Professors of Physics, Graduate School of Science

Professors with 「*」 do not take graduate students.

Professors with 「#」 do not take master's graduate students.

Professors with 「!」 has spesial report.

サブコース				NAME	BUREAU		E-mail	THEME
A0				Kenji FUKUSHIMA	Department of Physics		fuku@nt.phys.s.u-tokyo.ac.jp	We investigate various phenomena originating from the "strong interaction" that is associated with one of the most fundamental forces in nature. Quarks and gluons interact strongly to form hadrons such as pions, nucleons, and so on, and hadrons are constituents of any materials we know. From the same theory of the strong interaction, unexpectedly amusing physics can appear in special environments like high temperature, high density, or strong background (electromagnetic or gravitational) fields. We are pursuing novel phenomena based on this established and yet profound theory of the strong interaction.
A0	*	#		Tetsuo HATSUDA	The Institute of Physical and Chemical Research	http://www.riken.jp/en/research/labs/rnc/qtm_had_phys/	hatsudaRemoveThisPart@phys.s.u-tokyo.ac.jp	1. Theoretical studies on quantum chromodynamics at high temperature and density. In particular, the physics of quark-gluon plasma and color superconductivity in early Universe, in neutron stars and in relativisitic heavy-ion collisions. 2. Studies on quark-gluon structure of hadrons and hadron interactions on the basis of the numerical simulations of lattice quantum chromodynamics.
A0				Haozhao LIANG	The Institute of Physical and Chemical Research		haozhao.liang@riken.jp	Our research mainly focuses on the nuclear many-body theories and the relevant interdisciplinary studies in nuclear physics, nuclear astrophysics, and particle physics. Key topics include: nuclear density functional theory (DFT), structure of exotic nuclei, hidden symmetries in atomic nuclei, nuclear collective excitations, nuclear weak-interaction processes and r-process nucleosynthesis, etc.
A0				Osamu MORIMATSU	High Energy Accelerator		osamu.morimatsu@kek.jp	We study the properties of hadrons, the interaction of hadrons and the properties of the

				Research Organization			nuclear matter in the vacuum and at finite temperature and/or finite density based on QCD and its effective theory, aiming at clarifying the nature of the strongly interacting systems.
A0	*	#	Takaharu OTSUKA	Department of Physics		otsuka@phys.s.u-tokyo.ac.jp	Monte Carlo Shell Model Structure of exotic nuclei Magic numbers of exotic nuclei
A1			Koichi HAMAGUCHI	Department of Physics	http://www-hep.phys.s.u-tokyo.ac.jp/~hama/welcome-e.html	hama - AT - hep-th.phys.s.u-tokyo.ac.jp	I am interested in physics beyond the energy scale of the Standard Model of particle physics, and doing research aiming at a more fundamental unified theory underlying in nature. I have worked on model building, phenomenological study and particle cosmology of models beyond the Standard Model, such as the supersymmetric models. I also plan to pay attention to the latest results from high energy experiments and astrophysical observations, and then feed them back to theoretical research.
A1			Kentaro HORI	Ipmu	member.ipmu.jp/kentaro.hori/	kentaro.hori-atmark-ipmu.jp	My research is centered on discovery, understanding and application of duality in quantum field theory such as electric-magnetic duality and mirror symmetry; structure and properties of branes and orientifolds in superstring theory. It is sometimes developed through interaction with mathematics.
A1			Masahiro IBE	Institute for Cosmic Ray Research	http://www.icrr.u-tokyo.ac.jp/th/th.html	ibe@icrr.u-tokyo.ac.jp	In my research, I have focused on physics beyond the Standard Model which completes the Higgs mechanism at the energy scale around the TeV. The evidences of the new physics are expected to be discovered at the coming generation of collider experiments such as the large hadron collider (LHC) experiments. Especially, I have put emphasis on the interplay between the phenomenological aspects of the new physics and its cosmological/astrophysical implications. By the rapid progress in the cosmological/astrophysical observations as well as the full operation of the LHC experiments, the studies which exploit both particle phenomenology and cosmology/astrophysics will be more important than ever.
A1	*	#	Mitsuhiro	Department	http://dbs.c.u-tokyo.ac.jp/%7Ekatoh/		Research on the unified theory of elementary

				KATO	of Arts and Science			particles and the quantum structure of spacetime based on the string theory. Non-perturbative study of quantum field theory.
A1				Yutaka MATSUO	Department of Physics	http://www-hep.phys.s.u-tokyo.ac.jp	matsuoアトマークphys.s.u-tokyo.ac.jp	Subjects: Quantum Gravity, Superstring theory, Quantum field theory and related mathematica physics. More concretely, (1) Formulation of Branes in M-theory (2) related new symmetry and geometry (3) infinite dimensional symmetry appearing in 4D Yang-Mills and 2D solvable models
A1				Takeo MOROI	Department of Physics	http://www-hep.phys.s.u-tokyo.ac.jp/english/noframe.shtml	moroi at hepth.phys.s.u-tokyo.ac.jp	Particle physics, cosmology
A1				Hitoshi MURAYAMA	Ipmu	http://www.ipmu.jp/hitoshi-murayama	director@ipmu.jp	Supersymmetry Phenomenology, Particle Cosmology, Quantum Field Theory, Physics at e+ e- Linear Collider, Collider Physics, Neutrino Physics
A1				Yuji TACHIKAWA	Ipmu	http://member.ipmu.jp/yuji.tachikawa/	yuji.tachikawa@ipmu.jp	I mainly study quantum field theory (QFT), which governs the physics of elementary particles. QFT is especially interesting in the strongly-coupled regime, and is analyzable with just pencil, paper and a bit of computing power if we further assume the supersymmetry, a symmetry exchanging fermions and bosons. Supersymmetric quantum field theory is best studied by embedding it in string theory, which is another main subject of my study. An interesting aspect of this line of research is that many modern mathematical concepts somehow appear naturally.
A1				Izumi TSUTSUI	High Energy Accelerator Research Organization	http://research.kek.jp/people/itsutsui/index_e.html	izumi.tsutsui@kek.jp	Our group investigates the foundations of quantum mechanics and the nonperturbative aspects of quantum field theory. Recent research topics are: 1) Foundations of Quantum Mechanics * Quantum measurement (Weak Value and Weak Measurement) * Entanglement and quantum correlations in particle physics 2) Gauge Field Theory and Topology

							* Quantization of systems on topologically nontrivial spaces * Physics of nonperturbative field configurations such as topological solitons
A1			Taizan WATARI	Ipmu	http://member.ipmu.jp/taizan.watari/index.html	taizan.watari _at_ ipmu.jp	Institute for the Physics and Mathematics of the Universe (IPMU) welcomes graduate students who major in theoretical particle physics from the A1 subcourse (A5 subcourse for cosmology major). My research interest covers broad area in theoretical particle physics and dynamics of gauge theories. Theory of the very early universe is also a part of it, because quantum field theories and quantum gravity are the appropriate theoretical frame works to talk about the very early stage of the universe. I have been also trying to exploit superstring theory for a better understanding of particle physics, gauge theories and early universe. For more information, please visit my web page http://member.ipmu.jp/taizan.watari/index.html
A2			Hiroaki AIHARA	Department of Physics	http://tkybel1.phys.s.u-tokyo.ac.jp/index.html	aihara@phys.s.u-tokyo.ac.jp	High Energy Physics. Search for physics beyond the standard model based on measurements of CP violating processes and rare B and tau lepton decays at EKEK Super B factory accelerator. Neutrino oscillation experiment (T2K) using J-PARC neutrino beam and the Super Kamiokande neutrino detector. Study of dark energy based on the wide-field and deep galaxy survey at Subaru telescope.
A2			Shoji ASAI	Department of Physics	http://www.icepp.s.u-tokyo.ac.jp/asai/	Shoji.Asai@cern.ch	
A2	*	#	Ryugo HAYANO	Department of Physics	http://nucl.phys.s.u-tokyo.ac.jp/hayano/	hayano@phys.s.u-tokyo.ac.jp	Experimental study of elementary nuclear and atomic physics using exotic atom (atoms containing antiproton, meson, etc.) spectroscopy. 1) CPT symmetry test using high precision laser spectroscopy of antihydrogen and antiprotonic helium atoms. 2) Study of "the origin of hadron masses - chiral

							symmetry restoration in nuclei" using meson-nucleus bound states.
A2			Nobuaki IMAI	Center for Nuclear Study	http://www.researchgate.net/profile/Nobuaki_Imai	n.imai@cns.s.u-tokyo.ac.jp	Nuclear structure of neutron-rich nuclei which will be produced by RIPS or BigRIPS at RIBF are to be studied by employing the low-energy nuclear reactions such as proton resonance elastic scattering. In particular, the nuclei around 32Mg where the nuclear structure suddenly changes are being studied. This experiment can be related to an unknown nuclear force which breaks the isospin symmetry. We are also developing devices to produce a high spin isomer target of178m2Hf, which will be synthesized, and then purified by using the laser resonant ionization. When it is succeeded, long-standing dream of nuclear physics, production of hyper deformation, torus shape of nucleus, would come true.
A2			Masaya ISHINO	International Center for Elementary Particle Physics	http://www.icepp.s.u-tokyo.ac.jp/en/index.html	mishino@icepp.s.u-tokyo.ac.jp	[1] Searching for new elementary particles using Large-Hadron-Collider. Through the precise measurement of the new particles, unveil the physics beyond the standard-model. [2] To maximize the possibility to find new particles, develop a new technology on detector, trigger and software and deploy them to the real experiment.
A2	*	#	Tatsuo KAWAMOTO	International Center for Elementary Particle Physics	http://www.icepp.s.u-tokyo.ac.jp/	tatsuo.kawamoto@cern.ch	Study of particle physics using high energy accelerators. (1) Physics analyses of the highest energy e+e- collider LEP(1989-2000) at CERN: establishing the Standard Model and looking for hints of new physics. (2) Preparation for the experiment with the next generation highest energy pp collider LHC (2008-) at CERN: discovery and study of the Higgs boson, progress towards deeper understandings. (3) Study of experiment and physics with new generation of e+e- collider (linear collider) (20xy-)with energy much beyond LEP.
A2	*	#	Sachio KOMAMIYA	Department of Physics	http://www.icepp.s.u-tokyo.ac.jp/komamiya/	sachio@icepp.s.u-tokyo.ac.jp	(1) Studies on future projects on high energy physics. Promotion of the international e+e- linear collider ILC, the next principal project of high energy physics in the world. Studies on

								physics and detectors for the ILC experiments. Development of nano-beam size monitor(Shintake monitor) at ATF2 in KEK. (2) Elementary particle physics experiments using the highest energy colliders; specially, searches for Higgs bosons and Supersymmetric partcles at the CERN e+e- collider LEP and at the CERN pp-collider LHC. (3) Research and development of particle detectors and small sacle experiments; specially, development of detetors for an experiment to study quantum effect of ultra-cold neutrons in the gravitational field, and searching for new short-range force at ILL France.
A2				Tadashi KOSEKI	High Energy Accelerator Research Organization		tadashi.koseki@kek.jp	
A2				Hiroari MIYATAKE	High Energy Accelerator Research Organization	http://research.kek.jp/group/kekrnb/en/	hiroari.miyatake@kek.jp	nuclear structure and nuclear reaction mechanism of unstable nuclei, applied physics by means of RNB proves. Main subjects are, (1) nuclear astrophysics relevant to the rapid-neutron capture process, (2) mechanism of multi-nucleon transfer reactions, (3) R&D of an KEK Isotope Separation System (KISS) dedicated to the subject (1), (4) mechanism of atomic diffusion in matters by applying RNB probes.
A2				Toshinori MORI	International Center for Elementary Particle Physics	http://www.icepp.s.u-tokyo.ac.jp/~mori/	mori@icepp.s.u-tokyo.ac.jp	Exploring the mysteries of the Universe by discoveries and studies of new phenomena and particles. In particular, currently working on an international experiment to investigate supersymmetric grand unification of forces and the origin of neutrino masses through rare decays of muons (the MEG and MEG II Experiment). Also working on experimental researches in electron-positron collisions of the world's highest energy at the International Linear Collider (ILC) to study gauge interactions, symmetry breaking (Higgs bosons), and grand unified theories.
A2				Wataru OOTANI	International Center for Elementary	http://meg.icepp.s.u-tokyo.ac.jp/	wataru@icepp.s.u-tokyo.ac.jp	

				Particle Physics			
A2			Kyoichiro OZAWA	High Energy Accelerator Research Organization	http://nucl.phys.s.u-tokyo.ac.jp/ozawa_g	ozawa@post.kek.jp	Experimental study of non-perturbative QCD: 1) Study of quark-gluon-plasma and hadronic matter under high-temperature and high density condition at Relativistic Heavy Ion Collider (RHIC) at Brookhaven National Laboratory. 2) Study of mechanism of hadronic mass generation. I'm going to perform an experiment at J-PARC to study the mechanism of hadronic mass and interaction with "QCD vacuum". In addition, R&D for the new detector at J-PARC is on-going.
A2			Naohito SAITO	High Energy Accelerator Research Organization	http://g-2.kek.jp/gakusai/saito-ken.html	naohito.saito(AT)kek.jp	Spin as a tool to elucidate "origin of matter" and the symmetries of space-time We are studying the origin of matter as well as the symmetries in the space-time using "spin" of an elementary particle as a probe. With the high-energy polarized proton collider at RHIC of Brrokhaven National Laboratory (NY), we have been investigating the spin structure of the nucleon. In addition, we have started a new project to measure dipole moments of the muon with super-precision by creating a ultra-cold muon beam at J-PARC. The measurement aims a stringent test of the standard model as well we a search for CP violation in the lepton sector.
A2	*	#	Hiroshi SAKAMOTO	International Center for Elementary Particle Physics	http://www.icepp.s.u-tokyo.ac.jp/~sakamoto/index-e.html	sakamoto@icepp.s.u-tokyo.ac.jp	Mainly involved in particle physics experiments using collider accelerators. Belonging to the ATLAS experiment in LHC (Large Hadron Collider) which is being built at CERN near Geneva in Switzerland, I've been developing electronics system for the endcap muon trigger chambers. Also, I've been constructing a regional analysis center at ICEPP. The center is a part of the global analysis computer network.
A2			Yasuhiro SAKEMI	Center for Nuclear Study	http://www.cns.s.u-tokyo.ac.jp/index.php?Research%2FEDM	sakemi@cns.s.u-tokyo.ac.jp	To explore the mechanism responsible for the generation of observed matter-antimatter asymmetry in the Universe, the research on fundamental symmetry violations and various

							fundamental interactions using the laser cooled and trapped heavy elements is being promoted. The construction of a facility containing high density of laser cooled radioactive atoms is in progress, and it serves as a center for carrying out several studies on fundamental symmetries.
A2			Hiroyoshi SAKURAI	Department of Physics	http://nucl.phys.s.u-tokyo.ac.jp/sakurai_g/welcome-to-sakurai-lab-en/	sakurai@phys.s.u-tokyo.ac.jp	Heavy Ion Nuclear Physics Research activities covered by our laboratory are the field brought out by the advent of the radioactive nuclear beams. Special emphasis is placed on exotic properties and phenomena for nuclei with extreme isospin. Our research programs are coordinated to exploit these new opportunities and are directed to subjects related to 1) Study of nuclear structure and dynamics of unstable nuclei through development of new methods utilizing fast RI beams, 2) Exploration into limit of nuclear existence by development of RI beams, and 3) Reaction mechanism of heavy ion induced reactions. The experiments are mainly performed using the radioactive beam facility at RIKEN.
A2			Susumu SHIMOURA	Center for Nuclear Study	http://www.cns.s.u-tokyo.ac.jp/~shimoura/index-e.shtml	shimoura@cns.s.u-tokyo.ac.jp	Studying various properties of exotic nuclei, which have different numbers of neutrons and protons from those of stable nuclei, by using nuclear reactions with secondary beams of exotic nuclei. Wave functions of loosely bound nucleons, change of magic numbers, exotic excitation modes, and reaction mechanisms are studied by utilizing suitable selectabilities of nuclear reactions by selecting incident energies and targets.
A2			Junichi TANAKA	International Center for Elementary Particle Physics	http://www.icepp.s.u-tokyo.ac.jp/~jtanaka/tanaka_lab/	jtanaka@icepp.s.u-tokyo.ac.jp	Experimental particle physics: we aim to understand how to describe the universe with a few fundamental formula of elementary particles through experiments of high energy accelerators. We currently join LHC ATLAS experiment at CERN and search for additional Higgs particle, SUSY, extra dimension and so on, that is, the BSM physics. We also work on R&D of high-speed data transfer, energy reconstruction algorithm@FPGA etc for the ATLAS LAr EM calorimeter upgrade. In addition, we are interested in the future collider, for

								example, 100TeV hadron machine and just have started some studies for it.
A2				Yutaka USHIRODA	High Energy Accelerator Research Organization		yutaka.ushiroda@kek.jp	The main subject of my research is to search for New Physics beyond the Standard Model and to study the origin of CP violation. These studies are possible by precision measurements of decay processes of B meson, D meson and tau lepton produced in the world highest luminosity collisions of electron and positron by KEKB accelerator and up-coming SuperKEKB accelerator at KEK in Tsukuba. Also engaged in are practical researches in order to improve quality of data not limited to the Belle II detector, but also in the boundary region of machine and detector, which are unique at the host laboratory.
A2				Kathrin WIMMER	Department of Physics	http://nucl.phys.s.u-tokyo.ac.jp/wimmer/	wimmer@phys.s.u-tokyo.ac.jp	Our research focuses the structure of radioactive nuclei. Exotic nuclei, far away from stability, show many interesting features which are not understood yet. We use direct reactions to populate states in the exotic nuclei and state-of-the-art experimental equipment. Employing various spectroscopic tools we can gain new information on the properties of exotic nuclei and therefore a deeper understanding on the underlying mechanisms.
A2				Kentaro YAKO	Center for Nuclear Study	http://www.cns.s.u-tokyo.ac.jp/sharaq/	yako@cns.s.u-tokyo.ac.jp	My research subject is nuclear collective motion, especially the spin-isospin oscillation. Our group engages in producing the excited nuclei via charge exchange or other reactions to study their structure using ion beams of intermediate energies (several hundred MeV per nucleon).
A2				Hidetoshi YAMAGUCHI	Center for Nuclear Study	http://www.cns.s.u-tokyo.ac.jp/crib/crib-new/home-en	yamag@cns.s.u-tokyo.ac.jp	The main research is with the low-energy RI beam separator "CRIB", which was installed in the RIBF facility of RIKEN Nishina Center by CNS (Center for Nuclear Study) of Univ. of Tokyo. CRIB, producing low-energy and high-intensity RI beam via direct reactions, is a unique apparatus among low-energy RI beam facilities all over the world. Making use of the distinctive features of CRIB, we are performing unique experimental studies

							on important reactions in nuclear astrophysics and exotic nuclear structure.
A2			Satoru YAMASHITA	International Center for Elementary Particle Physics	http://www.icepp.s.u-tokyo.ac.jp/~satoru/yamashita/	satoru@icepp.s.u-tokyo.ac.jp	
A2			Masashi YOKOYAMA	Department of Physics	http://hep.phys.s.u-tokyo.ac.jp/~masashi/en/	masashi@phys.s.u-tokyo.ac.jp	Experimental particle physics. Study of neutrino oscillation using artificial neutrino beams. R&D for Hyper-Kamiokande project. Development of new neutrino detectors.
A3			Naomichi HATANO	Institute of Industrial Science	http://hatano-lab.iis.u-tokyo.ac.jp/index.html	hatano アットマーク iis.u-tokyo.ac.jp	We mainly study statistical physics and condensed matter physics theoretically. We cover both classical and quantum, equilibrium and non-equilibrium. The current topics include: (1) analysis of the resonant states using non-Hermitian Hamiltonian of open quantum systems; (2) Nontrivial complex eigenvalues of the Liouiville-von Neumann operator; (3) Quantum version of non-equilibrium fluctuation theorem; (4) Analysis of complex networks. We encourage you to visit our office. Contact Hatano.
A3			Takeo KATO	The Institute for Solid State Physics	http://kato.issp.u-tokyo.ac.jp/index_english.htm	kato_at_issp.u-tokyo.ac.jp	Theory for mesoscopic systems; evaluvation of conductance and noise power, treatment of electron-electron interaction, basic theory for nonequilibrium states, and new argothim of numerical calculation.
A3			Yusuke KATO	Department of Arts and Science	http://park.itc.u-tokyo.ac.jp/kato-yusuke-lab/	yusuke@phys.c.u-tokyo.ac.jp	Theory of Condensed Matter. Superconductivity, Superfluidity and Chiral magnetism
A3			Hosho KATSURA	Department of Physics	http://park.itc.u-tokyo.ac.jp/hkatsura-lab/	katsura_at_phys.s.u-tokyo.ac.jp	[Condensed matter theory] (1) Strongly correlated systems: quantum magnetism, multiferroics, low-dimensional systems, Hubbard-type models, quantum entanglement. (2) Topological systems: Hall effects, topological insulators, Majorana fermions. [Statistical mechanics] Algebraic structures behind classical and quantum solvable models and their applications. Nonlinear phenomena in physics.

A3				Naoki KAWASHIMA	The Institute for Solid State Physics	http://kawashima.issp.u-tokyo.ac.jp/index_e.html	kawashima AT issp.u-tokyo.ac.jp	We are developing new computational methods and algorithms for analytically intractable problems in condensed matter theory. We also use them in large-scale computing on parallel computers such as K-computer. Specifically, we study quantum spin liquids by tensor-network method, Z2 vortex dissociation transition by cluster algorithm, spinon deconfinement critical phenomena by quantum Monte Carlo, optical lattice systems by worm algorithm, and spin glass critical phenomena.
A3				Atsuo KUNIBA	Department of Arts and Science	http://webpark1739.sakura.ne.jp/atsuo/indexLP.html	atsuo@gokutan.c.u-tokyo.ac.jp	Symmetry in quantum and classical integrable systems and its applications to representation theory, combinatorics, statistical mechanics and quantum field theory. Relevant topics are Yang-Baxter equation, Bethe ansatz, solvable lattice models, conformal field theory, quantum group, affine Lie algebra, soliton equations, crystal base, box-ball systems, corner transfer matrices, fermionic characters, cluster algebras, tetrahedron equation, matrix product method etc.
A3		#		Seiji MIYASHITA	Department of Physics	http://spin.phys.s.u-tokyo.ac.jp	miya@spin.phys.s.u-tokyo.ac.jp	We study nature of cooperating phenomena in strongly interacting systems in the viewpoint of statistical mechanics. Concrete current objects are phase transitions in systems with frustration and/or quantum fluctuation. Dynamical aspects of ordering processes are also important subjects. We aim to understand mechanisms of time-dependent cooperating systems from a view point of non-equilibrium statistical mechanics and also quantum dynamics as a fundamental process of quantum information.
A3				Mio MURAO	Department of Physics	http://www.eve.phys.s.u-tokyo.ac.jp/indexe.htm	murao_RemoveThisPart_@phys.s.u-tokyo.ac.jp	We consider that a quantum computer is not just a machine to run computational algorithms but also a machine to perform any operations allowed by quantum mechanics. We analyze what kinds of new properties and effects may appear in quantum systems by using quantum

								computers to improve our understanding of quantum mechanics from an operational point of view. We also investigate applications of quantum properties and effects such as entanglement for information processing, communication, precise measurement and manipulations.
A3				Masao OGATA	Department of Physics	http://ogata.phys.s.u-tokyo.ac.jp/custom6.html	ogata_RemoveThisPart_@phys.s.u-tokyo.ac.jp	Condensed Matter Theory: Especially theories in many-body problems where quantum phenomena play essential roles. For example, strongly correlated electron systems, high-temperature superconductivity, magnetism, low-dimensional conductors such as organic conductors, mesoscopic systems, oxides with orbital, spin and charge degrees of freedom, and unconventional superconductivity phenomena. We use field-theoretical methods, exact solutions, renormalization group, variational theory, and numerical simulations.
A3				Masaki OSHIKAWA	The Institute for Solid State Physics	http://oshikawa.issp.u-tokyo.ac.jp/	oshikawa@(domain), (domain)=issp.u-tokyo.ac.jp	My study centers around the intersection of condensed matter theory, statistical mechanics, and field theory. Examples of my research include: * Quantized magnetization plateaux in quantum spin systems * Commensurability and topology in quantum many-body systems * Magnetic-field effects on a junction of three quantum wires (application of boundary conformal field theory) * Field-theory approach to Electron Spin Resonance in quantum spin chains I work on abstract theories as well as analysis and prediction of experimental data; often they are well connected.
A3				Akira SHIMIZU	Department of Arts and	http://as2.c.u-tokyo.ac.jp/	shmz(remove this part)@as2.c.u-tokyo.ac.jp	Quantum Physics, Fundamental Theory of Condensed Matter:

				Science			including Physics of many-body open quantum systems, Relations between microscopic physics and macroscopic physics, Theory of errors and backactions of quantum measurement, Fundamental limits of manipulation of quantum systems, and relations among these subjects. For details, see http://as2.c.u-tokyo.ac.jp/
A3			Osamu SUGINO	The Institute for Solid State Physics	http://sugino.issp.u-tokyo.ac.jp/public	sugino@issp.u-tokyo.ac.jp	Our research, the first principles calculation of materials, is motivated by keen interest in explanation of properties of materials and understanding of phenomena occurring in condensed phases by solving basic equations like Schroedinger equation. We also develop new computational methods to make more and more complex phenomena within the target of first principles calculation. The present theme: stimulated electron-ion dynamics in the condensed phases, tunneling phenomena via nano-structures or ultrathin layers, and catalytic reactions occurring at surface or interfaces.
A3			Synge TODO	Department of Physics	http://exa.phys.s.u-tokyo.ac.jp/	wistaria@phys.s.u-tokyo.ac.jp	Computational Physics: By using the cutting-edge simulation techniques, e.g. the quantum Monte Carlo method, we elucidate novel quantum states, phase transitions, and critical phenomena in strongly correlated many-body system, such as quantum magnets and Bose-Hubbard systems. In addition, we develop new simulation techniques, such as the tensor network algorithm, for quantum many-body systems, and effective parallelization schemes for state-of-the-art large-scale supercomputer, such as the K computer, as well as open-source software for next-generation parallel simulation.
A3			Hirokazu TSUNETSUGU	The Institute for Solid State Physics		tsune@issp.u-tokyo.ac.jp	Thoery of strongly correlated eletron systems. Electronic states, magnetism, superconductivity, transport phenomena in compounds of transition metal, rare earth, or actinide elements. Quest of new quantum orders driven by electron-electron interactions, interplay of electron spin and orbital degrees of freedom, and electron-lattice couplings.
A3			Shinji TSUNEYUKI	Department of Physics	http://white.phys.s.u-tokyo.ac.jp/index2_en.shtml	stsune@phys.s.u-tokyo.ac.jp	My research interest is in developing and applying methodologies of computational

							physics to investigate basic problems in condensed matter physics, especially focusing on dynamics and correlation in many-body systems. Areas of current research include: 1. Properties and structural transformation of materials under high pressure. 2. Structures and reactions of atoms and molecules on solid surfaces. 3. Quantum effect of light particles (protons, muons, etc.) in solids. 4. Impurities in ferroelectric materials. 5. Electronic structure of proteins.
A3			Masahito UEDA	Department of Physics	http://cat.phys.s.u-tokyo.ac.jp/index-e.html	uedaAAphys.s.u-tokyo.ac.jp (AAを@に置き換えてください)	cold atoms (Bose-Einstein condensation, Fermi superfluidity), information thermodynamics, quantum information and measurement,condensed-matter theory
A4		#	Atsushi FUJIMORI	Department of Physics	http://wyvern.phys.s.u-tokyo.ac.jp/welcome_en.html	fujimori.at.phys.s.u-tokyo.ac.jp	We study the electronic properties of condensed matter using photoemission and related spectroscopic techniques using synchrotron radiation. We aim at elucidating the mechanisms of high-temperature superconductivity, giant magnetoresistance, metal-insulator transitions and exotic ground states in strongly correlated systems, particularly, strongly correlated systems, magnetic semiconductors and their interfaces and nano-structures.
A4			Hiroshi FUKUYAMA	Department of Physics	http://kelvin.phys.s.u-tokyo.ac.jp/index_e.html	hiroshi_atmark_phys.s.u-tokyo.ac.jp	Low Temperature Physics: Our current interests include (i) magnetism, superfluidity, supersolidity and other many-body effects in low dimensional quantum liquids and solids such as monolayer 3He and 4He, (ii) edge states, bad gap control and superconducting proximity in graphene and (iii) development of experimental techniques at very low temperatures. We use a variety of techniques such as calorimetric, NMR, torsional oscillator, STM/STS and transport measurements.
A4			Shuji HASEGAWA	Department of Physics	http://www-surface.phys.s.u-tokyo.ac.jp/top.html	shuji@phys.s.u-tokyo.ac.jp(@マーク英数半角にする)	Our research targets are atomic arrangements, electronic band structures, electronic/spin transport, optical responses, phase transitions and other functional properties of a few atomic layers, atomic wires, atomic clusters, and other nanometer-scale structures formed on crystal surfaces such as semiconductors, metals, and

								topological insulators, etc. We utilize various kinds of experimental techniques such as electron diffraction/microscopy, scanning tunneling microscopy/spectroscopy, photoemission spectroscopy, microscopic four-point probe methods, molecular beam epitaxy, and focused ion beam techniques. We recently found single-atom-layer superconductors, and suppression of backscattering of carriers at topological surfaces, etc.
A4				Masamitsu HAYASHI	Department of Physics	http://qspin.phys.s.u-tokyo.ac.jp/	hayashi@phys.s.u-tokyo.ac.jp	Experimental physics of quantum Spintronics. Spin transport, magnetism and optical response of metallic and oxide/nitride heterostructures. In particular focus is on the physics of spin current and related effects.
A4				Shingo KATSUMOTO	The Institute for Solid State Physics	http://www.issp.u-tokyo.ac.jp/labs/frontier/kats/	kats.. a t ..issp.u-tokyo.ac.jp (.. a t ..をアットマークへ変更)	
A4				Koichi KINDO	The Institute for Solid State Physics		kindo@issp.u-tokyo.ac.jp	
A4				Kentaro KITAGAWA	Department of Physics	http://park.itc.u-tokyo.ac.jp/takagi_lab/		
A4				Fumio KOMORI	The Institute for Solid State Physics	http://komori.issp.u-tokyo.ac.jp/index-e.html	komoriアトissp.u-tokyo.ac.jp(アトを@マーク英数半角にする)	Surface and nanometer-scale science. 1. local electronic states of surfaces and nanometer-scale materials studied by tunneling spectroscopy using ultra-high vacuum low-temperature scanning tunneling microscopes. 2. electronic states and magnetism of surfaces, ultra-thin films and nanometer-scale materials studied by photoemission spectroscopy and magneto-optical Kerr measurement. 3. interaction between the above systems and pulsed laser light.
A4				Takeshi KONDO	The Institute for Solid State Physics		kondo1215@issp.u-tokyo.ac.jp	The angle-resolved photoemission spectroscopy (ARPES) is a powerful technique to visualize the band structure. With the spin-resolved technique, we can identify the spin-polarized character of the band. In addition, the time-resolved ARPES realized with a pump-probe technique can track the reordering process of electron system from its nonequilibrium state.

								In our laboratory, we utilize these various ARPES techniques and explore novel electronic states of matter. Furthermore, we develop a new ARPES machine capable of achieving both the lowest measurement temperature and the highest energy resolution in the world by innovating a 3He cryostat and a laser source.
A4				Iwao MATSUDA	The Institute for Solid State Physics	http://imatsuda.issp.u-tokyo.ac.jp/index_e.htm	imatsuda@issp.u-tokyo.ac.jp	We study electronic structures and spin properties of various magnetic nanodots and Rashba systems on solid surfaces. We directly determine their atomic structures and (spin-resolved) Fermi surfaces by photoemission spectroscopy methods. We also trace the spin dynamics by fast time-resolved experiments with high-brilliant soft-X ray synchrotron radiation and ultra-short pulse laser. Furthermore, we investigate the quantum magnetic transport phenomena through developing a new device to measure surface magnetic resistance with independently driven multi-probes.
A4				Satoshi MURAKAWA	Cryogenic Research Center		murakawa_@_crc.u-tokyo.ac.jp (_@_を半角@に換えてください)	
A4				Tohru OKAMOTO	Department of Physics	http://dolphin.phys.s.u-tokyo.ac.jp/index-e.html	okamotoアットphys.s.u-tokyo.ac.jp	We study low temperature electronic properties of low-dimensional systems, including the quantum Hall effect on semiconductor surfaces and the superconductivity of monolayer films.
A4				Toshiro SAKAKIBARA	The Institute for Solid State Physics	http://sakaki.issp.u-tokyo.ac.jp/	sakaki@issp.u-tokyo.ac.jp	Low temperature magnetism (experiment). Our research interest lies in various magnetic phenomena with low characteristic temperature below 1K. In order to study the magnetic properties at very low temperature, we have developed a high sensitivity capacitance magnetometer that can be operated at temperatures down to 30mK in magnetic fields up to 15T. Our current research subjects are: 1) low temperature magnetism in heavy-electron systems, 2) anisotropic superconductivity, 3) quadrupole ordering and multipole interactions in f-electron systems, 4) low dimensional and/or frustrated spin systems.
A4				Ryo	Cryogenic		shimano at phys.s.u-tokyo.ac.jp	Our main research interests are focused on the

			SHIMANO	Research Center			creation and manipulation of many body quantum systems with optical/terahertz pulses. The research subjects include: realization of low temperature quantum degenerate phases such as excitonic insulator (e-h BCS) in photoexcited semiconductors, optical control of superconductivity, study of collective excitations in correlated electron systems, and novel optical phenomena related to the topological phase in condensed matter.
A4			Hidenori TAKAGI	Department of Physics		takagi at phys.s.u-tokyo.ac.jp	We are aiming to explore exotic quantum condensates formed by correlated electrons in solids, in particular transition metal oxides, and to unveil the physics behind the phase formation. Of particular interest recently include high temperature superconductivity, quantum spin liquid, non-trivial ordering of spin and charge, topological insulator. We develop novel playgrounds (materials) and, utilizing a varety of probes including charge transport, thermal properties and x-ray and neutron diffractio/scattering, capture the static/dynamic self-organized staructures of correlated electrons.
A4			Masashi TAKIGAWA	The Institute for Solid State Physics	http://masashi.issp.u-tokyo.ac.jp/	masashi@issp.u-tokyo.ac.jp	We use nuclear magnetic resonance (NMR) as the major experimental tool to investigate various exotic phenomena caused by strong electronic correlations such as superconductivity, ferro- or antiferro-magnetism, spin and charge fluctuations and charge (orbital) order in transition metal and rare earth compounds. Because of the magnetic and eletric hyperfine interaction between nuclear magnetic and quadrupole moments and surrounding electrons, NMR is a powerful tool for microscopic investigation of the ordering and fluctuations of multiple degrees of freedom of electrons such as spin, charge and orbital.
A4			Masashi TOKUNAGA	The Institute for Solid State Physics		tokunaga@issp.u-tokyo.ac.jp （@を半角に変えて下さい）	We study field-induced phase transitions in strongly correlated electron system in which multiple degrees of freedom couple to each other. We are going to clarify the nature of such system through detailed measurements on changes in crystallographic symmetry and electric polarization in pulsed high magnetic

								fields. To this purpose, we will develop novel experimental technique, e.g. high-speed imaging in pulsed magnetic fields and various kinds of thermodynamic measurements with high accuracy. Experiments in high magnetic fields are carried out in collaboration with Prof. Kindo's group in ISSP.
A4				Yoshiya UWATOKO	The Institute for Solid State Physics		uwatoko@issp.u-tokyo.ac.jp	Research projects have been performed under multiple-extreme conditions of low temperatures, high pressure and high magnetic fields. Pressure-induced effects and phase transitions in the strongly correlated electron systems are investigated.
A4				Hiroki WADATI	The Institute for Solid State Physics	http://wadati.issp.u-tokyo.ac.jp/index_e.html	wadati.at.issp.u-tokyo.ac.jp	Our experimental techniques are x-ray scattering, photoemission spectroscopy, and x-ray absorption spectroscopy. Especially we study the electronic and magnetic structures of transition-metal oxides (bulk and thin films) by using a new experimental technique, resonant soft x-ray scattering. We plan to use synchrotron facilities both inside and outside Japan. We also perform theoretical analyses to experimental data by using configuration-interaction cluster-model calculations, band-structure calculations, and so on.
A4				Osamu YAMAMURO	The Institute for Solid State Physics	http://www.issp.u-tokyo.ac.jp/labs/neutron/yamamuro/	yamamuro@issp.u-tokyo.ac.jp	My laboratory is studying chemical physics of complex systems by means of neutron scattering, X-ray diffraction, calorimetric, dielectric (electric conductometric) and viscoelastic techniques. Our present interests are glasses, supercooled liquids, water, clathrate compounds, ionic liquids, hydrogen conductors, and single molecule magnets. We are studying them from the three different points of view, i.e., "structure", "dynamics", and "thermodynamics". Our goal is to reveal the essence (simple and beautiful principle) hidden in complex systems and phenomena.
A5				Kipp CANNON	Research Center for the Early Universe		kipp@resceu.s.u-tokyo.ac.jp	Detection and interpretation of gravitational waves from the collisions of compact objects including black holes and neutron stars, as well from other phenomena.
A5				Fujihiro HAMBA	Institute of Industrial	http://www.iis.u-tokyo.ac.jp/~hamba	hamba@iis.u-tokyo.ac.jp	Fluid physics: physics and modeling of inhomogeneous turbulence. The effect of

					Science			turbulence on the mean field can be modeled in terms of transport coefficients such as the eddy viscosity. We derive turbulence models by using statistical theory for turbulence; we investigate the mechanism of turbulence and assess models by performing numerical simulations. The present research topics are hybrid turbulence model, analysis of nonlocal eddy viscosity and diffusivity in turbulence, analysis and modeling of rotating and swirling turbulent flows, and modeling the dynamo mechanism in magnetohydrodynamic turbulence with its application to astronomical magnetic fields.
A5	*			Kenichi ISHIKAWA		http://www.atto.t.u-tokyo.ac.jp/en/	ishiken@n.t.u-tokyo.ac.jp	We theoretically study how atoms and molecules behave in an intense ultrashort laser field, using ab-initio simulations (first-principles simulations, first-principle simulations) based on quantum mechanics. Our particular interests include: - non-perturbative nonlinear processes such as high-harmonic generation and tunneling ionization - attosecond multielectron dynamics in atoms and molecules
A5				Masahiro KAWASAKI	Institute for Cosmic Ray Research	http://www.icrr.u-tokyo.ac.jp/th/th.html	kawasaki@icrr.u-tokyo.ac.jp	Particle Cosmology
A5				Yasushi SUTO	Department of Physics	http://www-utap.phys.s.u-tokyo.ac.jp/~suto/index.html	suto@phys.s.u-tokyo.ac.jp	Theoretical and observational studies in astrophysics and exoplanetary science. Specific examples include, construction of galaxy cluster models based on multi-band observations, statistical modeling of non-sphericity of dark matter halos, gravitational lens astronomy, unveiling the nature of dark energy from cosmological galaxy surveys, reliablity of Galactic dust extinction map, probing distant galaxies with stacking analysis, search for dark baryons with soft-X-ray spectroscopy, origin and evolution of angular momentum of exoplanetary systems, and dynamical evolution of multi-planetary systems.
A5				Masahiro TAKADA	Ipmu	http://db.ipmu.jp/member/personal/698en.html	masahiro.takada@ipmu.jp	Kavli IPMU is one of the leading institutions of the unprecedented massive galaxy survey

								carried with the 8.2m Subaru Telescope (http://www.ipmu.jp). My main research interest is exploring “experimental” high-precision cosmology with the Subaru data: 1) Exploring the nature of dark matter and dark energy with high-precision measurement of weak gravitational lensing due to cosmic structures 2) Constraining the mass scale of neutrinos from measurements of galaxy clustering statistics 3) To test theory of gravity at cosmological distance scales as well as test theory of cosmic structure formation
A5				Jun'ichi YOKOYAMA	Research Center for the Early Universe	http://www.resceu.s.u-tokyo.ac.jp/~yokoyama/	yokoyama(at)resceu.s.u-tokyo.ac.jp	Cosmology of the Early Universe and Gravitational Wave Physics Specific topics of recent research include: inflationary cosmology generation and evolution of density fluctuations baryogenesis origin of dark matter and dark energy nonequilibrium processes in the early universe primordial black holes and primordial nucleosynthesis cosmic microwave background radiation fundamental research on gravitational wave data analysis gravitational wave cosmology
A5				Naoki YOSHIDA	Department of Physics	http://member.ipmu.jp/naoki.yoshida/	naoki.yoshida@phys.s.u-tokyo.ac.jp	Theoretical astrophysics and observational cosmology. Recent research highlight includes structure formation in the early universe, the nature of dark matter and dark energy. Our research group members work on a broad range of topics from the formation of the first stars and blackholes to the distribution of dark matter in and around galaxies. We use data from galaxy redshift surveys and weak lensing observations to study the large-scale strucutre of the universe. Massive parallel computing such as gravitational N-body simulations and radiation-

								hydrodynamics is also of our primary interest. We also work with mathematicians and data scientists to develop a Big Data application to analyze literally big data from large telescopes.
A6				Hidefumi AKIYAMA	The Institute for Solid State Physics	http://www.issp.u-tokyo.ac.jp/maincontents/organization/labs/akiyama_group_en.html	golgo アットマーク issp.u-tokyo.ac.jp	Advanced laser micro-spectroscopy is developed and applied to various semiconductor nano-structures, in order to understand and control their optical properties quantum mechanically which vary with their size and shape. Subjects are, for example, physics of short-pulse generation from semiconductor lasers, solar cells, firefly bio-luminescence, micro-spectroscopy and imaging with solid immersion lens, and time-resolved spectroscopy for characterization and development of novel samples. We have particular interests in finding and solving fundamental physics problems which limit semiconductor and optical technologies.
A6	*	#		Yasuhiko ARAKAWA	Institute of Industrial Science	http://www.qdot.iis.u-tokyo.ac.jp/index-e.html	arakawa@iis.u-tokyo.ac.jp	Quantum dot is a nanostructure proposed by Y. Arakawa in 1982. Since then, the quantum dot has established a research field in semiconductor physics as well as device application such as lasers, quantum information devices, and solar cells. We investigate an ultimate light-matter interaction based on cavity quantum electrodynamics in quantum dots coupled with photonic crystal nanocavity for developing advanced quantum nanodevices. Active students who are interested in both science and engineering are highly welcome.
A6				Akira EJIRI	Department of Complexity Science and Engineering	http://fusion.k.u-tokyo.ac.jp/~ejiri/index-e.html	ejiri@k.u-tokyo.ac.jp	Plasma is characterized by huge degree of freedom and strong interaction between particles or fluid elements. Plasma shows nonlinear response, an in a state far from equilibrium. In order to investigate the physics arising from these features, we put emphasis on fluctuations. Our main plasma device is the TST-2 spherical tokamak (Univ. Tokyo), and we operate it in cooperation with Prof. Takase's group. Typical plasma parameters are: major radius 0.38m, minor radius 0.25m, toroidal magnetic field 0.2 T, plasma current 100 kA. We also participate in experiments at LHD (NIFS) and JFT-2M (JAERI) devices.

A6				Takuro IDEGUCHI	Department of Physics	http://takuroideguchi.jimdo.com/	ideguchi@phys.s.u-tokyo.ac.jp	We study optical science with advanced lasers. Currently, we are focusing on developing ultrafast spectroscopy and microscopy based on ultrashort pulse lasers including optical frequency combs. These techniques are to be powerful tools not only for physics but also for chemistry, biology, medicine, pharmacy and material science. Moreover, we aim at creating interdisciplinary or multidisciplinary science by combining optics with nanotechnology or microfluidics.
A6				Jiro ITATANI	The Institute for Solid State Physics	http://itatani.issp.u-tokyo.ac.jp/index.php?id=11	jitatani@issp.u-tokyo.ac.jp	Our main research subjects are the development of advanced intense ultrashort-pulse lasers and their applications to attosecond sciences. We especially work on (i) the development of waveform-controlled intense light sources, (ii) generation of attosecond soft-X-ray pulses, (iii) coherent control of ultrafast processes in a strong laser field, and (iv) ultrafast soft-x-ray spectroscopy on femtosecond to attosecond time scales.
A6				Hirofumi SAKAI	Department of Physics	http://www.amo-phys-s-u-tokyo.jp/en/	hsakai（ここを削除）@phys.s.u-tokyo.ac.jp	We do experimental studies of atomic, molecular, and optical physics. Our research interests are as follows: (1) Controlling alignment and orientation of gas-phase molecules with an intense laser field and its applications. (2) High-intensity laser physics typified by nonperturbative high-order nonlinear optical processes (ex. multiphoton ionization and high-order harmonic generation) and ultrafast phenomena in atoms and molecules. (3) Generation of single attosecond pulses in the soft x-ray region and control of their polarization states, and their applications to the control of ultrafast dynamics of electrons in atoms and molecules. (4) Taking molecular movies by utilizing the x-ray photoelectron diffraction technique with x-ray free-electron laser pulses.
A6		#		Masaki SANO	Department of Physics	http://daisy.phys.s.u-tokyo.ac.jp/	sano at phys.s.u-tokyo.ac.jp	Physics of Nonlinear Nonequilibrium System; Nonlinear Dynamics and Chaos, Pattern Formation, Turbulence, Fluctuations in microscopic non-equilibrium systems, Nonequilibrium Soft Matter, Active Matter Biophysics; Single Molecule Measurement of

							DNA and protein, Synthetic Genetic Networks, Quantitative Measurement of Cellular Dynamics
A6			Yuichi TAKASE	Department of Complexity Science and Engineering	http://fusion.k.u-tokyo.ac.jp/index-e.html	takase@phys.s.u-tokyo.ac.jp	Plasma is an ensemble of charged particles, and is a typical example of nonlinear complex system. High temperature plasmas have low dissipation, and are in a state far from thermal equilibrium. Nonlinearity becomes prominent and develops to a turbulent state. Plasma makes transitions between multiple states, and forms a structure spontaneously. High temperature plasma can be applied to power generation by nuclear fusion, but its realization depends on physical understanding and control of the plasma behavior. Wave phenomena, instability and turbulence in high temperature plasmas are being studied on the TST-2 spherical tokamak, and on larger fusion devices in Japan and abroad.
A6			Yoshio TORII	Department of Arts and Science	http://dbs.c.u-tokyo.ac.jp/~torii/	ytorii@phys.c.u-tokyo.ac.jp	Quantum atom optics using Bose-Einstein condensates of gaseous atoms (atom laser). Creation of correlated atoms and manipulation of quantum information. Realization and application of continuous-wave atom lasers.
A6	*	#	Kosuke YOSHIOKA		http://sola.c.u-tokyo.ac.jp/yoshioka.html.en	yoshioka@gono.phys.s.u-tokyo.ac.jp	
A6			Junji YUMOTO	Department of Physics		yumoto@ipst.s.u-tokyo.ac.jp	Electrons and atoms in materials interacting with a strong light field are excited to higher states and this interaction causes laser-ablation. This phenomenon is one of most attracting fields in physics because this is dealt as nonlinear, non-equilibrium and open systems. We are investigating these phenomena experimentally with femto-second time resolution in 10 figures of time range from femto-second to micro-second. These results are also expected to contribute to industrial applications.
A7			Munehito ARAI	Department of Arts and Science	http://folding.c.u-tokyo.ac.jp/	arai@bio.c.u-tokyo.ac.jp	Biophysics, protein folding, and protein design. Proteins are essential substances that drive life processes. (1) We study physical properties of proteins, in particular, how proteins form specific structures and exert their functions. We also study the structure-function relationship in

								intrinsically disordered proteins. (2) We develop novel proteins useful in medicine and industry.
A7				Chikara FURUSAWA	Department of Physics		furusawa@phys.s.u-tokyo.ac.jp	The aim of our study is to understand robustness and plasticity of complex biological dynamics involving a large number of components, including adaptation, evolution, development and immune system. By using computer simulations of simple models, theoretical analysis, and high-throughput experimental measurements, we will try to extract universal characteristics of biological dynamics and to establish macroscopic theories for biological robustness and plasticity.
A7				Hideo HIGUCHI	Department of Physics	http://nanobio.phys.s.u-tokyo.ac.jp/higuchipro/	higuchi at phys.s.u-tokyo.ac.jp	
A7				Kunihiko KANEKO	Department of Arts and Science	http://chaos.c.u-tokyo.ac.jp		Explore universal logic underlying biological systems, by expanding theory of dynamical systems and statistical physics. Uncover universal law in reproduction, adaptation, development, differentiation, and evolution. Study of high-dimensional chaos that potentially relate with life and cognition.
A7				Akio KITAO	Institute of Molecular and Cellular Biosciences	http://www.iam.u-tokyo.ac.jp/MolDes/indexE.html	kitao@iam.u-tokyo.ac.jp	In this laboratory, biomolecular system is studied based on statistical mechanics, bioinformatics and computational physics, e.g., molecular simulation. Our main targets are biopolymers, such as proteins, and biological supramolecules, which act as functional units in living organisms. We have been studying properties and functional mechanisms of biomolecules using theoretical and computational approaches. We also develop methodology for large-scale simulation, multi-scale simulation, structure prediction, functional regulation and functional conversion.
A7				Hiroshi NOGUCHI	The Institute for Solid State Physics	http://noguchi.issp.u-tokyo.ac.jp/index.html	noguchi at issp.u-tokyo.ac.jp	Study of soft-matter and biophysics using theory and simulation. Particularly, dynamics of biomembrane from nano to micro meter. i) Deformation of red blood cells in microvessels. ii) Fusion and fission of biomembrane. We also

								develop hydrodynamic methods and coarse-grained molecular models.
A7				Akinao NOSE	Department of Complexity Science and Engineering	http://bio.phys.s.u-tokyo.ac.jp/	nose at phys.s.u-tokyo.ac.jp	Biophysics of the nervous system. We use the fruit fly, Drosophila, as a model to try to understand the operational principle of neural circuits, based on the realistic neuronal connectivity and activity pattern. We use optogenetics, calcium imaging and electrophysiology to record and manipulate neural activity and connectome analyses to dissect neural wiring. By systematically using these techniques, we try to elucidate the functional connectivity among component neurons and information processing of the neural circuits.
A7				Masato OKADA	Department of Complexity Science and Engineering	http://mns.k.u-tokyo.ac.jp/index.php	okada@k.u-tokyo.ac.jp	We study brain functions such as memory and vision using methods of statistical mechanics. We also develop statistical-mechanical informatics focusing on the similarity between the framework of Bayesian inference and that of statistical mechanics. We have recently started to promote 'Data-Driven Science' for the purpose of establishing an efficient methodology to extract scientific knowledge from high-dimensional data.
A7				Yasushi OKADA	Department of Physics	http://www.qbic.riken.jp/english/research/outline/lab-07.html	y.okada@riken.jp	We want to answer "What is Life?" through a viewpoint of physics. For that purpose, we have been developing imaging technologies including super-resolution microscopy, in order to make quantitative measurements in living cells, such as the transport within a cell, especially a neural cell. Recently, we have demonstrated that the phase transition of the conformation of a protein polymer, a microtubule, regulates the directionality of the transport. We are also applying non equilibrium statistical physics to the cellular phenomena. For example, we are developing a non-invasive method to measure force exerted to the vesicles during the intracellular transport by applying the fluctuation theorem.
A7				Kuniyoshi SAKAI	Department of Arts and	http://mind.c.u-tokyo.ac.jp/index.html	kuni@mind.c.u-tokyo.ac.jp	

					Science			
A7				Akira SUYAMA	Department of Arts and Science	http://dna.c.u-tokyo.ac.jp/	suyama@dna.c.u-tokyo.ac.jp	Biophysics of the mechanism of living organisms as molecular computer and its application to biotechnology. Ongoing research subjects: Development of DNA and autonomous molecular computers and their application to mathematical and biological problems. Molecular dynamics study of the mechanism of protein folding. Structure and dynamics of gene networks relevant to cell differentiation. genome structure and evolution.
A7				Chikashi TOYOSHIMA	Institute of Molecular and Cellular Biosciences	http://www.iam.u-tokyo.ac.jp/StrBiol/en/index.html	ct@iam.u-tokyo.ac.jp	X-ray and electron crystallography of membrane proteins and computer simulation. Current goal is to determine the structures of calcium ATPase, a calcium ion pump, in different physiological states and to simulate the structural changes between the intermediates by molecular dynamics calculation, thereby elucidate the mechanism of ion transport against concentration gradient from its structures. In a very near future we may be able to understand the mechanism completely at an atomic level.
A8				Masaki ANDO	Department of Physics	http://granite.phys.s.u-tokyo.ac.jp/en	ando@phys.s.u-tokyo.ac.jp	Our main target is to expand a new field of gravitational-wave astronomy. For it, we are participating as a main institute to a KAGRA project and constructing a large-scale cryogenic laser interferometer for gravitational-wave observation at Kamioka, Gifu. We are also developing key components for DECIGO, a space gravitational-wave telescope. In addition, we are working for experimental tests of relativity, and quantum measurements using laser interferometers.
A8				Aya BAMBA	Department of Physics	http://www-utheal.phys.s.u-tokyo.ac.jp/wordpress/en/		
A8				Yoshinari HAYATO	Institute for Cosmic Ray Research	http://www-sk.icrr.u-tokyo.ac.jp	hayato@icrr.u-tokyo.ac.jp	1) Neutrino oscillation experiments Mainly working on the accelerator based long baseline neutrino oscillation experiments. 2) Neutrino-nucleus scattering experiments including the development of a simulation program of neutrino-nucleus scattering. 3) R&D of the data acquisition system for the experiments.

A8				Takaaki KAJITA	Institute for Cosmic Ray Research	http://www-rccn.icrr.u-tokyo.ac.jp/index_e.html	kajita@icrr.u-tokyo.ac.jp	Gravitational wave will be studied by a very high sensitivity, large scale (3km X 3km) laser interferometer, which is under construction at Kamioka. Neutrino oscillations are studied with Super-Kamiokande by observing atmospheric neutrinos.
A8				Seiji KAWAMURA	Institute for Cosmic Ray Research	http://gwcenter.icrr.u-tokyo.ac.jp/en/	seiji@icrr.u-tokyo.ac.jp	Gravitational waves were predicted by A. Einstein in general relativity and have been detected for the first time by Advanced LIGO on September 2015. By this detection gravitational wave astronomy was established. We are building large-scale cryogenic gravitational wave telescope KAGRA to further develop gravitational wave astronomy.
A8				Yasuhiro KISHIMOTO	Institute for Cosmic Ray Research	http://www-sk.icrr.u-tokyo.ac.jp/index-e.html	kisimoto@km.icrr.u-tokyo.ac.jp	Main research activity is (1) dark matter search, (2) neutrino physics, and (3) R&D for current and future experiments. We constructed a large unique detector using liquid Xe, XMASS, in Kamioka. With XMASS, we have started to search for dark matter. Neutrino studies are also important subject in our research area. We are now planning to observe supernova neutrinos burst by upgrade Super Kamiokande. Dark matter and neutrino measurements are very attractive physics targets, but both are very much rare events, and so it is quiet important to select signals form backgrounds. To overcome these difficulties, we will have active R&D studies for future experiments
A8				Akito KUSAKA	Department of Physics		akusaka@phys.s.u-tokyo.ac.jp	
A8				Kazuhisa MITSUDA	The Institute of Space and Astronautical Science	http://www.astro.isas.jaxa.jp/~mitsuda/labo/indexE.html	mitsuda@astro.isas.jaxa.jp	Experimental/observational high-energy astrophysics. Our goal is to understand why the Universe is as it now, by studying formation/evolution of structure of the Universe using cryogenic sensors. Our labo lead development of the SXS onboard ASTRO-H whose major science goal was to study

								evolution of clusters of galaxies and is working on the LiteBIRD mission whose purpose is to prove the inflation of the Universe. We are also leading Japan’s contribution to ESA’s Athena mission which will push forward the SXS science a lot. Another our major effort is R&D of cryogenic sensor technologies for missions beyond Athena. The outcome is also used for various ground experiments.
A8				Shinji MIYOKI	Institute for Cosmic Ray Research	http://www.icrr.u-tokyo.ac.jp/gr/GWPOHPe/index-e.html	miyoki _@_ icrr.u-tokyo.ac.jp	I am working toward the direct detection of gravitational waves that is predicted by general theory of relativity. We have finished research and developments for over 20 years by using proto-type laser interferometers, and then we are now developing "KAGRA" Large-scale Cryogenic laser interferometer Telescope. I would like to detect gravitational waves and to start gravitational wave astronomy as one of GW detectors as LIGO, VIRGO and GEO600 in the world. In addition to gravitational wave research, I am trying to observe macroscopic quantum mechanics by using ultra-precise length measurement technique.
A8				Shigetaka MORIYAMA	Institute for Cosmic Ray Research	http://www-sk.icrr.u-tokyo.ac.jp/	moriyama@icrr.u-tokyo.ac.jp	
A8				Takao NAKAGAWA	The Institute of Space and Astronautical Science	http://www.ir.isas.jaxa.jp/index-e.html	nakagawa@ir.isas.jaxa.jp	Using Infrared observations from space-borne platforms, especially the infrared astronomical satellite AKARI, I am working on the birth and evolution of various types of objects in the universe, namely (1) galaxy formation and evolution, (2) formation of stellar and planetary systems. I am also working on the projects to develop unique observation instruments, which enables the above mentioned targets. The current main project is SPICA, which is expected to play cruicial roles in every field of astronomy.
A8				Masayuki NAKAHATA	Institute for Cosmic Ray Research	http://www-sk.icrr.u-tokyo.ac.jp/%7Enakahata	nakahata@suketto.icrr.u-tokyo.ac.jp	Research on neutrinos using the Super-Kamiokande detector. Especially, observations of supernova neutrinos and solar neutrinos are performed. With these observations, I study elementary-particle physics and neutrino astronomy.

A8				Kazuhiro NAKAZAWA	Department of Physics		nakazawa.at.phys.s.u-tokyo.ac.jp	Universe is the only laboratory for large-scale and extreme high energy phenomena. To find new physics and dominant processes in the evolution of the univerese, we are developing X-ray and gamma-ray detectors to be mounted on space observatories (satellites), and observe high energy objects such as black holes and clusters of galaxies. We are currently utilizing the Hitomi X-ray observatory, on which our own detector is mounted.
A8				Masatake OHASHI	Institute for Cosmic Ray Research	http://www.icrr.u-tokyo.ac.jp/gr/GWPOHPe/index-e.html	ohashi@icrr.u-tokyo.ac.jp	We want to detect gravitational waves from various sources as compact binary by KAGRA. The observation of KAGRA will start at 2018.
A8				Kimihiro OKUMURA	Institute for Cosmic Ray Research	http://www-rccn.icrr.u-tokyo.ac.jp/index_e.html	okumura(atmark)icrr.u-tokyo.ac.jp	I am interested in neutrino physics, and involved in Super-Kamiokande experiment, T2K experiment, and Hyper-Kamiokande project. We are studying for the issues of leptonic CP asymmetry and mass hierarchy via the precise measurements of neutrino oscillation in the atmospheric and accelerator neutrinos. Another research on the cosmic ray physics is being done by the flux measurement of the atmospheric neutrino. We plan to promote the development of the future neutrino detector and instrument in future.
A8				Masami OUCHI	Institute for Cosmic Ray Research	http://cos.icrr.u-tokyo.ac.jp/16.html	ouchims_at_icrr.u-tokyo.ac.jp	We study the early universe by observations. Armed with the state-of-the art telescopes such as Subaru and Hubble (+ALMA soon), we aim to push the today's observational frontier towards the very high redshift universe that no one has ever seen by observations. Our goal is understanding physical processes of galaxy formation at the early stage and the relevant event of cosmic reionization.
A8				Hiroyuki SAGAWA	Institute for Cosmic Ray Research	http://www.icrr.u-tokyo.ac.jp/~hsagawa/index-e.html	hsagawa@icrr.u-tokyo.ac.jp	Ultra-high energy cosmic rays with more than 10^{20} eV were observed by AGASA. We completed the construction of the Telescope Array [TA] observatory, which consists of an array of surface detectors with an area of about 700km^2 and air fluorescence telescopes in order to verify or refute the existence of the highest

							energy cosmic rays and explore the origin. We will study energy spectrum, arrival direction, and chemical composition of the extremely high energy cosmic rays.
A8	*	#	Makoto SASAKI	Institute for Cosmic Ray Research	http://www.icrr.u-tokyo.ac.jp/~ashra/index-e.html	sasakim(at)icrr.u-tokyo.ac.jp	We make observations of very-high energy gamma, nuclei, neutrinos, and optical flashes from violent celestial objects with wide angle high resolution compound-eye optical telescopes deployed on Mauna Loa on Hawaii Island toward night sky and the earth. We are planning to make observations simultaneously with compound-eye optical telescopes deployed at four sites on Hawaii Island, which are scaled up from the Ashra-1 detector units and the world largest astronomical tau neutrino telescope, i.e. Ashra Neutrino Telescope Array (Ashra NTA). We are pioneering full-fledged particle astronomy with PeV-EeV neutrinos and TeV-PeV gamma-rays by clearly identifying positions of the unrevealed source objects.
A8			Hiroyuki SEKIYA	Institute for Cosmic Ray Research	http://www-sk.icrr.u-tokyo.ac.jp/~sekiya/	sekiya@icrr.u-tokyo.ac.jp	Neutrino experiments and dark matter searches using Super-Kamiokande, EGADS, XMASS and other detectors. In order to detect the diffuse supernova neutrino background, R&Ds for Super-Kamiokande Gd project are ongoing.
A8			Masato SHIOZAWA	Institute for Cosmic Ray Research	http://www-sk.icrr.u-tokyo.ac.jp/~masato/	masato@suketto.icrr.u-tokyo.ac.jp	My research interests are experimental tests of unification of elementally particles and their forces by nucleon decay searches and neutrino oscillation studies. I have been participating the Super-Kamioande, K2K, and T2K experiments. As a project leader, I am aiming to realize the next generation detector Hyper-Kamiokande.
A8			Tadayuki TAKAHASHI	The Institute of Space and Astronautical Science	http://www.astro.isas.jaxa.jp/~takahasi/index-e.html	takahasi@astro.isas.jaxa.jp	(1) Experimental and observational high-energy astro-particle physics. In particular, study of X-ray and gamma-ray emission from blazars and SNRs. (2) Detectors for future satellite-borne X-ray and gamma-ray missions; Astro-E2, Swift and Glast. (3) New gamma-ray detectors based on

								CdTe/CdZnTe semi-conductor. Hard X-ray imaging detector for the NeXT and the Xeus mission. Semiconductor multi-Compton telescope.
A8				Masato TAKITA	Institute for Cosmic Ray Research	http://www.icrr.u-tokyo.ac.jp/em/index.html	takita@icrr.u-tokyo.ac.jp	We set up a large (37000-m**2) air shower arrays at Yangbajing in Tibet, China. We aim at observing multi-TeV cosmic gamma rays from astoronomical point sources such as AGN (active galactic nuclei), supernova remnants, GRBs (galactic gamma-ray bursts), etc. At the same time, we are tryingto disentangle the old enigmas in cosmic-ray physics: the origin of cosmic rays and their acceleration mecanism and the chemical composition of the primary cosmic rays. Those who find research fun in discussing with colleagues and in cooperative work (detector construction, for example) maybe more suitable than those who like to do physics by themselves. Normally, we do data analysis and development of new detectors at ICRR (Institute for Cosmic Ray Research) at Kashiwa.
A8				Masahiro TESHIMA	Institute for Cosmic Ray Research	http://www.icrr.u-tokyo.ac.jp/~mteshima/	mteshima@icrr.u-tokyo.ac.jp	High Energy Gamma Ray Astronomy. (1) Study of particle acceleration and high energy gamma ray emission in Super Nova Remnants, Active Galactic Nuclei and Gamma Ray Bursts. (2) Indirect Search for Dark Matters. (3) Study of Extragalactic Background Light using gamma ray absorption. (4) Research and Development for the next generation high energy gamma ray facility, Cherenkov Telescope Array.
A8				Takashi UCHIYAMA	Institute for Cosmic Ray Research	http://www.icrr.u-tokyo.ac.jp/gr/GWPOHPe/index-e.html	uchiyama@icrr.u-tokyo.ac.jp	Detection of gravitational wave which is predicted in Einstein's general theory of relativity and establishment of gravitational wave astronomy.
A8				Satoshi YAMAMOTO	Department of Physics	http://www.resceu.s.u-tokyo.ac.jp/%7Esubmm/Welcome.html	yamamoto@phys.s.u-tokyo.ac.jp	Our group is studying physical and chemical processes of interstellar clouds, which are birthplaces of new stars. For this purpose we are running the 1.2 m submillimeter-wave

								telescope at the summit of Mount Fuji. With this telescope, we are observing the submillimeter-wave emission lines from the neutral carbon atom, which are good tracers for interface regions between the molecular gas and atomic gas. By comparing the large scale distribution of the neutral carbon atom with that of the carbon monoxide molecule, the formation and evolution of molecular clouds are being explored in detail. In addition, we are also conducting the laboratory microwave spectroscopy of free radicals which are related to interstellar molecules.
A8				Noriko YAMASAKI	The Institute of Space and Astronautical Science	http://www.astro.isas.jaxa.jp/~yamasaki/index.html	yamasaki _at_ astro.isas.jaxa.jp	High energy astrophysics: Through observational studies of hot plasma associated with galaxies, hot /warm inter-galactic medium and high energy phenomena in the intra-cluster medium, I try to understand the dynamical and chemical evolution in the universe. With observational study with Suzaku and Hitomi observatory, I promote to realize ultra-high energy resolution spectroscopy in coming missions, Athena, DIOS etc. Also novel detector development like TES and other kind of non-resistive calorimeters is underway.
A8				Takanori YOSHIKOSHI	Institute for Cosmic Ray Research	http://www.icrr.u-tokyo.ac.jp/~tyoshiko/	tyoshiko@icrr.u-tokyo.ac.jp	T.Y. researches physics of celestial objects emitting very high energy gamma rays using imaging atmospheric Cherenkov telescope arrays. In particular, he aims to resolve the mystery of the origin of cosmic rays by observing supernova remnants, pulsar wind nebulae, etc. He is also doing R & D studies for next generation atmospheric Cherenkov telescopes.

Professors with 「*」 do not take graduate students.
Professors with 「#」 do not take master's graduate students.
Professors with 「!」 has spesial report.