

◆Section/Keywords List

NOTICE

Former 3,4,5 categories were merged in to Category 3. Please check the category and section again before submission.

Category	
Section	
No.	keyword (English)
1.Applied Physics in General	
1.1 Interdisciplinary and General Physics	
01101	Interdisciplinary studies
01102	Dynamics
01103	Optics and color
01104	Thermal measurements, analysis, and evaluation
01105	Acoustics
01106	Fluid
01107	Static electricity and electromagnetic waves
01108	Tribology
01109	others
1.2 Education	
01201	System
01202	Development of teaching materials, physics experiments
01203	Information education
1.3 Novel Technologies and Frontier Engineering Science	
01301	New technologies
01302	New materials
01303	Device, process technologies
01304	New mechanisms
01305	Sensor, sensing technology, observation method
01306	Characterization technique
01307	Biotechnological applications
01308	Chemical applications
01309	Circuit and Computer technologies
01310	Impacts and Collision
01311	Gravity and its application
01312	Others
1.4 Energy conversion and storage	
01401	Energy conversion
01402	Energy storage
01403	Photovoltaics
01404	Hydrogen storage
01405	Fuel cell
01406	Storage battery, condenser
01407	Solar car
01408	Energy conservation technology
01409	Nuclear application
1.5 Resources and environment	
01501	Resources
01502	Environment
01503	Materials, elements, devices, control
01504	Monitoring, sensing, simulation, LCA, systems
01505	Energy
01506	Reuse, reduce, recycle
01507	Research
1.6 Magnetic field and its application	
01601	Magnetic field effects
01602	Magnetic energy
01603	Magnetic orientation
01604	Magneto-science
01605	Instrumentations in magnetic field
01606	Strong magnetic field

Category	
Section	
No.	keyword (English)
1.7 Instrumentation and measurement, metrology	
01701	Time, frequency, space-time measurement and control
01702	Dimension, distance, displacement, shape, angle
01703	Mass, force, torque, gravity, pressure, flow
01704	Electricity, electromagnetic wave, electromagnetic field
01705	Optical radiation, optical property
01706	Temperature, humidity, heat, thermophysical property
01707	Nanoscale, particle
01708	General measurement, limiting measurement, sensing, instrumentation
01709	Control technology, control theory
01710	Fundamental physical constant, SI, uncertainty, applied statistics
01711	Reference material, material database
01712	Frequency, wavelength, standard time
01713	Geometrical quantities, length, angle, surface morphology, critical dimension
01714	Mechanical quantity, mass, force, pressure, acceleration, acoustics, flow
01715	Thermodynamic quantity, temperature, humidity, density, viscosity, thermophysical quantity, PVT
01716	Electrical quantity, current, voltage, resistance, capacitance, inductance
01717	Electromagnetic wave, RF, photometry and radiometry, laser power, ionizing radiation
1.8 Ultrasonic	
01801	Ultrasonic properties of materials
01802	Measurement techniques
01803	Phonon physics
01804	Acousto-optics
01805	Nondestructive evaluation
01806	Piezoelectric devices
01807	Nonlinear acoustics
01808	High power ultrasound
01809	Sonochemistry
01810	Thermo-acoustics
01811	Medical ultrasound
01812	Underwater sound
2. Ionizing Radiation	
2.1 Radiation physics and detectors	
02101	Radiation physics
02102	Detection principles and fundamentals
02103	Detector materials development
02104	Scintillators
02105	Compound semiconductors
2.2 Detection systems	
02201	Detector development
02202	Signal processing technology
02203	Measurement electronics
02204	Simulation technology
2.3 Application of radiation, radiation generators and technologies	
02301	Radiation generators
02302	Industrial applications
02303	Medical and biological applications
02304	Radiation protection and health physics
02305	Cosmic ray
02306	Image processing
02307	Dosimetry
02308	Environmental radioactivity and radiation
02309	Trace element separation and analysis
02310	Radiation standards
02311	Other applications
3. Optics and Photonics	
Former 3,4,5 categories were merged in to Category 3.	
3.1 Basic optics and frontier of optics	
03101	Light scattering, absorption, diffraction, polarization, coherence
03102	Light-matter interaction, electron-photon interaction
03103	Electromagnetic field analysis
03104	Optical vortex, polarized beam
03105	Laser trapping, laser manipulation
03106	Micro-and nano-optics
03107	Resonator
03108	New technologies

Category	
Section	
No.	keyword (English)
3.2 Materials and equipment optics	
03201	Changes in optical characteristics (reflections, refractions, birefringences, structures, absorptions, etc.) and their applications
03202	Optical waveguiding, diffractive optical elements and materials for them
03203	Nonlinear optical materials, organic optical materials and their elements and applications
03204	Nanomaterials, other materials and their applications
03205	Optical instruments and its designing
03206	Optical fabrication and testing
03207	Optical memories, related materials, instruments
03208	Displays, lightings, related materials, instruments
3.3 Information photonics and image engineering	
03301	Optical & photonic information processing
03302	Digital optics
03303	Computational imaging
03304	Image processing
03305	Optical computing
03306	Optical memory system
03307	Display system, lighting system
03308	Optical communication system
3.4 Biomedical optics	
03401	Biomedical measurements and analyses
03402	Optical properties of biological tissues
03403	Biomedical imaging (OCT, optical topography, etc.)
03404	Biomedical measurements with ultra-short optical pulses
03405	Fluorescence and Raman microscopy
03406	Photonic therapeutics and diagnostics
03407	Visual information processing, visual function
03408	Photoacoustic spectroscopy and imaging
3.5 Laser devices and materials	
03501	DPSS lasers, solid state lasers
03502	Fiber lasers, organic dye lasers
03503	Gas lasers, FEL
03504	Laser materials, nonlinear crystal
03505	Pumping technologies, beam control technology, cavity designs, frequency control technologies
03506	Thermal analysis, thermal compensation technologies
03507	Medium for nonlinear optics, thin film for optics, optical property of materials, periodic-poled medium
03508	The conversion of wavelength, quasi-phase matching, ultraviolet light, tunable laser
03509	Phase conjugate, four-wave mixing, phase conjugate mirror
03510	Mode-lock laser
3.6 Ultrashort-pulse and high-intensity lasers	
03601	Ultrashort-pulse generation and characterization
03602	Ultrashort-pulse laser technology, frequency comb, nonlinear optics
03603	High-intensity laser systems, parametric amplification
03604	High-field phenomena, high energy density science
03605	Ultrafast phenomena
03606	Short pulse, pulse compression
3.7 Laser processing	
03701	Fundamentals, monitoring, dynamics
03702	Thin films, micro- and nanoparticles
03703	Surface modification
03704	Micro processing
03705	High power laser processing
03706	Femtosecond process
03707	Bio and medical applications
03708	Laser excited phenomena
3.8 Optical measurement technology and devices	
03801	Interferometric measurement, polarization measurement, spectroscopy and absorption spectra
03802	Atomic and molecular spectroscopy, high resolution spectroscopy, spectroscopic light source
03803	Speckle and scattering
03804	Femtosecond measurement
03805	Nanoscale measurement
03806	Measurements of refractive index, film thickness, distance, displacement, velocity and particle diameter
03807	Optical sensor, optical measurement system
03808	Lidar, environmental measurement
03809	Applied spectroscopy, industrial measurement, microanalysis
03810	Photoinduced chemistry, biometrics

Category	
Section	
No.	keyword (English)
3.9 THz technology	
03901	THz generation and detection, non-linear optics, photoconductive switch, MQW, photo-mixing
03902	THz optical elements, waveguides, metamaterials, photonic crystals
03903	THz system, spectroscopy, imaging, sensing
03904	THz application, THz probe for carrier dynamics, bio, security, communication
3.10 Optical quantum physics and technologies	
031001	Coherent effects
031002	Quantum correlation, entanglement
031003	Generation and control of quantum states
031004	Quantum information and computation
031005	Quantum communication and cryptography
031006	Atom optics
031007	Laser cooling
031008	Laser chaos, chaos synchronization, cipher communication, semiconductor laser with optical feedback
3.11 Photonic structures and phenomena	
031101	Theories of photonic crystals, theories of electro-magnetic field analyses, new photonic structures
031102	Fabrication processes and materials of multi-dimensional photonic structures
031103	Photonic crystal lasers, nano lasers, light emitting devices
031104	Photonic crystal waveguides, photonic nanowires, ultrasmall photonic circuits
031105	Photonic crystal functional devices, nano-size light control devices
031106	Spontaneous control by photonic nanostructures, control of optical nonlinearities, optical new phenomena
031107	Metal photonic crystals, metamaterials, plasmons, polaritons
3.12 Nanoscale optical science and near-field optics	
031201	Nanophotonics
031202	Nano-optoelectronic devices
031203	Nanoscale optical fabrication
031204	Plasmonics and metamaterials
031205	Raman enhancement
031206	Electromagnetic-field interaction
031207	Nonlinear optics
031208	Scanning probe microscope
031209	Quantum dots
031210	Atom photonics
031211	Dressed photon
3.13 Semiconductor optical devices	
031301	Semiconductor laser, light emitting diode
031302	Semiconductor optical amplifier, optical modulators, optical switch, optical functional device, nonlinear device
031303	Photodiode, photo conductive device, photo-transistor, imaging, sensing
031304	Optical transmitter, optical receiver, integrated device, module, subsystem, optical communication
031305	Solar cell
031306	High sensitivity optical sensing, noise characteristics
031307	Optical property of semiconductors, phenomena
031308	Designing, evaluation, materials, processing, reliability
031309	Novel material, devices, application
3.14 Optical control devices and optical fiber	
031401	Waveguides, passive devices, optical interconnection
031402	Light modulators, optical switch, wavelength conversion device, quasi phase matching, quasi velocity matching, periodical poling, other devices
031403	Integrated device, optical integrated circuits
031404	module, subsystem, system, optical communication
031405	Optical fiber (structures, characteristics, materials, process, evaluation)
031406	Optical fiber devices, sensors
3.15 Silicon photonics	
031501	Novel materials, process, evaluation
031502	Waveguides, passive devices, fiber couplers
031503	Optical modulators, optical switches, nonlinear devices
031504	Light emitters on silicon, group IV light emitting
031505	Photo Detectors
031506	Optical functional devices, optical integrated circuits, photonics-electronics convergence
031507	Photonic circuits, optical system design
031508	Optical signal processing, optical interconnection, optical communication, other applications
6. Thin Films and Surfaces	
6.1 Ferroelectric thin films	
06101	Ferroelectric, dielectric thin films
06102	Multiferroic thin films
06103	Electrode materials
06104	Ferroelectric, piezoelectric devices
06105	Energy harvesting
06106	Process, characterization

Category	
Section	
No.	keyword (English)
6.2 Carbon-based thin films	
06201	Diamond thin films
06202	Microcrystalline diamond
06203	Amorphous carbon thin films
06204	B-C-N thin films
6.3 Oxide-based electronics	
06301	Oxides for electronic functionalities
06302	Strongly correlated electron system
06303	ReRAM
06304	Wide gap semiconductors and transparent materials
06305	Solar cells and photocatalysts
06306	Ionic transport and rechargeable battery
6.4 New thin-film materials *english session is scheduled	
06401	Dielectric thin films
06402	Semiconductive and conductive thin films
06403	Metal thin films
06404	New materials and technologies
6.5 Surface physics and vacuum	
06501	Surfaces
06502	Interfaces
06503	Vacuum
06504	Surface nanostructures
06505	Measurement methods and theories
06506	General surface science
6.6 Probe microscopy	
06601	Scanning probe microscopy
06602	Nanoscience
06603	Nanotechnology
06604	Nanoprobes
06605	Evaluation of surfaces and interfaces
06606	Atomic and molecular manipulation
7. Beam Technology and Nanofabrication	
7.1 X-ray technologies	
07101	X-ray sources
07102	X-ray devices
07103	X-ray optics
07104	X-ray detectors
07105	X-ray microscopes
07106	X-ray applications
07107	X-ray measurement
07108	EUV sources
7.2 Electron microscopes, evaluation, measurement and analysis	
07201	Electron microscopy
07202	Microbeam technique
07203	Analysis and evaluation technique
07204	Surface and interface analysis
07205	Ultrafine structure analysis
07206	Ultratrace analysis
7.3 Lithography	
07301	Optical lithography
07302	EUV lithography
07303	Electron beam lithography
07304	Ion beam lithography
07305	X-ray lithography
07306	Masks
07307	Resists
7.4 Nanoimprint	
07401	Thermal nanoimprint
07402	UV nanoimprint
07403	Contact print and dip pen technology
07404	Molds
07405	Nanoimprint Tools
07406	Nanoimprint applications
07407	Inspections and other imprint related technologies

Category	
Section	
No.	keyword (English)
7.5 Particle/photon-beam-induced surface reactions	
07501	Application of atomic and molecular beams
07502	Application of electron beams
07503	Application of ion beams
07504	Application of laser beams
07505	Application of synchrotron radiation
07506	Excitation processes by probes
07507	Excitation processes by combination techniques or other methods
07508	Fundamental theory
7.6 Ion beams	
07601	Ion sources
07602	Ion beam apparatuses
07603	Ion solid interactions
07604	Ion implantation
07605	Ion beam deposition
07606	Ion beam processes
07607	Ion beam analysis
07608	Theory
7.7 Vacuum nanoelectronics and electron sources	
07701	Emission properties of electron sources
07702	Fabrication of electron sources
07703	Characterization of electron sources
07704	Materials for electron sources
07705	Applications of vacuum nanoelectronics and electron sources
07706	Emission fundamental and modeling
07707	Novel technologies for electron emission and vacuum tunneling
7.8 New beam-application technologies	
07801	New application technologies and instruments of atomic and molecular beams
07802	New application technologies and instruments of electron beams
07803	New application technologies and instruments of ion beams
07804	New application technologies and instruments of laser beams
07805	New application technologies and instruments of synchrotron radiation
07806	New application technologies and instruments of optical lithography and its related techniques
8. Plasma Electronics	
English session is scheduled in 8. If you choose "English" as the presentation language, your presentation will be preferentially programmed in	
8.1 Plasma production and control	
08101	Production and control of microwave plasmas
08102	Production and control of RF plasmas
08103	Production and control of atmospheric non-thermal plasmas
08104	Production and control of thermal plasmas
08105	Production and control of plasmas in or on liquid
08106	Production and control of reactive plasmas
08107	Simulations of plasma production and control
08108	Production and control of other plasmas
8.2 Plasma measurements and diagnostics	
08201	Optical measurements and diagnostics
08202	Particle measurements and diagnostics
08203	Solid and liquid surface condition measurements
08204	Plasma/surface reactions and diagnostics
08205	Process monitoring techniques
08206	Other techniques
8.3 Plasma deposition of thin film and surface treatment	
08301	CVD, PVD and sputtering
08302	Surface treatment, modification, and functionalization
08303	Organic processing
08304	Equipment and control technique
08305	Process cleaning
08306	Particle growth
08307	Arc and plasma jets
8.4 Plasma etching	
08401	Etching technology for Si and conductive materials
08402	Etching technology for dielectric materials
08403	Plasma induced damage and process integration
08404	Etching technology for new materials and new structures
08405	Modeling and Simulation
08406	Equipment and its control

Category	
Section	
No.	keyword (English)
8.5 Plasma nanotechnology	
08501	Nanotubes, nanowalls, nanohorns and graphene
08502	Fullerenes and nano particles
08503	Plasma nanoprocessing
08504	Self-organized and self-assembled films
08505	Structure control and new structure
08506	Synthesis of nanostructured materials
08507	Properties and functions enhanced by nanostructure
08508	Nanodevices
8.6 General plasma phenomena, emerging area of plasmas and their new applications	
08601	Fundamental processes in atomic, molecular and gas discharges
08602	Light sources and displays
08603	Laser plasmas
08604	Plasma photonics
08605	Plasma biological applications
08606	Environmental and energy applications
08607	Liquid and in-liquid plasma applications
08608	Plasma medical applications
08609	Plasma agricultural applications
08610	Novel plasma applications
9. Applied Materials Science	
9.1 Dielectrics, ferroelectrics	
09101	Dielectric, ferroelectric, and piezoelectric materials
09102	Dielectric and piezoelectric properties
09103	Domains
09104	Layered compounds
09105	Ceramics and single crystals
09106	Characterization and measurement techniques
9.2 Nanowires, nanoparticles	
09201	nanowires
09202	nanoparticles
09203	powder/fine particles: electric charge, discharge, and ions
09204	hybrids between nanowires and nanoparticles, between inorganic and organic materials
09205	formation mechanisms
09206	characterization of nano-material properties
09207	characterization methods
09208	applications to nanobiotechnologies, energy harvesting technologies, novel/multi-functional devices
09209	safety evaluations
9.3 Nanoelectronics	
09301	Quantum and nanoscale devices
09302	Nanoscale materials and structures: fabrication and characterization
09303	Physical properties of nanoscale materials and structures
09304	Nanoscale devices: new concepts and architectures
09305	Quantum information
9.4 Thermoelectric conversion	
09401	Oxide materials
09402	Compound semiconductors
09403	Systems and modules
09404	Measurements
09405	Others
9.5 New functional materials and new physical properties	
09501	Novel functional materials, novel physical properties
09502	Characterization methods for novel functional materials, novel physical properties
09503	Luminescent materials, memory materials, and magnetostriction materials and sensor applications
09504	Environmentally friendly semiconductors, energy storage materials, thermal conductive materials, heat radiation materials, nano materials
10. Spintronics and Magnetism	
English presentations are welcomed in this category. Outstanding presentations by student speakers will be awarded by Professional Group of	
10.1 Creation of new materials	
10101	Spin-functional oxides and their heterostructures
10102	Heusler alloys and their heterostructures
10103	Novel magnetic materials and their heterostructures
10104	Nanostructured magnetic materials (including nanoparticles) and their fabrication processes and simulations
10.2 Spin torque, spin current, circuits, and measurement technologies	
10201	MRAM (including circuit and device designs)
10202	Spin-dependent transport phenomena and devices (including circuit and device designs)
10203	Magnetic imaging, measurements and instrumentation
10204	Fabrication processes for magnetic devices
10205	Novel spin transport phenomena

Category	
Section	
No.	keyword (English)
10.3 Giant magnetoresistance (GMR), tunnel magnetoresistance (TMR) and magnetic recording technologies	
10301	Materials and fabrication technologies for TMR and GMR devices
10302	Magnetic recording technologies (HDD, etc.)
10303	Magnetic sensors
10304	High frequency devices
10305	Other spin and magnetic devices (including device and circuit designs)
10.4 Semiconductors, organic, optical, and quantum spintronics	
10401	III-V magnetic semiconductors and their heterostructures
10402	IV magnetic semiconductors and their heterostructures
10403	II-VI magnetic semiconductors and their heterostructures
10404	Spin-functional organic materials and their heterostructures
10405	Spin-dependent optical devices and phenomena (including device and circuit designs)
10406	Detection and manipulation of nuclear spin
10407	Spin-based quantum communication and computer
10408	Other novel spin related phenomena
11. Superconductivity	
11.1 Fundamental properties	
11101	Novel phenomena, physics and chemistry, theory
11102	Crystal growth, substitution effect, intercalation
11103	Josephson effect, intrinsic Josephson junctions
11104	Vortex properties, high-frequency response
11105	Novel superconducting materials, new evaluation technology
11106	Bismuth and thallium systems
11107	123 cuprate superconductors
11108	214 superconductors, other oxide superconductors
11109	Metallic superconductors, organic superconductors, Non-copper oxide superconductors
11.2 Thin films, thick films, coated conductors and thin film crystal growth	
11201	YBCO and REBCO thin films
11202	Bi-, Tl- and Hg-oxide thin films
11203	Coated conductor process
11204	Large-area thin films
11205	Low-Tc thin films
11206	Thin film crystal growth
11207	Others
11.3 Critical current, superconducting power applications	
11301	Critical current, pinning, E-J characteristics
11302	Electromagnetic phenomenon
11303	Evaluation of characteristics of thin films
11304	Evaluation of characteristics of wires
11305	Evaluation of characteristics of bulks
11306	Superconducting power applications
11307	Methods for evaluations
11308	Others
11.4 Analog application and its related technologies	
11401	SQUID and its applications (device structures, properties of devices, amplifiers, etc.)
11402	Microwave devices and applications (microwave passive devices, filters, antennas, tunable filters, active devices, etc.)
11403	Mixers, transmitters, and receivers (heterodyne receivers, transmitters, bolometers, STJ detectors, transition edge sensors)
11404	Other analog devices
11405	Advanced measurement application and its related technologies (SQUID measurements, voltage standards, cryogenic systems, magnetic shielding technologies, etc.)
11.5 Junction, circuit fabrication process and digital applications	
11501	Josephson junction fabrication process (LTS, HTS, NbN, MgB2, etc.)
11502	Circuit fabrication process (LTS, HTS, NbN, MgB2 etc.)
11503	Circuit design (circuit simulation, optimized design, circuit design tool)
11504	Small/middle scale circuit application (AD converter, etc.)
11505	Large scale application (server, router, etc.)
11506	Other applications

Category	
Section	
No.	keyword (English)
12. Organic Molecules and Bioelectronics	
12.1 Fabrications and Structure Controls	
12101	Dry processes (vacuum evaporation, chemical vapor deposition)
12102	Wet processes (spin coating, dip coating, spray deposition, inkjet printing, Langmuir-Blodgett technique, self-organization, self-assembled monolayer)
12103	Epitaxy, epitaxial growth
12104	Electrochemical crystal growth
12105	Control of molecular alignment, orientation
12106	Liquid crystals (phase transition, structure and ordering, polymer network)
12107	Liquid crystal alignment (surface alignment, photoalignment, anchoring)
12108	Micro and nanoparticles
12109	Organic-inorganic hybrids
12110	Organic nanocrystals, nanoarchitecture
12111	Nanopores, nanosheets
12112	Other fabrication techniques
12.2 Characterization and Materials Physics	
12201	Scanning probe microscopy (STM, AFM, KPFM, SNOM, etc.)
12202	Spectroscopic analyses (photoelectron, laser, vibrational, ESR, EELS, thermally stimulated current, etc.)
12203	Structural analyses (X-ray diffraction, electron beam diffraction, etc.)
12204	Surface plasmon resonance and spectroscopy
12205	Carrier transport phenomena, thermal transport phenomena
12206	Molecular-scale electronics and photonics
12207	Theoretical study and simulation
12208	Other analyses and characterization techniques
12.3 Functional materials and novel devices	
12301	Electro- and optical-functional materials (molecular design, synthesis, characterization)
12302	Liquid crystals
12303	Organic semiconductors
12304	Conductive polymers
12305	Self assembled materials
12306	Soft materials (polymer, gel, colloid)
12307	Optical functional materials (nonlinear optics, photoinduced structural change and photoisomerization, luminescence, lasing)
12308	Exciton and plasmon engineering
12309	Electronic devices (photoelectron conversion, thermoelectric conversion, sensor, memory, etc.)
12310	Optical functional devices (luminescence device, optical waveguide, microcavity, etc.)
12311	Liquid crystal devices (display, photonics, biological applications, etc.)
12312	Polymer functional devices
12313	Polymer electronics
12.4 Organic light-emitting devices and organic transistors	
12401	Fundamental properties of organic devices (device physics, carrier transport, carrier injection, interfaces, surfaces, molecular ordering)
12402	Degradation mechanism
12403	Highly efficient OLEDs and materials
12404	Small-molecule OLEDs and materials
12405	Polymer OLEDs and materials
12406	OLED fabrication technology
12407	Light extraction
12408	Application of OLEDs (display, lighting, etc.)
12409	Transistor materials (synthesis, evaluation, properties)
12410	Transistor fabrication technology (electrode, gate dielectric, surface treatment)
12411	Application of transistors (display, sensor, memory, integration circuit)
12412	Novel devices (light-emitting transistors, organic semiconductor lasers, etc.)
12.5 Organic solar cells	
12501	Organic photovoltaic cells
12502	Dye-sensitized solar cells
12503	Organic-inorganic hybrid solar cells, nanostructured solar cells, advanced solar cells
12504	Photovoltaic science (photophysics, device physics, charge transport, optical and electronic properties, etc.)
12505	New organic semiconductor materials (polymers, small molecules, dyes, etc.), interfacial materials, barrier materials
12506	Photovoltaic systems, reliability and testing techniques, field testing techniques
12507	Photovoltaic modules, large-area manufacturing techniques, roll-to-roll fabrication techniques
12508	Photovoltaic batteries, other combined techniques

Category	
Section	
No.	keyword (English)
12.6 Nanobiotechnology	
12601	Nanomaterials and nanostructures for biosensor and biochip (DNA chip, protein chip, cell chip)
12602	Measurement and manipulation of single molecule and single cell (including mechanics and optics)/ high-sensitivity detection, spectroscopic or imaging method for biology
12603	Nanobio-process, self-assembly and self-organization of biomolecules/ bio-inspired materials
12604	Bio-interface and related techniques (surface treatment, modification, patterning and microfabrication)
12605	Nanobioelectronics, nanobiophotonics, nanobio-green technology
12606	Other nano&bio interdisciplinary fields
12.7 Medical Engineering and Biochips	
12701	Cell function, biological function, biological property, biophysics, regenerative medicine (tissue engineering)
12702	Medical engineering, medical robotics, biophotonic devices, biosensors, chemical sensors
12703	Genetic engineering, protein engineering, supramolecular engineering
12704	Smartbiochips, bioelectronics
12705	Bio-MEMS, μ -TAS
12706	Biomaterial, biomass, biomimetics
12707	Bioimaging
13. Semiconductors A (Silicon)	
13.1 Basic Properties, Surface and Interface Phenomena, and Simulation	
13101	Material properties
13102	Novel functions
13103	Novel characterization
13104	Nano structures
13105	Interface
13106	Thin films
13107	Theory
13108	Surface preparation
13109	Reaction, nucleation, and initial film growth
13110	Contamination detection and removal
13111	Adsorption and desorption
13112	Fine structure
13113	Aqueous etching
13114	Process simulation
13115	Device simulation
13116	Circuit simulation
13117	Thermal transport simulation
13118	Others
13.2 Insulator technology	
13201	Gate insulator
13202	Silicon oxide/silicon oxynitride/silicon nitride
13203	high-k film
13204	Ge/SiGe/Strained-channel
13205	III/V group semiconductor
13206	Film formation method/evaluation method
13207	Electrical property/reliability
13208	Model/simulation
13209	Passivation film
13210	Insulative film for Memory devices(Floating gate, Charge trapping, ReRAM)
13211	Gate stack for TFT
13212	Others

Category	
Section	
No.	keyword (English)
13.3 Si Process • Interconnect • MEMS • Integration	
13301	SOI
13302	TFT
13303	Epitaxy/CVD/sputter
13304	Impurity doping/shallow junction/transient enhanced diffusion
13305	Low- and high-temperature poly-Si and related materials
13306	Gate materials
13307	Process-induced defect
13308	Nanoscale process
13309	Metal-semiconductor interface/Contact
13310	Silicide
13311	Interconnect/Process/Materials/Barrier metal
13312	Interlayer dielectrics/Low-k material/Barrier dielectric
13313	Planarization/Lamination/bonding
13314	3D stacking/TSV/Redistribution Layer
13315	MEMS/NEMS/Sensor
13316	Biodevice
13317	Reliability
13318	Packaging
13319	Multi-physics simulation
13320	Others
13.4 Devices/Integration Technologies	
13401	New device structures (Nanowire, FinFET, etc.)
13402	New material devices (Si, Ge, III-V, oxide channel, etc.)
13403	Quantum effect devices (SET, QD, Tunnel, Spin, etc.)
13404	Non-volatile memories (Flash, ReRAM, MRAM, FeRAM, etc.)
13405	Integration technologies (New process, etching, junction, etc.)
13406	Device operating principles and various phenomena
13407	Reliability and measurement techniques
13408	Circuit design
13409	others
13.5 Si-English Session *All-English session	
13501	Presentation in English
14. Semiconductors B (Exploratory Materials, Physical Properties, Devices)	
14.1 Physical properties of exploratory materials	
14101	Semiconducting silicides
14102	Properties of new materials, material design
14103	Impurity, defect, deep level
14104	Carrier transport
14105	Evaluation technique, new principle
14.2 Ultrathin films and quantum nanostructures	
14201	Quantum dots
14202	Quantum wires
14203	Quantum wells
14204	Optical properties in low-dimensional materials
14205	Electronic properties in low-dimensional materials
14206	Tunneling effects
14207	Nanostructure fabrication
14208	Nanodevices
14.3 Electron devices and Process technology	
14301	Nitride semiconductor electron devices and circuits
14302	III-V channel electron devices and circuits
14303	Functional devices with new materials and/or new concepts
14304	Process technology and characterization of nitride devices
14305	Process technology and characterization of III-V devices
14.4 Optical properties and light-emitting devices	
14401	Si-based materials
14402	Rare-earth doped materials
14403	EL (Phosphor, Inorganic EL)
14404	Others
14.5 Compound solar cells	
14501	III-V solar cells
14502	Quantum structured solar cells
14503	Nitride/oxide solar cells
14504	Chalcogenide solar cells
14505	Novel solar cells and related materials

Category	
Section	
No.	keyword (English)
15. Crystal Engineering	
15.1 Bulk crystal growth	
15101	Czochralski method
15102	Bulk single crystals
15103	Dislocation
15104	Melt growth
15105	Substrate material
15.2 II-VI-group crystals and multicomponent crystals	
15201	Crystal growth
15202	Optical properties
15203	Electrical properties
15204	Devices, process
15205	New material, multi-element oxide
15206	Nano-structure
15.3 III-V-group epitaxial crystals	
15301	Diluted nitrides
15302	Sb-containing alloys
15303	Quantum structures
15304	MBE
15305	MOCVD/MOMBE
15.4 III-V-group nitride crystals	
15401	Optical properties and characterization
15402	Electronic properties and characterization
15403	Epitaxial growth (MOVPE, MBE)
15404	Cubic GaN
15405	Bulk crystals and freestanding crystals
15406	Dislocation
15407	Devices (LD, LED and photo detectors) and their process
15408	InN
15409	AlN
15.5 IV-group crystals and IV-IV-group mixed crystals	
15501	SiGe(Ge) virtual substrate
15502	SiGeSn, SiGeC
15503	Quantum dot, nano structure
15504	Poly Si/Ge
15505	SGOI, GOI
15506	Strained Si, Ge
15507	Dislocation, defect
15508	Crystal growth
15509	Optical device
15.6 IV-group-based compounds	
15601	Crystal growth
15602	Epitaxial growth
15603	Contact
15604	Oxide and other dielectrics
15605	Processing
15606	Devices
15607	Characterization
15.7 Fundamentals of epitaxy	
15701	Theory
15702	Growth mechanism
15703	Surface structures
15.8 Crystal evaluation, impurities and crystal defects	
15801	Point defect
15802	Impurity effect
15803	Hydrogenation
15804	Optical characterization
15805	X-ray characterization
15806	Electrical characterization
16. Amorphous and Microcrystalline Materials	
16.1 Fundamental properties and their evaluation in disordered materials	
16101	Chalcogenide materials
16102	Oxide materials
16103	Fiber devices
16104	Silicon-based materials (non-PV)
16105	Organic-inorganic hybrid materials
16106	Metal nanoparticles
16107	Surface, interface, multilayers, stacked structures
16108	Crystalline/amorphous mixed-phase materials
16109	New materials, novel characterization technique

Category	
Section	
No.	keyword (English)
16.2 Processing technologies and devices	
16201	Chemical vapor deposition
16202	Sputtering, vapor-phase deposition
16203	In-situ diagnostics, growth mechanism
16204	Printing, coating, non-vacuum process
16205	Annealing, liquid/solid phase growth
16206	Thin-film devices (non-PV)
16207	Novel devices (non-PV)
16.3 Bulk, thin-film and other silicon-based solar cells	
16301	Bulk crystalline silicon : growth and characterization
16302	Bulk crystalline silicon solar cells
16303	Thin-film silicon : fabrication and characterization
16304	Thin-film silicon solar cells
16305	Crystalline/amorphous heterojunction solar cells
16306	Light trapping, TCO
16307	Surface passivation
16308	Modules, testing, standardization
16309	Novel photovoltaic devices
17. Nanocarbon Technology	
17.1 Growth technology	
17101	Nanotube
17102	Graphene
17103	Fullerene
17104	Other nanocarbon materials
17105	Other layered or two-dimensional materials
17106	CVD, plasma CVD
17107	Sublimation
17108	In-situ observation, new growth method
17109	Others
17.2 Structural control and process	
17201	Alignment
17202	Formation of special structure, composite structure
17203	Separation, dispersion, modification
17204	Surface, interface
17205	Stacking, stacking structure
17206	Others
17.3 Exploration of new functions and evaluation of basic properties	
17301	Transport properties
17302	Optical properties
17303	Mechanical properties, thermal properties, and others
17.4 Device application	
17401	FET, and integrated circuit
17402	Quantum devices
17403	Optical devices
17404	Sensing devices
17405	Field emission
17406	NEMS and others
18. JSAP-OSA Joint Symposia	
All-English sessions.	
18.1 Plasmonics	
18101	Surface-enhanced spectroscopy
18102	Plasmonic nanoimaging
18103	Plasmonic antennas: design and fabrication
18104	Plasmonic circuits and waveguides
18105	Metamaterials
18.2 Bio- and Medical Photonics	
18201	Biomedical spectroscopy, microscopy, and imaging
18202	Clinical technologies and systems
18203	Cell manipulation
18204	Light tissue interaction
18205	Biosensors
18.3 Laser Manufacturing	
18301	Laser additive manufacturing
18302	Laser deposition
18303	Laser cutting
18304	Laser joining
18305	Laser for industrial use

Category	
Section	
No.	keyword (English)
18.4 Optical Micro-sensing, Manipulation, and Fabrications	
18401	Optical tweezers
18402	Optical fiber sensing
18403	Biomedical sensing
18404	Sensing of microparticles
18405	Manipulation of micro-particles
18406	Sub-wavelength structures
18407	Micro-fabrication with optical vortices
18408	Micro-fabrications with nano-particles
18409	Surface relief grating
18410	Micro fabrications with fs and ps laser pulses
18411	Interferometric micro fabrications
18412	Optical materials with nano particles
18.5 Opto-electronics	
18501	Semiconductor laser and light emitter, photodetector
18502	Si photonics, photonic crystal, optical modulator, optical switch, waveguide devices, and MEMS
18503	Dielectric/ferroelectric materials and devices
18504	III-V material and devices, IV material and devices
18.6 Information Photonics	
18601	Digital / computer generated holography
18602	Three-dimensional imaging and display
18603	Computational imaging and display
18604	Multispectral imaging
18605	Polarimetric imaging
18.7 Laser Photonics —XFEL and ultrafast optics—	
18701	Ultrafast laser & phenomena
18702	High-intensity laser physics
18703	Attosecond science
18704	New sources and applications of coherent ultrafast X-rays
18.8 Carbon Photonics	
18801	Carbon nanotube
18802	Graphene
18803	Atomically-thin layered materials
18804	Plasmonics
18805	Optical devices

21.1 Joint Session K "Wide bandgap oxide semiconductor materials and devices"	
21101	Crystal growth
21102	Materials properties and characterization
21103	Bandgap engineering
21104	Heterostructures and multilayers
21105	Doping
21106	Transparent conducting film
21107	Thin-film devices
21108	Excitonic devices
21109	Ultraviolet optical devices

Symposium	
31.1	Interfacial nano electrochemistry: Research frontiers of semiconductor wet processes
32.1	Phase problem in the analysis of buried interfaces by X-ray reflectivity and surface X-ray scattering - Towards new research with coherent light sources
33.1	Low-Temperature Growth of Group-IV Semiconductors on Insulator - Emerging New Crystallization Techniques -
34.1	Current situation and issues of thin-film silicon solar cell technologies
35.1	Japan-Korea Joint Symposium on Semiconductor Physics and Technology - Nano-carbon materials including graphene -
36.1	Activity of the scientific enlightenment including upbringing of the student
37.1	Micro and nano behavior of bio material surfaces and its application
38.1	Oxide electronics at solid-liquid interfaces: Chemistry and device applications
39.1	Surface reaction control by atomic and molecular beams, its development and application
40.1	Computer Simulations for Plasma Processing (state-of-the-art plasma modelling)
41.1	Frontier of Spintronic Materials and Devices
42.1	Present and Future of Functional atomic thin film research
43.1	応用物理に期待される資源リサイクルとエネルギー問題 (English title TBA)
44.1	Behavior of nuclear fuel and fission products during severe accident and activities on decontamination
45.1	量子計測技術における新展開 (English title TBA)
46.1	New Frontiers and Future Perspectives in Surface Reaction Observation Using Synchrotron Radiation
47.1	Innovation in R&D of the Flexible Electronics -Toward the Inorganic Flexible Devices-
48.1	Materials Science of Singularity in Nitride semiconductors - Characterization and Crystallography-