

# Rhea Space Activity Receives UK Contract to Engineer the Quantum Vacuum

*Rhea Space Activity Advances Fusion Energy, Quantum Computing, and Quantum Communications*

WASHINGTON, DC, USA, May 17, 2023 /EINPresswire.com/ -- Rhea Space Activity (RSA) has been awarded a contract by the UK Defense and Security Accelerator (DASA) for a program to develop techniques for manipulating the quantum vacuum called INFINITE EXCHANGE. This award marks RSA's first UK contract and represents the company's expansion into collaborating with Five Eyes nations.

Inspired by the Transformation Multiphysics framework developed in conjunction with metamaterial-based invisibility cloaking, this project aims to develop a similar transformation approach for engineering the quantum electrodynamic (QED) vacuum using metamaterials and metasurfaces. The INFINITE EXCHANGE program will allow for the design of new microcavities that can be exploited to advance fusion energy and quantum computing research.

Cameo Lance, Physicist & COO, stated: "We're excited the UK Ministry of Defense recognizes the value of high-risk high reward projects and awarded us this contract. Pursuing the potential of ideas like INFINITE EXCHANGE is what allows our nations to maintain a competitive edge in developing new and emerging technology. Our efforts in this research are two-fold. Firstly, INFINITE EXCHANGE will engineer quantum cavities that could significantly boost nuclear fusion interactions. Secondly, we will also be able to create microcavities that advance quantum computing/communication capabilities.

The INFINITE EXCHANGE project could lead to advances in emerging quantum technologies by tailoring the interactions between qubits and the quantum vacuum. Potential applications include suppressing noise and decoherence effects that limit the fidelity and lifetime of qubits, quantum communications, and fusion nuclear reactions.

Robert Thompson, a theoretical physicist at RSA remarked: "Metamaterials developed over the last 20 years have demonstrated a unique capability to engineer physical fields like light and sound beyond what is possible with ordinary materials. Transformation Multiphysics is a mathematical framework that guides the implementation of metamaterials to achieve desired goals. The quantum vacuum is not actually empty, and we hope to be able to exploit the properties of the quantum vacuum by developing a Transformation Multiphysics approach to quantum electrodynamics."

RSA will pursue further development of the theoretical framework for manipulating the quantum vacuum and identify applications that could be significantly advanced. For the next phase of the project, RSA plans to collaborate with researchers from Imperial College London (UK), which is consistently ranked as one of the world's top universities and is a leading institution for metamaterials and Transformation Multiphysics research. RSA plans to pitch their phase 2 solution to the UK Ministry of Defence (MoD) on May 18, 2023 in Birmingham, UK.

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#### About Rhea Space Activity

Rhea Space Activity (RSA) is an astrophysics company that ideates and creates high-risk/high-reward research and development concepts to support U.S. national security objectives. RSA has developed various technologies in the fields of infrared satellites, directed energy, artificial intelligence, Light Detection and Ranging (LIDAR), astro-particle physics, small satellites, cis-lunar operations, intelligence collection, autonomous underwater vehicles, and for the F35 Lightning II.

For more information, please visit:

[www.rheaspaceactivity.com](http://www.rheaspaceactivity.com)

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