The Themes List of JAXA Aerospace Project Research Association recruitment 2015

Attached Sheet #1

No.	Places of work	Themes	Details	Required Abilities	Environment	Research Leaders	Contacts	Ratios (Own research: Project contribution)
1	Chofu Tokyo	ECLSS (air and water revitalization) for Manned Expolaration	Operation of the ISS has been extended until 2020. The research on environmental control and life support system(ECLSS) has progressed as a mission project. There is a limit to the supply of resources such in space station, Moon base and Mars base. In order to build the technology to reuse the material, circulation type life-support systems (especially focusing on air revitalization) is studied. i) Carbon dioxide separation and concentration from the atmosphere. ii) Water and methane are generated by the reaction of carbon dioxide and hydrogen (Sabatier reaction) iii) Oxygen is generated by water electrolysis Japan has advantage of environmental technology on the ground. JAXA should carry out study of environmental technology also in Space, including water re-vitalization.	It is desirable to have experience of analysis of gas and water. It is desirable to have knowledge of gas adsorption and desorption, catalysis, electrochemistry, chemical engineering. In addition, it is desirable to have a basic knowledge material balance, energy balance. It is desirable to have a wide range of knowledge and interest can combine studies and the project.	Research leader will instruct you directly. The experiment is carried out in cooperation with student trainees sometimes. Experiments on the air revitalization (CO2 removal device , CO2 reduction apparatus , water electrolysis equipment) Ventilation, Gas chromatography and mass spectrometer Experiments on the Water Reclamation	Associate Senior Researcher **Masato Sakurai**	Accociate Senior Researcher **Masato Sakurai** sakurai.masato@jaxa.jp	6:4
2	Sagamihara Kanagawa	Research and Development on Scientific Payloads for Future Solar Missions	Applicants for this position shall participate in future Japanese space solar programs such as SOLAR-C and contribute to the relevant program through R&D studies of on-board scientific instrument(s). Towards SOLAR-C, ISAS solar physics group are now engaged in studying photon-counting soft X-ray telescope and its focal-plane detector, and are also developing high-reliability mechanisms allowing >10 million movements in space which are indispensable for observing continuously magnetic activities in the solar atmosphere. Applicants are requested to be engaged in either such R&D studies on scientific instruments that can bring break-through in future space solar physics, or in the development of on-board acquisition/processing systems for science data, performance evaluation on scientific instruments followed by detailed assessment on their science performance, or in the study on engineering aspects of the spacecraft system.	Applicants are requested to have good knowledge of physics or astrophysics. For applicants who aim to carry out engineering study, basic knowledge and research capability for the relevant area are required. It is desired that the applicants have experience in hardware R&Dstudies on physics and/or astrophysics. It is requested that the applicants can promote collaborative research activities with other groups inside or outside JAXA whenever needed. Those who have strong will to push next generation space solar physics forward through hardware development are highly welcomed.	ISAS solar physics group (SOLAR-B project) will supervise the research and it is possible to use various test facilities in ISAS. Meanwhile,collaborative research activities with solar physics group at NAOJ (with which ISAS solar group have years-long working relationship) as well as use of test facilities at NAOJ are also available and encouraged.	Associate Professor **Taro Sakao** Associate Professor **Toshifumi Shimizu**	Associate Professor **Taro Sakao** sakao.taro@isas.jaxa.jp	3:7
3	Sagamihara Kanagawa	Solar physics researches based on Hinode observations	ISAS/JAXA is leading solar physics researches with the Hinode satellite. Hinode was developed and launched on September 2006 by ISAS, with NAOJ as domestic partner and with international partners. Applicants are expected to make major contributions to Hinode's scientific operations and to perform data analysis for leading researches on solar physics and its related field. Hinode has three advanced telescopes, providing high spatial resolution data of magnetic and velocity field at the photosphere and diagnostics of the hot plasma in the corona. Depending on the applicants' interests, the research topics can be selected from various kinds of topics, including the heating of the corona and chromosphere, coronal dynamics, solar flares, generation, development, and dissipation of solar magnetic fields, Sun-heliosphere connection, and Sun-laboratory plasma comparisons. In addition to science researches with Hinode, applicants are encouraged to participate in conceptual studies and research developments for the future solar physics missions, such as Solar-C.	Research experiences on solar physics or its relevant research field are required for applicants. Applicants are expected to promote his/her researches (either observationally or theoretically) based on observations including Hinode. Researches should make contributions to further improvements on our knowledge on the Sun.	Researches can be promoted in deep collaboration with researchers in ISAS and NAOJ. Also, applicants can promote research works with foreign residents at ISAS. The computers at ISAS allow researchers to access all the Hinode data on line. Applicants are highly encouraged to participant in scientific operations of Hinode. With such opportunities, he/she can realize new observations with Hinode.	Associate Professor **Taro Sakao** Associate Professor **Toshifumi Shimizu**	Associate Professor **Toshifumi Shimizu** shimizu.toshifumi@isas.jaxa.jp	5:5
4	Sagamihara Kanagawa	Astronomical researches with AKARI archival data	The infrared astronomical satellite AKARI had carried out an all-sky survey in the mid- and far-IR wavelengths as well as almost 20,000 pointed observations in various wavelengths from near- to far-IR. The AKARI data processing and analysis team is in charge of data processing and archiving of these huge amount of data to provide "Science Ready" data archive to world-wide astronomical community. The successful candidates will participate the AKARI data processing activity. In addition, the persons are expected to carry out (1) astronomical researches based on the AKARI data, and/or (2) researches in the data processing / archiving technology.	The candidates must be self-standing researchers in astronomy or software science. The candidates must have skills in astronomical data processing and software development.	The successive candidates will work together with AKARI data processing and analysis team (1 research staff, 4 post-docs) and members in the infrared astronomy group of the Department of Space Astronomy and Astrophysics (9 research staffs, 6 post-docs, 15 graduate students). Computer facilities are provided.	AKARI data processing and analysis team leader/ Associate Professor **Issei Yamamura**	Associate Professor **Issei Yamamura** yamamura@ir.isas.jaxa.jp	4:6
5	Sagamihara Kanagawa	Development of an advanced information system to promote interdisciplinary space science research and an original research using that system	In the department of interdisciplinary space science, we carry out research on informatics and information technologies in order to promote interdisciplinary space sciences, as well as individual researches in various domains of space sciences. We collect various space science data, archive them and release thme from DARTS (http://darts.isas.jaxa.jp). We develop web-applications to facilitate using the data archived at DARTS. The applicant will develop an advanced information system to access these data and to promote interdisciplinary space sciences, in cooperation with staff members in the department. Also, he/she is expected to achieve innovative scientific results using that system, which would have been difficult unless that system.	Doctoral degree in space science, informatics, or information technologies. He/she is expected to have sufficient experiences of analyzing space science data, and development of data analysis system/web system.	In our group, there are world experts on astronomy, solar physics, solar-terrestrial-physics, database, and informatics, etc. The applicants can access various archival data in these fields, and can use high performace computers to develop a new system.	Professor **Ken Ebisawa**	Professor **Ken Ebisawa** ebiswa@isas.jaxa.jp	7:3
6	Sagamihara Kanagawa	Deep Space Mission Desgin	Unlike earth-orbiting satellites, deep space explorers must reach their target objects by themselves. Trajectory desgin is the first step of deep space mission planning, which strongly constrains schedule and scale of the mission and provides critical conditions for the spacecraft design. Accordingly, trajectory design of deep space mission is not a simple energy optimization process, but a high level synthesis process of spacecraft design, operation plan, and program management. For this reason, it is also frequently called "mission design."Therefore, a researcher is expected to join the study team on future deep space missions and to cope with the problems on mission analysis and spacecraft design. The researcher is also expected to study on the design process specific to deep space missions.	What is required to perform this research is a wide range of knowledge and capability in space technology. In particular, to have research experience in the field of astrodynamics (mainly of trajectory design), or research/development experience of spacecraft system is preferable.	The research is done under the lead of research staffs in ISAS Department of Space Systems and Astronautics, as well as the colaboration with other research staffs in JAXA (ISAS, JSPEC, etc.). A PC for design and analysis use will be provided to the researcher, and the JAXA super computer is also available on research necessity.	Associate Professor **Yasuhiro Kawakatsu**	Associate Professor **Yasuhiro Kawakatsu** Kawakatsu.Yasuhiro@jaxa.jp	5:5

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7	Tsukuba Ibaraki	Life Time Prediction and Vibration Simulation for Rockets and Spacecraft	To ensure high reliability in developing rockets and spacecraft, life time and vibration characteristic are key design issues. Simulation technology is often used to predict and understand the multi-physics phenomena of rockets and spacecraft to avoid the critical failure in the late developing stage. The life time prediction of the combustion chamber and the spacecraft is important because they are exposed to a severe heat-structure loaded environment. Also the system's vibration characteristic is also important because the effect of launch-induced vibration and orbital disturbance could lead to a structural catastrophe. Our research is to develop the simulation technology to predict and understand the phenomena of rockets and spacecraft in early developing stage and it leads us to a development with higher reliability.	(1) Basic knowledge of structural dynamics, vibrational dynamics and fracture mechanics. (2) Knowledge of computational engineering and R&D skills of simulation method. (3) Communication skill including oral and written language.	You will be working as a team with mainly 3 other engineers/researchers in structural simulation field and provided with a support from every member in the simulation team. We offer opportunities to create network with project managers, commercial and academic partners through a technical meeting we organize at University of Tokyo. Also you may use JSS(JAXA's super computer) for your research.	Councilor **Hiroshi Inoue**	Researcher **Yu Daimon** daimon.yu@jaxa.jp	6:4