

## LIST OF THESIS ADVISORS FOR 2014 ENTRY

Applicants are required to contact prospective thesis advisors in advance. The following is a list of faculty members together with brief descriptions of their research. They can be contacted by sending an email to the representative email address, admission-g@cl.sophia.ac.jp. Make sure you clearly mention the name of the faculty member whom you are interested in. Some faculty members list their own URL pages. Otherwise, more information for all faculty members can be found through [http://librsh01.lib.sophia.ac.jp/scripts/websearch/gakubu\\_result.htm](http://librsh01.lib.sophia.ac.jp/scripts/websearch/gakubu_result.htm)

<p><b>ADACHI, Tadashi</b> (Associate Professor)            Research field: Superconductivity, New Functional Materials</p> <ul style="list-style-type: none"> <li>• Muon-spin-relaxation study of the spin dynamics in Cu-based and Fe-based high-Tc superconductors</li> <li>• Novel charge-spin order/fluctuation studied by transport properties in high magnetic fields</li> <li>• Synthesis of novel functional materials by the solid-state reaction, flux and floating-zone methods</li> </ul>	<p><b>ARAI, Takayuki</b> (Professor)  <a href="http://www.splab.net/">http://www.splab.net/</a></p> <p>Research field: Speech Communication</p> <ul style="list-style-type: none"> <li>• Education in acoustics, acoustic phonetics, and speech processing</li> <li>• Speech science (incl. production), hearing science (incl. perception)</li> <li>• Speech signal processing for people with communication disorders</li> </ul>
<p><b>AZUMA, Yoshiro</b> (Professor)  <a href="https://sites.google.com/site/sophiaazumalab/home">https://sites.google.com/site/sophiaazumalab/home</a></p> <p>Research field: Atomic and Molecular Physics</p> <ul style="list-style-type: none"> <li>• Multi-electron photoexcitation of atoms and molecules</li> <li>• Synchrotron radiation science</li> </ul>	<p><b>BANDAI, Masaki</b> (Associate Professor)  <a href="http://bandailab.org">http://bandailab.org</a></p> <p>Research field: Computer Networks</p> <ul style="list-style-type: none"> <li>• Network systems (wireless networks, ad hoc networks and sensor networks)</li> <li>• Network protocols (medium access control, routing, transport protocols)</li> <li>• Network applications</li> </ul>
<p><b>CHIBA, Atsuhiko</b> (Associate Professor)  <a href="http://librsh01.lib.sophia.ac.jp/Profiles/57/0005669/prof_e.html">http://librsh01.lib.sophia.ac.jp/Profiles/57/0005669/prof_e.html</a></p> <p>Research field: Behavioral Neuroscience</p> <ul style="list-style-type: none"> <li>• Studies on the molecular basis and neuronal mechanism of the amphibian circadian clock</li> <li>• Behavioral and neuroendocrinological studies of sexual odor preference in rodents</li> </ul>	<p><b>EMA, Kazuhiro</b> (Professor)  <a href="http://soliton.ph.sophia.ac.jp/">http://soliton.ph.sophia.ac.jp/</a></p> <p>Research field: Optical Physics, Optical Properties of Solids, Photonics</p> <ul style="list-style-type: none"> <li>• Excitonic optical properties of semiconductors, organic materials, and inorganic-organic hybrid materials</li> <li>• Ultrafast dynamics of excited states in solids</li> <li>• Optical properties of semiconductor nanostructures</li> <li>• Generation and control of coherent phonons in wide-gap semiconductors</li> <li>• Ultrafast optical pulse control and its application for optical Communications</li> </ul>
<p><b>ENDO, Akira</b> (Associate Professor)  <a href="http://www.mls.sophia.ac.jp/~analysis/">http://www.mls.sophia.ac.jp/~analysis/</a></p> <p>Research field: Electrochemistry, Coordination Chemistry</p> <ul style="list-style-type: none"> <li>• Synthesis and electrode reaction of dinuclear <math>\beta</math>-diketonato ruthenium complex</li> <li>• Control of mixed-valence state by molecular recognition</li> <li>• Electrochemical molecular recognition by <math>\beta</math>-diketonato ruthenium / dendrimer complex</li> <li>• Electrochemical properties of gold nanoparticles modified by ruthenium complexes</li> </ul>	<p><b>FUJII, Mamiko</b> (Associate Professor)</p> <p>Research field: Bio-medical Optics, Bio-medical Engineering</p> <ul style="list-style-type: none"> <li>• Application of bio-medical optics: Development for depth-selective Diffuse</li> <li>• Optical Topography</li> <li>• Fundamental study of bio-medical optics: Theoretical and experimental study of tissue characterization</li> <li>• Biomedical Instrumentation: Application of electrical impedance</li> </ul>

<p><b>FUJITA, Masahiro</b> (Associate Professor)  <a href="http://www.mls.sophia.ac.jp/~polymer/index.html">http://www.mls.sophia.ac.jp/~polymer/index.html</a>  Research field: Polymer Chemistry, Organic Chemistry</p> <ul style="list-style-type: none"> <li>• Synthesis and characterization of ion conductive polymers</li> <li>• Development of functional ionic liquids for lithium ion transport</li> <li>• Synthesis of organic ionic plastic crystals and their electrochemical properties</li> <li>• Ionic liquids as new solvents for dissolution of polysaccharide</li> </ul>	<p><b>FUJIWARA, Makoto</b> (Associate Professor)  <a href="http://librsh01.lib.sophia.ac.jp/Profiles/70/0006951/prof_e.html">http://librsh01.lib.sophia.ac.jp/Profiles/70/0006951/prof_e.html</a>  Research field: Molecular Cell Biology, Plant Science</p> <ul style="list-style-type: none"> <li>• Genetic control of chloroplast division</li> <li>• Live imaging of plant cell organelles</li> </ul>
<p><b>GOMI, Yasushi</b> (Associate Professor)  <a href="http://pweb.sophia.ac.jp/y-gomi/en/">http://pweb.sophia.ac.jp/y-gomi/en/</a>  Research field: Algebra</p> <ul style="list-style-type: none"> <li>• Representation theory of algebraic groups and Hecke algebras</li> </ul>	<p><b>GONSALVES, Tad</b> (Associate Professor)  <a href="http://www.me.sophia.ac.jp/~t-gonsal/">http://www.me.sophia.ac.jp/~t-gonsal/</a>  Research field: Computational Intelligence, Computer Simulation, Knowledge Engineering</p> <ul style="list-style-type: none"> <li>• Simulation Optimization Meta-heuristics</li> <li>• Knowledge Management &amp; Design of Expert Systems</li> <li>• Ontology and Semantic Web</li> </ul>
<p><b>GOTO, Satoshi</b> (Assistant professor)  <a href="http://pweb.sophia.ac.jp/s-goto/en-SGoto.html">http://pweb.sophia.ac.jp/s-goto/en-SGoto.html</a>  Research field: Operator Algebras and Mathematical Physics</p> <ul style="list-style-type: none"> <li>• The Jones index theory of subfactors in the theory of operator algebras</li> <li>• Algebraic/combinatorial aspects of subfactor theory (graphs, fusion algebras etc.) and its relation to other fields in mathematics and mathematical physics such as quantum groups, solvable lattice models, topological quantum field theory (3-dimensional topology) and rational conformal field theory</li> </ul>	<p><b>GOTO, Takayuki</b> (Professor)  Research field: Low Temperature Condensed State Physics  This laboratory studies magnetic and superconducting properties of strongly-correlated electron systems at low temperatures by microscopic probes of nuclear magnetic resonance (NMR) and muon spin relaxation (<math>\mu</math>SR)</p> <ul style="list-style-type: none"> <li>• The ground state and various quantum phase transitions in quantum spin systems</li> <li>• The effect of the incoherent local structure on the superconductivity in high-T<sub>c</sub> superconductors</li> <li>• Superconducting properties including the novel vortex state in organic complexes</li> </ul>
<p><b>HASHIMOTO, Takeshi</b> (Assistant Professor)  <a href="http://www.mls.sophia.ac.jp/~analysis/">http://www.mls.sophia.ac.jp/~analysis/</a>  Research field: Analytical Chemistry, Coordination Chemistry</p> <ul style="list-style-type: none"> <li>• Ion and molecule recognition based on metal complexes chemistry</li> <li>• Electrochemical studies for (<math>\beta</math>-diketonato) ruthenium complexes</li> <li>• Design of supramolecular chemosensors for ion and molecule recognition in water</li> </ul>	<p><b>HAYASHI, Hitoshi</b> (Associate Professor)  <a href="http://librsh01.lib.sophia.ac.jp/Profiles/73/0007245/prof_e.html">http://librsh01.lib.sophia.ac.jp/Profiles/73/0007245/prof_e.html</a>  Research field: Application of RFID and sensor networks</p> <ul style="list-style-type: none"> <li>• Fundamental study of RFID and sensor networks</li> <li>• Design of miniaturized and low-power microwave circuits/wireless systems</li> </ul>
<p><b>HAYASHI, Kensuke</b> (Professor)  <a href="http://librsh01.lib.sophia.ac.jp/Profiles/62/0006178/prof_e.html">http://librsh01.lib.sophia.ac.jp/Profiles/62/0006178/prof_e.html</a>  Research field: Cell Biology, Developmental Neuroscience</p> <ul style="list-style-type: none"> <li>• Development of the axon and dendrites in mammalian neurons</li> <li>• Cell migration during the neuronal development</li> </ul>	<p><b>HAYASHITA, Takashi</b> (Professor)  <a href="http://www.mls.sophia.ac.jp/~analysis/">http://www.mls.sophia.ac.jp/~analysis/</a>  Research field: Analytical Chemistry, Supramolecular Chemistry</p> <ul style="list-style-type: none"> <li>• Development of novel sensing and separation systems for innovation in chemical analysis</li> <li>• Design of supramolecular chemosensors for ion and molecule recognition in water</li> <li>• Studies on synthesis, reaction and characterization of the photo-functional and electro-functional metal complexes for molecular recognition</li> </ul>

<p><b>HIRANO, Tetsufumi</b> (Associate Professor)  Research field: Hadron physics (theory)</p> <ul style="list-style-type: none"> <li>• Quark gluon plasma</li> <li>• High energy nuclear collision</li> <li>• Relativistic hydrodynamics</li> </ul>	<p><b>HIRATA, Hitoshi</b> (Assistant Professor)  <a href="http://pweb.sophia.ac.jp/h-hirata/en/">http://pweb.sophia.ac.jp/h-hirata/en/</a>  Research field: Analysis, Applied Analysis</p> <ul style="list-style-type: none"> <li>• Nonlinear Schroedinger Equations</li> <li>• Nonlinear Waves</li> <li>• Biological Mathematics</li> </ul>
<p><b>HISAMORI, Noriyuki</b> (Associate professor)  <a href="http://www.me.sophia.ac.jp/~hisamori/">http://www.me.sophia.ac.jp/~hisamori/</a>  Research field: Biomaterial Science, Material Science and Engineering</p> <ul style="list-style-type: none"> <li>• Bio-functional materials for advanced medical technology</li> <li>• Metallic biomaterials and Bioactive materials</li> <li>• Strength and fracture of materials</li> <li>• New surface modification processes</li> </ul>	<p><b>HORIKOSHI, Satoshi</b> (Associate Professor)  <a href="http://pweb.cc.sophia.ac.jp/horikosi/">http://pweb.cc.sophia.ac.jp/horikosi/</a>  Research field: Green Chemistry, Energy &amp; Fuel Chemistry</p> <ul style="list-style-type: none"> <li>• Environmental protection with photocatalyst</li> <li>• Organic synthesis in microwave green chemistry</li> <li>• Hydrogen storage with novel microwave catalyst</li> </ul>
<p><b>HOSHINO, Masamitsu</b> (Associate Professor)  <a href="http://www.ph.sophia.ac.jp/~tana-ken/index.html">http://www.ph.sophia.ac.jp/~tana-ken/index.html</a>  Research field: Atomic and Molecular Physics</p> <ul style="list-style-type: none"> <li>• Excitation of atoms / molecules by low energy electron / positron/ion impact</li> <li>• Core excitation of molecules by synchrotron radiation</li> <li>• Negative ion formation from dissociative electron attachment</li> </ul>	<p><b>ICHIYANAGI, Mitsuhsa</b> (Assistant Professor)  Research field: Thermal Engineering, Heat and Mass Transfer</p> <ul style="list-style-type: none"> <li>• Investigation of micro-and nano-scale transport phenomena</li> <li>• Experimental analysis of interfacial phenomena in multiphase flow</li> <li>• Evaluation of heat transfer characteristics in next-generation semiconductor devices</li> <li>• Development of laser-based measurement technique</li> </ul>
<p><b>IROHARA, Takashi</b> (Professor)  <a href="http://www.me.sophia.ac.jp/~irohara/">http://www.me.sophia.ac.jp/~irohara/</a>  Research field: Industrial and Systems Engineering</p> <ul style="list-style-type: none"> <li>• Facility logistics in factory and warehouse</li> <li>• Global supply chain management</li> <li>• Energy efficient production scheduling</li> </ul>	<p><b>ITATANI, Kiyoshi</b> (Professor)  Research field: Industrial Inorganic Chemistry, Biomaterials, Luminescence Materials, High-temperature Structural Ceramics</p> <ul style="list-style-type: none"> <li>• Development of novel biomaterials (inorganic-organic composites)</li> <li>• Luminescence properties of novel oxynitride materials</li> <li>• Mechanical properties of non-oxide ceramics</li> </ul>
<p><b>ITOH, Kiyoshi</b> (Professor)  <a href="http://lise.me.sophia.ac.jp/kktn/">http://lise.me.sophia.ac.jp/kktn/</a>  Research field: Software and Systems Engineering, Knowledge Engineering</p> <ul style="list-style-type: none"> <li>• Methodology and tool for software and systems engineering</li> <li>• Evaluation system for systems improvement</li> <li>• Domain analysis and modeling</li> </ul>	<p><b>KANZAWA, Nobuyuki</b> (Associate Professor)  <a href="http://www.mls.sophia.ac.jp/~kanzawa/index-e.html">http://www.mls.sophia.ac.jp/~kanzawa/index-e.html</a>  Research field: Biochemistry, Plant Molecular Biology</p> <ul style="list-style-type: none"> <li>• Regulatory mechanism of the seismonastic movement of Mimosa plant</li> <li>• Biochemical characterization of a novel invertebrate enzyme</li> <li>• Biochemical engineering of an advanced bioceramics</li> </ul>
<p><b>KATO, Takeshi</b> (Associate Professor)  <a href="http://pweb.sophia.ac.jp/tkskato/en/">http://pweb.sophia.ac.jp/tkskato/en/</a>  Research field: Mathematical Statistics</p> <ul style="list-style-type: none"> <li>• Time series analysis</li> <li>• Application of wavelet analysis to mathematical statistics and probability theory</li> <li>• Asymptotic theory in statistical inference</li> </ul>	<p><b>KAWABATA, Ryo</b> (Associate Professor)  <a href="http://lise.me.sophia.ac.jp/Sinfosys/index-j_ISE.html">http://lise.me.sophia.ac.jp/Sinfosys/index-j_ISE.html</a>  Research field: Software Engineering</p> <ul style="list-style-type: none"> <li>• Knowledge Base for Systems Analysis</li> <li>• Reusing Diagrams for Systems Specification</li> </ul>

<p><b>KAWAGUCHI, Mari</b> (Assistant Professor)  <a href="http://librsh01.lib.sophia.ac.jp/Profiles/72/0007144/prof_e.html">http://librsh01.lib.sophia.ac.jp/Profiles/72/0007144/prof_e.html</a>  Research field: Molecular Evolutionary Biology</p> <ul style="list-style-type: none"> <li>• Evolution of reproductive strategy of fishes</li> <li>• Molecular evolution of brood pouch from seahorses and pipefishes</li> <li>• Mechanism of sub-functionalization of duplicated genes during evolution</li> </ul>	<p><b>KAWANAKA, Akira</b> (Professor)  <a href="http://www.ee.sophia.ac.jp/labs/kawanaka.html">http://www.ee.sophia.ac.jp/labs/kawanaka.html</a>  Research field: Signal Processing, Image Information Processing</p> <ul style="list-style-type: none"> <li>• Multidimensional signal processing</li> <li>• Data compression for still pictures, moving pictures, and texture information for CG</li> <li>• Representation and modeling of three-dimensional objects for realistic image synthesis</li> </ul>
<p><b>KIKUCHI Akihiko</b> (Associate Professor)  Research field: Semiconductor Engineering, Optoelectronics, Nano Technology</p> <ul style="list-style-type: none"> <li>• Inorganic/organic hybrid devices(light emitting diode, laser diode, solar-cell, etc.)</li> <li>• Growth and characterization of III-nitride semiconductor nano-crystal and epitaxial film</li> <li>• Development of nano-structural optoelectronic semiconductor devices</li> <li>• Development of novel semiconductor materials and devices</li> </ul>	<p><b>KISHINO, Katsumi</b> (Professor)  Research field: Optoelectronics, Nano-technology, Wide-gap Semiconductors</p> <ul style="list-style-type: none"> <li>• Green light semiconductor lasers</li> <li>• Wide-gap semiconductors and related optical devices</li> <li>• Semiconductor nano-structure and nano-devices</li> </ul>
<p><b>KONDO, Jiro</b> (Assistant Professor)  <a href="http://pweb.cc.sophia.ac.jp/jkondo/index-e.html">http://pweb.cc.sophia.ac.jp/jkondo/index-e.html</a>  Research field: Biophysics, Structural Biology</p> <ul style="list-style-type: none"> <li>• Motion picture crystallography of DNA/RNA molecular switches</li> <li>• Structure based drug and material design</li> </ul>	<p><b>KUNUGITA, Hideyuki</b> (Assistant Professor)  Research field: Optical Physics, Optical Properties of Solids</p> <ul style="list-style-type: none"> <li>• Ultrafast spectroscopy</li> <li>• Excitonic optical properties of solids</li> <li>• Generation and control of coherent phonons in wide-gap semiconductors</li> <li>• Carrier dynamics in photocatalytic materials</li> </ul>
<p><b>KUROE, Haruhiko</b> (Associate Professor)  Research field: Solid-State Physics, Magnetism</p> <ul style="list-style-type: none"> <li>• Raman scattering in magnetic materials under multi-extreme condition</li> <li>• Magnetic and electric measurements in magnetic materials</li> </ul>	<p><b>KUWAHARA, Hideki</b> (Professor)  Research field: Materials Science, Solid State Physics</p> <ul style="list-style-type: none"> <li>• Exploration for novel spintronic (spin-based electronic) and multiferroic materials, e.g., giant magnetoresistive and gigantic magnetoelectric oxides</li> <li>• External field control of electronic phases in strongly correlated materials: Magnetic(Electric) field control of electric-polarization or resistivity (magnetization) for next-generation high-density memories</li> <li>• Design and synthesis for A-site ordered perovskite-type oxides with high phase-transition temperatures for future electronic devices</li> <li>• Transport (resistivity, Hall effect, thermopower, specific heat, etc.) and magnetic properties near the Mott insulator-metal phase boundary in band-width and/or band-filling controlled systems with strong electron correlation</li> </ul>
<p><b>KUZE, Nobuhiko</b> (Associate Professor)  Research field: Physical Chemistry, Molecular Science</p> <ul style="list-style-type: none"> <li>• Molecular spectroscopy (rotational and vibrational) in the gas-phase</li> <li>• Structural determination by gas-electron diffraction</li> <li>• Computational chemistry</li> </ul>	<p><b>MAKINO, Osamu</b> (Associate Professor)  <a href="http://librsh01.lib.sophia.ac.jp/Profiles/57/0005608/prof_e.html">http://librsh01.lib.sophia.ac.jp/Profiles/57/0005608/prof_e.html</a>  Research field: Molecular Genetics, Molecular Biology</p> <ul style="list-style-type: none"> <li>• Studies on translational control by RNA binding protein</li> <li>• Replication mechanism of linear DNA with terminal protein</li> <li>• Molecular mechanism of homologous recombination</li> </ul>

<p><b>MASUYAMA, Yoshiro (Professor)</b>  <a href="http://www.mls.sophia.ac.jp/~orgsynth/">http://www.mls.sophia.ac.jp/~orgsynth/</a>  Research field: Synthetic Organic Chemistry, Organometallic Chemistry</p> <ul style="list-style-type: none"> <li>• Homologation or transformation with metal complex catalysts</li> <li>• Activation of metal complexes with tin(II) chloride and its application</li> <li>• Heterogeneous catalysis of hydroxyapatite-supported metals</li> </ul>	<p><b>MIYAMOTO, Yuichiro (Associate Professor)</b>  <a href="http://www.ics.sophia.ac.jp/miyamoto/">http://www.ics.sophia.ac.jp/miyamoto/</a>  Research field: Combinatorial Optimization, Mathematical Programming</p> <ul style="list-style-type: none"> <li>• Approximation algorithms</li> <li>• Graph coloring problem and perfect graphs</li> <li>• Network design and network flows</li> </ul>
<p><b>MIYATAKE, Masafumi (Associate Professor)</b>  <a href="http://miyatake.main.jp/">http://miyatake.main.jp/</a>  Research field: Electrical Energy Systems and Applications</p> <ul style="list-style-type: none"> <li>• Energy-saving design and operation of rail and road transportation systems</li> <li>• Energy management and control of rail and road vehicles</li> <li>• Applications of renewable energy sources and storage devices</li> </ul>	<p><b>MIZUGAI, Yoshihiro (Assistant Professor)</b>  Research field: Spectroscopy of Supre Molecules</p> <ul style="list-style-type: none"> <li>• Non-linear Spectroscopy</li> <li>• Simulation of Non-linear Process</li> </ul>
<p><b>MUTOH, Yasuhiko (Professor)</b>  Research field: Control Engineering</p> <ul style="list-style-type: none"> <li>• Nonlinear Control</li> <li>• Adaptive Control</li> <li>• Multivariable Control Systems, etc.</li> </ul>	<p><b>NAGAO, Hirotaka (Professor)</b>  Research field: Coordination Chemistry, Bioinorganic Chemistry</p> <ul style="list-style-type: none"> <li>• Activation and conversion of nitrogen-containing compounds by transition metal complex</li> <li>• Synthesis of novel transition metal complexes</li> <li>• Regulation of geometry and reactivity around metal centers</li> </ul>
<p><b>NAGASHIMA, Toshio (Professor)</b>  <a href="http://www.strmech.com/nagashima/">http://www.strmech.com/nagashima/</a>  Research field: Computational Mechanics, Structural Engineering</p> <ul style="list-style-type: none"> <li>• Meshfree method</li> <li>• Extended FEM</li> <li>• Crack propagation simulation</li> </ul>	<p><b>NAKAMURA, Kazuya (Associate Professor)</b>  Research field: Applied Superconductivity, Electric Power Application</p> <ul style="list-style-type: none"> <li>• Fusion magnet technology</li> <li>• Accelerator magnet technology</li> <li>• Advanced cryogenic materials for magnets</li> </ul>
<p><b>NAKAOKA, Toshihiro (Associate Professor)</b>  <a href="http://pweb.sophia.ac.jp/nakaoka/nakaoka.html">http://pweb.sophia.ac.jp/nakaoka/nakaoka.html</a>  Research field: Nano Electronics, Semiconductor Physics</p> <ul style="list-style-type: none"> <li>• Quantum optoelectronic devices</li> <li>• Single electron / photon devices</li> <li>• Transport phenomena and optical spectroscopy in semiconductor nanostructures</li> </ul>	<p><b>NAKASHIMA, Toshiki (Professor)</b>  <a href="http://pweb.cc.sophia.ac.jp/toshiki/">http://pweb.cc.sophia.ac.jp/toshiki/</a>  Research field: Quantum Groups, Representation Theory</p> <ul style="list-style-type: none"> <li>• Crystal Bases and Geometric Crystals</li> <li>• Quantum groups at roots of unity</li> <li>• q-boson Kashiwara algebras</li> </ul>
<p><b>NAKASUJI, Maki (Associate Professor)</b>  <a href="http://www.ics.sophia.ac.jp/nakasuji/">http://www.ics.sophia.ac.jp/nakasuji/</a>  Research field: Analytic number theory, Representation Theory</p> <ul style="list-style-type: none"> <li>• Multiple Dirichlet series</li> <li>• Automorphic forms and L-functions</li> <li>• Selberg zeta functions and the spectral theory</li> </ul>	<p><b>NANBU, Shinkoh (Professor)</b>  <a href="http://pweb.cc.sophia.ac.jp/nanbu_lab/index.html">http://pweb.cc.sophia.ac.jp/nanbu_lab/index.html</a>  Research field: Theoretical Chemistry</p> <ul style="list-style-type: none"> <li>• Theory-Aided Molecular Design</li> <li>• Quantum Reaction Dynamics</li> </ul>
<p><b>NIKURA, Takako (Associate Professor)</b>  <a href="http://librsh01.lib.sophia.ac.jp/Profiles/73/0007244/prof_e.html">http://librsh01.lib.sophia.ac.jp/Profiles/73/0007244/prof_e.html</a>  Research field: Neuroscience</p> <ul style="list-style-type: none"> <li>• Neurodegeneration</li> </ul>	<p><b>NOMURA, Ichirou (Associate Professor)</b>  Research field: Semiconductor engineering, Optoelectronics</p> <ul style="list-style-type: none"> <li>• Semiconductor materials and devices</li> <li>• II-VI compound semiconductors and their applications</li> <li>• Visible light emitting diodes and laser diodes</li> </ul>

<p><b>ODAGIRI, Takeshi</b> (Associate Professor)  <a href="http://sephiroth.mls.sophia.ac.jp/teacher/archives/000086.html">http://sephiroth.mls.sophia.ac.jp/teacher/archives/000086.html</a>  Research field: Atomic and molecular physics</p> <ul style="list-style-type: none"> <li>• Reaction Kinetics</li> </ul>	<p><b>OGAWA, Masakatsu</b> (Associate Professor)  Research field: Wireless communication systems</p> <ul style="list-style-type: none"> <li>• Wireless LAN System (Access Control, Power Saving Control, etc.)</li> <li>• Sensor Network System (Access Control, Power Saving Control, etc.)</li> <li>• Cellular Network System (Resource Allocation, etc.)</li> <li>• Heterogeneous Wireless Network (Cooperative control, etc.)</li> </ul>
<p><b>OHTSUKI, Tomi (Professor)</b>  <a href="http://www.ph.sophia.ac.jp/~tomi/english.html">http://www.ph.sophia.ac.jp/~tomi/english.html</a>  Research field: Solid State Physics (theory)</p> <ul style="list-style-type: none"> <li>• Anderson localization</li> <li>• Quantum Hall and quantum spin Hall effects</li> <li>• Quantum network model</li> <li>• Light propagation in non-uniform media</li> </ul>	<p><b>OI, Takao (Professor)</b>  <a href="http://sephiroth.mls.sophia.ac.jp/teacher/archives/000035.html">http://sephiroth.mls.sophia.ac.jp/teacher/archives/000035.html</a>  Research field: Isotope Science and Technology</p> <ul style="list-style-type: none"> <li>• Isotope separation by chemical methods</li> <li>• Precision measurement of isotopic ratios by double focusing mass spectrometry</li> <li>• Isotope effects studied by molecular orbital calculations</li> </ul>
<p><b>OKADA, Kunihiro</b> (Associate Professor)  Research field: Atomic and Molecular Physics, Quantum Electronics</p> <ul style="list-style-type: none"> <li>• Gas-phase ion-molecule reactions at very low temperatures</li> <li>• Production of ion Coulomb crystals and cold molecular ions</li> <li>• Laser and microwave spectroscopy of trapped unstable nuclear ions</li> </ul>	<p><b>OSHIRO, Kanako</b> (Assistant Professor )  <a href="http://pweb.sophia.ac.jp/oshirok/">http://pweb.sophia.ac.jp/oshirok/</a>  Research field: Topology, Knot Theory</p> <ul style="list-style-type: none"> <li>• Surface-knot theory</li> <li>• Quandle algebra</li> </ul>
<p><b>RIKUKAWA, Masahiro</b> (Professor)  <a href="http://www.mls.sophia.ac.jp/~polymer/index.html">http://www.mls.sophia.ac.jp/~polymer/index.html</a>  Research field: Polymer Chemistry, Nano Science</p> <ul style="list-style-type: none"> <li>• Proton conducting polymer electrolytes and fuel cell applications</li> <li>• Synthesis and applications to medical materials of biodegradable polymers</li> <li>• Synthesis and applications to solar cells and EL devices of conducting Polymers</li> </ul>	<p><b>SAITO, Tamao</b> (Associate Professor)  <a href="http://librsh01.lib.sophia.ac.jp/Profiles/69/0006815/prof_e.html">http://librsh01.lib.sophia.ac.jp/Profiles/69/0006815/prof_e.html</a>  Research field: Environmental Molecular Biology, Biochemistry</p> <ul style="list-style-type: none"> <li>• Analysis of small molecules (especially “polyketides”) for communication and ecology</li> <li>• Functional analysis of novel polyketide synthases found in the cellular slime mould</li> <li>• Pattern formation of the cellular slime mould as a model system</li> </ul>
<p><b>SAKAMA, Hiroshi</b> (Professor)  Research field: Applied Physics, Surface Science.</p> <ul style="list-style-type: none"> <li>• Thin films: Nucleation and growth mechanism. Epitaxy. Structure and chemical composition, Sputtering, Pulsed-laser deposition</li> <li>• Transition metal oxide thin films: Growth, micro-fabrication and physical property measurement. Charge and spin order</li> <li>• Surface: Structure and physical properties of solid surfaces, Phase transitions, Electron diffraction</li> <li>• Photocatalyst: Reaction mechanism, Electronic structure of photocatalyst</li> </ul>	<p><b>SAKAMOTO, Haruhisa</b> (Professor)  <a href="http://www.me.sophia.ac.jp/pel/EnglishToppage.html">http://www.me.sophia.ac.jp/pel/EnglishToppage.html</a>  Research field: Precision machining, Micro machining</p> <ul style="list-style-type: none"> <li>• Development of advanced machining technology for high-quality surface generation</li> <li>• Environmental impact reduction in precision machining</li> <li>• Development and improvement of laser micro-machining technology for three-dimensional mechanical parts</li> </ul>
<p><b>SAKAMOTO, Orië</b> (Assistant Professor)  Research field: Power System Engineering</p> <ul style="list-style-type: none"> <li>• Analysis and control of power systems</li> <li>• Modeling of synchronous generators</li> <li>• Stabilizing control of power systems including renewable energy sources</li> </ul>	<p><b>SASAKAWA, Nobuyuki</b> (Professor)  <a href="http://librsh01.lib.sophia.ac.jp/Profiles/57/0005687/prof_e.html">http://librsh01.lib.sophia.ac.jp/Profiles/57/0005687/prof_e.html</a>  Research field: Pharmacology, Neuroscience</p> <ul style="list-style-type: none"> <li>• Spatial and temporal regulation of neurotransmitter release by physiologically active substances</li> <li>• Functional roles of inositol pentakis- and hexakisphosphates in neuronal cells</li> </ul>

<p><b>SHEN, Tielong</b> (Professor)  Research field: Control Theory and Applications</p> <ul style="list-style-type: none"> <li>• Robust control of nonlinear systems</li> <li>• Mechanical system control</li> <li>• Modeling and control of automotive systems</li> </ul>	<p><b>SHIBUYA, Tomoharu</b> (Associate Professor)  <a href="http://www.ts-lab.net">http://www.ts-lab.net</a></p> <p>Research field: Coding Theory, Communication Theory, Information Theory</p> <p>We study various coding techniques for realizing reliable digital communication. This includes an analysis of behavior of the iterative decoding algorithm, design of codes suitable for the iterative decoding algorithm, estimation of parameters of linear codes, and so on.</p>
<p><b>SHIMOMURA, Kazuhiko</b> (Professor)  Research field: Optoelectronics, Photonic Devices, Nano Structure, Semiconductor Crystal Growth</p> <ul style="list-style-type: none"> <li>• Photonic Integrated Circuits: Integration of various functional photonic devices</li> <li>• Optical devices for photonic systems, such as optical switch and modulator, arrayed waveguide grating</li> <li>• Quantum-dots structure for laser, SOA, switch, and nonlinear photonic devices</li> <li>• Optical interconnection technology</li> <li>• Selective area growth using Metal-Organic Vapor Phase Epitaxy for the control of in-plane bandgap of epitaxial layers and integration of photonic devices</li> </ul>	<p><b>SUEMASU, Hiroshi</b> (Professor)  <a href="http://www.me.sophia.ac.jp/~suemasu/">http://www.me.sophia.ac.jp/~suemasu/</a></p> <p>Research fields: Structural Mechanics, Engineering of Composite Materials</p> <ul style="list-style-type: none"> <li>• Structural and fracture mechanical study of damaged composite structures and structural elements</li> <li>• Testing methods of composite materials</li> <li>• Fracture mechanical study on adhesive structures such as joints and repairs</li> </ul>
<p><b>SUMI, Chikayoshi</b> (Associate Professor)  <a href="http://eesvr.ee.sophia.ac.jp/biomed/">http://eesvr.ee.sophia.ac.jp/biomed/</a></p> <p>Research field: Biomedical Engineering, Measurement System Engineering, Visualization</p> <ul style="list-style-type: none"> <li>• Techniques of diagnosis/therapy/culture for human diseases and various functional disorders (bioelectromagnetics, biomechanics, biothermodynamics, nanomedicine, etc.)</li> <li>• Techniques of nondestructive evaluations of structures/materials for environment</li> <li>• Reconstructions using functional, stochastics, optimization (signal, image, function, etc.)</li> </ul>	<p><b>SUZUKI, Hiroshi</b> (Associate Professor)  <a href="http://www.me.sophia.ac.jp/~h-suzuki/">http://www.me.sophia.ac.jp/~h-suzuki/</a></p> <p>Research field: Materials Science</p> <ul style="list-style-type: none"> <li>• Modeling and simulation of deformation, fracture and diffusion kinetics of materials</li> <li>• Effect of hydrogen on behavior of metallic materials</li> </ul>
<p><b>SUZUKI, Noriyuki</b> (Associate Professor)  <a href="http://www.mls.sophia.ac.jp/~orgsynth/">http://www.mls.sophia.ac.jp/~orgsynth/</a></p> <p>Research field: Synthetic Organic Chemistry, Organometallic Chemistry</p> <ul style="list-style-type: none"> <li>• Synthesis of five-membered metallacyclic alkynes and allenes, and study of their reactivity</li> <li>• Development of organic reactions using organozirconium compounds</li> </ul>	<p><b>SUZUKI, Takashi</b> (Associate Professor)  Research field: Internal combustion engine, Heat transfer</p> <ul style="list-style-type: none"> <li>• Heat flow of SI engine for control</li> <li>• Energy flow analysis of hybrid engine system</li> </ul>
<p><b>SUZUKI, Yumiko</b> (Associate Professor)  <a href="http://www.mls.sophia.ac.jp/~yumiko_suzuki/">http://www.mls.sophia.ac.jp/~yumiko_suzuki/</a></p> <p>Research field: Synthetic Organic Chemistry, Medicinal Chemistry</p> <ul style="list-style-type: none"> <li>• Design and Development of New Methodologies in Organocatalysis</li> <li>• Synthesis of Functional Materials and Bioactive Compounds</li> </ul>	<p><b>TAHARA, Hidetoshi</b> (Professor)  <a href="http://www.ics.sophia.ac.jp/tahara/en/">http://www.ics.sophia.ac.jp/tahara/en/</a></p> <p>Research field: Mathematical Analysis</p> <ul style="list-style-type: none"> <li>• Differential equations in the complex domain</li> <li>• Complex analysis</li> </ul>

<p><b>TAKAHASHI, Hiroshi</b> (Associate Professor)  Research field: High speed optical fiber communication system</p> <ul style="list-style-type: none"> <li>• Optical signal transmission analysis</li> <li>• Multiplexing, modulation and demodulation method</li> <li>• Signal processing based on combination of optics and electronics</li> </ul>	<p><b>TAKAHASHI, Kazuo</b> (Associate Professor)  <a href="http://sephiroth.mls.sophia.ac.jp/teacher/archives/000039.html">http://sephiroth.mls.sophia.ac.jp/teacher/archives/000039.html</a></p> <p>Research field: Physical Chemistry, Chemical Kinetics, Combustion Chemistry</p> <ul style="list-style-type: none"> <li>• High-pressure autoignitions of gasoline components for HCCI engines</li> <li>• Combustion chemistry of biomass fuels</li> <li>• Computational chemistry using ab initio MO and DFT methods</li> </ul>
<p><b>TAKAI, Kenichi</b> (Professor)  <a href="http://www.me.sophia.ac.jp/~takai/">http://www.me.sophia.ac.jp/~takai/</a></p> <p>Research field: Materials Science, Hydrogen Technology</p> <ul style="list-style-type: none"> <li>• Hydrogen embrittlement mechanism of bcc, fcc and hcp metals</li> <li>• Hydrogen trapping characteristic of metals measured by TDS</li> <li>• Infrastructural material development for hydrogen energy society</li> <li>• Interaction between hydrogen and lattice defects of metals</li> </ul>	<p><b>TAKAO, Tomoaki</b> (Professor)  Research field: Electric Energy, Applied Superconductivity</p> <ul style="list-style-type: none"> <li>• AC loss in superconducting magnet</li> <li>• YBCO and Bi-2223 tapes</li> <li>• Advanced cryogenic materials for magnets</li> <li>• Motor for ship propulsion</li> <li>• Magnetic levitation system</li> <li>• Some technologies related to superconductivity</li> </ul>
<p><b>TAKAOKA, Eiko</b> (Associate Professor)  <a href="http://pweb.cc.sophia.ac.jp/et/">http://pweb.cc.sophia.ac.jp/et/</a></p> <p>Research Field: Database, Web Application Development, Programming Language Education</p> <ul style="list-style-type: none"> <li>• Development of the weather visualization system and analysis of local weather data</li> <li>• Application of micrometeorological data analysis to education</li> <li>• Touch-typing training method</li> <li>• Scalable video streaming for computer education</li> <li>• Development of the template for computer programming education</li> <li>• Development of support system for community-based volunteer Activities</li> </ul>	<p><b>TAKAYANAGI, Kazuo</b> (Professor)  Research field: Quantum Many-Body Problems, Condensed Matter Physics, Nuclear Physics</p> <ul style="list-style-type: none"> <li>• Short range correlation and its realization as an effective interaction in electron systems and in nuclei</li> <li>• Long range correlation, collective excitation and its softening, and quantum phase transitions</li> </ul>
<p><b>TAKEHARA, Shoichiro</b> (Associate Professor)  Research field: Multibody Dynamics</p> <ul style="list-style-type: none"> <li>• Motion analysis of Human body</li> <li>• Motion and control of tethered system</li> <li>• Design of Personal Mobility</li> </ul>	<p><b>TAKEOKA, Yuko</b> (Associate Professor)  <a href="http://www.mls.sophia.ac.jp/~polymer/index.html">http://www.mls.sophia.ac.jp/~polymer/index.html</a></p> <p>Research field: Polymer Chemistry</p> <ul style="list-style-type: none"> <li>• Development of organic-inorganic hybrid</li> <li>• Electrical and optical properties of polymer materials</li> <li>• Synthesis and applications to medical materials of biodegradable Polymers</li> </ul>
<p><b>TAMURA, Yasuhisa</b> (Associate Professor)  <a href="http://tamuralabo.info/">http://tamuralabo.info/</a></p> <p>Research Field: Learning Technology</p> <ul style="list-style-type: none"> <li>• CSCL support with use of Natural language processing</li> <li>• Tablet PC / e-textbook utilization of e-Learning</li> <li>• Material and learner information repository analysis and reuse</li> </ul>	<p><b>TANAKA, Kunihito</b> (Associate Professor)  <a href="http://www.mls.sophia.ac.jp/~tanaka/">http://www.mls.sophia.ac.jp/~tanaka/</a></p> <p>Research field: Applied Physical Chemistry, Plasma Chemistry</p> <ul style="list-style-type: none"> <li>• Surface treatment and thin film deposition by atmospheric pressure glow plasma discharge</li> <li>• Plasma diagnostic of atmospheric pressure glow plasma</li> </ul>
<p><b>TANAKA, Shoji</b> (Professor)  <a href="https://sites.google.com/site/stlab10/Home">https://sites.google.com/site/stlab10/Home</a></p> <p>Research Field: Brain Imaging, Brain Science</p> <ul style="list-style-type: none"> <li>• Imaging of higher brain functions (cognition, memory, and self)</li> <li>• Network architecture of cognitive systems of the human brain</li> <li>• Dynamics and network principles for brain information processing</li> <li>• Statistical analysis of brain imaging data</li> </ul>	<p><b>TERUMICHI, Yoshiaki</b> (Professor)  Research field: Multibody Dynamics</p> <ul style="list-style-type: none"> <li>• Motion analysis of high speed train</li> <li>• Contact mechanics between rail and wheel</li> <li>• Pattern formation phenomena due to machine vibration</li> <li>• Motion and control of tethered system</li> </ul>



<p><b>TSUJI, Hajime</b> (Professor)  <a href="http://pweb.sophia.ac.jp/tsuji/en/">http://pweb.sophia.ac.jp/tsuji/en/</a>  Research field: Algebraic Geometry, Several Complex Variables</p> <ul style="list-style-type: none"> <li>• Abundance of canonical line bundles</li> <li>• Study of pluricanonical systems</li> <li>• Convexity and semipositivity of family of projective varieties</li> </ul>	<p><b>TSUKIJI, Tetsuhiro</b> (Professor)  <a href="http://www.me.sophia.ac.jp/fluid/Lab/tsukiji.htm">http://www.me.sophia.ac.jp/fluid/Lab/tsukiji.htm</a>  Research field: Fluid Engineering</p> <ul style="list-style-type: none"> <li>• Development of micro motor and pump using functional fluids</li> <li>• Flow analyses in hydraulic control valves and pump</li> <li>• Flow analyses around a bluff body and a jet flow using CFD</li> <li>• Flow measurement around a body in a wind tunnel</li> <li>• Flow-induced vibration</li> <li>• Device development using pneumatic technology</li> </ul>
<p><b>TSUNOGAI, Hiroshi</b> (Professor)  <a href="http://pweb.cc.sophia.ac.jp/tsunogai/index.html">http://pweb.cc.sophia.ac.jp/tsunogai/index.html</a>  Research field: Mathematics, Number Theory</p> <ul style="list-style-type: none"> <li>• Constructive Galois theory, Noether's Problem and its variants</li> <li>• Galois representation attached to arithmetic fundamental groups</li> <li>• Moduli spaces of projective lines with marked points</li> </ul>	<p><b>TSUZUKI, Masao</b> (Associate Professor)  Research field: Number Theory</p> <ul style="list-style-type: none"> <li>• Modular forms and related L-functions</li> <li>• Selberg zeta functions and trace formulas</li> </ul>
<p><b>UCHIDA, Hiroshi</b> (Associate Professor)  <a href="http://pweb.cc.sophia.ac.jp/h-uchida">http://pweb.cc.sophia.ac.jp/h-uchida</a>  Research field: Material Science (Inorganic), Chemical Processing</p> <ul style="list-style-type: none"> <li>• Thin film processing using metal-organic precursors</li> <li>• Pb-free dielectric/ferroelectric materials with large polarization properties</li> <li>• Material synthesis using supercritical fluid</li> </ul>	<p><b>USUKI, Toyonobu</b> (Associate Professor)  <a href="http://www.mls.sophia.ac.jp/~usuki/">http://www.mls.sophia.ac.jp/~usuki/</a>  Research field: Natural Product Chemistry, Organic Chemistry</p> <ul style="list-style-type: none"> <li>• Bioorganic study of plant natural products</li> <li>• Chemistry of enediyne antitumor antibiotic calicheamicin</li> <li>• Structural elucidation of elastin peptides</li> </ul>
<p><b>WAHO, Takao</b> (Professor)  <a href="http://pweb.cc.sophia.ac.jp/sscd/">http://pweb.cc.sophia.ac.jp/sscd/</a>  Research field: Analog Circuit Design, Semiconductor Devices</p> <ul style="list-style-type: none"> <li>• Design of low-power and high-speed analog-to-digital converters</li> <li>• Circuit applications of emerging devices</li> <li>• Signal processing based on multiple-valued logic</li> </ul>	<p><b>WATANABE, Mariko</b> (Associate Professor)  Research field: Fluid Engineering</p> <ul style="list-style-type: none"> <li>• Multiphase Flow</li> <li>• Reactive Flow</li> </ul>
<p><b>YAGAI, Tsuyoshi</b> (Associate Professor)  Research field: Superconducting Power Application</p> <ul style="list-style-type: none"> <li>• Design DC micro grid with renewable energy resources</li> <li>• Development of DC power supply system for IT devices</li> <li>• Development of new energy resource use</li> <li>• Stability analysis of CIC conductor for large scale magnet</li> </ul>	<p><b>YAIRI, Ikuko</b> (Associate Professor)  <a href="http://www.yairilab.net/">http://www.yairilab.net/</a>  Research field: Informatics, Media and Communication Science and Technology</p> <p>Applied research:</p> <ul style="list-style-type: none"> <li>• Barrier-free ubiquitous mobility support system</li> <li>• Geographic information system for disabled pedestrian navigation</li> <li>• Universal-designed interactive map contents and interfaces, etc.</li> </ul> <p>Basic research:</p> <ul style="list-style-type: none"> <li>• Spatial and graphic information representation method with sound and touch without vision</li> <li>• Interactive interface design for the aged, the disabled and children</li> <li>• Community support for offering spatial information, etc.</li> </ul>

**YAMANAKA, Takao** (Associate Professor)

<http://islab.ee.sophia.ac.jp/>

Research field: Sensory Information Processing, Computer Vision

- Automatic understanding of image contents
- Generic-object recognition
- Saliency detection
- Palmprint recognition for biometrics

**YASUMASU, Shigeki** (Professor)

[http://librsh01.lib.sophia.ac.jp/Profiles/57/0005612/prof\\_e.html](http://librsh01.lib.sophia.ac.jp/Profiles/57/0005612/prof_e.html)

Research field: Developmental Biology

- Differentiation of fish hatching gland cells
- Molecular evolution of hatching enzyme gene
- Mechanism of egg envelope digestion by hatching enzyme