Recruitment Theme for Postdoctoral Fellow
(Quantum Life and Medical Science Directorate)

（別紙1）

No.	Recruitment Field	Contact Person	Department/ Section	電話 (外線)	E-mail	Research Theme	Radiation Worker/Non-Radiation Worker
1	Research and development of a next-generation medical accelerators, quantum scalpel, for heavy-ion radiotherapy.	Iwata Yoshiyuki	Department of Accelerator and Medical Physics	+81-043-206-4144	iwata.yoshiyuki@qst.go.jp	A candidate considered for the position is expected to perform research and development of the next-generation medical accelerators, quantum scalpel, for heavy-ion radiotherapy, as well as to involve the construction project of the quantum scalpel in QST, Chiba. Further, the position will focus on development of a laser-driven ion injector and a compact rotating gantry for the fifth-generation quantum scalpel.	Radiation Worker
2	Development of quantum sensors or quantum life science research using them.	Hiroshi Yukawa	Institute for Qunatum Life Science	+81-043-206-3061	yukawa.hiroshi@qst.go.jp	We are looking for an individual who will research the application of nano-quantum sensors for improving biocompatibility, functionalization, spin measurement, and life measurement, or who will conduct innovative research on the elucidation of the nature of cancer and prevention by utilizing quantum sensors.	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	+81-043-382-4295	kono.hidetoshi@qst.go.jp	We are looking for a person to carry out research to analyze the electronic structure of biomolecules using synchrotron radiation and/or 2D electron spectroscopy.	Radiation Worker
4	Tau network mapping in dementia patients using resting-state functional MRI connectivity	Toshiyuki Hirabayashi	Department of Functional Brain Imaging	+81-043-206-3249	hirabayashi.toshiyuki@qst.go.jp	To identify the brain network dysfunction underlying a specific symptom in tauopathy patients by combining information on the distributed locations of tau-deposit across patients showing the symptom with the resting-state fMRI connectivity derived from a large population of normal subjects.	Radiation Worker
5	Studies on bio-metal dynamics using quantum beam analyses	Shino Takeda	Internal Decorporation Research Group	+81-043-382-5511	takeda.shino@qst.go.jp	We aim to clarify the elemental characteristics and formation mechanism of localized and concentrated bio-metals by in situ determination of metal distribution and chemical status with quantum beam based elemental analysis, such as PIXE, SR-XRF and XAFS. In particular, we promote technological development that can contribute to radiation emergency medicine, such as evaluation methods of actinide in vivo kinetics and tissue migration.	Radiation Worker
6	Mechanisms of radiation-induced carcinogenesis via inflammaging and relevant strategy to reduce radiation risk	Tatsuhiko Imaoka	Department of Radiation Effects Research	+81-043-206-4721	imaoka.tatsuhiko@qst.go.jp	The various effects of low-dose radiation appear to have some commonality with age-related diseases. In recent years, senescent cells that accumulate in the body with aging are thought to induce inflammation and cause age-related diseases. Currently, most of the findings on radiation and cellular senescence are motivated to explain and overcome cancer recurrence and normal tissue damage after radiotherapy, and there is a knowledge gap in explaiingn and overcoming the effects of low-dose radiation. Therefore, this study aims to demonstrate the induction of cellular senescence and inflammation in animal models of radiation carcinogenesis, to elucidate their roles, and to prevent their effects.	Radiation Worker

Recruitment Theme for Postdoctoral Fellow
(Foundational Quantum Technology Research Directorate)

（別紙1）

No.	Recruitment Field	Contact Person	Department/ Section	電話 (外線)	E-mail	Research Theme	Radiation Worker/Non-Radiation Worker
1	Nanoscale imaging of structure and dynamics using coherent X-ray synchrotron radiation	OHWADA Kenji	Coherent X-ray research group	+81-0791-58-1045	ohwada.kenji@qst.go.jp	Development of techniques for using the characteristic coherence properties of X-rays from high-brightness synchrotron radiation sources for the nanoscale imaging of structure and dynamics. Using both ring-based and also X-ray free-electron laser lightsources to study nanoparticles at high spatial resolution, and work to extend measurement techniques into the femtosecond timescale domain using the latest technical developments. Applying these new technologies to areas ranging from phase transitions in atomic clusters to quantum materials.	Radition worker
2	Study of Quantum Technologies Based on Photon Source and Spin Defects	OHSHIMA Takeshi	Quantum Materials and Applications Research Center/Quantum Sensing Project	+81-027-335-8995	ohshima.takeshi@qst.go.jp	Creation of single photon sources (SPSs) and spin defects in wide bandgap semiconductors and applying them to quantum bits (qubits) and quantum sensors are studied. Thus, Exploration/fabrication of SPSs and/or spin defects, which act as qubit and quantum sensor, in wide bandgap semiconductors such as diamond, silicon carbide and hexagonal boron nitride is conducted using ion and electron beams. In addition, in order to realize quantum computing with high fidelity and quantum sensing with high sensitivity, optical and spin properties of SPSs/spin defects are evaluated, and also the technologies for the manipulation of photons/spins with high accuracy and high fidelity are developed.	Radiation Worker
3	Research and development on high-intensity, ultra-short pulse laser science	ITAKURA Ryuji/KIRIYAMA Hiromitsu	Ultrafast Electronic Dynamics Project Advanced Laser Science Group	+81-0774-80-8687 '+81-0774-80-8681	itakura.ryuji@qst.go.jp kiriyama.hiromitsu@qst.go.jp	The applicant will conduct either the control and diagnostics of electronic dynamics using ultra-short laser pulses or high-fieled science such as ion generation using high power lasers. In particular, the applicant will develop an near-infrared laser system, involve the generation of attosecond, high-order harmonics in soft X-rays and its applications, or fast ion generation, ion characterization, improvement of the beam quality, covering the foundational quantum technology and related beam technology.	Radiation Worker

Recruitment Theme for Postdoctoral Fellow
(Fusion Energy Directorate)

（別紙1）

No.	Recruitment Field	Contact Person	Department/ Section	電話 (外線)	E-mail	Research Theme	Radiation Worker/Non-Radiation Worker
1	Design study on diagnostic and control system of fusion DEMO reactor	SAKAMOTO Yoshiteru	Department of Fusion Reactor Systems Research / Fusion Reactor Design Group	+81-0175-71-6709	sakamoto.yoshiteru@qst.go.	In order to contribute to the conceptual design activities of a fusion DEMO reactor, a conceptual design study on the diagnostic and control systems of fusion plasma is conducted. Specifically, the diagnostic equipment applicable to the DEMO environment is identified based on the diagnostic system to be developed in ITER and JT-60SA, and the concept of overall diagnostic system configuration will be developed in consideration of the interaction conditions with other systems. Moreover, a fusion plasma control concept will be studied to ensure consistency with the diagnostic system. In addition, we will contribute to the design activities conducted by the joint special design team for fusion DEMO and the Broader Approach activity.	Non-Radiation Worker
2	Research and development on integrity and quality improvement of high-heat-flux components (Plasma-Facing Components, PFC) in fusion reactors	EZATO Koichiro	Department of ITER Project / Plasma Facing Component Technology Group	+81-029-210-2661	ezato.koichiro@qst.go.jp	High heat flux components for fusion reactors are repeatedly exposed to high energy particles, high heat loads, and electromagnetic forces, requiring high heat removal capability and durability against electromagnetic forces. Therefore, the surfaces exposed to plasma are made of tungsten, metallurgically bonded to a water-cooled heat removal structure, which consists of a plasma-facing unit and its supporting structure. In this solicited theme, from the viewpoint of improving the performance of high heat load components for fusion reactors, research and development will be conducted on surface material modification, heat removal performance and durability of the cooling structure, fabrication and inspection of the support structure, and quality improvement of joining and welding between different materials.	Non-Radiation Worker
3	Research for integrated modeling of tokamak plasmas	Nobuyuki Aiba	Department of Advanced Plasma Research / Advanced Plasma Modeling Group	+81-029-277-5909	aiba.nobuyuki@qst.go.jp	Realization and sustainment of high-performance tokamak plasmas in JT-60SA, ITER and DEMO require not only to understand physics mechanisms of various phenomena observed in tokamaks but also to develop plasma control methods based on the understanding. In this research theme, modeling activities of physics phenomena, such as transport, instability etc., in core/edge/divertor regions in tokamak plasmas will be carried out to develop a numerical code which can analyze the phenomena. After the modeling and code development, a so-called integrated modeling and simulation performed by coupling multi-model/code will be carried out to consider interactions between various phenomena in tokamaks. Through such modeling and simulation, physics mechanisms of the phenomena will be clarified, and numerical examinations of the control methods required for realizing a sustained high-performance tokamak plasma.	Non-Radiation Worker