July 29, 2026
TerraSky Co., Ltd.

"Development of a Materials Simulation Platform Using Quantum Computers" Selected for a NEDO Project

- Advancing Validation for Battery Materials in Collaboration with Tohoku University -

TerraSky Co., Ltd. (Headquarters: Chuo-ku, Tokyo; Representative Director, CEO and President: Hideya Sato) announces that its group company, Quemix Inc. (Head Office: Chuo-ku, Tokyo; President and CEO : Yu-ichiro Matsushita; hereinafter "Quemix"), a company engaged in the research and development of quantum computing algorithms and software, is pleased to announce that its proposal, "Development of a Materials Simulation Platform Using Quantum Computers and Demonstration of Its Application to Battery Materials" (hereinafter the "Demonstration Project"), has been selected under the "Large-Scale Demonstration for Use Cases Creation" category of the subsidy program "Research and Development Project of the Enhanced Infrastructures for Post-5G Information and Communication Systems (Acceleration of the Development and Demonstration of Next-Generation Quantum Computers for Addressing Social Challenges)" administered by the New Energy and Industrial Technology Development Organization (NEDO; hereinafter the “NEDO Project”).

Quemix will conduct the Demonstration Project in collaboration with Tohoku University (hereinafter "Tohoku University"). Through the development of quantum computing software for simulating battery materials and the validation of its effectiveness, Quemix and Tohoku University aim to accelerate the industrialization of quantum computing and contribute to enhancing Japan’s international competitiveness.

About NEDO's "Research and Development Project of the Enhanced Infrastructures for Post-5G Information and Communication Systems"

This NEDO project aims to develop core technologies for information and communication systems compatible with Post-5G networks (hereinafter "Post-5G information and communication systems") and to strengthen Japan's capabilities for developing and manufacturing such systems. With significantly enhanced capabilities, including ultra-low latency and massive simultaneous connectivity, Post-5G technology is expected to be utilized in a wide range of industrial applications, such as smart factories and autonomous driving. It is also anticipated to become a key technology underpinning Japan's competitiveness. Quantum computers are positioned as a core computing platform within Post 5-G information and communication systems, with the potential to dramatically expand the range of computationally tractable problems. Accordingly, the creation of quantum computing use cases has been identified as one of the project's key research and development areas.

NEDO: Decision on the Implementation Structure for the "Research and Development Project of the Enhanced Infrastructures for Post-5G Information and Communication Systems (Acceleration of the Development and Demonstration of Next-Generation Quantum Computers for Addressing Societal Challenges)"

https://www.nedo.go.jp/koubo/CD3_100424.html (Japanese only)

New Energy and Industrial Technology Development Organization

Social Significance of the Demonstration Project and the Roles of the two Organizations

Achieving carbon neutrality requires dramatic improvements in the performance of materials used in technologies such as all-solid-state batteries, high-performance catalysts, and next-generation semiconductors. However, conventional materials development—based on classical computing using traditional computers and experiment-driven approaches that rely heavily on researchers' experience and intuition—is reaching its limits. Longer development cycles and rising costs have become structural barriers to maintaining the international competitiveness of Japan's materials industry.

Battery materials development, in particular, is an issue of critical national importance, as it is directly linked to the electrification of the automotive industry, particularly electric vehicles (EVs); the effective use of renewable energy; and securing power sources for autonomous robots and next-generation mobility. Storage batteries are more than mere components or materials: they are a foundational technology that supports energy security and industrial competitiveness. As such, they represent a strategic field that will significantly influence the future international competitiveness of Japanese manufacturing.

The electronic states and chemical bonds in storage battery materials are inherently quantum many-body problems. Due to limitations in approximation methods and computational scale, conventional classical computing has difficulty fully capturing the complexity of real-world materials. The use of quantum computers is therefore essential to elucidating material degradation mechanisms and designing innovative materials.

In the Demonstration Project, Quemix will develop its proprietary "quantum computing solver" and "quantum computing execution platform." Quemix will work closely with Tohoku University to evaluate these technologies and demonstrate the effectiveness of the quantum computing solver by comparing and validating its results against high-precision experimental data obtained at NanoTerasu, the 3GeV high-brilliance synchrotron radiation facility.

Looking ahead, Quemix aims to integrate the quantum computing solver and quantum computing utilization technologies developed through the Demonstration Project into Quloud, its cloud-based materials simulation platform. The goal is to deploy these technologies as a next-generation materials development platform that will be widely accessible to companies and research institutions in Japan and worldwide.

Click here for Quemix's press release on this matter:

https://www.quemix.com/en/post/en-20260729-nedo

About Quemix Inc.

Quemix Inc., a consolidated subsidiary of TerraSky Co., Ltd. (Head Office: Chuo-ku, Tokyo; Representative Director Executive President and CEO: Hideya Sato) conducts research and development in quantum computing, quantum sensing, and computational materials science. Under the vision of "realizing the future humanity has dreamed of through quantum technology," Quemix supports breakthrough innovations for companies leading the next generation of quantum technologies.

Since its establishment in 2019, the company has focused on research and development of algorithms for fault-tolerant quantum computers (FTQC), including the development and patenting of the "Probabilistic Imaginary-Time Evolution (PITE®)," a quantum chemistry calculation algorithm with mathematically proven quantum acceleration. As a leading company in FTQC algorithm research in Japan, Quemix is actively advancing research and development aimed at the practical application of quantum computing in materials computation and simulation by 2030.

About Quloud, the Cloud-based Materials Calculation Platform

Quloud is a cloud-based materials calculation platform that enables users to perform advanced materials simulations through a web browser. It features an intuitive user interface that seamlessly supports computational methods such as first-principles calculations and molecular dynamics simulations, making it accessible to a wide range of users, from experts to beginners.

Going forward, Quemix will integrate its proprietary quantum algorithms and computational solvers into Quloud. By harnessing quantum computers as computational resources, Quloud will evolve into a next-generation materials development platform that provides powerful support for materials development across the manufacturing industry.

About NanoTerasu, the 3GeV High-Brilliance Synchrotron Radiation Facility

NanoTerasu, a state-of-the-art 3GeV synchrotron radiation facility, is one of the world's leading large-scale research facilities, capable of observing the nanoscale world — a scale as small as one-billionth of a meter. At NanoTerasu, electrons are accelerated to nearly the speed of light using an accelerator. These electrons generate extremely bright X-rays, known as synchrotron radiation, which is about a billion times brighter than sunlight. By illuminating materials with this powerful light, NanoTerasu enables observations at the nanoscale. These capabilities are widely utilized not only in fundamental science but also across various industrial fields, including energy, materials, devices, biotechnology, and food, supporting both scientific advancement and innovation.

Contact Information

- Inquiries regarding Quemix business:
  Quemix Inc. https://www.quemix.com/en/contact

- Media Inquiries:
  TerraSky Co., Ltd. Public Relations: pr@terrasky.co.jp