Recent reports claim quantum computer networks could be made with a hybrid mechanism. It is reported that this could make a practical, unbreakable, method of encryption. Strangest of all is the possibility that these technologies could make communications faster than light.

Previous quantum systems fall into two categories: discrete and continuous. Discrete systems use mechanisms that can represent a fixed number of distinct, different, non-overlapping states. By contrast, continuous ones can take values in a form similar to analog technologies, where components can take on any value within a certain range.

By creating a hybrid system of discrete and continuous variables, researchers think they can gain the benefits of both patterns while avoiding the weaknesses of each one. Quantum discrete systems suffer from being relatively difficult to use. Continuous ones tend to be more delicate and have more difficulty dealing with faults. The advantage of discrete systems is their increased fault tolerance and being less error-prone. The advantage of continuous systems is that they can be more efficient.

The more recent report is that a complex optical system used can generate three entanglements every minute, proving that this is not a statistical fluke. A previous account shows hybrid quantum systems of this type have been considered possible since two-thousand fifteen.

The fundamental idea that underpins all of this is quantum entanglement. By a particular manipulation, it is possible to entangle two particles so that changing the state of one particle causes a simultaneous change in the entangled particle over long distances.

There are multiple possible applications of this mechanism. One of the main ones proposed is achieving perfectly secure communication. Apparently, any attempt to spy on quantum connections disrupts the entanglement. This makes attempted eavesdropping pointless.

Another application has to do with the potential range. One source suggests that repeaters would be required to form long distance links, which implies that there may be a limit to the distances over which quantum entanglements can form or be maintained. However, depending on the achievable range -- either by the repeaters or a final, direct connection -- the simultaneous nature of changes to entangled particles might allow communication at faster than light speeds.

Regardless of whatever else the future holds, the advent of quantum networking promises change for computer science, physics, and human civilization. I am hopeful because it might be the first whisper of a new age of space exploration.