"Quantum Art" Competition

Universal quantum computer was a holy grail for over 40 years. However, since few years, IBM provides access to limited scale quantum computers in the cloud to everyone for free! You can program them using Qiskit – open source Python framework.

Today we'd like you to enter the world of quantum computers by using them for generating the art. Concepts such as quantum superposition and entanglement, but also noise and errors (since we're speaking about noisy quantum computers at the moment) can be used for that in multiple ways and it is restricted only by the user's imagination.

Goal of the task:

> Program existing IBM quantum computer in Qiskit to generate art. This can be art in any form (music, graphics, charts, animations, text, design, etc.).

Few hints:

1. Colors in the visual art can be mapped to quantum states. Quantum algorithm can be used to generate superposition of states in quantum computer, which then measured gives colors with programmed probabilities.
2. Entanglement makes qubits dependent on each other – this allows to apply constraints to realize only certain combinations, not all.
3. Noise/errors may result in measuring state which we did not expect – this allows to insert imperfections into generated patterns.

Here are two examples: Fractals and Bubble Art.

What will be valued:

- Innovative idea how to leverage quantum computer specifics (directly or in hybrid use with the classical computing)
- Clear explanation of the idea.
- Elegant code implementation.

- Beauty and quality of generated art samples.
- Use of real quantum computer is more valued than simulator.
- Simple usage allowing others to reproduce and generate their own art samples.
- Educational aspect for learning quantum computing.

What are the required conditions:

- Your own code, written in Qiskit (postprocessing of the measurement results can be done outside of Qiskit of course)
- Use IBM quantum computers or simulators.
- At least one art sample generated and provided.
- Code on the public Github repository.

Check the task Terms published separately for more detailed requirements and information about assessment.