The Themes List of JAXA Aerospace Project Research Association recruitment 2014

Attached Sheet #1

No.	Places of work	Themes	Details	Required Abilities	Environment	Research Leaders	Contacts	Ratios (Own research: Project contribution)
1	Sagamihara Kanagawa	Research works on space astrophysics with international missions	We have opportunities for postdoctoral researchers, who will engage in research activities on space astronomy and astrophysics with international missions, which is being promoted with intensive international collaboration including our department. The successful applicant is expected to contribute for missions such as the U.S-Japan joint rocket experiments CIBER2 (to explore the first-generation stars by infrared observation) and FOXSI2 (hard X-ray observations of the sun) and to participate in data analysis activities of Gamma-ray Fermi mission. Astronomical observations, related with space missions, with ground-based telescopes are also included in the tasks.	Experience in space instrumentation, astronomical instrumentation for ground-based telescopes, or experimental physics related to this research area is expected.	Successful applicants will be involved in the international research groups under the supervision of faculty members in the Department of Space Astronomy and Astrophysics. The department has fabrication equipment and test facilities for the experimental research.	Professors Tadayuki Takahashi, Kazuhisa Mitsuda, Tadayasu Dotani Manabu Ishida, Takao Nakagawa, Hideo Matsuhara, Masato Tsuboi	Professor Tadayuki Takahashi +81-50-3362-6448	5:5
2	Sagamihara Kanagawa	Research works for future space astrophysics missions	We have opportunities for postdoctral researchers, who will work on fundamental researches for mission concepts, development of innovative observation instruments, and related studies for future space astrophysics missions. The department of Space Astronomy and Astrophysics currently consists of three groupes: X-ray astoronomy, infrared astronomy and radio astronomy. The successful applicant is expected to contribute for examination of future missions in these areas. We also welcome researches for mission concepts based on new ideas outside of the areas mentioned above and development of observational instruments for these missions.	Experience in space instrumentation, astronomical instrumentation for ground-based telescopes, or experimental physics related to this research area is expected.	Successful applicants will be involved in the international research groups under the supervision of faculty members in the Department of Space Astronomy and Astrophysics. The department has fabrication equipment and test facilities for the experimental research.	Professors Tadayuki Takahashi, Kazuhisa Mitsuda, Tadayasu Dotani Manabu Ishida, Takao Nakagawa, Hideo Matsuhara, Masato Tsuboi	Professor Tadayuki Takahashi +81-50-3362-6448	5:5
3	Sagamihara Kanagawa	Reserch work in the astronomical instrumnentation for SPICA and future space infrared missions	Our group is promoting the next-generation infrared astronomical satellite, SPICA, to the key issues in modern astronomy, e.g., birth and evolution of galaxies and planetary systems. SPICA is a 3.2m, cold telescope which has outstanding sensitivity and angular resolution. SPICA is proposed to be launched in FY2022 under extensive international collaboration. Moreover, we supplement such a large mission with sub-orbital small missions using sounding rockets and balloons. We have opportunities for postdoctral researchers, who will work in basic research and development including highly-sensitive infrared detectors, focal plane instruments, coronagraph system, light-weight telescope, and cryogenics, and/or system design of the instrumentation for above missions.	Experience in the satellite instrumentation, astronomical instrumentation for ground-based telescopes, or experimental physics related to this research area is expected.	Succesful applicants will be involved in the international research group that drives the SPICA project under the supervision of faculty of the Infrared Astronomy Group in the Department of Space Astronomy and Astrophysics. With two professors, four associate professors, and three assistant professors, the Infrared Astronomy Group at ISAS is one of the largest research group in infrared astronomy in Japan. The group has fabrication equipments and test facilities for the experimental research.	Professor Takao Nakagawa	Professor Takao Nakagawa +81-50-3362-5920	4:6
4	Sagamihara Kanagawa	Researches in/for radio astronomy including space VLBI	Both of (1) researches in radio astronomy including space VLBI and (2) conceptual study and/or technical developments for a future space mission of radio astronomy are supposed to be conducted.	Basic understanding of radio telescope, interferometry, and VLBI. Research experiences in radio astronomy.	Collaboration with the radio astronomy groups in ISAS/JAXA, NAOJ and Unversities. Instruments for developements in mm-wave including a 4-K cryostat, a spectrum analyser, and a mm-wave radiometer. Radio astronomical facilities in th Usuda and Uchinoura stations.	Professor Masato Tsuboi Associate Professor Yasuhiro Murata	Professor Masato Tsuboi +81-50-3362-6549 Associate Professor Yasuhiro Murata +81-50-3362-2956	7:3
5	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 opeations 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, cornal dynamics, solar flares, genration, 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 theoritically) based on observations including Hinode. Researches should make contributions to further improvements on our knowledge on the Sun.	Reseaches can be promoted in deep collaboration with researchers in ISAS and NAOJ. Also, applicants can promote resarch 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 realise new observations with Hinode.	Associate Professors Taro Sakao Toshifumi Shimizu	Associate Professor Toshifumi Shimizu +81-50-3362-4663	5:5

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6	Sagamihara Kanagawa	Numerical simulation/Data analysis study in solar system sciences	Spacecraft data analysis studies or numerical simulation studies on themes in the field of solar system sciences. Successful applicants are expected to collaborate with members of Department of Solar Sytem Sciences and/or JAXA's International Top Young Fellows. The Department consists of four groups: Solar, Space Plasma, Planetary Atmosphere and Planetology. While the applicant's research themes can be the ones dealt in each group, it is desirable that the proposed themes are over-arching ones. Likewise, the themes over-arching between solar system science and astrophyiscs are welcome.	Research experience in solar system sciences.	Access to various spacecraft data will be possible via members of the Department. JAXA's high-performance computational facility is available for numerical simulations. Some of the JAXA's ITYFs are having good collaboration with members of the Department.	Professor Masaki Fujimoto	Professor Masaki Fujimoto +81-50-3362-5063	7:3
7	Sagamihara Kanagawa	Development of new methods for science data analysys/instrument design with high-performance computing technology	Numerical simulations can virtually reproduce the space environment that is quite diffucult to simulation in ground experiments, so that, they are expected to contribute design process of spacecraft system. Mission data obtained from the advanced science spacecrafts become huge volume, and complicated data process is required. Moreover, modern space science research styles require not only complex data analysis itself, but also cooperation with numerical modelings. Now that, high performance computing technology should be applied to wider situations of space science missions, not only to theoretical numerical simulations. In this sense, we will develop the applied technique of numerical simulations to science data analysis or spacecraft subsystem design.	The project researchers of this application is expected to propose new ideas for science data analysis technique or onboard subsystem design utilizing high-performance computing technology.	The project researchers will do their research topics under the collaboration with JAXA staffs related to their thema. The JAXA supercomputer system can be utilized for this research application.	Associate Professors I. Shinohara, and R. Takaki	Associate Professor Iku Shinohara +81-50-3362-3279	7:3
8	Sagamihara Kanagawa	Space Flight Systems Engineering	Space flight systems engineering covers the fields of astronautics, space systems engineering, space transportation engineering, and structure & material engineering. Applicants are expected to contribute to space scinece research and projects by their speciality in these fields.	Applicants are required to have wide range of knowledge and capability of space engineering. It is preferable to have master degrees or higher in the fields of space engineering.	The research is done under the lead of research staffs in ISAS Department of Space Flight Systems, as well as the colaboration with other research staffs in JAXA. The ISAS facilities and tecnology staffs' supports are also available when necessary.	Professor Yasuhiro Morita	Professor Yasuhiro Morita +81-50-3362-6234	7:3
9	Sagamihara Kanagawa	Research on On-board Instruments for Synthetic Aperture Radar with Small Satellite	A dream comes true. Real-time earth observations at any time at any weather become possible with satellite constellation if a synthetic aperture radar (SAR) can be compatible with a 100kg small satellite. In order to realize SAR observation with a small satellite, a RF amplifier with high-efficiency and high- duty cycle, an efficient power/thermal system that can manage its high peak-power requirement will be developed in this research. For an example we will develop a X band GaN HEMT amplifier based on device physics, microwave circuit design and thermal engineering such as heat-pipe technologies and spatial combiner technologies.	Knowleges and experimences that are required for this research are on device physics/simulations, microwace circuit design, micorwave measurement, powe and thermal engineering and thermal engineering.	Our institute can provide with research guidance on device physics, microwave circuit, micrawave measurement and SAR sensor. RF measurement systems and space environment test equipments are available at our institute. Above all, we can provide you with a chance that your idea or device flight to space.	Professor Hirobumi Saito	Professor Hirobumi Saito +81-50-3362-2657	8:2
10	Sagamihara Kanagawa	GEOTAIL Data Analysis Studies in International Multi-Point Observations	Nowadays, there are a lots of magnetospheric observatories in the Earth's magnetosphere, such as NASA THEMIS, ESA Cluster-II as well as JAXA's GEOTAIL satellites. Making well-organized multipoint simultaneous high-quality observation datasets provide a big jump for understanding the Earth's magnetosphere. Project researchers of this application are expected to contribute to international joint research of the magnetospheric multi-point measurement studies by maximizing GEOTAIL results. A launch of NASA MMS fleet is scheduled in 2014, and the GEOTAIL project will have good chance to make collaboration with the MMS project. Project researchers are highly expected to promote collaborative studies using both GEOTAIL and MMS data.	Project researchers are expected to promote data analysis studies using GEOTAIL data in the international multi-point observations, under the condition where the latest datasets of a number of magnetosheric observatories can be easily used. It is desirable to have English ability required for the abovementioned international research promotion.	The staff scientists of GEOTAIL projects will collaborate with project researchers. The project researchers can use scientific datasets of GEOTAIL as well as the data analysis computer fascility.	GEOTAIL Project Manager Iku Shinohara	GEOTAIL Project Manager Iku Shinohara +81-50-3362-3279	7:3
11	Sagamihara Kanagawa	Research in astronomy and astrophysics with the Suzaku observatory, operation and instrument calibrations	The Suzaku observatory which was put into the orbit in July 2005. There are many research themes utilizing the eight years of observations. The researchers are also expected to contribute in improving calibrations of the instruments and/or analysis software, and operations of the spacecraft.	Research experience in physics and astrophysics, data analysis in using UNIX computers.	The Suzaku project will provide all necessary data-analysis environment. We can support researches of various different fields in high-energy astrophysics, since there are six supervisors with different research interests.	Professors K.Mitsuda, T.Takahashi, T.Dotani, M.Ishida Associate Professors N.Y.Yamasaki, .M.Kokubun	Professor Kazuhisa Mitsuda +81-50-3362-3621	7:3

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12	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&D studies 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 Professors Taro Sakao Toshifumi Shimizu	Associate Professor Taro Sakao +81-50-3362-3718	3:7
13	Sagamihara Kanagawa	Development of the X-ray Satellite, ASTRO-H	Telescopes for the Hard X-ray Imager, and two Soft X-ray Telescopes, one with a micro-calorimeter spectrometer array with excellent energy resolution of <7 eV, and the other with a large area CCD in their respective focal planes. In order to extend the energy coverage to the soft gamma-ray region up to 600 keV, the Soft Gamma-ray Detector, which is based on the cocept of Si/CdTe Compton Gamma Camera, will be implemented as a non-focusing detector. Applicants are expected to participate in the project to develop these instruments and also to work on science achieved by the mission. Contribution to the mission-wide technologies such as data acquisition, data processing and satellite bus system is also the area of research. (For further information on the project, please visit http://astro-h.isas.jaxa.jp).	Background of physics or astrophysics, It would be desireable if applicants have some experiences on design and actual development of radiation detectors for X-rays and gamma-rays.	Reseach will be performed under supervision by professors in the department of high energy astrophysics and related departments. In addition to perform research in the field of high energy astrophysics, applicants can access cutting edge technologies implemented in the instruments to be onboard the ASTRO-H satellite. These technologies include highly advanced X-ray and gamma-ray detectors, Space Wire network, and analog VLSI.	Professor・ Tadayuki Takahashi	Professor Tadayuki Takahashi +81-50-3362-6448	5:5
14	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 more than 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 taken by the AKARI mission. 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 are expected to work together with AKARI data processing and analysis team (1 research staff, 3 post-docs) and members in the infrared astronomy group of the Department of Space Astronomy and Astrophysics (9 research staff, 7 post-docs, 16 Ph.D. students). Computer facilities are provided.	AKARI data processing and analysis team, leader/Associate Professor, Issei Yamamura	Associate Professor Issei Yamamura +81-50-3362-7398	4:6
15	Tsukuba Ibaraki	Investigation for Low Toxic Spacecraft Propulsion Subsystem with Green Propellant	A low toxic spacecraft propulsion subsystem with green propellnats is required to reduce environmental pollution in substitution for hydrazine-based propellnat. The objective of this project is to solve the basic engineering problems for a thruster with green propellants and lead to achieve a low toxic spacecraft propulsion system. The researchers are expected to participate in the development of the low toxic propulsion sysytem and investigation of refractory catalyst and optimization its reaction process.	Research experience and skills in green propellnats, HAN-based and ADN-based, and these catalyst reaction chemistory. Experimental skills for the chemical reaction with catalyst to assess these phenomena cited above. Experimental and management skills to perform thruster static firing tests in vacuum conditions. Research experience in spcecraft propulsions.	Propulsion Group will provide the proplsion evaluation facilities. JAXA's thruster firing facility, AKIRUNO facility, is also provided.	Associate Senior Engineer Taiichi Nagata	Associate Senior Engineer Taiichi Nagata, +81-50-3362-4520	5:5
16	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 revitalization.	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 instruct directly. The experiment is carried out in cooperation with student trainees sometimes. Experiments on the air revitalization (CO_2 removal device , CO_2 reduction apparatus , water electrolysis equipment) Ventilation, Gas chromatography and mass spectrometer Experiments on the Water Reclamation	Accociate Senior Researcher Masato Sakurai	Accociate Senior Researcher Masato Sakurai +81-50-3362-2909	6:4

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17	Chofu Tokyo	Improved Modelling of Nonequilibrium Radiative Heat Transfer Processes around High-Speed Atmospheric Entry Systems	Currenty, a number of sample return missions for superior planets and astroids are entertained worldwide as candidates for future planetary explorations. In such missions, high-speed atmospheric entry systems with atmospheric entry velocities greater than 13 km/s are needed, which are expected to encounter intense radiative heating due to surrounding high-temperature gases in considerable non-equilibrium state. This research is aimed at improvement of analytical procedures to predict significant radiative heat transfer rate in considerable non-equilibrium state. The scope of this study covers experimental validation of numerical models by using a shock tube operated in JAXA, in collaboration with JAXA's on-going research programs on radiation researches.	Applicants are requested to have comprehensive knowledge about radiative heat transfer, chemical kinetics, and state-resolved transitions between internal states in high-temperature gases. Applicants are requested to have a total of at least 2 years' experience in numerical analysis in the above categories, including researches in doctoral course. Applicants are requested to be cooperative enough to get engaged in collaborative research with JAXA staffs.	The high-speed computing environments (super-computers, clusterred parallel PCs) are available for large-scale radiative heat transfer calculations. A high-speed shock tube, an expansion tube, and a ballistic range are available for experimental validation of the numerical models, though they should be operated with JAXA staffs. Four supervisors having detailed knowledge on radiation and non-equilibrium aerotherodynamics will support both numerical and experimental researches.	Senior Researcher Dr. Kazuhisa Fujita	Senior Researcher Dr. Kazuhisa Fujita +81-50-3362-4378	5:5
18	Tsukuba Ibaraki	Aerosol study by using GOSAT FTS and CAI data for application to GOSAT-2	The GOSAT is operated over 4 years from 2009. The next GOSAT-2 will be developed on the basis of GOSAT. Retrieval of CO2 and CH4 from FTS spectra is significantly affected by aerosol conditions. Estimation of aerosol properties of amount and profile is necessary to improve the FTS spectral quality precisely by evaluating the spectral residual features. We will investigate the appropriate FTS-2 observation and analysis methodologies by using FTS data. Also CAI-2 post-launch vicarious calibration independent of on-board calibration is investigated by using CAI data. We will also propose the pre-launch test items for GOSAT-2 in development phase.	Experience on radiative transfer calculation with aerosol scattering and absorption Knowledge on retrieval of CO2 and CH4 from SWIR and TIR spectra Technique for comaprison with other data (L1 spectral radiance, L2 geophysical parameter)	GOSAT FTS and CAI data over 4 ayears from 2009 and processing computers Instruments and data for calibration and validation activity (FTS, OSA, skyradiometer, FieldSpec etc.) Collaboration with international and dmestic researchers on GHGs, cloud and aerosol	Associate Senior Engineer Kei Shiomi	Associate Senior Engineer Shuji Kawakami +81-50-3362-7531	4:6
19	Tsukuba Ibaraki	Development of methods to integrate satellite observations and numerical weather/climate models	JAXA has promoted various missions, such as Global Precipitation Measurement (GPM) with the NASA, Earth Cloud, Aerosol and Radiation Explorer (EarthCARE) with the ESA. Satellite data simulator can be very helpful for more distinct validation of numerical weather and climate model using the data from the satellite observation. The JAXA has developed Joint Simulator for Satellite Sensors (Joint-Simulator). Satellite simulators can be used as a tool to take in the satellite data to assimilation system. The data assimilation of the satellite data will be expected to be carried out in the joint-work of the JAXA and the Meteorological Research Institute (MRI) of the Japan Meteorological Agency (JMA). Project researchers of this application are expected to contribute to research to integrate the GPM/EarthCARE data and numerical weather/climate models.	Research experience in atmospheric science, in particular, numerical weather/climate model studies and/or satellite data studies related to cloud and precipitation.	Researchers can be promoted in deep collaboration with researchers at Earth Observation Research Center (EORC). Also, researchers can promote research works with researchers at MRI/JMA and Tokyo University/NICAM group. The computers allow researchers to access all the satellite data at the EORC.	Senior Researcher Dr. Riko Oki	Senior Researcher Dr. Riko Oki +81-50-3362-3823	6:4
20	Chofu Tokyo	Researches on High-Temperature Composite Materials for Future Aerospace Systems	Currently, light-weight structural materials which can withstand high temperatures due to aerodynamic heating or combustion environments are of importance for the developments of future aerospace systems, such as hypersonic cruiser, reusable space transportation systems and reentry capsules. In this research project, the followings will become the main task. 1. Researches on the processing of newly-designed heat-resistant materials in the field of ceramic matrix composites, ablators and insulators. 2. Evaluations of mechanical properties, heat-resistance and oxidation-resistance of the newly-designed heat-resistant materials. 3. Numerical thermo-structural designing of thermal protection systems of future aerospace systems.	The applicant should have sufficient knowledge on materials science and applied chemistry, and should have experiences on the processing and evaluation of heat-resistant composites, such as ceramic matrix composites, polymer matrix composites, ablators, ceramics and insulators. In addition, it is necessary to have an ability to investigate new materials which can offer superior performance over currently available materials based on new concepts.	Facilities regarding processing, evaluation and numerical structural designing are available. They include, for example, hot press, furnaces, XRD, SEM, EPMA, TEM, FIB, TGA, DSC, TMA and mechanical testing machines. Researchers in Advanced Composite Research Center will support this research project.	Senior Researcher Takuya Aoki	Senior Researcher Takuya Aoki +81-50-3362-2358	6:4