Why quantum computers cannot work

Gil Kalai from Einstein Institute of Mathematics, Hebrew University of Jerusalem

Quantum computers are hypothetical devices based on quantum physics that can out-perform classical computers. A famous algorithm by Peter Shor shows that quantum computers can factor an n-digit integer in n³ steps, exponentially better than the number of steps required by the best known classical algorithms. The question of whether quantum computers are realistic is one of the most fascinating and clear-cut scientific problems of our time.

What makes it hard to believe that superior quantum computers "can" be built is that building them represents a completely new reality in terms of controlled and observed quantum evolutions, and also a new computational complexity reality. What makes it hard to believe that quantum computers "cannot" be built is that this may require profoundly new insights into the understanding of quantum mechanical systems.

My work is geared toward a negative answer, and I offer an explanation within the framework of quantum mechanics, for why quantum computers cannot be built.

I will also mention some highlights from a scientific debate on the matter between myself and Aram Harrow (started here).

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Department of Mathematics
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Administrative Office
C-138 Padelford
Box 354350
Seattle, WA 98195-4350
Phone: (206) 543-1150
Fax: (206) 543-0397

For all academic inquiries, please contact:
Math Student Services
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