PRESS RELEASE

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Tokyo Institute of Technology
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Tokyo Tech and QST partner to develop quantum technology

QST laboratory to be established at Tokyo Tech focusing on society-driven quantum sensor development

(Tokyo, July 12) **Tokyo Institute of Technology (Tokyo Tech) and National Institutes for Quantum and Radiological Science and Technology (QST) entered into a comprehensive collaboration agreement on July 12, 2018 to address societal needs through the advancement of quantum science and technology.**

Research and development in **quantum science and technology**[1], including quantum computers, quantum cryptography, and solid-state quantum sensors, continue to progress, attracting worldwide attention. Quantum science has the potential to realize fundamental technology that will lead to creation of new value and industries, as well as help in achieving Sustainable Development Goals (SDGs).

Tokyo Tech has been at the forefront of quantum research, particularly through theoretical advances in quantum computing by Professor Hidetoshi Nishimori, and development in **quantum sensors**[2] including quantum inertial sensors and solid-state quantum sensors. QST, also a pioneer in quantum science and technology, has promoted cutting-edge research and industrial applications in the fields of radiology, quantum beam science, and nuclear fusion. Through the Tokyo Tech-QST agreement, the two organizations will combine research capabilities, resources, and talent to lead the world in the study and application of quantum science and technology.

Linking Tokyo Tech research on materials, devices, and quantum sensors with QST research on materials using quantum beam science will make possible wide-reaching advances, from the creation of new materials to the application of quantum devices. In solid-state quantum sensors, a highly competitive global industry, Tokyo Tech professor Mutsuko Hatano and QST project leader Takeshi Ohshima will collaborate to develop novel sensors based on diamond nitrogen-vacancy centers (NVC). These sensors will offer high sensitivity, room-temperature operation, and scalability from nano to macro levels.

The QST Quantum Science and Technology Industry-University Collaboration Laboratory “QST Co-Creative Laboratory for Quantum Technologies at Meguro” will be established on August 1, 2018 at Tokyo Tech’s Ookayama campus, becoming a base for solid-state quantum research. The laboratory will be staffed by approximately 30 researchers from both organizations. Collaborations with industry will also be pursued, with the goal of applying solid-state quantum sensors in medical care,

motor vehicles, and social infrastructure.

Technical terms
[1]: **Quantum science and technology** examines quantum behaviors and influence, and technology that applies the science.

[2] : **Quantum sensors** utilize quantum mechanical effects rather than classical mechanics, allowing them to achieve sensitivities and resolutions that surpass existing technology. Among these, sensors used to measure magnetic fields using the quantum state of electrons in atomic-level vacancies in solid substances such as diamonds are called solid-state quantum sensors. Operational at room temperature and normal atmosphere, they are well suited for real world environments and biological measurement.

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About Tokyo Institute of Technology
Tokyo Tech stands at the forefront of research and higher education as the leading university for science and technology in Japan. Tokyo Tech researchers excel in fields ranging from materials science to biology, computer science, and physics. Founded in 1881, Tokyo Tech hosts over 10,000 undergraduate and graduate students per year, who develop into scientific leaders and some of the most sought-after engineers in industry. Embodying the Japanese philosophy of “monotsukuri,” meaning “technical ingenuity and innovation,” the Tokyo Tech community strives to contribute to society through high-impact research. http:www.titech.ac.jp/english/

About National Institutes for Quantum and Radiological Science and Technology

The National Institutes for Quantum and Radiological Science and Technology (QST) was established in April 2016 to promote quantum science and technology in a comprehensive and integrated manner. The new organization was formed from the merger of the National Institute of Radiological Sciences (NIRS) with certain operations that were previously undertaken by the Japan Atomic Energy Agency (JAEA).

QST's mission is to raise the level of quantum and radiological sciences and technologies through its commitment to research and development into quantum science and technology, the effect of radiation on humans, radiation emergency medicine, and the medical use of radiation.

To ensure that research and development delivers significant academic, social and economic impacts, and to maximize benefits from global innovation, QST is striving to establish world-leading research and development platforms, explore new fields, and serve as a center for radiation protection and radiation emergency medicine. http://www.qst.go.jp/ENG/