Explore Quantum Computing with Serious Games

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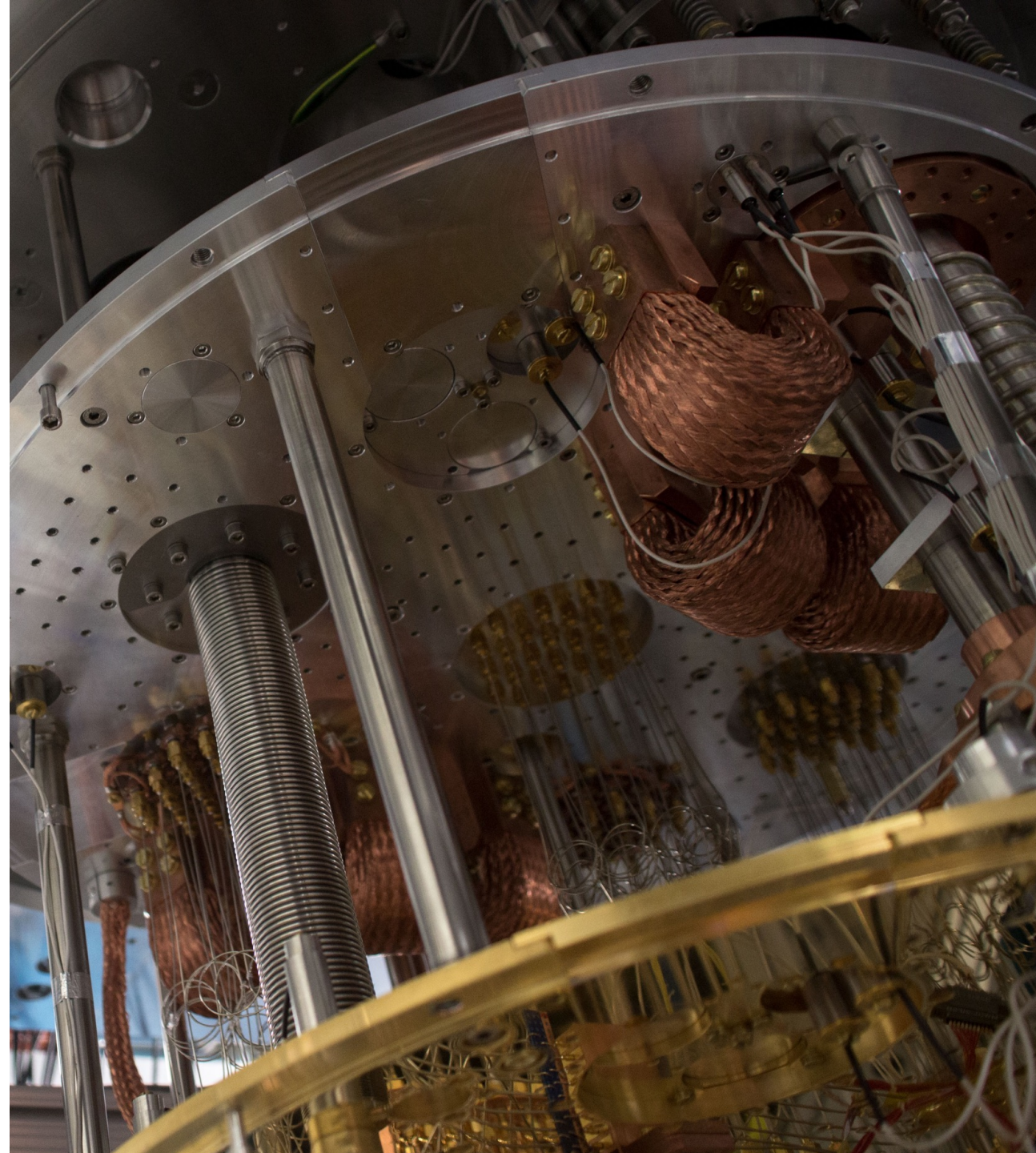
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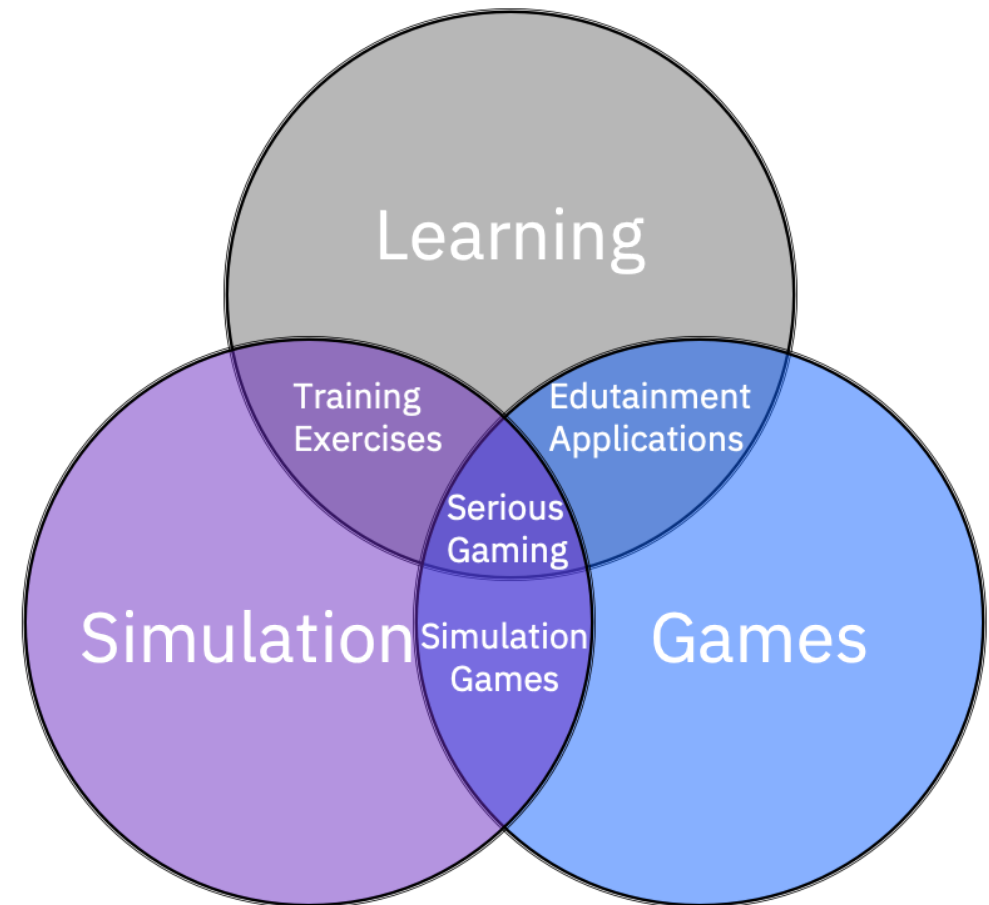IBM Quantum Ambassador
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Serious Games...

... are **digital games** using **game technology** for an **additional purpose** besides entertainment.

Advantages:

- Player makes own decisions
- Direct Feedback
- Individual experiences, knowledge and interpretations
- Explore information in a playful way
- Enjoy freedom in learning (self-directed)
- Involve the player in a story
- Identify with the game

Serious Games for Quantum Computing - Status

- ~50 Quantum Games

- 12 Serious Games
  - Different purposes, goals, strength and weaknesses

Serious Games Overview

- Different Games are suitable for different learning targets

	Superposition	Interference	Entanglement	Quantum gates	Other
Hello Quantum					
QPong					
Quantum coin game					
Battleship with partial NOT gates					
Hunt the Quantpus					
Quantum Solitaire					
Quantum TicTacToe					
Quantum Poker					
Qiskit Blocks					
Quantum Awesomeness					
Quantum Chess					
GHZ-Game					

Low → High

Name	URL	Description
"Hello Quantum"	http://helloquantum.mybluemix.net	Puzzle game using Quantum gates
"QPong"	https://github.com/HuangJunye/QPong	Pong game with quantum gates as control
"Quantum Coin Game"	http://ibm.biz/QiskitCoinGame	Introduction to Superposition and Interference based on a Coin Game
"Battleship with partial NOT gates"	https://github.com/Qiskit/qiskit-community-tutorials/blob/master/games/battleships_with_partial_NOT_gates.ipynb	Multiplayer battleship, running on a Quantum Computer
"Hunt the Quantpus"	https://decodoku.itch.io/hunt-the-quantpus	Game to find and defeat Quantpusses with quantum properties
"Quantum Solitaire"	https://decodoku.itch.io/quantum-solitaire	Card game using Entanglement
"Quantum TicTacToe"	https://quantumtictactoe.com/play	TicTacToe with additional Superposition and Entanglement moves
"Qiskit Blocks"	https://github.com/JavaFXpert/QiskitBlocks	Game to build quantum circuits in a Minetest environment
"Quantum Awesomeness"	https://github.com/decodoku/A_Game_to_Benchmark_Quantum_Computers/blob/master/README.md	Puzzle game to test quality of Quantum Computer
"Quantum Chess"	https://truly-quantum-chess.sloppy.zone	Chess with possibility of Superposition moves
"Quantum Poker"	https://github.com/sintefmath/QuantumPoker	Version of Poker to introduce quantum gates, Superposition and Entanglement
"Entanglion"	https://entanglion.github.io	Board game exposing player to fundamental quantum concepts
"GHZ-Game"	https://ibm.biz/GHZ-Game	Introduction to Entanglement based on the GHZ-Experiment. Available on a simulator or on a real device (to learn about error mitigation)