-time properties, has not been constrained yet by observational tests, but it is subject to strong conceptual consistency conditions. This talk presents a possible physical picture of the big bang, based on several unexpected properties of space and time in quantum physics.

Monday  
**October 28, 2019**  
Starts at 12:15 PM  
Coffee at 12:00 PM  
Physics Conference Room, SB B326