Q-PELS - Kyushu University Program for Emerging Leaders in Science -

Introduction

Kyushu University is recognized as a leading science university internationally.
Kyushu University's Program for Emerging Leaders in Science (Q-PELS) is a research-oriented student exchange program for graduate and undergraduate students.
Q-PELS provides students with hands-on experience at a wide range of top-level laboratories* to enrich their knowledge and skills. We believe students from our prestigious partner universities can make a future research hub by collaborating and networking in this program.

*Please check the attached list.

Eligibility

Q-PELS applicants must meet the following requirements.

- Applicants must be full-time registered degree-seeking students at their home institution with a student exchange agreement with Kyushu University.
- Applicants must be in excellent academic performance at their home institutions.
- Applicants must be reminded as full-time registered degree-seeking students at their home institution after completing this program.
  (Graduation/completion of a regular course of study at their home universities during participation in this program is not acceptable.)
- Applicants must meet other requirements by the host laboratory or host faculty member.

Language Requirements

Q-PELS applicants must meet one of the following language requirements.

<For English proficiency>

- TOEFL iBT 80 or higher
- IELTS 6.0 or higher
- Cambridge English with CEFR B2 level or higher
- Official document (certificate/letter) which proves English is the medium of instruction at their school/graduate school/faculty.

<For Japanese Proficiency>

- JLPT N2 or higher

Student Workload

Category Name	TYPE1* 32days - 3months	TYPE2 Semester (15 weeks)	TYPE3 Full-year (30 weeks)
Period	**June.2025- Sep.2026**	**Oct.2025- Feb.2026**	**Oct.2025- Aug.2026**
Contact Hours (i.e. hours you spend in the assigned Lab)	Arrange with their host labs /faculty member	420	840
Supervised Study (Meeting with their supervisor)		20	40
Independent research hours		210	420
Tutorial (Supplementary advised from senior students)		30	60
Preparation hours		40	80
Other Laboratory Activities		30	60
Total Student Workload	N/A	**750**	**1500**
Student Workload ECTS Equivalent (25hrs 1ECTS)	N/A	30	60

ECT: European Credit Transfer and Accumulation System

***TYPE1: TYPE 1 applicants will arrange with the host lab to determine the length of study abroad, which will be between 32 days and 3 months.**

<Mandatory Assignment>

- **Poster presentation (full-year student)**
- **Oral presentation (at the end of the exchange term)**
- **Other assignments as assigned by your host laboratory or faculty member**

*Numbers indicate hours per semester or a full year. On average, daily contact hours will be 5.6 hours. The above ECTS-compliant table can be referred to facilitate credit transfer between Kyushu University and partner institutions.

Note:

- The ECT equivalent will be awarded based on the 'Total Student Workload' when performances are

approved by the committee members.
- Q-PELS students are not required to complete a thesis; however, the activities during the program could be a part of a master/doctoral thesis with permission from an academic advisor)
- Other than Contact hours are estimated that vary by laboratory.

Student Status

●32days – 3 months (No credits at KU)
<Both Graduate and Undergraduate student> Trainee Student or Short-term Visiting Student
●Semester/Full-year
<Undergraduate student> Special Auditing Student
<Graduate Student> Special Research Student or Special Auditing Student

Note:
- Special Auditing Students are allowed to take other credited courses at KU.
(Courses conducted in English) https://www.isc.kyushu-u.ac.jp/intlweb/en/student/english
(Japanese classes for Undergraduate students) https://isc.kyushu-u.ac.jp/center/jacs/
(JTW core courses) https://isc.kyushu-u.ac.jp/jtw/nonjtw

Completion

Students who complete the mandatory assignments and are approved by the program's host school/graduate school will be issued a Certificate of Completion signed by the dean of the host school.

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Course code	Category			Course		Host Laboratry Information				Research Description	Pre-Requisites	Maximum number of partcipants per period	Keywords
	TYPE1	TYPE2	TYPE3	Undergraduate	Graduate	Faculty Member(s)		School/ Graduate school	Department				
	32days-3months	Semester Fall 2025	Full-year Fall 2025-Spring 2026			Surname	First Name						
SC24001	○	○	-	○	○	FUKUDA	Jun-ichi	Science	Physics	Theoretical study of soft matter physics (liquid crystals, polymers, glasses, supercooled liquids, etc.) and biophysics. More information can be found at https://www.sci.kyushu-u.ac.jp/e/departments/phys/labo/condensed.html.	Programming experience is desirable, although not mandatory.	1	Soft Matter Physics
						MATSUI	Jun						Liquid Crystal
						TARAMA	Mitsusuke						Polymer
													Glass
													Supercooled liquid
													biophysics
SC24002	○	○	○	○	○	Inagaki	Shio	Science	Physics	Physics of granular matter has been a main research topic in our research group. A collection of dissipative solid particles (granular matter) shows various intriguing phenomena such as size segregation, convective flow, pattern formation, flow clogging, non-Gaussian statistics, etc. We are striving to reveal the fundamental physics of granular behaviors.We mainly work on experiments but also numerical simulations such as Discrete Element Method.	Background in Physics, especially mechanics and statistical physics.	2	Non-equilibrium statistical physics
													Complex systems
													Granular physics
													Molecular dynamics simulation
													Experiments
SC24003	○	○	○	-	○	Tojo	Junji	Science	Physics	Our laboratory carries out a wide range of the experimental particle physics programs. Our focus is especially to search for a new physics beyond the Standard Model of particle physics in high-energy frontier experiments and in several experiments using muon and neutron. Students have opportunities to join those programs.	Experience of general physics experiment and learning of introductory particle physics.	1	Experimental particle physics
SC24004	○	○	○	○	○	Ohba	Masaaki	Science	Chemistry	The Ohba Lab (Physical Coordination Chemistry) focuses on functions and properties of the "space" formed by assembled metal complexes. Our interests are in novel properties based on magnetic, dielectric and luminescence properties incorporated in the framework of space, and functions based on enzyme-metal complex composites. We develop research in the interdisciplinary field of chemistry, physics, and biology with a focus on coordination chemistry.		1	Coordination Chemistry
						Ohtani	Ryo						Metal-organic framework (MOF)
						LeOuay	Benjamin						Metal-organic polyhedra (MOP)
													Functional Material
													Metal complex-enzyme composite
SC24005	○	○	○	○	○	Terasaki	Akira	Science	Chemistry	Physical chemistry of atomic and molecular clusters by means of mass spectrometry and laser spectroscopy. Please visit http://www.scc.kyushu-u.ac.jp/quantum/index_e.php for further information.	Interest in experimental physics and chemistry	2	Physical chemistry
						Horio	Takuya						Nanoscience
													Atoms, molecules, and clusters
													Laser spectroscopy
													Mass spectrometry
													Reaction kinetics

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	TYPE1	TYPE2	TYPE3			Faculty Member(s)		School/ Graduate school	Department				
	32days-3months	Semester Fall 2025	Full-year Fall 2025-Spring 2026	Undergraduate	Graduate	Surname	First Name						
SC24006	○	○	○	-	○	Hori	Yuichiro	Science	Chemical	In our laboratory, we are developing chemical biology techniques to label and visualize proteins with synthetic fluorescent molecules by devising and applying chemical principles. In living cells, countless biomolecules exist, dynamically changing their localization and controlling cellular events by performing the biomolecular functions in a subcellular region where they are needed. Visualization of the movement of these biomolecules provides important information to elucidate the physiological functions they control. We are developing original technology for fluorescent labeling of proteins to reveal how proteins move in living cells and regulate biological phenomena. Furthermore, we aim to elucidate biological phenomena regulated by nucleic acids, glycans, and extracellular vesicles in addition to proteins, and to control functions of biomolecules at will by making full use of our protein labeling technology.	Knowledge of chemistry and biology	1	Chemical Biology Fluorescence imaging Protein chemistry Synthetic fluorophores
						Adachi	Junya						
						Kanae	Yumimoto						
SC24007	○	○	○	-	○	Matsushima	Ayami	Science	Chemistry	http://chem.kyushu-univ.jp/biochem/en/ https://www.sci.kyushu-u.ac.jp/e/departments/chem/labo/struct_funct.html We have a strong interest in the molecular mechanisms of ligand-receptor interaction. Our main research targets are nuclear receptors which precisely regulate gene transcription. We focus on all nuclear receptors to elucidate their activation mechanisms comprehensively. Binding affinity is analyzed in vitro by many techniques, and transcription activity is measured by reporter gene assays using cultured cells.	Comfortable with laboratory animal care (mouse)	1	Nuclear receptor estrogen transcription endocrine-disrupting chemical opioid peptide precursor
SC24008	○	○	-	-	○	Yoshikawa	Akimasa	Science	Earth and Planetary Schiences	Various plasma phenomena occurring in "Geospace," the space around the Earth, and the associated space weather phenomena' effects on the Earth are studied using plasma physics, magnetospheric physics, and ionospheric physics. This course is intended for students who are interested in the solar-terrestrial environment and in the future application of space physics to space weather prediction.	The student must have a background in basic physics such as electromagnetism and mechanics, and an interest in space physics.	2	Space weather Space plasma physics Space and Earth electromagnetism Global electromagnetic fields obserbation
SC24009	○	○	○	○	○	Liu	Huixin	Science	Earth and Planetary Science	We study the upper atmosphere (thermosphere/ionosphere) of the Earth, Mars and Venus and their response to solar forcing, and lower atmosphere forcing via atmospheric waves and chemical processes. Ground/Satellite observations, along with model simulations are used to explore the physical and chemical coupling processes between various regions of the atmosphere.	Programing ability with Python or Matlab	3	space weather Earth and planetary atmosphere Earth and planetary ionosphere Earth and planetary thermosphere satellite observation model simulation
MA24003	○	○	○	○	○	Kaji	Shizuo	Mathematics	Mathematics	Professor Shizuo KAJI works in the field of applied topology. His research interests include topological data analysis, geometric models of graphs and other discrete structures for machine learning, and 3D shape analysis and design. Please visit his web page at https://www.skaji.org for more information.	Knowledge of undergraduate mathematics such as linear algebra, calculus, point set topology, and metric space	2	Topological Data Analysis Geometric Representation Learning Geometric Shape Design Applied Topology

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MA24004	○	○	○	○	○	CESANA	Pierluigi	Mathematics	Mathematics	My Lab focusses on two main lines. 1) (more classical) Partial Differential Equations and Continuum Mechanical models for smart materials. This includes Shape Memory Alloys, Liquid crystals and more. Some of this work in collaboration with Caltech and Oxford groups. See: https://arxiv.org/abs/2207.02511 https://arxiv.org/abs/1501.06859 2) Artificial Intelligence and Machine Learning methods for the accelerated design of molecules and materials for targeted applications in electronics, semiconductors, etc. See: https://linkinghub.elsevier.com/retrieve/pii/S2666827022000093	Flexible as various projects will be available based on each student's background.	2	Partial Differential Equations Plasticity Dislocation Disclination Liquid crystals Continuum Mechanics Calculus of Variations Cellular Automata Machine Learning Quantum chemistry Density Functional Theory
MA24005	○	○	○	○	○	Hiroshima	Fumio	Mathematics	Mathematics	I am studying the spectral analysis of operators on an infinite dimensional space. Especially, from the mathematical standpoint, we investigate the quantum field theory on pseudo-Riemannian manifolds by using operator theory, micro-local analysis, theory of one-parameter semigroup, stochastic analysis, functional integral.	Knowledge of measure theory, linear algebra, general topology	1	quantum field theory path integral functional analysis spectral analysis measure theory mathematical physics
MA24006	○	○	○	○	○	Ochiai	Hiroyuki	Mathematics	Mathematics	Professor Ochiai works on Algebraic Analysis, including Special Functions, Hypergeometric functions, Representation Theory of Lie groups and Lie algebra, D-modules	Calculus and Linear algebra are necessary.	2	Algebraic Analysis D-module hypergeometric function spherical function Hecke algebra Lie group

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MA24007	○	○	○	○	○	Nguyen	Dinh Hoa	Mathematics	Mathematics	Professor Nguyen's research is on the modeling, optimization and control towards clean and autonomous power and energy systems. His particular interests are on distributed control and optimization; multi-agent systems; integration of renewable and distributed energy resources; stability, robustness and resiliency of smart grids. For more details, please see: https://sites.google.com/site/dinhhoanguyensite	Basic programming; Linear Algebra; Ordinary Differential Equation	1	Control Theory Smart Grid Optimization Multi-Agent System Renewable and Distributed Energy Resources Artificial Intelligence
MA24008	○	○	○	○	○	Matsue	Kaname	Mathematics	Mathematics	Research interests in this Lab are mainly twofolds. 1: Dynamical Systems. Based on (ordinary) differential equations, various complex, singular behavior are studied. Recently, blow-up solutions and singular perturbation problems are mainly studied. 2: Numerical Analysis with application to dynamical systems. Singular nature in dynamical systems is also studied from the viewpoint of numerics. Numerical difficulties in these problems are our issues here. As an application, the following topic is also studied. 3: Combustion.	Knowledge of undergraduate level mathematics. Basic programming skills (like C or Python) are preferable to have. Students who are interested in Topic 1 (in Research Description) are strongly welcome.	1	Dynamical Systems Numerical Analysis Singular Perturbation, Blow-up Complex Systems involving Combustion
MA24009	○	○	-	○	○	Fukumoto	Yasuhide	Mathematics	Mathematics	This course is to conduct a mathematical modeling of fluid phenomena in terms of partial differential equations, an asymptotic analysis for getting an essential information of their solution and a numerical calculation of the full solution.experience, with its feedback to the phenomena. Specific targets are vortex dynamics, stability of fluid motions, magnetohydrodynamics, flows through porous media, flood of rivers, combustion.	Communications are made in English	2	Fluid mechanics Hamiltonian mechanics Hydrodynamic stability Vortex motion Magnetohydrodynamics Combustion
MI24001	○	○	○	○	○	Ta	Ton	Joint Graduate School of Mathematics for innovation	Agro-Environmental Sciences	Mathematical Modeling Lab website: http://www.agr.kyushu-u.ac.jp/lab/ta/ We study various real-world phenomena by using stochastic ordinary/partial differential equations, statistical models, or deep learning. Some topics include Fish Schooling, Forest Ecosystem, Weather Prediction.	Love mathematics or applied statistics or programming (MATLAB, Python,...)	2	Stochastic differential equations Fish schooling Deep learning Applied statistics Forest ecosystem Stochastic evolution equations
SL24001	○	○	○	○	○	Kenshi	Hayashi	System Life Science	Electronics	Hayashi Lab/Organic Electronics Lab is focused on bio-mimetic/organic material devices, which detect odor information. Espetially, odor imaging device for robotic application based on two dimensional plasmonic materials and molecular selective materials, which realize high-sensitive, high-speed and high throughput visualize spatiotemporal changes of chemical space. Fully inkjet printed sensor devices are also researched.		2	gas sensor plasmonic device nano material IoT application sensor robot application

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SL24002	○	○	○	○	○	Iramina	Keiji	System Life Science	System Life Science	Iramina lab is focused on neuroimaging, Biomedical engineering, and Neuroengineering. We study in the fields of the measurements of brain function by EEG and NIRS, the development of measurement technology. The elucidation of the mechanism of brain function is one of foundations of life science, and it can be applied to almost all the fields. Have a deep understanding of brain information processing, and apply the research results to fields of life science, medicine, welfare and education is the purpose of our study.		4	Neuroimaging Neuroengineering Biomedical engineering
SL24003	○	○	○	○	○	Lauwereyns	Johan	Systems Life Sciences	Systems Life Sciences	The Lauwereyns Lab hosts research in the areas of cognitive science and bioethics, particularly with respect to meta-decision-making and cognitive biases. We typically use eye-tracking, biometrics and behavioral measurements in our research.	One of the following is required: 1) have studied experimental psychology or cognitive science; 2) have studied bioethics; 3) have good programming skills (Python); or 4) have good statistical skills (particularly ANOVA).	2	Bioethics Cognitive biases Meta-decision-making
SL24004	○	○	○	-	○	Arata	Jumpei	Systems Life Sciences	Systems Life Sciences	Our research aims at new medical applications based on Robotic technology. Robotic technology includes many elements – mechanism, sensor, control, system integration and etc. We study about these elements to realize further effective medical applications. Visit our website for more details: https://amd.mech.kyushu-u.ac.jp/	Fluent English conversation skills. Basic knowledge of Mechanical Engineering (Mathematics, Mechanics, Mechanical Design)	1	Robotics Medical Application Surgical robots Rehabilitation robots Bio sensors Brain-Machine Interface