In the 2023 Quantum Next Generation Minesweeper Challenge, teams will help Army explore how quantum sensors could help detect land mines and inform further development in this technology.

Current detection methods can be slow and dangerous, requiring human operators to manually sweep an area. Army needs a way to quickly and accurately detect land mines at scale while reducing the danger to personnel.

Quantum sensors that can detect tiny changes in magnetic fields are a promising new technology. They are small enough to be attached to UASs and can detect a deviation of the Earth's magnetic field due to the presence of a land mine.

Teams will be provided a simulation of the sensor attached to a UAS and tasked with helping Army answer key questions, including:

- Can the sensors accurately detect land mines, distinguish them from other magnetic objects in the field and how many false positives will be produced?

- What is the optimal strategy for the UASs to sweep an area, how long does it take and how fast it this compared with existing methods?

Teams must demonstrate their solutions by developing software that interfaces with the simulator provided. They must devise, or train a machine to find, the best method for controlling the UAS and processing sensor data to detect land mines in a fixed area as quickly as possible.

The challenge will proceed through three stages increasing in complexity:

- **Stage 1** will involve a field containing a random distribution of only mines. Using a fixed UAS trajectory, you must detect all mines and locate them to better than 1 m of accuracy.

- **Stage 2** will involve a field containing land mines and other metallic objects. You must repeat the same task while achieving less than 10% false positives.

- **Stage 3** will require you to repeat stage 2 and find the best UAS trajectory.

Each stage will be marked by a live test where teams will demonstrate their software. Teams will accrue points and be ranked on their performance in the tests.