Recruitment Field for Postdoctoral Fellow of JAEA 2019

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№	Theme	Department	Section	Location (*)	Contact Person	Summary	Radiation Worker/ Non-Radiation Worker	Field (for reference)
F1	Study on medium- and long-term structural integrity evaluation for nuclear materials in specific environment	Collaborative Laboratories for Advanced Decommissioning Science	Corrosion Analysis Group for Specific Environment in Decommissioning	Nuclear Science Research Institute	Masahiro Yamamoto Tel +81-3-3592-2379 E-mail yamamoto.masahiro75@jaea.go.jp	The post doctoral fellow will perform the study on corrosion behavior of metalic materials for the primary containment vessel and piping systems under the specific environment condition predicted in the decommissioning process of Fukushima Dai-ichi Nuclear Power Station, and obtain basic data for medium- and long-term structural integrity evaluation of nuclear materials. Specifically, acquisition of the knowledge for corrosion phenomena and severe corrosion environment conditions by both immersion and electrochemistry tests in gamma-ray irradiation and non-irradiation condition will be conducted.	Radiation Worker	Material Radiation Chemistry
F2	Analysis of physical and chemical states of fission products under LWR severe accidents	Collaborative Laboratories for Advanced Decommissioning Science	Radionuclide Behavior Analysis Group	Nuclear Science Research Institute	Masahiko Osaka Tel +81-29-282-5922 E-mail ohsaka.masahiko@jaea.go.jp	Physical and chemical states of fission products (FP, such as cesium) should be characterized towards the decommssioning of Fukushima Dai-ichi Nuclear Power Station (1F). A CFD-based chemical reaction analyses will be made on various experimental data of reproduction tests for FP behavior. In addition, analysis results of the environmental samples around 1F site will also be used for the evaluation of physical and chemical states. The post doctoral fellow will participate to additional reproduction tests for FP behavior, if needed.	Non-Radiation Worker	Chemistry Physics Material Chemical Engineering
F3	Development of rapid measurement method of radionuclides in the environment and its application to understanding of migration and transfoer behavior of radionuclides	Fukushima Environmental Safety Center (https://fukushima.jaea.go.jp/initiatives/cat01/)	Fukushima Radiation Measurement Group	Fukushima Environmental Safety Center	Kazuki Iijima Tel: +81-247-61-2911 E-mail: iijima.kazuki@jaea.go.jp	We will develop simple and rapid methods for measurement of radionuclides in environmental samples, and apply to the real environmantal samples in order to understand the tranfer and accumulation process of radionuclides in the environment. Target radionuclides are cesium, strontium, non-exchangeable organic bound tritium, other FP and actinides. Methods are expected to use analytical equipments installed at Fukushima Environmental Safety Center, which are solid measurement techniques such as TOF-SIMS, TEM, EPMA, FIB, XPS, liquid measurement techniques such as ICP-MS, and various radioactivity techniques.	Non-Radiation Worker	Geo and Environemtal Sciences Chemistry Measurements and Instruments
F4	Elucidation of biogeochemical cycle mechanisms of radionuclides in Fukushima forest	Advanced Science Research Center (http://asrc.jaea.go.jp/index.html)	Research Group for Interfacial Reaction Field Chemistry http://asrc.jaea.go.jp/soshiki/gr/interfacial0/index.html	Nuclear Science Research Institute	Naofumi Kozai Tel +81-292-6031 E-mail kozai.naofumi@jaea.go.jp	Elucidation of biogeochemical cycle mechanisms of radiocesium in Fukushima forest is necessary to evaluate long-term influence of radiocesium on plants and animals. Forest is a very complex system where minerals, humus, microbes (fungi, bacteria, etc.), and plants involve in biogeochemical cycle of radiocesium. This study aims to elucidate the biogeochemical cycle mechanisms in Fukushima forest through investigation on microbial effect on solubilization of radiocesium in soil, chemistry of radiocesium returning from plants and mushrooms to soil after their death and the subsequent re-fixation to soil, and difference of environmental behavior between potassium and cesium.	Radiation Worker	Geo and Environemtal Sciences Biology Applied Chemistry
F5	Basic research on technological development for post-treatment of contaminated water	Advanced Science Research Center (http://asrc.jaea.go.jp/index.html)	Research Group for Interfacial Reaction Field Chemistry http://asrc.jaea.go.jp/soshiki/gr/interfacial0/index.html	Nuclear Science Research Institute	Naofumi Kozai Tel +81-292-6031 E-mail kozai.naofumi@jaea.go.jp	At Fukushima Daiichi nuclear power plants (FDNPP), spent adsorbents used for collecting radionuclides in the contaminated water have been stored in the site and posttreatment method for disposal of those spent adsorbents has yet to be examined. This study aims to develop effective posttreatment methods for mainly long-life anionic radionuclides (99-Tc, 131-I) for which few effective treatment methods for geological disposal are known. Although detailed information is not available, it is likely that at FDNPP those anionic radionuclides in contaminated water are removed by organic adsorbents (ion exchange resin, activated carbon) which are however inappropriate for solidification for burial disposal due to gas generation by degradation. To contribute accelerating decommissioning processes, this study explores novel methods to recover anionic radionuclides and stably solidify them in waste forms.	Radiation Worker	Geo and Environemtal Sciences Material Applied Chemistry

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J1	Computer science research for nuclear CFD simulations	Center for computational science and e-systems	Computational science research and development office	Center for computational science and e-systems (Kashiwa)	Yasuhiro Idomura Tel +81-70-1470-5237 E-mail idomura.yasuhiro@jaea.go.jp	JAEA promotes the development of exascale CFD simulations for analyzing severe accidents in nucelar reactor, environmental dynamics of radioactive substances, and thermal hydlaurics in accelerator driven systems. In this theme, the candidate develops simulation technologies needed for exascale coplex CFD simulations. The candidate will adress one or a few topics from the following research topics, 1) optimization of existing CFD codes for accelerators, 2) development of exascale CFD algorithms, 3) improvement of extreme scale sparse matrix solvers, and 4) simulation studies on complex fluid phenomena.	Non-Radiation Worker	Physics Mathematics Computer and Information
J2	Development of visualization techniques for nuclear CFD simulations	Center for computational science and e-systems	Computational science research and development office	Center for computational science and e-systems (Kashiwa)	Yasuhiro Idomura Tel +81-70-1470-5237 E-mail idomura.yasuhiro@jaea.go.jp	JAEA promotes the development of exascale CFD simulations for analyzing severe accidents in nucelar reactor, environmental dynamics of radioactive substances, and thermal hydlaurics in accelerator driven systems. Since a performance gap between computation and data I/O expands in such exascale simulations, one needs in-situ visualization, in which simulation data is visualized at runtime without data I/O. In this theme, the candidate promotes the development of visual analytics techniques for analyzing multi-variate and multi-scale data and/or the extension of in-situ visualization technologies using VR devices.	Non-Radiation Worker	Computer and Information Mathematics
J3	Application of machine-learning to the quantum simulations of strongly-correlated systems	Center for computational science and e-systems	Simulation technology R&D office	Center for computational science and e-systems (Kashiwa)	Mitsuhiro Itakura Tel +81-80-9668-6997 E-mail itakura.mitsuhiro@jaea.go.jp	For the evaluation of material properties and material design of strongly-correlated systems such as actinide compounds for nuclear fuels and high-temperature superconductors, applicant is supposed to employ computational science techniques for the elucidation of the many-body correlation effect of electrons. Specifically, applicant is supposed to develop computational technique to accelerate quantum simulations of strongly-correlated systems using machine-learning method. In addition, applicant is expected to extend the developed methodology and generalize it for the breakthrough of the compuational amount problem in general quantum simulations.	Non-Radiation Worker	Physics Material Computer and Information
J4	Experimental and analytical studies on the fuel behavior under accident conditions of light-water-reactor	Nuclear Safety Research Center	Fuel Safety Research Group	Nuclear Science Research Institute	Masaki Amaya +81-29-282-5028 E-mail amaya.masaki@jaea.go.jp	The objective of this study is to develop and/or improve models concerning fuel behavior under reactivity-initiated accidents (RIAs), loss-of-coolant accidents (LOCAs), etc. by conducting experiments on light-water-reactor fuel and/or analyses using calculation codes etc. The following or related studies will be carried out. ・Model development and evaluation by using calculation codes etc., concerning effects of the deformation of fuel cladding tube and axial relocation of fuel pellets inside the fuel rod on the fuel temperature during LOCAs. ・Analysis and model improvement in terms of fuel dispersal behavior following failures of fuel cladding tube during accidents by using calculation codes etc.	Non-Radiation Worker	Mechanics Material Robotics Geo and Environemtal Sciences
J5	Study on the methodology of the structural integrity assessment for nuclear reactor components	Nuclear Safety Research Center	Structural Integrity Research Group	Nuclear Science Research Institute	Yinsheng Li +81-29-282-6457 li.yinsheng@jaea.go.jp	Due to the long term operation of some domestic nuclear power plants and occurrence of the earthquakes beyond the designed seismic ground motion, developing the methodologies of structural integrity assessments for the reactor components concerning seismic loading and age related degradation mechanisms such as neutron irradiation embrittlement, stress corrosion cracking and so on is of great importance. In this theme, one of the following related researches will be conducted. - Advanced structural integrity assessment research for important nuclear components, such as failure estimation, crack propagation or weld residual stress evaluation, on the basis of numerical simulation, material testing, and fracture testing and so on - Advanced seismic safety assessment research including development of three-dimensional evaluation models of nuclear facility buildings, components and piping systems, and numerical simulation considering nonlinear mechanical properties.	Non-Radiation Worker	Mechanics Architectural and CivilEngineering Material Physics Applied Physics Measurements and Instruments Measurements and Instruments

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J6	Study on feasibility and effectiveness evaluation for severe accident countermeasures	Nuclear Safety Research Center	Severe Accident Analysis Research Group	Nuclear Science Research Institute	Tomoyuki Sugiyama Tel +81-29-282-5253 E-mail sugiyama.tomoyuki@jaea.go.jp	This research aims at development of analysis models and tools to improve evaluation techniques of severe accident countermeasures. One of the following tasks or that related to the tasks is carried out. - Source term analysis of severe accidents, such as Fukushima daiichi NPS accident, using the SA analysis code THALES2/KICHE. - Analysis of fluid dynamic behaviors of core melt in containment vessel using the mechanistic FCI code JASMINE. - Analysis of thermal-hydraulic and deflagration/detonation behaviors of hydrogen in containment vessel or reactor building using the open CFD code OpenFOAM.	Non-Radiation Worker	Physics Chemistry Mechanics Applied Physics
J7	Study on methodology of accident consequence analysis and its application to the protection of people living in affected areas after a Nuclear Accident	Nuclear Safety Research Cener	Radiation Risk Analysis Research Group	Nuclear Science Research Institute	Shogo Takahara +81-29-282-6139 takahara.shogo@jaea.go.jp	The aim of this study is to develop the assessment methods of consequences due to a Nuclear Accident, and also application to the protection of people living in affected areas after the accident. To achieve this aim, one of the following tasks or other related tasks will be made: ①Development of accident consequence assessement methods including radiation dose assessement and social-econical impacts analysis; ②Development of calculation codes which are implemented latest methods related to consequence assessments, and of a level 3 PRA code OSCAAR; ③Optimization of nuclear emergency preparedness by using a level 3PRA code OSCAAR.	Radiation Worker	Physics Geo and Environemtal Sciences Chemistry Mathematics Radiation Other
J8	Study on analytical techniques for individual particles containing nuclear materials in environmental samples	Nuclear Safety Research Center	Research Group for Safeguards Analytical Chemisty	Nuclear Science Research Institute	Fumitaka Esaka +81-29-282-6165 esaka.fumitaka@jaea.go.jp	Analysis of trace amounts of nuclear materials in environmental samples taken at nuclear facilities in the world is performed to reveal nuclear activities, which is important for nuclear safeguards. In this study, analytical techniques for such samples are developed. For example, in order to clarify elemental composition, chemical states and isotopic composition, individual micron-sized particles containing uranium and/or plutonium are measured by using scanning electron microscopy, total-reflection X-ray analysis, micro-Raman spectroscopy and secondary ion mass spectrometry.	Radiation Worker	Chemistry Physics
J9	Study on the methodology of estimation of property changes in radioactive waste disposal system due to natural events	Nuclear Safety Research Center	Environmental Safety Research Group	Nuclear Science Research Institute	Seiji Takeda +81-29-282-6170 E-mail takeda.seiji@jaea.go.jp	In the safety assessment for a geological disposal of radioactive wastes, it is important to estimate the effect of property changes in radioactive waste disposal system resulting from the occurrence of natural events such as volcanic and magmatic activity, seismic activity, uplifts, erosion etc.. In this study, the methodologies for estimating the possibility of the occurrence and the effect of topographical, hydrogeological, thermal and geochemical changes due to natural events are developed based on previous information and observation data on natural events of Japan.	Non-Radiation Worker	Physics Geo and Environemtal Sciences Chemistry Architectural and CivilEngineering Measurements and Instruments Computer and Information□
J10	Study on release and transport behavior of radioactive materials in reprocessing plant under severe accident conditions	Nuclear Safety Research Center	Fuel Cycle Safety Research Group	Nuclear Science Research Institute	Hitoshi Abe +81-29-282-6672 abe.hitoshi@jaea.go.jp	Newly defined as as severe accidents in fuel reprocessing plant are organic solvent fire in cell as well as boiling and exsiccation of highly-active liquid waste in concentrators. Therefore, establishment of method for evaluating their effect on the public dose and effectiveness of countermeasures for the accidents become an urgent issue. Purposes of this study are 1) acquiring data about release, transport and confinement of radioactive materials under the accident conditions and 2) establishing a simulation code to evaluate the accident evolution with high applicability.	Non-Radiation Worker	Chemistry Chemical Engineering

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J11	Experimental and analytical study on thermohydraulic safety of light water reactor	Nuclear Safety Research Center	Thermohydraulic Safety Research Group	Nuclear Science Research Institute	Yasuteru Sibamoto +81-29-282-5263 sibamoto.yasuteru@jaea.go.jp	This experimental and analytical research focuses on thermo-hydraulic phenomena occurring in the reactor and the containment of the nuclear power plant during an accident before and after core damage. For the experimental study, two-phase flow, heat transfer, hydrogen behavior, and/or source term behavior are investigated using a high-pressure reactor simulation test facility or a small-scale test device that exits or will be built for this research. The development of the two-phase flow measurement technique is also an important topic for this research. By using the data obtained from the experiments, prediction models are validated and improved in order to be used in lumped parameter codes such as RELAP5 and MELCOR, or the CFD codes. A specific research topic will be selected considering the request by the applicant.	Non-Radiation Worker	Mechanics Measurements and Instruments Computer and Information
J12	Study on material degradation and integrity evaluation of nuclear reactor components	Nuclear Safety Research Center	Materials and Water Chemistry Research Group	Nuclear Science Research Institute	Satoshi Hanawa +81-29-282-5044 hanawa.satoshi@jaea.go.jp	Researches contribute to safety assessment of nuclear reactor components such as reactor pressure vessel (RPV) and reactor internals are carreid out. In particular, effect of environmental conditions such as irradiation, high temperature-high pressure coolant on material degradation is investigated by micro-structural analysis, mechanical testing and water radiolysis/electrochemical corrosion potential calculations. Not only from the viewpoint of material degradation mentioned above, but the approach by fracture mechanics is also performed.	Radiation Worker	Mechanics Material Measurements and Instruments Computer and Information
J13	Research on Criticality Safety/Management of Damaged- or Molten-Fuel formed by Severe Accidents	Nuclear Safety Research Center	Criticality Safety Research Group	Nuclear Science Research Institute	Kotaro Tonoike +81-29-284-3762 tonoike.kotaro@jaea.go.jp	It is important to establish both the cooling and the criticality control of fuel debris after the severe accident, such as the Fukushima Daiichi accident, where large amount of fuel is damaged and melts. It is difficult, however, to control the situation of fuel debris and the coolant flow path, which leads the difficulty in securing the subcritical condition. Thus, the evaluation of re-criticality risk is necessary. In this research, critical mass, kinetic parameters, etc. of fuel debris will be obtained by computation; and critical experiments to validate the computation will be studied as well.	Radiation Worker	Physics Computer and Information Applied Physics Other
J14	Experimental Research on Safety Assessment of Storage and Disposal of Radioactive Waste	Nuclear Safety Research Center	Waste Safety Research Group	Nuclear Science Research Institute	Toshikatsu Maeda +81-29-282-6001 maeda.toshikatsu@jaea.go.jp	Safety assessments of storage and disposal of radioactive wastes require quantitative analysis of long-term alteration of barrier materials used in storage and disposal systems. This study investigates long-term alteration behavior such as corrosion, dissolution redox reactions and colloid formation associated with glass, metals, clays, concretes and polyethlene focusing on primary factors such as adjacent barrier materials, groundwater composition, geology, microbes and radiolysis. The goal is to obtain scientific basis for models evaluating changes in the barrier functions and for systematical establishment of datasets. Methods for chemical analysis of radioactive wastes themselves are also investigated.	Radiation Worker	Chemistry Geo and Environemtal Sciences Material
J15	Materials physics in heavy element systems	Advanced Science Resarch Center	R.G. for Material Physics for Heavy element systems	Nuclear Science Research Institute	Shinsaku KAMBE Tel +81-29-284-3525 E-mail kambe.shinsaku@jaea.go.jp	New electronic states in heavy element systems are investigated experimentally and theoretically. Especially magnetic and superconducting properties at low temperatures in bulk and thin film samples are focused.	Radiation Worker	Physics Material Chemistry Applied Physics Applied Chemistry

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J16	Experimental and theoretical studies of exotic nuclei	Advanced Science Research Center	Research Group for Heavy Element Nuclear Science	Nuclear Science Research Institute	Katsuhisa Nishio Tel: +81-29-282-5454 E-mail: nishio.katsuhisa@jaea.go.jp	Experimental and theoretical studies of unstable nuclei and superheavy elements will be prompted. The research topics include nucler structure, nuclear reaction, and nuclear fission for nuclei far from the stable isotopes. In experimental programs, JAEA facilities and/or external facilities will be used to produce exotic nuclei. In theorey subjects nuclear structure and fission process will be studied by taking advantage of the JAEA supercomputer. (http://asrc.jaea.go.jp/soshiki/gr/HENS-gr/index_e.html)	Radiation Worker	Physics Mathematics Radiation Applied Physics Measurements and Instruments Computer and Information Other
J17	Nuclear chemistry of superheavy elements	Advanced Science Research Center	Research Group for Heavy Element Nuclear Science	Nuclear Science Research Institute	Kazuaki Tsukada Tel: +81-29-282-5491 E-mail: tsukada.kazuaki@jaea.go.jp	The main objective is to understand chemical and atomic properties of superheavy elements (SHEs) placed at the uppermost end of the Periodic Table. This theme will focus on the valence electronic structure of SHEs from the measurements of ionization-energy, electron spin, surface adsorption, ionic radii, redox potentials, and molecular formations. The subjects include development of the measuring system based on an "atom-at-a-time" method. These experiments will be performed at the JAEA Tandem Accelerator Facility. (http://asrc.jaea.go.jp/soshiki/gr/HENS-gr/nc/index-e.htm)	Radiation Worker	Chemistry Radiation Physics Measurements and Instruments Other
J18	Theoretical study on spin-energy transformation materials	Advanced Science Research Cetner	Nuclear Science Research Institute	Nuclear Science Research Institute	Michiyasu Mori Tel +81-29-284-3508 E-mail mori.michiyasu@jaea.go.jp	A sucessful candidate will theoretically study spin- and thermal-transport properties using some numerical techniques such as density functional theory, density matrix renormalization group method, quantum Monte Carlo method and so on. Thermoelectric materials, primarily related to spin Seebeck effect, and radiation-proof devices will be also important subjects of candidate.	Non-Radiation Worker	Physics
J19	Experimental study on spin-energy transformation materials	Advanced Science Research Cetner	Nuclear Science Research Institute	Nuclear Science Research Institute	Michiyasu Mori Tel +81-29-284-3508 E-mail mori.michiyasu@jaea.go.jp	The theme is the experimental study on spintronics based on a noble cocept of spin current generation / manipuration using mechanical motion and nuclear spin. We approach the phenomenon that originate in the interaction of nuclear spin and mechanical motion using spectroscopy methods including Nuclear Magnetic Resonance. Our goal is to esablish a experimental method of the noble cocept of spin current generation / manipuration decrived above.	Non-Radiation Worker	Physics
J20	Study on Structure and Property of Nanoscale Materials	Nuclear Science Research Institute, Advanced Sciene Research Center (https://asrc.jaea.go.jp/)	Research Group for Nanoscale Structure and Function of Advanced Materials (https://asrc.jaea.go.jp/soshiki/gr/Nanoscale-gr/index.html)	Nuclear Science Research Institute	Yuki Fukaya Tel +81-29-282-6582 E-mail fukaya.yuki99@jaea.go.jp	The research theme is focused on fabrication and structural investigation of nanoscale materials such as atomic sheets and surface superstructures. By using advanced surface-sensitive techniques, e.g. positron diffraction, electron diffraction, and scanning tunneling microscopy, the atomic configurations and electronic states are investigated, toward further developing novel functional materials having a radiation resistance. No positron diffraction experience necessary.	Radiation Worker	Physics Applied Physics Chemistry Material Radiation

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J21	Research of Material Science by using Advanced Muon Beam	Nuclear Science Research Institute, Advanced Sciene Research Center (https://asrc.jaea.go.jp/)	Research Group for Nanoscale Structure and Function of Advanced Materials (https://asrc.jaea.go.jp/soshiki/gr/Nanoscale-gr/index.html)	Nuclear Science Research Institute	Wataru Higemoto Tel +81-29-284-3873 E-mail higemoto.wataru@jaea.go.jp	Muon is one of an elemental paeticle and used as a probe of local state inside material. By using muon, which is obatined at J-PARC and other proton accelarator facilities, the candiate advance a material science and develpment of experimental instruments. An experience of muon experiment does not be required.	Radiation Worker	Physics Chemistry Material Applied Physics Applied Chemistry Measurements and Instruments
J22	Development of highly selective extraction separation systems for hardly separated substances	Advanced Science Research Center (http://asrc.jaea.go.jp/index.html)	Research Group for Interfacial Reaction Field Chemistry (http://asrc.jaea.go.jp/soshiki/gr/interfacial0/index.html)	Nuclear Science Research Institute	Hirochika Naganawa Phone +81-29-282-6615 E-mail naganawa.hirochika@jaea.go.jp	Our research project focuses on the development of a highly selective extraction separation technique for hardly separated radioactive nuclides and/or valuable metals in environmental samples and radioactive liquid wastes. In this study, we develope efficient metal separation and anion recognition systems using novel ligands and inorganic adsorbents, which possess high extraction performance and selectivity for actinoids, lanthanoids, precious metals, and oxoanions. We analyze the structure of extracted complexes by various spectroscopic methods and use a simulation technique such as molecular modeling. Furthermore, we challenge the development of separation process using an emulsion flow extractor for practical application. We hope that applicant has experiences for separation chemistry, organic synthesis, coordination chemistry and/or geochemistry, however, it doesn't matter whether applicant has these experiences described above or not if applicant works energetically with great interest in this project.	Radiation Worker	Chemistry Applied Chemistry Geo and Environemtal Sciences Material
J23	Experimental research for hadron and nuclear physics related to J-PARC	Advanced Science Research Center	Research Group for Hadron and Nuclear Physics	Nuclear Science Research Institute	Hiroyuki Sako Tel +81-29-284-3828 E-mail sako.hiroyuki@jaea.go.jp	Successful candidates will work on experimental research for hadron and nuclear physics either at J-PARC Hadron Experimental Facility, J-PARC Heavy-Ion Projection, RHIC, LHC, or Belle II.	Radiation Worker	Physics
J24	Theoretical study of hadron nuclear physics at Advanced Science Research Center	Advanced Science Research Center	Research group for hadron nuclear physics	Nuclear Science Research Institute	Toshiki Maruyama tel: +81 29 282 5457 maruyama.toshiki@jaea.go.jp	Theoretical studies of structures and properties of hadron and high-density matter, dynamical features of hadrons, and QCD. Collaborations with experimentalists and researchers of different fields such as condensed matter physics are highly encouraged.	Non-Radiation Worker	Physics
J25	Development of chemical analytical methods for radioactive nuclide	Nuclear Science and Engineering Center (https://nsec.jaea.go.jp/)	Research Group for Analytical Chemistry, Nuclear Chemistry Division (https://nsec.jaea.go.jp/analy_chem/top.php)	Nuclear Science Research Institute	Yoshihiro Kitatsuji Tel +81-29-282-5517 E-mail kitatsuji.yoshihiro@jaea.go.jp	The Analytical Chemistry group is developing new quick methodologies to quantify the specific radionuclide in radioactive wastes with various properties, which are generated from research facilities or Fukushima-Daiichi Nuclear Power Station. The removal of interference elements prior to instrumental analysis is a key technique for the high precision chemical analysis. On the research theme, practical analytical methods for actinide and fission products will be developed based on studies of elucidation of ion separation phenomena such as adsorption, extraction, aggregation, etc.	Radiation Worker	Chemistry Measurements and Instruments Geo and Environemtal Sciences

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J26	Study on interaction of fission product with fuel and structural material	Nuclear Science and Engineering Center (https://nsec.jaea.go.jp/)	Development Group for LWR Advanced technology, LWR Key Technology Development Division (https://nsec.jaea.go.jp/organization/div5/en_detail2.html	Nuclear Science Research Institute	Shuhei Miwa Tel +81-29-282-5379 E-mail miwa.shuhei@jaea.go.jp	In a severe accident of nuclear facility, fission products (FPs), such as cesium and iodine, induce chemical and physical interactions with structural materials; e.g. reactor vessel, hot-cell surface and so on. Thus, it is important to continuously improve the FP interaction models in a wide temperature range for the accurate source term. In this study, the post-doctoral fellow will investigate such FP interaction as chemical reaction between FPs within fuel, chemical and physical reactions with stainless steel and concrete structural materials under various conditions. Heating tests of simulated fuel containing non-radioactive FPs will be conducted for this purpose using the experimental set-ups for FP release and transport behavior. Experimental results are interpreted and modelled for the improvement of analysis of FP release and transport behavior. This research will be conducted by cooperation with group members. A part of research contents can be modified upon requests.	Radiation Worker	Chemistry Physics Material Applied Chemistry Measurements and Instruments
J27	Study on pyrochemical reprocessing of spent MA transmutation fuel	Nuclear Science and Engineering Center (https://nsec.jaea.go.jp/)	Research Group for MA Transmutation Fuel Cycl, Partitioning and Transmutation Technology Division (https://nsec.jaea.go.jp/ndre/ndre3/macycle/index-e.htm)	Nuclear Science Research Institute	Hirokazu Hayashi Tel +81-29-282-6097 E-mail hayashi.hirokzu55@jaea.go.jp	In order to reduce the burden of the geological disposal of high level waste (HLW), partitioning and transmutation (P&T) technology has been investigated. JAEA have been developing a transmutation fuel cycle technology for transmutation of highly radioactive long-lived MA using a dedicated Accelerator-Driven System (ADS). Reprocessing of spent MA transmutation fuels and reuse of MA and Pu remaining in the spent MA transmutation fuels are necessary in order to raise the transmutation ratio of MA. We aim at establishing pyroreprocessing technology using molten salts and liquid metals as solvents, which is expected to be suitable for treatment of MA transmutation nitride fuels. Thermochemical properties and kinetics of chemical and electrochemical reactions related to the pyroreprocessing are our main concerns. In this research theme, the experiments will be carried out to clarify the behavior of melts, compounds and alloys containing actinides and fission product elements.	Radiation Worker	Chemistry Material Chemical Engineering Applied Chemistry
J28	Study on carbon cycling in terrestrial ecosystems and its interactions with environmental changes, using radioactive and stable carbon isotope analyses	Nuclear Science and Engineering Center (https://nsec.jaea.go.jp/)	Research Group for Environmental Science (https://nsec.jaea.go.jp/ers/environment/envs/index.html)	Nuclear Science Research Institute	Dr. Jun Koarashi Tel +81-29-282-5903 E-mail koarashi.jun@jaea.go.jp	There is growing concern that recent rapid changes in climate and environment could have a significant influence on carbon cycling in terrestrial ecosystems and could consequently lead to a positive feedback for global warming. However, the magnitude and timing of this effect remain highly uncertain due to a lack of quantitative understanding of the migration and storage processes of carbon in terrestrial ecosystems (especially forests) and their responses to the changes in environment. In this study, we will conduct field (with different ecosystem properties) and laboratory (under controlled environmental conditions) experiments to quantify the processes and their interactions with changes in environment, using radioactive (14C) and stable carbon isotopes as tracers for carbon cycling in terrestrial ecosystems.	Non-Radiation Worker	Geo and Environemtal Sciences Biology Chemistry Measurements and Instruments
J29	Research on improving functions to calculate indiced radioactivity in PHITS	Nuclear Science and Engineering Center (https://nsec.jaea.go.jp/)	Research Group for Radiation Transport Analysis (https://nsec.jaea.go.jp/ers/radiation/rpro/index.htm)	Nuclear Science Research Institute	Tatsuhiko Sato Tel +81-29-282-5803 E-mail sato.tatsuhiko@jaea.go.jp	Japan Atomic Energy Agency (JAEA) is developing Particle and Heavy Ion Transport code System (PHITS). In this study, PHITS is improved for applying to decommissioning of nuclear and accelerator facilities by updating its calculation capability of induced activity. For that purpose, the accuracy in calculated activation cross sections is to be improved. A new computational algorithm to deduce the systematic and statistical uncertainties of the calculated residual nuclides yields is to be developed.	Radiation Worker	Radiation Applied Physics Computer and Information Measurements and Instruments
J30	Numerical study on turbulent process at the land-surface to improve a local-scale atmospheric dispersion model	Nuclear Science and Engineering Center (https://nsec.jaea.go.jp/)	Research Group for Environmental Science (https://nsec.jaea.go.jp/ers/environment/envs/index.html)	Nuclear Science Research Institute	Dr. Hiromasa Nakayama Tel: +81-29-282-5170 E-mail: nakayama.hiromasa@jaea.go.jp	It is important to consider the effects of topography, land-use, and building on turbulent process at the land-surface for estimating dispersion behaviors of radionuclides normally or accidentally released from nuclear facilities into the atmosphere. In this study, our objective is to clarify the turbulent process at the land-surface and parameterize the aerodynamic roughness properties in order to improve prediction accuracy of a local-scale atmospheric dispersion model by means of large-eddy simulaion capable of capturing unsteady turbulent flows.	Non-Radiation Worker	Geo and Environemtal Sciences Architectural and CivilEngineering

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(*) http://www.jaea.go.jp/english/about/locationmap.html

№	Theme	Department	Section	Location (*)	Contact Person	Summary	Radiation Worker/ Non-Radiation Worker	Field (for reference)
J31	Research and development of separation process of minor actinide and long lived fission products from high level liquid waste	Nuclear Science and Engineering Center (https://nsec.jaea.go.jp/)	Research Croup for Partitioning	Nuclear Science Research Institute	Tatsuro Matsumura Tel +81-29-282-6673 E-mail matsumura.tatsuro@jaea.go.jp	In order to reduce the burden of the geological disposal of high level waste (HLW), partitioning and transmutation technology has been investigated. Since minor actinides (MA) and long lived fission products (LLFP) have high radiotoxity and long half lives, the separation of MA and LLFP from HLW is very important. The subject of this theme is development of recovery and separation process with novel extractant from HLW for partitioning and transmutation technology. In this study, the novel extractants which has high selectivity of MA and LLFP from HLW will be used and applicability for practical separation process will be evaluated. The experiments using minor actinides and high level liquid waste in glove boxes and hot cells will be carried out.	Radiation Worker	Chemistry Applied Chemistry Chemical Engineering
J32	Research on structures and properties of strongly correlated electron systems utilizing neutron and synchrotron X-ray beams.	Materials Sciences Research Center	Multiple-Degree-of-Freedom Correlation Research Group	Nuclear Science Research Institute	Toyotaka Osakabe Tel: +81-29-282-6094 E-mail: osakabe.toyotakai@jaea.go.jp	In this research, we will clarify the correlation between structures and functions of strongly correlated electron systems such as transition metal oxides by complementarily and organicly combining neutron scattering, synchrotron X-ray scattering and measurements of the bulk physical properties. We will also develop measuring techniques and sample environment apparatus indispensable for this research.	Radiation Worker	Physics Material Measurements and Instruments
J33	Development and application of the energy-resolved neutron imaging technique for visualization of spatial distribution of physical and chemical information	J-PARC Center	Neutron Science Section	J-PARC Center	Takenao Shinohara Tel +81-29-284-3285 E-mail takenao.shinohara@j-parc.jp	Development of an energy-resolved neutron imaging technique and application study of this technique will be performed to visualize spatial distributions of several physical and chemical information, such as crystalline structures, nuclides, magnetic fields, and heats using the pulsed neutron imaging instruments named "RADEN" at MLF of J-PARC. In addition, support of other pulsed neutron imaging experiments and development of neutron devices and data analysis software regarding the energy resolved neutron imaging using pulsed neutrons will be performed.	Radiation Worker	Physics Applied Physics Mechanics Material Radiation
J34	Sophistication of the mercury target for high-power pulsed spallation neutron source	J-PARC Center	Neutron Source Section	J-PARC Center	Takashi Naoe Tel +81-29-284-3210 Email takashi.naoe@j-parc.jp	At the pulsed spallation neutron source in the Materials and Life science experimental Facility of J-PARC, mercury is employed as a target material and embraced in a multi-walled stainless steel vessels. With a 3-GeV high-intensity pulsed proton beam injection on to the target, pressure waves are generated in the mercury due to the abrupt heat deposition, generating pressure waves in mercury. The pressure waves propagate in mercury, causing severe erosion damage on an inner wall surface of the vessel. A technique of injecting gas microbubbles into the mercury has been adopted to mitigate the pressure waves that causes cavitation. This technique is also expected to reduce cyclic stress to the vessel, leading to prolong fatigue life. Aiming at achieving stable at the rated beam power of 1 MW, in this theme, optimization of the numerical calculation method to estimate the interference effect on pressure waves between the bubbly mercury and the elastic wall of the target vessel made with stainless steel, extending the calculation method to structural analysis, sophistication of the flow channel structure of the vessel to enhance the effect of pressure wave mitigation will be conducted.	Radiation Worker	Material Mechanics Applied Physics Mathematics
J35	Research and development for increasing beam power and stability of the J-PARC accelerator system	J-PARC Center	Accelerator Section II	J-PARC Center	Kazami Yamamoto Tel +81-29-284-3095 E-mail kazami@post.j-parc.jp	Research and development is carryied out for realizing stable 1-MW beam power operation in the J-PARC proton accelerators. Beam loss reduction is one of the main issues with such a high power beam in the accelerators. A stable and long lifetime operation of accelerator components is also an important issue. The candidate will research one or more topics for beam loss reduction in the J-PARC Linac and 3GeV rapid cycling synchrotron, for improvement of accelerator components to establish stability, and for development of control system to precisely manipurate the components and the beam.	Radiation Worker	Physics Radiation Measurements and Instruments Electricityand Electronics Applied Physics

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№	Theme	Department	Section	Location (*)	Contact Person	Summary	Radiation Worker/ Non-Radiation Worker	Field (for reference)
J36	Research for Thermal-hydraulics properties of liquid lead-bismuth eutectic alloy	J-PARC Center	Target Technology Development Section (http://j-parc.jp/Transmutation/ja/ads-j.html)	J-PARC Center	Hironari Obayashi Phone: +81-29-282-6026 E-mail: obayashi.hironari@jaea.go.jp	Liquid Lead-bismuth eutectic alloy (LBE) is one of the candndate materials for accelerator driven system (ADS) to transmute long-lived radioactive waste. However, by the heavy weight of LBE itself, there exists several difficulties to circurate LBE safely. To perform the design study of ADS, especially for the plant heat balance, it is important to predict thermal-hadraulic perofrmance of LBE accurately. These data are also useful to perform precise thermal-hydraulic analysis of LBE spallation target planned within the framework of J-PARC project. The experimental studies are expected to understand thermal-hydraulic capabilities of LBE by using large-scale LBE experimental loops installed in J-PARC Center.	Non-Radiation Worker	Mechanics Material Physics Applied Physics
J37	Development and application of structure analysis techniques for surface and interfaces of softmatter	J-PARC Center	Neutron Science Section	J-PARC Center	Hiroyuki Aoki Tel +81-29-284-3333 E-mail hiroyuki.aoki@j-parc.jp	In Materials and Life Science Experiemt Facility (MLF) in J-PARC, structure analysis techniques at a length scale from sub-nanometers to micrometers have been developed at neutron beam lines such as a reflectometer SHARAKU and a deuteration laboratory is launched to develop preparation methods of deuterated samples for neutron experiments. This research project studies the structure and dynamics of soft matters at the surface and interfaces using the neutron beam lines and the deuteration facility in MLF.	Radiation Worker	Chemistry Physics Material Applied Physics Applied Chemistry Measurements and Instruments
J38	R&D of high temperature heat utilization process for hydrogen production	HTGR Research and Development Center	IS Process Experiment Group	Oarai Research and Development Institute	Shinji Kubo Tel +81-29-267-1919 (Ext. 3791) E-mail kubo.shinji@jaea.go.jp	Promising next generation heat source such as high temperature gas-cooled reactors can be utilized for thermochmical hydrogen production processes and various heat application system. This study subject aims to improve performances of such hydrogen production process by developing innovative separation methods or chemical reaction techniques.	Non-Radiation Worker	Chemistry Applied Chemistry Chemical Engineering Measurements and Instruments
J39	Development of techniques of radiometric dating for geological events	Tono Geoscience Center	Geochronology Research Group	Tono Geoscience Center	Akiomi Shimada Tel +81-572-53-0211 E-mail: shimada.akiomi@jaea.go.jp	For the study on long-term geological stability related to research and development of the geological disposal of high-level radioactive waste, we need to estimate the ages of past fault and volcanic activities, as well as uplift and erosion rates by techniques of radiometric dating. The aim of our study is improvement for the techniques of radiometric dating using an accelerator mass spectrometry and an inductively coupled plasma mass spectrometry in order to know the age of geological events.	Non-Radiation Worker	Radiation Geo and Environemtal Sciences Measurements and Instruments Chemistry
J40	Research on Uranium transport in the Environment	Ningyo-toge Environmental Engineering Center	Environmental Research Section	Ningyo-toge Environmental Engineering Center	Toshio Nakagiri Tel +81-868-44-2211 E-mail nakagiri.toshio@jaea.go.jp	Candidates with challenging spirits for discovery, exploiting new research fields, and creating new technology in either of the following research fields are preferable. 1. Experimental and/or field research to elucidate desolution behavior into groundwater in near surface and reaction mechanisms (sorption, mineralization, complexation, microbial response etc.) between uranium/daughter nuclides and solid phase (mineral, microorganism, environmental organics, etc.). 2. Creation of novel technologies to simulate transport behavior of uranium/daughter nuclides in ground water. 3. Computational science for the above-mentioned research.	Non-Radiation Worker	Physics Chemistry Geo and Environemtal Sciences Material Measurements and Instruments Computer and Information