博士研究員募集テーマ一覧

（別紙1）

No.	Recruitment Field	Contact Person	Department/ Section	E-mail	Research Theme	Radiation Worker/Non-Radiation Worker
1	Research on quantum entanglement sensing using spin quantum defects	OHSHIMA/Takeshi ONODA/Shinobu	Quantum Materials and Applications Research Center/Quantum Sensing Project	ohshima.takeshi@qst.go.jp onoda.shinobu@qst.go.jp	Quantum sensing is one of the quantum science and technology that will lead the transformation to a super-smart society. Quantum sensing, which has been developed in recent years, has achieved measurement sensitivity that is so high that it cannot be achieved using classical methods. To further enhance this, we are focusing on quantum entanglement to establish a quantum entanglement sensing technique that achieves ultra-high sensitivity. Theoretically, it is said that quantum entanglement can be used to exceed the upper limit of sensitivity (standard quantum limit) of existing quantum sensing technique. The quantum sensing beyond the standard quantum limit is expected to be realized.	Radiation Worker
2	Ultrafast electronic dynamics of quantum materials	ITAKURA, Ryuji	Ultrafast electronic dynamics project, Department of quantum applied photonics, Kansai Institute for Photon Science	itakura.ryuji@qst.go.jp	Toward the realization of coherent control of quantum devices, new experimental technique to monitor ultrafast dynamics should be developed. In Kansai Insitute for Photon Science, ultrashort light sources such as few-cycle infrared laser and attosecond soft X-ray beam line by laser high-harmonic generation are being developled. In addition, using such advanced ultrashort laser pulses, ultrafast coherenet spectroscopic measurement will be performed, leading to a novel method to visualized ultrafast dynamics in two-dimentional quantum meterials and photosynthetic systems with femtosecond/attosecond temporal resolution.	Non-Radiation Worker
3	Study on quantum mechanical understanding of biological phenomena by experimental, theoretical, or simulation-based approaches, or a combination thereof.	Hidetoshi Kono	Institute for Qunatum Life Science	kono.hidetoshi@qst.go.jp	We are looking for an individual to develop force fields bridging ab initio molecular dynamics (MD) and classical MD, and to carry out research on enzyme reaction mechanisms using QM/MM simulations and neutron/X-ray structure analysis. We are also looking for an individual to conduct research on single molecule dynamics and functional analysis using optical tweezers.	Radiation Worker
4	Study of the electron cyclotron heating current drive system in JT-60SA	Ken Kajiwara	Department of ITER Project/RF Heating Technology Group	kajiwara.ken@qst.go.jp	R&D for the electron cyclotron heating and current drive system in JT-60SA, which includes gyrotron, which is a high power millimeter wave oscillator, millimeter wave transmission line and millimeter wave launcher, which injects the millimeter wave into tokamak.	Radiation Worker
5	Sophistication of tritium breeder blanket design including ITER-TBM under various loading environments	Wenhai Guan	Rokkasho Institute for Fusion Energy,Department of Blanket Systems Research,Blanket Technology Group	guan.wenhai@qst.go.jp	Blankets are important components in fusion reactors because they serve the functions of fuel production, heat extraction, and neutron shielding. Since the blanket is subjected to extremely severe loads in diverse environments, the evaluation of its integrity is an important issue. The structural and nuclear integrity of the blanket will be evaluated by thermo-structural and neutronic analyses based on the conceptual structure of the ITER test blanket being studied by the National Institutes for Quantum Science and Technology (QST), assuming that the blanket will be loaded in the environment including the DEMO reactor. Based on the existing blanket design and the characteristics of the structural materials, we will try to advance the design of a blanket that can achieve both structural integrity and high tritium breeding performance.	Non-Radiation Worker