

# The Research Abstracts



October 2017

Graduate School of Engineering  
Nagasaki University

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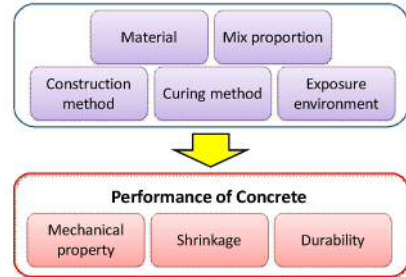
# Division of System Science

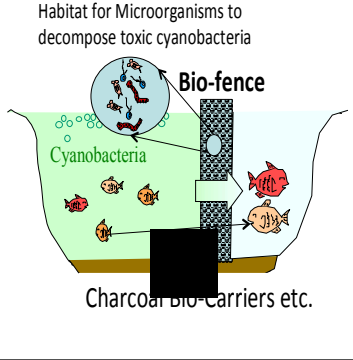
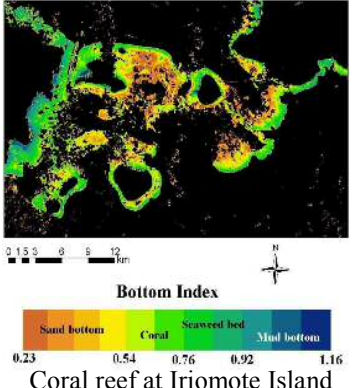
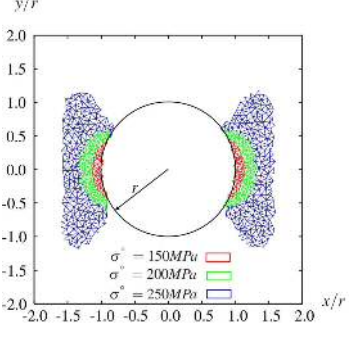
Name Kiyoshi Omine	Position Professor	Field of Specialty Geo-environmental Engineering
<p>Research Topics</p> <p>1. Utilization of disaster wastes as geo-materials A large amount of disaster wastes were caused by the great east Japan Earthquake. Compaction, CBR and direct shear tests were conducted on the disaster waste obtained from several sites at Tohoku region. An innovative approach by using compost containing Halo bacteria/salt tolerance bacteria was tested to restore the saline soil. It was found that the disaster waste has a similar strength in comparison with usual sandy soil. The disaster waste contains organic waste such as wood chip. It was considered that the organic waste will affect on the strength of the disaster waste for a long term. It was also found the compost is useful for reducing the excessive salts from the soil.</p> <p>2. Geo-environmental improvement techniques using microorganism for sustainable development Various geo-environmental issues have occurred in regional and global levels. Utilization of wastes and remediation of contaminated soils are examples of geo-environmental problems. When waste material is utilized as geomaterials, it is required to apply any treatment for reducing the harmful substances. From a viewpoint of reducing environmental load, a method with low cost and without using special chemicals is needed for sustainable development. A remediation method by using aerobic or anaerobic fermentation is applied. The effect of composting with aerobic or anaerobic fermentation was discussed based on the test results. It is concluded that the anaerobic fermentation with organic matter, effective microorganism resources, and leaf mold is very effective for remedying the contaminated soil with hexavalent chromium.</p>		 <p><i>Disaster wastes</i></p>
Special mention <b>Lab. HP</b> <a href="http://www.cee.nagasaki-u.ac.jp/~jiban/">http://www.cee.nagasaki-u.ac.jp/~jiban/</a>		
Name Yujing Jiang	Position Professor	Field of Specialty : Geo-environmental Engineering, Rock Engineering, Disaster Prevention Engineering
<p>Research Topics</p> <p>1. <b>Prediction and measures of slope disaster induced by torrential rains</b> The slope stability prediction technique is established in consideration of rain strength, duration and ground characteristics, and the newly proposed remote monitoring system is also being promoted to the field utilization.</p> <p>2. <b>Asset management technique for road tunnels</b> The AM (asset management) system which included the GIS-based database, deterioration curve, priority ranking, reinforcement technology (e.g. FRP-PCM method), LCC calculation has been developed for the effective maintenance management of road tunnels.</p> <p>3. <b>Methane Hydrate development techniques</b> Because the subsidence of sea ground, the critical damage of casing due to consolidation of the formations around the well and collapse of methane hydrate layer occur during the production, the effective development technique is being established complying with environment.</p>		 <p>Residential area near to the danger slope</p>
Special mention • Kyushu Construction Research Grant : “Mechanism and evaluation technique of slope collapse caused by the torrential rain”; Challenging Exploratory Research (JSPS) : “Developing rock slope hazard monitoring system with wireless network communication technology” (Research representative) <b>Lab. HP</b> <a href="http://www.cee.nagasaki-u.ac.jp/~jiban/">http://www.cee.nagasaki-u.ac.jp/~jiban/</a>		
Name Shozo Nakamura	Position Professor	Field of Specialty Steel Structure, Maintenance Engineering
<p>Research Topics</p> <p>1. Maintenance of Existing Structures Degradation curve of structural members, remaining load bearing capacity and life, correlation between atmospheric corrosion environment and corrosion speed, and durability of corrosion protection methods have been studied by field survey, remote monitoring and combined cyclic corrosion test.</p> <p>2. Design Method of Steel Bridges Studies aiming at cost down and labor saving of steel bridges, such as formulation of impact coefficient for fatigue design and evaluation of major design code, have been carried out mainly by nonlinear finite element analysis.</p>		  <p>Combined cyclic corrosion test</p>   <p>Damage Example of Steel Bridges</p>
Special mention • Member of Committee for Bridge Management of Nagasaki Prefectural Government • Tec-doctor of Kyushu Regional Development Bureau of MLIT <b>Lab. HP</b> <a href="http://www.cee.nagasaki-u.ac.jp/~dokou/">http://www.cee.nagasaki-u.ac.jp/~dokou/</a>		



Name Tetsuo Harada	Position Professor	Field of Specialty Concrete Materials & Structures
<p>Research Topics</p> <p><b>1. Various Applications of CFRP Strands for Civil Engineering Structures</b>  Various applications of CFRP strands which have many superior mechanical properties for civil engineering structures, for example, ground anchor methods, external or inner cables of prestressed concrete structures and offshore structures, are investigated.</p> <p><b>2. Development of New Anchoring and Strengthening Method Using Highly Expansive Material (HEM)</b>  HEM anchoring method has been developed as superior anchoring method for Continuous fiber reinforcing materials including CFRP strands or PC tendons. New strengthening method using HEM for corroded steel bridge and many other applications are investigated.</p> <p><b>3. Development of High Durable Fly Ash Concrete</b>  Fly ash concrete, which has high flowing and durability, has been investigated.  Papers: Journal of Japan Society of Civil Engineers, Ser. E2, Vol.70, No.4 (2014), Vol.69, No.1 (2013) .</p>		
<p>Ground Anchor Method</p>		
<p>Special mention  JSCE Award 2016 (Tanaka Award For Research Paper)  <b>Lab. HP</b> <a href="http://www.st.nagasaki-u.ac.jp/ken/harada/index.html">http://www.st.nagasaki-u.ac.jp/ken/harada/index.html</a></p>		
Name Hiroshi Matsuda	Position Professor	Field of Specialty Maintenance of Infrastructure, Concrete Engineering
<p>Research Topics</p> <p><b>1. Development of infrastructure inspection technology</b>  By using the optical metrology technique, high-precision detection methods of the deterioration of the infrastructure have been studied. And safety remote inspection methods for the infrastructure have been studied.</p> <p><b>2. Development and operation of the road management system by ICT</b>  In order to support the extraction and utilization of information in an emergency and peacetime, the road information management system that centralizes the various information infrastructure to the cloud computing database have been development. Research for the visualization of the information data has been performed.</p>		
<p>Inspect diagnosis by ICT and optical measurement technology</p>		
<p>Special mention  ”Michimori” training course (Infrastructure Management Research Center)  <b>Lab. HP</b> <a href="http://www.st.nagasaki-u.ac.jp/ken/matsuda/index-j.html">http://www.st.nagasaki-u.ac.jp/ken/matsuda/index-j.html</a>  <b>Infrastructure Management Research Center</b> <a href="https://michimori.net/">https://michimori.net/</a></p>		
Name Toshihiro Okumatsu	Position Associate Professor	Field of Specialty Vibration, Maintenance and Management, Remote Monitoring of Civil Structures
<p>Research Topics</p> <p><b>1. Bridge Health Monitoring</b>  Health monitoring and diagnosis of bridge structures and other civil structures with sensing technologies and robotics.</p> <p><b>2. ICT &amp; Autonomous control and construction</b>  Hazardous area construction and monitoring with camera, gps, mems and various electric devices such as unmanned construction system in Unzen mt.area</p> <p>Papers:  Okumatsu et al: Temperature effect for natural frequencies of a steel langer truss girder bridge, Proc. of 4th International Symposium on Life-Cycle Civil Engineering, (in CD-ROM) (2014.11)</p>		
<p>Special mention  Infra monitoring system with ICT, Environmental Vibration measurement, Autonomous control/construction  <b>Lab. HP</b> <a href="http://www.cee.nagasaki-u.ac.jp/~dokou/">http://www.cee.nagasaki-u.ac.jp/~dokou/</a></p>		

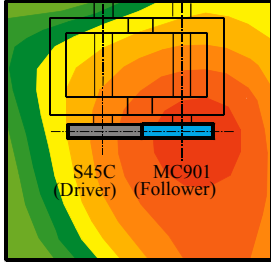
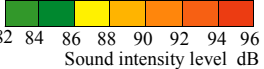


Name Takafumi Nishikawa	Position Associate Professor	Field of Specialty Structural Engineering
<p>Research Topics</p> <ol style="list-style-type: none"> <li><b>Structural Health Monitoring of Infrastructure</b> Measurement techniques for structural system identification have been developed with employing system identification theories such as Realization theory. Developed techniques make measurement operations 'on-line' by ICT-aided computerized-operations from data collection to showing results of analysis. The system demonstrates high accuracy of identification and its practicability through applications to the several actual bridges.</li> <li><b>A Simple Pavement Diagnostic System Using Dynamic Responses of an Ordinary Vehicle</b> A simple monitoring system 'Vehicle Intelligent Monitoring System' has been proposed for inspecting road surface conditions objectively, promptly and inexpensively. The system estimates International Roughness Index by capturing the vehicle's dynamic response from vertical acceleration. In this study, VIMS has been introduced for road inspections in some countries.</li> <li><b>Image Processing Techniques for Detecting Structural Damage on Surface</b> New robust automated image processing methods for detecting cracks in surface images of concrete and asphalt structures have been developed in this study. The mark of this study is the multiple sequential image filters which are generated by evolutionary computation with genetic programming (: GP). The proposed method can be used for the accurate detection of cracks in surface images recorded under various conditions. Moreover, the widths of the detected cracks can be quantified on the basis of the spatial derivatives of the brightness patterns in sub-pixel resolution.</li> </ol>		
<p>Special mention <b>Lab. HP</b> <a href="http://www.cee.nagasaki-u.ac.jp/~dokou/">http://www.cee.nagasaki-u.ac.jp/~dokou/</a></p>		
Name Kenji Sasaki	Position Assistant Professor	Field of Specialty Concrete Engineering
<p>Research Topics</p> <ol style="list-style-type: none"> <li><b>Performance evaluation of concrete containing supplementary cementitious materials under severe environmental conditions</b> Performances of concrete containing supplementary cementitious materials, such as mechanical properties, shrinkage and durability under severe environmental conditions are investigated.</li> <li><b>Development of High Flow and Durable Fly Ash Concrete</b> Fly ash concrete, which has high flowing and durability, has been investigated.</li> </ol>		
<p>Special mention <b>Lab. HP</b> <a href="http://www.st.nagasaki-u.ac.jp/ken/harada/index.html">http://www.st.nagasaki-u.ac.jp/ken/harada/index.html</a></p>		
Name Satoshi Sugimoto	Position Assistant Professor	Field of Specialty Geo-environmental Eng., Geo-disaster Eng.
<p>Research Topics</p> <ol style="list-style-type: none"> <li><b>Development of low-alkaline stabilizer with recycled materials</b> In these years, amount of waste plaster board continue to increase caused by reconstructing houses or building in Japan. It is required that recycled plaster will be utilized as stabilizer for being used in great quantities. In this study, low-alkaline and harmless stabilizer is developed with recycled plaster, fly ash, bed ash and burned sludge.</li> <li><b>Risk assessment on slope failure with weathering or human alteration</b> On slope failure by repeated heavy rainfall in Japan, this potential risk is ascribed as the cause of progression of weathering or cutting slope and so on. In this study, evaluation method is suggested by laboratory tests, numerical analysis and in-situ tests with construction machine from the aspect of these causes.</li> </ol>		
<p>Special mention The both of topics stated above have been carried out as joint research or funded research. <b>Lab. HP</b> <a href="http://www.cee.nagasaki-u.ac.jp/~jiban/">http://www.cee.nagasaki-u.ac.jp/~jiban/</a></p>		



Name Tomoaki Itayama	Position Professor	Field of Specialty Water Treatment, Ecological Engineering
<p>Research Topics</p> <ol style="list-style-type: none"> <li>1. Study on toxic cyanobacteria in eutrophicated lakes and ponds using molecular ecological method. In particular, investigation of the global warming effect on the growth of toxic cyanobacteria. Research and development of water purification system using “Bio-fence” for water area that toxic cyanobacteria proliferate.</li> <li>2. Research and development of a hybrid water treatment system using biological treatment and membrane treatment that can be applied to developing countries in Africa and South East Asia.</li> <li>3. Investigation for developing “Aqua Health Network System” to monitor a hygiene condition of water in each household and health condition of inhabitants.</li> </ol>		
<p>Special mention</p> <p>“Japan-China-Korea Intercollegiate Cooperative Project to Foster Leading Water Environment Engineers” (MEXT, Japan), “The Lake Victoria Comprehensive Ecosystem and Aquatic Environment Research for Development Project”(Kenyan Government), Environmental genomic analysis on global warming effect using fish aquaculture ponds at different elevation in Thailand (KAKENHI-kiban (B)-Kaigai, JSPS)</p> <p><b>Lab. HP</b> <a href="http://www.eng.nagasaki-u.ac.jp/water/index.html">http://www.eng.nagasaki-u.ac.jp/water/index.html</a></p>		
Name Susumu Ogawa	Position Professor	Field of Specialty Remote Sensing, GIS, Risk Assessment
<p>Research Topics</p> <ol style="list-style-type: none"> <li>1. <b>Radio-isotope pollution from Fukushima nuclear power plant</b> Using a particle model, radio-isotope pollution is analyzed from Fukushima nuclear power plant</li> <li>2. PM2.5 atmospheric pollution and its causes Using remote sensing and atmospheric diffusion models, PM 2.5 pollution is analyzed.</li> <li>3. Remote sensing archeology Using remote sensing, archaeological remains are detected in Bolivia.</li> </ol> <p>Ogawa S., Cesium 137 pollution from Fukushima Nuclear Power Plant, <i>Japanese Studies Journal</i>, Vol. 29, pp. 5-10, 2012.</p>		
<p>Special mention</p> <p>Development of radio-isotope free pavements with Tokyo metropolitan government.</p> <p><b>Lab. HP</b> <a href="http://www.cee.nagasaki-u.ac.jp/~uchu/">http://www.cee.nagasaki-u.ac.jp/~uchu/</a></p>		
Name Akihide Saimoto	Position Professor	Field of Specialty Mechanics of Solids, Stress & Fracture Analysis
<p>Research Topics</p> <ol style="list-style-type: none"> <li>1. <b>Stress analysis of functionary graded composite</b> Development of the stress analysis system based on the body force method. The stress analysis for generalized composite whose composition changes with special coordinate is also treated.</li> <li>2. <b>Analysis of 3D crack growth</b> A simulation of 3D crack growth under various loads including thermo-mechanical loading is studied. The influence of thermal stress induced by the irradiation of Laser beam on the resulted crack path is studied in detail.</li> </ol> <p>Papers : Enc. Thermal Stress, Springer (2013), Eng. Failure Anal.,<b>17</b>, 838(2010), Key Eng. Mat.,<b>417</b>, 245(2010), Int. J. Fract. <b>157</b>, 101 (2009)</p>		 <p>Elastic-Plastic analysis using Body Force Method</p>
<p>Special mention</p> <p>Collaboration research on various fracture related problems can be examined.</p> <p><b>Lab. HP</b> <a href="http://bowie.mech.nagasaki-u.ac.jp">http://bowie.mech.nagasaki-u.ac.jp</a>, <a href="http://www.mech.nagasaki-u.ac.jp">http://www.mech.nagasaki-u.ac.jp</a></p>		



Name Akihide Tada	Position Professor	Field of Specialty Hydraulic Eng., River Eng., Coastal Eng.
<p>Research Topics</p> <p><b>1. Study on the relation between water quality dynamic and occurrence of red tide in Isahaya Bay;</b>  A big project that consists of the construction of sea-dike and reclamation in Isahaya Bay was completed in 2009. These caused several environmental problems such as a change in current, eutrophication, oxygen depression and so on. Recently, big damage was given to clam farming at the outbreak of red tide. However, the hydrodynamic mechanism related to these phenomena has not been clarified because of the insufficiency of scientific data. In order to realize the relation between water quality dynamic and occurrence of red tide, field observations on water quality has carried out during every summer season since 2007.</p> <p><b>2. Fundamental studies on dynamic behavior of mercury in Minamata Bay;</b>  Recently, measurement result of mercury distribution obtained by sediment sampling shows that mercury-contaminated sediment has been dispersing into the Yatsushiro Sea from Minamata Bay. In order to realize mercury transport from Minamata Bay, water quality observation and marine water sampling were performed once a month in this study.</p> <p><b>【Reference】</b> 1) Matsuyama, A., Eguchi, T., Sonoda, I., <u>Tada, A.</u>, Yano, S., Tai, A., Marumoto, K., Tomiyasu, T. and Akagi, H. (2011), Mercury Speciation in the Water of Minamata Bay, Japan, <i>Water, Air and Soil Pollution</i>, Vol.218, pp.399-412.</p>		
<p style="text-align: right;"><b>Measured stations in Isahaya Bay</b></p>		
<p>Special mention</p> <ul style="list-style-type: none"> <li>• <i>CAMPUS ASIA Project</i>, “Japan-China-Korea Interuniversity Cooperative Project of Fostering Water Environment Leading Engineers”, (Oct. in 2010 ~Mar. in 2015), a person in charge of education program</li> <li>• Lake Victoria Development Project under the Kenya Government &amp; JICA, (Oct. in 2013~Sept. in 2015), a person in charge of water environmental monitoring <b>Lab. HP</b> <a href="http://www.cee.nagasaki-u.ac.jp/~suiken/">http://www.cee.nagasaki-u.ac.jp/~suiken/</a></li> </ul>		
Name Hiroyuki Nakahara	Position Professor	Field of Specialty Aseismic Design for Building Structure
<p>Research Topics</p> <ol style="list-style-type: none"> <li>1. Disaster Preventing Approaches through Seismic Retrofitting by CFT Braces on Existing RC Building</li> <li>2. Research and Development of Earthquake Resistant Wall with Damage control capacity</li> <li>3. Test and Analysis for Shearing Behavior of Circular CFT Short Columns</li> <li>4. Seismic Retrofitting Strategy for Disaster Mitigation by Voluntary Citizens</li> </ol>		
<p>Special mention</p> <p>Right side picture shows the result of seismic retrofit and local citizens who visited to see the buildings. This research was supported by Asahi Glass Foundation in 2013-2014.</p> <p><b>Lab. HP</b> under construction</p>		
Name Hidechito Hayashi	Position Professor	Field of Specialty Fluid Dynamics
<p>Research Topics</p> <ol style="list-style-type: none"> <li>1. Aeroacoustics. Fan noise reduction. Investigation to high performance fan.</li> <li>2. Power generation by PRO System. System Performance of PRO. Flow analysis of Hollow Fiber module</li> <li>3. Wave power generation with new type high performance turbine.</li> <li>4. Power generation by Obama hot spring. Influence of Scale in heat exchanger. Development of anti-scale heat exchanger</li> </ol>		
<p>Special mention</p> <p><b>Lab. HP</b></p>		

Name Yasuhiko Ogiya	Position Associate Professor	Field of Specialty Machine Elements, Machining Process
<p>Research Topics</p> <p><b>1. Improvement of Running Performance of Plastic Gears</b> According to increasing demand of plastic gears, improvement of load capacity and noise properties of plastic gears have been required strongly. We are studying about improvement of running performance based on properties of plastic gears.</p> <p><b>2. Improvement of machining accuracy of finishing process by ball end mill</b> In finishing process by a ball end mill, the machining error caused by the tool displacement by the cutting force can be not avoided. we are studying about a practical method to improve machining accuracy by correcting depth of cut on the basis of the relationship the tool displacement during machining and the tool displacement when a static load is applied.</p>		 <p>S45C (Driver) MC901 (Follower)</p>  <p>&lt;82 84 86 88 90 92 94 96 Sound intensity level dB</p> <p>Noise emission state of plastic gear</p>
<p>Special mention Working group leader of Technical Committee on Molded Plastic Gears (2013)</p>		
Name Kahori Genjo	Position Associate Professor	Field of Specialty Environmental Engineering in Architecture
<p>Research Topics</p> <p><b>1.Evaluation &amp; improvement of health, comfort of indoor climate</b> Measurements are undertaken to evaluate and improve indoor thermal environment and indoor air quality in residential buildings.</p> <p><b>2.Energy consumption &amp; energy conservation in various buildings</b> This study aims to propose energy conservation methods for each building such as residential buildings or universities.</p> <p><b>3.Feasibility study on mental healthcare effect by plants</b> The objective of this study is to investigate the effects of plants on occupants' physiological/psychological response and productivity. Paper: Proc. ICHES2016 Nagoya, 20122 (2016), AIJ Annual Meeting, D-2, pp.197-198 (2016), AIJ Annual Meeting, D-1, pp.1249-1250 (2016), AIJ Kyushu Branch Research Report, No.56, pp.5-9 (2017).</p>		 <p>Measurement of indoor thermal, air and sound environments in nursery school classrooms</p>
<p>Special mention <b>Lab. HP</b> <a href="http://www.st.nagasaki-u.ac.jp/ken/genjo/index.html">http://www.st.nagasaki-u.ac.jp/ken/genjo/index.html</a></p>		
Name Seiji Suzuki	Position Associate Professor	Field of Specialty Estuary Engineering, River Environmental Engineering
<p>Research Topics</p> <p><b>1. Development of the water quality improvement devices at lakes.</b> A blooming of blue-green algae is one of the most severe problems in the lakes. To utilize the oxidation effect with ozone, new devices which improve water quality are developed.</p> <p><b>2. Study of the environmental reclamation in water area.</b> Ecosystem in water area has been changed dramatically over the past century because of human activities. A prediction of the trend for ecosystem is developed by means of field observations and numerical experiment.</p>		
<p>Special mention <b>Lab. HP</b></p>		

Name Shinta Seto	Position Associate Professor	Field of Specialty Radio Hydrology
Research Topics <b>1. Satellite Remote Sensing of Precipitation</b> By means of radars, microwave radiometers, and infrared radiometers on satellites, precipitation can be measured regardless of land surface conditions almost all over the world. I have been working on the development of GSMaP, a gridded precipitation data (hourly and 0.1degree resolutions) with JAXA, and currently I am working on the precipitation retrieval algorithm for the Dual-frequency Precipitation Radar, which will be operated from 2014.  <b>2. Water-related Disaster Prevention in Asia</b> I have been working on collaboration studies with Thai researchers under the support of JICA. The purpose of studies to detect water-related disasters in their early stages and mitigate the damage caused by the disasters. Satellite remote sensing is an important tool in this project, because ground-based measurements are not well organized in Thailand or some other Asian countries.		
Special mention The studies are supported mainly by JAXA (PMM) and JSPS (Kakenhi) for three years (2013-2015). <b>Lab. HP</b> <a href="http://www.cee.nagasaki-u.ac.jp/~uchu/">http://www.cee.nagasaki-u.ac.jp/~uchu/</a>		
Name Yoshiyuki Tanaka	Position Associate Professor	Field of Specialty: Human-machine System, Bio-mechatronics, Robotics
Research Topics <b>1. Bio-medical &amp; Assistive Robotic Systems Based on Human Sensory-motor Control Mechanism</b> (1) Advanced robot-aided neuro-rehabilitation system has been developed in considerations of human sensory-motor properties. (2) New intelligent gait-assistive robotic device has been developed, which can reinforce the control ability for body balance in walking.  <b>2. Human-centered Automotive Driving Interface System</b> Novel control methodology for the automotive driving interface system with embedded human-driver properties has been developed.  Refs: <i>IEEE Trans. on Haptics</i> , <b>8-1</b> (2015); <i>IEEE Trans. on ITS</i> , <b>15-4</b> (2014); <i>J. Society of Automotive Eng. Japan</i> , <b>45-2</b> (2014); <i>Experimental Brain Research</i> , <b>193-1</b> (2009) etc		
Special mention KAKENHI Grant-in-Aid for Scientific Research (C) "A Study on Myesthesia Characteristics in Limbs Coordination Task with Application to Driving Interface Control Systems" (from H25.4) Res. Representative <b>Lab. HP</b> <a href="http://hms.mech.nagasaki-u.ac.jp/">http://hms.mech.nagasaki-u.ac.jp/</a>		
Name Atsuko Yasutake	Position Associate Professor	Field of Specialty Architectural and Urban Planning
Research Topics 1. Community Planning under Depopulation : Studying community structures and their changes in former coal-producing areas and on remote islands and engaging in joint workshops and other activities with local governments and residents to seek rehabilitation 2. Conservation Planning for Disaster Heritage : Elucidating how disaster remnants have so far been preserved, with implications for rebuilding plans and pre-disaster rebuilding plans 3. Urban Landscapes : Studies on urban landscapes using old photographs 4. Conservation of Traditional Houses Paper 1: Conservation of Traditional Houses Yet to Be Designated as Cultural Properties, 24th World Congress of Architecture, International Union of Architects (UIA), Academic Program, Tokyo, September 2011, 30396. Paper 2: Maintenance of Traditional Houses Utilizing "Housing Record Cards," 16th Congress, International Union of Women Architects (UIFA), Seoul, October 2010, pp. 124-126.		
Special mention <b>Lab. HP</b> <a href="http://www.st.nagasaki-u.ac.jp/ken/yasutake/index.html">http://www.st.nagasaki-u.ac.jp/ken/yasutake/index.html</a>		

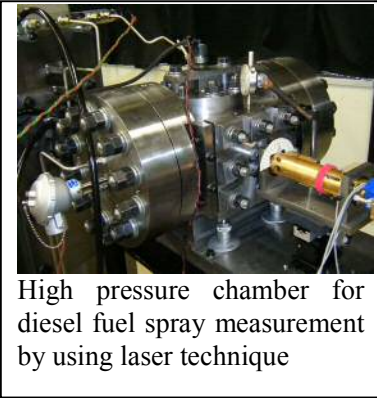
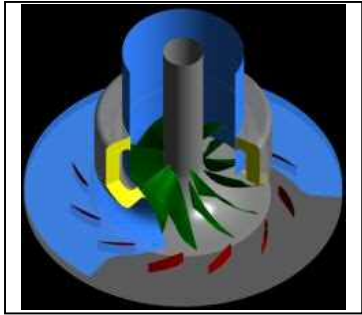


Name Kohei Yamaguchi	Position Associate Professor	Field of Specialty Hybrid Structure and Maintenance or Infrastructure
<p>Research Topics</p> <p><b>1. Development of innovative monitoring technology and its development to general bridges</b> Bridges unrivaled in the world have been developed that can pass large aircrafts, which weigh tens of times the truck load of road bridges. In addition, innovative monitoring techniques have also been developed.</p> <p><b>2. Development of high-quality maintenance and repair technology of RC structure by high performance FRP</b> High-quality reinforcement technology for RC structures with high durability and LCC evaluation is being developed using various FRPs which are highly functional materials.</p> <p><b>3. High durability of bridge members with high update frequency and development of Easy Maintenance Bridge including inspection equipment</b></p>		
<p>Special mention Joint of hybrid structure, Evaluation of bridge inspection and diagnostic method, Numerical simulation, Loading test <b>Lab. HP</b> <a href="http://www.st.nagasaki-u.ac.jp">www.st.nagasaki-u.ac.jp</a></p>		
Name Soichi Sasaki	Position Assistant Professor	Field of Specialty Fluid Engineering, Turbomachinery, Aeroacoustics
<p>Research Topics</p> <p><b>Study of Turbomachinery and Aeroacoustics</b> (1) Prediction of Broadband Noise generated from a Wind Turbine based on Blade Element Theory (ordinary), (2) Measurement of Aeroacoustics Source on an Automobile Door Mirror by Hot-film Sensor (collaboration), (3) Modeling of Broadband Noise generated from a Low Pressure Propeller Fan, Turbomachinery, Vol. 45 No. 10, 8 pages. (Review Article)</p> <p><b>Study of Renewable Energy</b> (1) Research and Development of Compact Organic Rankine Cycle based on Performance of Turbomachinery (KAKEN, Grants-in-Aid), (2) Study on Stall Control of a Wind Turbine by Trailing Edge Flap Blade (collaboration).</p>		
<p>Special mention (1) Collaboration Project, "Seminar of Small Hydraulic Energy", Committee Member, 2017. (2) Project in Industrial Technology Center of Nagasaki Basic, "Seminar of Fluid Measurement", Invited Lecture, 2017. <b>Lab. HP</b> <a href="http://www.mech.nagasaki-u.ac.jp">http://www.mech.nagasaki-u.ac.jp</a></p>		
Name Fumitaka Motomura	Position Assistant Professor	Field of Specialty Fracture Mechanics, Laser Processing
<p>Research Topics</p> <p><b>1. Numerical analysis of laser scribing method</b> Brittle materials such as glass which is irradiated with CW laser to generate thermal stress. It is possible by the finite element method has been applied fracture mechanics, estimates the propagation path of crack caused by thermal stress and applies it for cutting process.</p> <p><b>2. Numerical simulation of ultra-short pulsed laser ablation for micro processing</b> Surface of glass irradiated with the pulsed laser having pulse duration of picoseconds level and high laser intensity is removed by laser ablation. By revealing numerical simulation of phenomena such as filamentation and ablation, it is possible to estimate the optimal conditions for micromachining of internal modification or surface removal.</p>		
<p>Special mention • Ablation processing of brittle materials using ultra-short pulse lasers • Thermal stress cleaving of brittle materials using CW lasers <b>Lab. HP</b></p>		



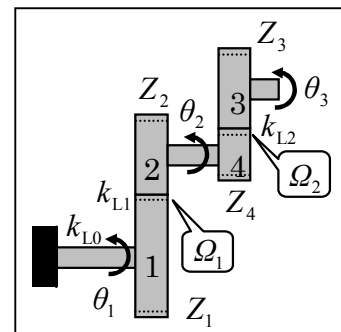
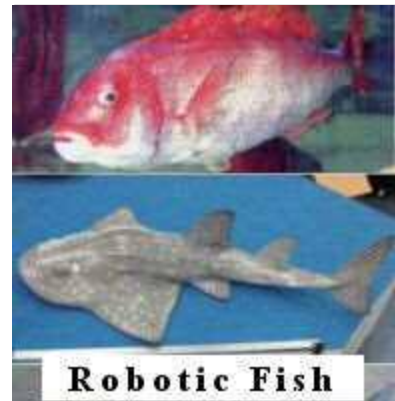
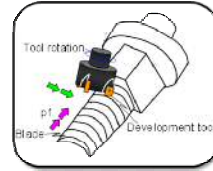
Prototype of innovative stall control blade of a Wind Turbine made in collaboration work

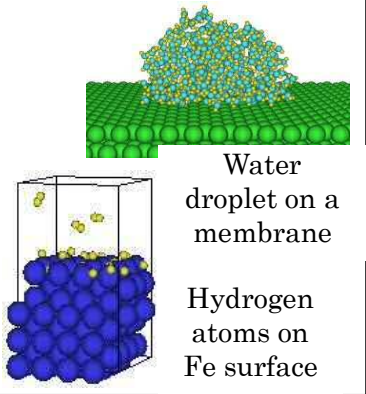
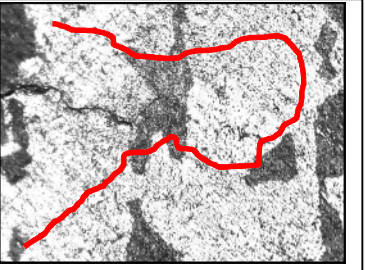
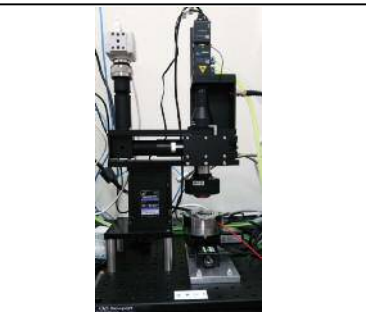


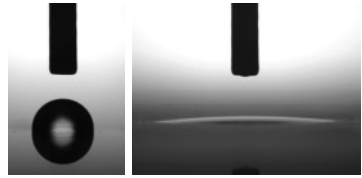
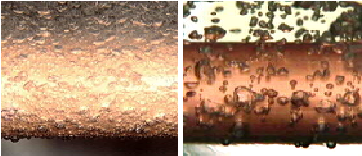
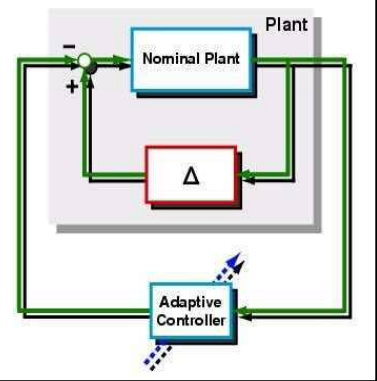
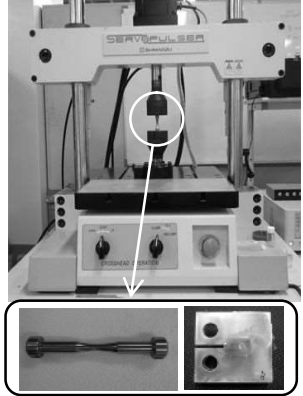
Name Hironobu Ueki	Position Professor	Field of Specialty Thermal Fluid Engineering
Research Topics <b>1. Laser Diagnostic of High Number Density Sprays</b> Laser 2-focus technique is used to probe droplets inside high speed and high number density sprays, yielding measurements of velocity and size of each droplets. The objective of this approach is to elucidate breakup physics in sprays by evaluating the cause and effect of breakup.		 <p>High pressure chamber for diesel fuel spray measurement by using laser technique</p>
<b>2. Breakup Process of Diesel Fuel Sprays</b> Research of breakup process in sprays is conducted by using the chamber (right) at engine-relevant pressure of 5 MPa. The key focus is to exploit the clear understanding of breakup for the validation of computational models of sprays and for the increase in engine efficiency. Papers: <i>The Int. J. ENERGY</i> , Elsevier, 35-12, 4572-4581 (2010). <i>J. Fluid Science and Technology</i> , JSME, 5-1, 75-85 (2010).		
Special mention Chairman of ILASS-Asia 2013, 16 <sup>th</sup> Annual Conference on Liquid Atomization and Spray Systems (2013.12), Chairman of the 22 <sup>nd</sup> Symposium of Liquid Atomization(2013.12) <b>Lab. HP</b> <a href="http://www.mech.nagasaki-u.ac.jp/htmls/top_laboratory.html">http://www.mech.nagasaki-u.ac.jp/htmls/top_laboratory.html</a>		
Name Daisaku Sakaguchi	Position Professor	Field of Specialty Turbomachinery
Research Topics <b>1. Multi-disciplinary optimization of Turbomachinery</b> Multi-disciplinary optimization technique is developed especially for a design of Turbomachinery. Genetic algorithm and Artificial Neural Networks are implemented in order to reduce optimization cost. The optimization technique is applied for several type of Turbomachinery design.		
<b>2. Development of Low Solidity cascade Diffuser</b> A novel concept of the secondary flow effect in a Low Solidity cascade diffuser is analyzed in this research. High pressure ratio type diffuser with wide operating flow range has developed taking into account the secondary flow concept.		
<b>3. Improvement of surge margin by passive casing treatment</b> Internal flow of a recirculation type casing treatment is analyzed by numerical simulation. The concept is confirmed by the experimental test rig of a turbocharger for diesel engines.		
Special mention Multi-disciplinary optimization of Turbomachinery <b>Lab. HP</b> <a href="http://www.mech.nagasaki-u.ac.jp/index.html">http://www.mech.nagasaki-u.ac.jp/index.html</a>		
Name Satoru Momoki	Position Professor	Field of Specialty Thermal Engineering, Mechanical Engineering
Research Topics <b>1. Flow Characteristics and Heat transfer of Liquids Evaporating inside Tubes</b> I am investigating the mechanism of the flow pattern generation and developing the heat transfer performance to clarify the evaporation and condensation phenomena of fluids flowing inside tubes.		
<b>2. Estimation of Lower Limit of Film Boiling</b> Film boiling is the phenomena where the generated vapor covers the heat transfer surface wholly and often occurs at the initial stage in the cooling process of very high temperature objects with fluids such as water. I am investigating the mechanism the collapse of the vapor film at the lower limit of the film boiling.		
<b>3. The Development of Thermophysical Properties Database</b> I am an core member of the developing team for the following two large databases, "A Program Package for Thermophysical Properties of Fluids, PROPATH", and "Hydrogen Thermophysical Properties Database".		
Special mention <b>PROPATH HP</b> <a href="http://propath.mech.nagasaki-u.ac.jp/w/">http://propath.mech.nagasaki-u.ac.jp/w/</a> <b>Hydrogen Thermophysical Properties Database HP</b> <a href="http://h2db.mech.nagasaki-u.ac.jp/">http://h2db.mech.nagasaki-u.ac.jp/</a> <b>Lab. HP</b> <a href="http://propath.mech.nagasaki-u.ac.jp/lab/">http://propath.mech.nagasaki-u.ac.jp/lab/</a>		

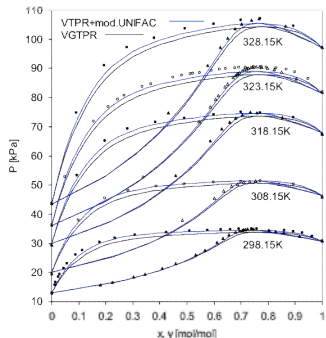
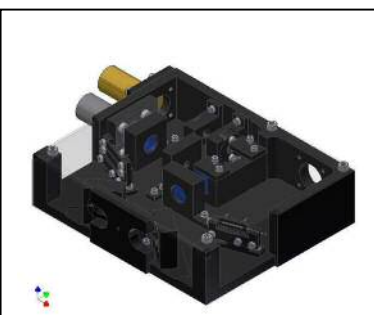
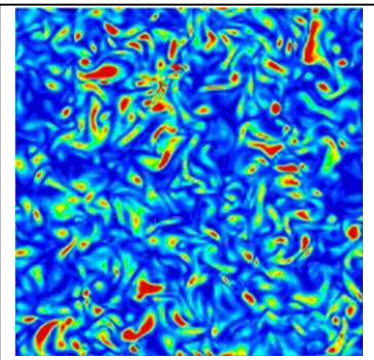


Name Takanori Yazawa	Position Professor	Field of Specialty Ultra Precision Measurement and Machining
<p>Research Topics</p> <ol style="list-style-type: none"> <li><b>1. On machine measurement for machine tool by optical measurement</b> Development of high-speed, high-precision and non-contact measuring technique on the machine tool in a large disturbance.</li> <li><b>2. Development of high efficiency cutting by rigid grain wire</b> Study on wire cutting into complex shapes of brittle materials and comosite materials.</li> <li><b>3. High efficiency and precition milling using small end mill</b> Analysis of small milling mechanism and development of high efficiency and high precision milling system for turbine blade.</li> </ol>		
<p>Special mention <b>Lab. HP</b> <a href="http://manuf.mech.nagasaki-u.ac.jp/index.html">http://manuf.mech.nagasaki-u.ac.jp/index.html</a></p>		
Name Ikuo Yamamoto	Position Professor	Field of Specialty Robotics, System Engineering, Dynamics & Control
<p>Research Topics</p> <ol style="list-style-type: none"> <li><b>1. Robotics</b> Offshore, Onshore, Aerospace, Medeical robotics with autonomous function have been developed.</li> <li><b>2. Offshore energy</b> Total technologies for practical renewable offshore energy system have been developed.</li> </ol>		
<p>Special mention 2005 Archipelaego award, France (Bio-Manoeuvring Type Underwater Vehicle), The world record of autonomous underwater vehicle cruising 317km by Urashima from Feb.26-28,2005. MARIN CONTROL SYSTEMS, IFAC Interanational Journal, Robust and Nonlinear Control, Vol.11, No.13, 2001, Wiley. <b>Lab. HP</b> <a href="http://manuf.mech.nagasaki-u.ac.jp/yamamotolab/">http://manuf.mech.nagasaki-u.ac.jp/yamamotolab/</a></p>		
Name Yutaka Yoshitake	Position Professor	Field of Specialty Mechanical Vibration
<p>Research Topics</p> <ol style="list-style-type: none"> <li><b>1. Development of vibration quenching devices for machines and structures</b></li> <li><b>2. Research on vibration of gear system</b> Analysis of gear noise and rattle to quench those phenomena and to submit design guidelines in gear system</li> <li><b>3. Research on vibration characteristics of motor stator and vibration quenching device for it</b></li> </ol>		
<p>Papers: J. of JSME C, Vol.79, No.803 (2013-7), pp.2286-2297., Vol.78, No.790 (2012-8), pp.2760-2770., Vol.73, No.728(2007-4), pp.997-1004., J. of Sound &amp; Vibration, Vol.272(2004), pp.21-38., Vol.275(2004), pp.77-88.</p> <p>Special mention Patent : Generator using walk, New type vibration quenching devices</p> <p><b>Lab. HP</b> <a href="http://www.st.nagasaki-u.ac.jp/ken/yoshitake/index.html">http://www.st.nagasaki-u.ac.jp/ken/yoshitake/index.html</a></p>		

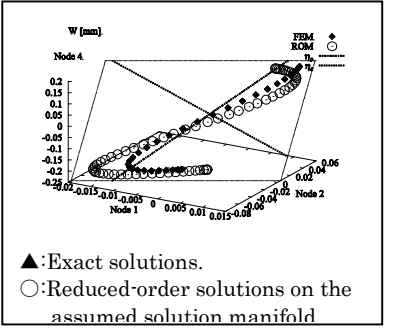
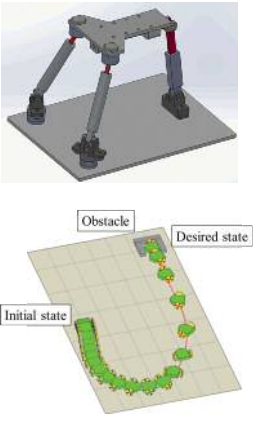


Name Tetsuya Okumura	Position Associate Professor	Field of Specialty Tribology, Surface Engineering
Research Topics <b>1.</b> The behaviors of the ions and molecules on a membrane surface The behaviors of the ions and molecules on a membrane surface are studied to develop a new membrane material by molecular simulations. <b>2.</b> The behaviors of hydrogen in tribo-systems The effects of hydrogen on tribological properties are investigated by molecular simulations. <b>3.</b> The mechanism of ultra-thin film lubrication The behaviors of lubricant molecules under ultra-thin film lubrication condition examined by molecular simulations.		 <p>Water droplet on a membrane</p> <p>Hydrogen atoms on Fe surface</p>
Special mention Funding program for World-Leading Innovative R&D on Science and Technology (FIRST) Mega-ton Water System (2009-) Nonsteady state analysis of nanoscale flow <b>Lab. HP</b> <a href="http://www.mech.nagasaki-u.ac.jp/labo/design.html">http://www.mech.nagasaki-u.ac.jp/labo/design.html</a>		
Name Junichi Katsuta	Position Associate Professor	Field of Specialty Fracture Strength & Mechanics, Human Error
Research Topics <b>1.</b> The new evaluation method of fatigue crack propagation 1.1 The simulation method for crack propagation in consideration of the material characteristics at the tip of a crack The purpose of this research is development of the evaluation method for the delayed propagation of fatigue crack. 1.2 The propagation simulation method using the re-compressive plastic deformation measured by the PIV method The purpose of this research is development of the steel materials excellent in the fatigue crack propagation characteristic. <b>2.</b> A research on the failure accident prevention of the structure by human error Human does not escape making a mistake. It is research for that.		 <p>Fig. A fatigue crack image and plastic deformation area at a fatigue crack tip</p>
Special mention I can perform the joint research about fatigue fracture, and instruction about human error prevention. <b>Lab. HP</b> <a href="http://www.st.nagasaki-u.ac.jp/ken/katsuta/index2.html">http://www.st.nagasaki-u.ac.jp/ken/katsuta/index2.html</a>		
Name Atsuhiko Koyama	Position Associate Professor	Field of Specialty Strength and Fracture of Materials, Fatigue
Research Topics <b>1. Evaluation of Fatigue of the various engineering materials</b> I experimentally investigate the fatigue characteristics of engineering materials. Especially, I'm researching on the fatigue characteristics under variable amplitude load sequences. <b>2. Development and Application of Scanning Laser/Electron induced Acoustic Microscope</b> I have been developing the microscope system using laser or electron beam for non-destructive observation of the micro defects (crack, void, etc.) just beneath the specimen surface. Papers: <i>J. of Solid Mechanics and Materials Engineering</i> , 6-6, 512(2012), <i>Transactions of the Japan Society of Mechanical Engineers. A</i> , 78-789, 637(2012), <i>Journal of the Society of Materials Science, Japan</i> , 60-12, 1110(2011) etc.		 <p>Scanning Laser induced Acoustic Microscope</p>
Special mention <b>Lab. HP</b> <a href="http://www.mech.nagasaki-u.ac.jp/">http://www.mech.nagasaki-u.ac.jp/</a>		

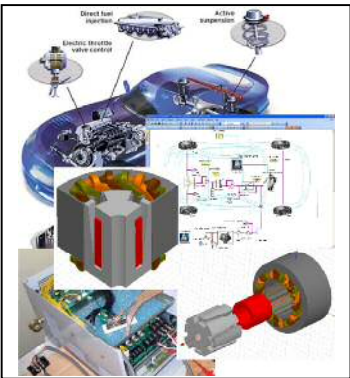
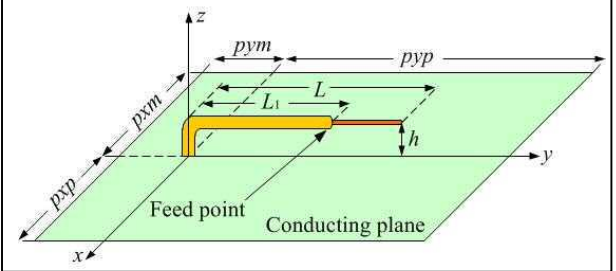
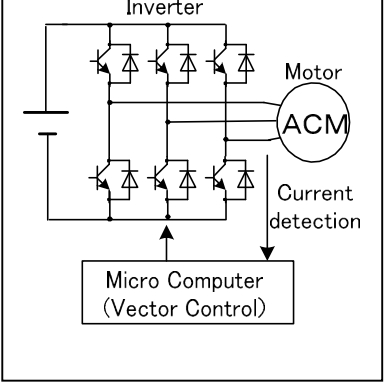
Name Chieko Kondou	Position Associate Professor	Field of Specialty Heat transfer, Thermodynamics, Heat pumps
<p><b>1. Loop Heat Pipe Type Advanced Electronics Cooling Device</b> Improving electronics cooling devices becomes increasingly important for further development of super computers, power devices, and so on. In order to increase the cooling capacity and to downsize the devices, we test combination of a medium pressure working fluid and a super-hydrophilic boiling surface, which is modified by using laser irradiation.</p> <p><b>2. Development of High-Efficient Heat Pumps Using Environmentally Benign Refrigerants</b> Investigating refrigerants of global warming potential nearly 1 and also achieving high efficiency for HEVAC&amp;R systems. We study their heat transfer characteristic, physical properties, and cycle performance. <b>Publications:</b> <i>Int. J. Refrig.</i>, <b>53</b> 80-89 (2015), <i>Int. J. Refrig.</i> <b>53</b> 126-141 (2015), <i>Int. J. Refrig.</i> <b>40</b> 161-173 (2014), <i>Int. J. Heat Mass Transfer</i> <b>55</b> 2779-2791 (2012), etc.</p>		 <p>Superhydrophilic boiling surface</p>  <p>Boiling R1234ze(Z) and R1233zd(E)</p>
Special mention NEDO Project "Development of High Efficiency and Non-Freon Air Conditioning Systems" Technical Adviser <b>Lab. HP</b> N/A		
Name Yoichi Shimomoto	Position Associate Professor	Field of Specialty Control Engineering, Control Theory
Research Topics <b>1. Control Systems Design based on an LMI</b> In the Control system design Linear Matrix Inequality (LMI) theory can obtain a control law which satisfy various control requirements, and scheduled control laws with high-degree dynamics simultaneously. (1) An application to a flight control of small flight vehicles In this research the stability margin of the control system is directly designed and repetition of the design process is reduced. (2) An application to a control problem of flexible boom vibration Since the controller parameters are embedded in the same way and they are common for all LMI's, the control system design for the multiple specification can achieved simultaneously.		
Special mention <b>Lab. HP</b> <a href="http://www.mech.nagasaki-u.ac.jp/htmls/top_research.html">http://www.mech.nagasaki-u.ac.jp/htmls/top_research.html</a>		
Name Toru Takase	Position Associate Professor	Field of Specialty Strength and Fracture of Materials
Research Topics <b>1.</b> Fatigue strength evaluation of steel produced by controlled rolling Fatigue life, Fatigue limit, Grain size, Crystal orientation, Carbon steel <b>2.</b> Behavior of fatigue crack initiation and propagation in friction stir welded aluminum alloy Fatigue, Stress intensity factor, Crack propagation rate, Crack closure, Constant amplitude loading, Variable amplitude loading <b>3.</b> Fatigue life estimation of structural materials Fatigue life, Cumulative fatigue damage, Miner's law, Endurance limit diagram, Service load		
Special mention <b>Lab. HP</b> <a href="http://www.mech.nagasaki-u.ac.jp/2011/">http://www.mech.nagasaki-u.ac.jp/2011/</a>		

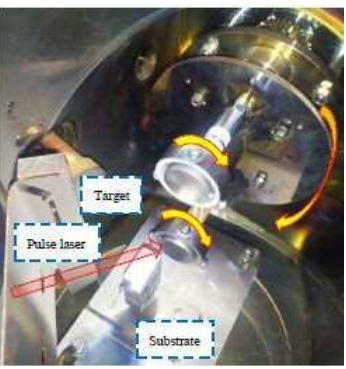
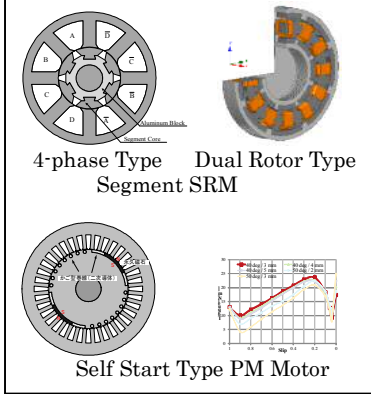
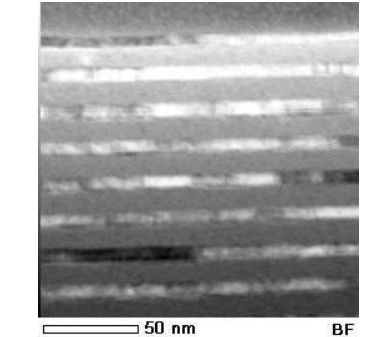
Name Tomohiko Yamaguchi	Position Associate Professor	Field of Specialty Thermal Engineering
Research Topics <b>1.</b> Measurement of thermophysical properties and Development of equation of state (a) Measurement of isothermal vapor-liquid equilibrium of mixtures (b) Measurement of sound speed of gas (c) Development of general cubic equation of state <b>2.</b> Numerical analysis for heat and mass transfer (a) Solid-gas multi-phase flow by Discrete Particle Simulation (b) Liquid-gas two-phase flow in complex structure by Lattice Boltzmann Method <b>3.</b> Air conditioning and thermal comfort index (a) Experimental study for the thermal comfort index (b) Air conditioning by radiation		 <p>VLE prediction by EOS (acetone - cyclohexane)</p>
Special mention Visiting researcher of the University of Nottingham <b>Lab. HP</b> <a href="http://www2.mech.nagasaki-u.ac.jp">http://www2.mech.nagasaki-u.ac.jp</a>		
Name Tatsuki Otsubo	Position Assistant Professor	Field of Specialty Precision measurement • machining
Research Topics <b>1.</b> Measuring Three-Dimensional Shape Using a Laser Displacement Meter on the Machine Tool The triangulation method sensor with the optical skid removes the vibration error. We have carried out research in order to get the high measurement accuracy when we measure the three-dimensional shape on machine tool.  <b>2.</b> Study on Tool Wear In-Process Estimation for Ball End Mill Using Rotation Control Air Turbine Spindle  Publications: Key Engineering Materials, Vols.656-657(2015), pp.768-773, Precision Engineering, 43(2016),pp.439-447 etc.		 <p>Optical skid sensor</p>
Special mention <b>Lab. HP</b> <a href="http://ppsel-nagasakiuniv.jp/">http://ppsel-nagasakiuniv.jp/</a>		
Name Takuya Kitamura	Position Assistant Professor	Field of Specialty Fluid Physics
Research Topics <b>1.</b> Geometry optimization of multi-scale grid using artificial intelligence The optimum geometry of multi scale grid for mixing promotion, which is the advantage of turbulence, has been explored by means of the artificial neural network and genetic algorithm.  <b>2.</b> Statistical theory analysis of turbulence The main purpose is the theoretical derivation of statistical law of turbulence from the first principle such as Navier-Stokes equation. By means of direct numerical simulations and experiments, we try further understanding of phenomenology of turbulence transport.		 <p>Visualization of vorticity in isotropic turbulence</p>
Publications: <i>Phys. Fluids</i> , <b>29</b> (2017) 065114, <i>J. Fluid Mech.</i> , <b>802</b> (2016), pp. 108-146 etc.		
Special mention Grants in Aid for Scientific Research, Young Research B (2017. 4~) representative <b>Lab. HP</b> N/A		



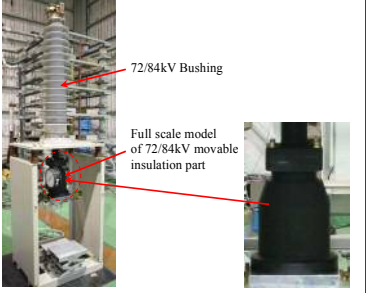

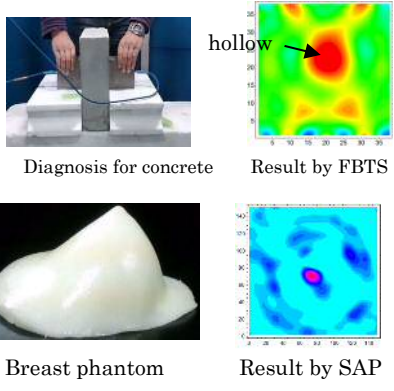
Name Akira Harada	Position Assistant Professor	Field of Specialty Dynamics of Machines, Nonlinear Dynamics
Research Topics <b>1.</b> Research on analytic methods to nonlinear systems. A goal of this research is as follows: not applying the methods for linear systems to nonlinear systems, but applying a method for nonlinear systems to nonlinear systems. <b>2.</b> Research on use of nonlinearity. Research on transforming low density energy into high density energy by localizing in the frequency domain by use of nonlinear characteristics, in order to extract energy efficiently from low density energy source.		
Special mention • KAKENHI: Grant-in-Aid for Young Scientists (B), "Research on reduced-order nonlinear equations based on the finite element method taking into account geometrical nonlinearity", (2005.4-2006.3) • KAKENHI: Grant-in-Aid for Exploratory Research, "Research on an efficient energy extraction from natural energy source by use of nonlinear characteristics.", (2013.4-) <b>Lab. HP</b> <a href="http://research.jimu.nagasaki-u.ac.jp/IST?ISTActId=FINDENDetail&amp;userId=199">http://research.jimu.nagasaki-u.ac.jp/IST?ISTActId=FINDENDetail&amp;userId=199</a>		
Name Akihiro Morinaga	Position Assistant Professor	Field of Specialty Robotics, Control Engineering
Research Topics <b>1.</b> Underactuated Parallel-link mechanism We are studying a parallel-link mechanism that can control more degrees of freedom than the number of actuators. As an application destination of this mechanism, we are developing a motion reducing device that can be mounted on a small ship.  <b>2.</b> Motion Planning of Drifting Vehicle with Nonholonomic Constraint We research on driving control of vehicles actively using tire slippage like drift driving. We define an extended Coulomb friction model including constraint force caused by nonholonomic constraint that the tire does not slip. The purpose of this research is establishment of a trajectory planning and control method that vehicles can travel efficiently on slippery road surface.		
Special mention KAKENHI: Grant-in-Aid for Young Scientists (B), 2017.4-2018.3 <b>Lab. HP</b> <a href="http://robotics.mech.nagasaki-u.ac.jp/">http://robotics.mech.nagasaki-u.ac.jp/</a>		

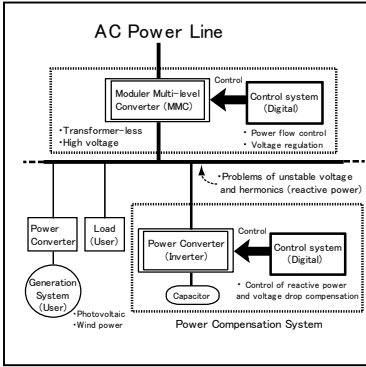

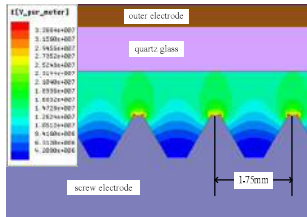
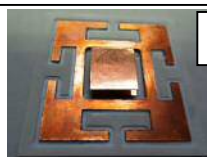
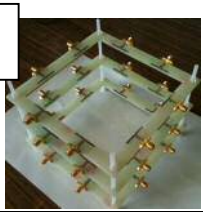
Division of Electrical Engineering  
and Computer Science


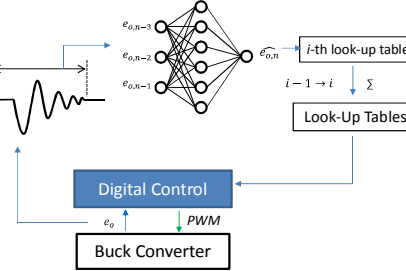

Name Takashi Abe	Position Professor	Field of Specialty Power Electronics, Motor Drive System
<p>Research Topics</p> <ol style="list-style-type: none"> <li><b>Development of high performance motor drive system</b> A development of the new structure and principle motor for EV or HEV. A research of optimization control and drive technology for application specific reluctance motors and reluctance torque assisted motors.</li> <li><b>Development of power conversion system</b> A development of environmentally friendly matrix converter that is a bidirectional and directly AC to AC conversion device, generates variable-voltage variable-frequency output and is realized using soft switching technology.</li> <li><b>Research of Vehicle Simulation method</b> The goal of this research is a proposal of a standard model for vehicle system simulations in order to realize the CO2 reduction and efficiency improvement of the energy consumption on the development stage.</li> </ol>		
		
<p>Special mention <b>Lab. HP</b> <a href="http://www.eee.nagasaki-u.ac.jp/">www.eee.nagasaki-u.ac.jp/</a></p>		
Name Mitsuo Taguchi	Position Professor	Field of Specialty Antenna Engineering
<p>Research Topics</p> <ol style="list-style-type: none"> <li><b>Ultra Low Profile Inverted L Antenna</b> The ultra low profile inverted L antenna on a finite ground plane has been proposed. Now this antenna is applied to the wideband antenna, the multi band antenna, MIMO antenna, the circular polarized antenna and the wireless power transmission (WPT) system. The power transfer efficiency more than 99 % is obtained in the WPT system.</li> <li><b>Research on Instruction by Using Electromagnetic Simulator</b> The instruction of the antenna engineering by using electromagnetic simulator is studied.</li> </ol>		
		
<p>Special mention The ultra low profile inverted L antenna and the WPT system are applied for patents. <b>Lab. HP</b> <a href="http://www.eee.nagasaki-u.ac.jp/~emlab/study/staff/taguchi/">http://www.eee.nagasaki-u.ac.jp/~emlab/study/staff/taguchi/</a></p>		
Name Mineo Tsuji	Position Professor	Field of Specialty Control of Electrical Systems
<p>Research Topics</p> <ol style="list-style-type: none"> <li><b>Encoder-less Vector Control of Induction Motors</b> Induction motors are applied to trains and industrial plants. In order to control the torque and speed, an encoder is used. I proposed a encoder-less vector control method which could control the torque and speed.</li> <li><b>Encoder-less Vector Control of Synchronous Motors</b> Synchronous motors are applied to robots and electrical carts. In order to control the torque and speed, an encoder is used. I proposed a encoder-less vector control method which could control the torque and speed.</li> <li><b>Control of Distributed Power Sources (DPS)</b> DPS is composed by PV, wind power and battery etc.</li> </ol>		
		
<p>Special mention My interests are applications of control theories (PID control, Observer, Model Reference Adaptive System, Vector Control, Digital Control) to electrical and electronic systems. <b>Lab. HP</b> <a href="http://www.eee.nagasaki-u.ac.jp/~asca/index.html">http://www.eee.nagasaki-u.ac.jp/~asca/index.html</a></p>		

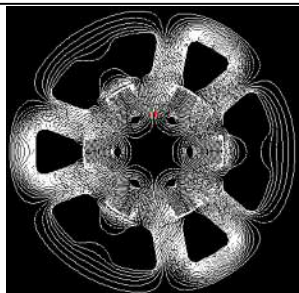
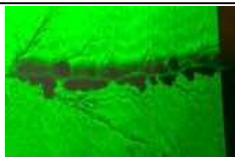

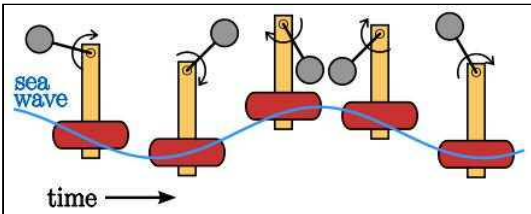
Name Masaki Nakano	Position Professor	Field of Specialty Magnetic Materials	
<p>Research Topics</p> <p><b>1. PLD-fabricated rare-earth and platinum-based thick film magnets applied for electro devices</b>  A PLD method with a high deposition rate enabled us to obtain several-ten-microns thick film magnets deposited on metal substrates applied for a couple of devices. Moreover, the preparation of an energy harvest device is under investigation by taking advantage of the deposition on Si substrates together with a micro-machining technique.</p> <p><b>2. Nd-Fe-B film magnets prepared by a vacuum arc deposition</b>  A preparation of isotropic Nd-Fe-B thick film magnets was carried out by using a vacuum arc deposition. The control of number and/or size of droplets enabled us to improve magnetic properties in nano-composite films by taking advantage of a discharge energy.</p>			 <p>Photo : Equipment of PLD</p>
<p>Special mention</p> <p>Project leader(Up to 31<sup>st</sup> March 2018)</p> <p><b>Lab. HP</b> <a href="http://www.eee.nagasaki-u.ac.jp/labs/magnet/index.html">http://www.eee.nagasaki-u.ac.jp/labs/magnet/index.html</a></p>			
Name Tsuyoshi Higuchi	Position Professor	Field of Specialty Electric Machinery	
<p>Research Topics</p> <p><b>1. Novel Switched Reluctance Motor (SRM)</b>  We have proposed a novel segment type SRM as a rear-earth-permanent-magnet-less motor. Now we are developing 4-phase type one to decrease torque ripple and dual rotor type one for flat type usage.</p> <p><b>2. Self Start Type Permanent Magnet (PM) Synchronous Motor</b>  We have proposed a novel self start type PM motor that has squirrel cage rotor conductors as well as permanent magnets. It starts in a state of rest, accelerates and rotates at synchronous speed without position sensor and inverter.</p> <p><b>3. Generators for Wind Power Generation</b>  We are developing several type small output generators for wind power generation, for examples , multiples PM generator, axial rotor type PM generator, segment type switched reluctance generator and self excitation type synchronous generator.</p>			
<p>Special mention</p> <p><b>Lab. HP</b> <a href="http://www.eee.nagasaki-u.ac.jp/~pec/higuchi-lab/web/index.php">http://www.eee.nagasaki-u.ac.jp/~pec/higuchi-lab/web/index.php</a></p>			
Name Hirotooshi Fukunaga	Position Professor	Field of Specialty Magnetics	
<p><b>Research Topics</b></p> <p>Next generation magnetic materials and their applications have been studied in our laboratories in cooperation with Prof. M. Nakano and Assistant Prof. T. Yanai. Two examples of research topics are shown below.</p> <p><b>1. Computer Simulation of Magnetization Process of Ferromagnets</b>  The magnetization process of a new kind of permanent magnets will be computer-simulated by using the micromagnetic theory, and next generation magnets will be designed based on the simulation results.  An example of publications: <i>IEEE Trans. Magn.</i> <b>49</b> (2013) 3240.</p> <p><b>2. Synthesis of State-of-Art Magnets for Next Generation by PLD Method</b>  Nanostructured state-of-art magnets for next generation will be synthesized by the pulse laser deposition (PLD) method which enables us to achieve a high deposition rate and to control a nanostructure.  An example of publications: <i>IEEE Trans. Magn.</i> <b>49</b> (2013) 3240.</p>			 <p>50 nm BF Sm-Co/<math>\alpha</math>-Fe layered structure synthesized by PLD method.</p>
<p>Special mention</p> <p>Program Officer of Research Project “High Performance Magnets : Towards Innovative Development of Next Generation Magnets” provided by JST.</p> <p><b>Lab. HP</b> <a href="http://www.eee.nagasaki-u.ac.jp/~magnet/index.html">http://www.eee.nagasaki-u.ac.jp/~magnet/index.html</a></p>			



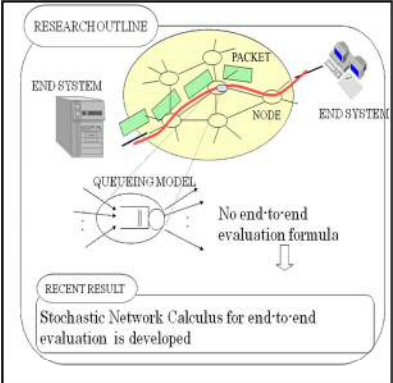
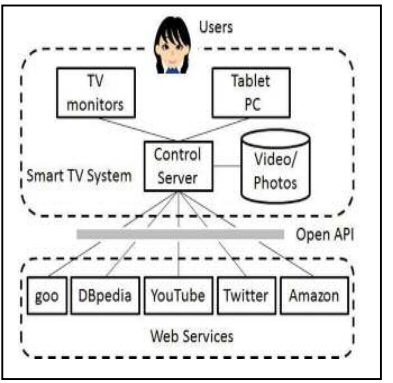
Name Takahiko Yamashita	Position Professor	Field of Specialty Electric Power and High Voltage Engineering
Research Topics <b>1. Solid/Air Insulation Coordination</b> Insulation performance of Solid/Air Insulation system for the operation part of high voltage switchgears has been investigated. Relaxation effect of electric field by embedded electrode was clarified. <b>2. Discharge Phenomena on the Surface of Polluted Insulators</b> A series of researches on surface discharge phenomena on wet polluted insulators have been done. Various phenomena were clarified and some models were proposed. <b>3. Evaluation of Polymeric Materials for Polymer Insulators</b> In relation to the evaluation of polymeric materials for polymer insulators, quality assessment of not only initial performance but the anti-aging performance has been researched.		 <p>An example of proto-type of 72/84kV solid insulated switchgear</p>
Special mention <b>Lab. HP</b>		
Name Yoichi Ishizuka	Position Associate Professor	Field of Specialty Electronic Circuits
Research Topics <b>PEMSIC(Power Electronic and Mixed-Signal Integrated Circuit) are focused on developing electronic circuit for smart, safe and secure social life.</b>  <b>1. Power Electronic Circuit:</b> Switching Mode Power Supply (SMPS), Contactless Power Supply <b>2. Mixed-signal and Mixed-power Integrated Circuit:</b> ➢ Digital Controller for next-generation SMPS ➢ Integrated Power supply on Chip <b>3. Wireless Sensor Network with Micro Module:</b> Autonomy Infrastructure assisted with Sensors and Network		
Special mention Many alumnus and alumna are related with SMPS development and research. <b>Lab. HP</b> <a href="http://isy2.wordpress.com">http://isy2.wordpress.com</a>		
Name Toshiyuki Tanaka	Position Associate Professor	Field of Specialty Applied Electromagnetic Wave Engineering
Research Topics <b>1. Non-Destructive Testing</b> We have developed methods to estimate rebar or cavities in the concrete structure. <b>2. Estimation of fresh concrete composition</b> We have developed methods to estimate mix of fresh concrete. <b>3. Development of microwave mammography</b> We have developed methods to detect early breast cancer : Filtered FBTS method <b>4. Create breast phantom(fat,skin,cancer, mammary gland, muscle)</b> Papers : PIERS Online, 7, 5, 466(2011), IEEE Trans. on Biomedical Engineering, 56, 2232(2009), Electromagn. Waves Appl., 17(2), 253 (2003)		
Special mention Patent number :4691656 (Diagnosis of concrete), 4803529 (Microwave mammography) <b>Lab. HP</b> <a href="http://www.eee.nagasaki-u.ac.jp/labs/emlab/index.html">http://www.eee.nagasaki-u.ac.jp/labs/emlab/index.html</a>		

Name Shinichi Hamasaki	Position Associate Professor	Field of Specialty Power Electronics, Control Engineering
<p>Research Topics</p> <p><b>1. Research on Novel Power Converter using Modular Multi-Level Converter (MMC)</b> The MMC consists of cascaded switching device modules without transformers and can output high voltage in AC/AC system. New control method of the MMC for power grid connection is researched.</p> <p><b>2. Research on Performance Improvement of Power Conditioners</b> Power conditioners such as a power flow controller are required to compensate unstable states in power system. Control method based on digital control to improve its performance is researched. Paper: <i>JICEMS</i>, Vol.3-2, 126-131 (2014), <i>JICEMS</i>, Vol.2-2, 248-255 (2013), <i>SPEEDAM</i>, Vol. 1, 902-907 (2010)</p>		
<p>Special mention JSPS KAKENHI (Grant-in-Aid for Young Scientists (A)) “3-phase AC-AC Converter of Hexagonal Modular Multilevel Converter” (2014-2016) <b>Lab. HP</b> <a href="http://www.eee.nagasaki-u.ac.jp/labs/asca/">http://www.eee.nagasaki-u.ac.jp/labs/asca/</a></p>		
Name Tomoyuki Fujishima	Position Associate Professor	Field of Specialty Discharge application, High voltage engineering
<p>Research Topics</p> <p><b>1. Ozone Generation with Dielectric Barrier Discharge</b></p> <p><b>2. Development of Simple Lightning Protection System for Outdoor Installed Electronic Equipment</b></p> <p><b>3. Soil Sterilization by Discharge-Generated Ozone</b></p> <p><b>4. Calculation of Intensity Distribution of Electric Field</b></p>		 <p>Ozone Generation</p>  <p>Calculations of Electric Field Intensity</p>
<p>Special mention <b>Lab. HP</b> <a href="http://www.eee.nagasaki-u.ac.jp/">www.eee.nagasaki-u.ac.jp/</a></p>		
Name Takafumi Fujimoto	Position Associate Professor	Field of Specialty Antenna, Electromagnetic Wave
<p>Research Topics</p> <p><b>1. Development of Small and planar antennas</b> I have developed some wideband antennas and multiband antennas by simulation and measurements.</p> <p><b>2. Development of antenna system using Small and planar antennas</b> I have developed following systems using small and planar antennas proposed by our laboratory.</p> <ul style="list-style-type: none"> <li>• Antenna system for breast cancer detection</li> <li>• Antenna system for Fresh Concrete Diagnosis</li> <li>• MIMO antenna system</li> </ul> <p>Papers: <i>IET Microwaves, Antennas &amp; Propagation</i>, 6, 13, pp.144-1450 (2012). <i>Progress in Electromagnetics Research C</i>, 37, pp.1-13 (2013). etc.</p>		 <p>Triple-band planar antenna</p>  <p>Antenna system for breast cancer detection</p>
<p>Special mention I can design antenna elements and antenna systems for any applications. <b>Lab. HP</b> <a href="http://www.eee.nagasaki-u.ac.jp/~emlab/study/staff/fujimoto/index.html">http://www.eee.nagasaki-u.ac.jp/~emlab/study/staff/fujimoto/index.html</a></p>		

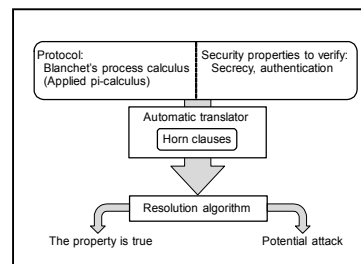
Name Yoshinobu Matsuda	Position Associate Professor	Field of Specialty Plasma Science and Engineering
Research Topics 1. Sputtering deposition of environmentally friendly functional thin films such as: (ア)Indium free ZnO based transparent conductive films (イ)Rare-earth element free magnetic films 2. Developments of plasma diagnostics and plasma sources for: (ア)accessing the atomic/molecular reaction process to reveal the plasma surface interaction in the above deposition processes (イ)upgrading the deposition process Reference: Y. Matsuda et al., Deposition of Aluminum-Doped ZnO Films by ICP Assisted Sputtering, in "ZnO Nanocrystals and Allied Materials", Springer Series in Materials Science, Vol. 180, Rao, M S Ramachandra; Okada, Tatsuo (Eds.) 2013		 Rf superimposed dc magnetron Sputtering deposition apparatus
Special mention • JST (2009.4-2012.3): development of next generation environmentally friendly white light sources • Participating in medical engineering joint project, future technology center project <b>Lab. HP</b> <a href="http://www.eee.nagasaki-u.ac.jp/~plasma/matsuda/index.html">http://www.eee.nagasaki-u.ac.jp/~plasma/matsuda/index.html</a>		
Name Hidenori Maruta	Position Associate Professor	Field of Specialty Electrical Circuit, Signal and Image Processing
Research Topics 1. <b>Intelligent Digital Control of DC-DC converter</b> We aim to realize the intelligent digital control method with machine learning and digital signal processing for dc-dc converter, which can provide superior transient response compared to conventional method. 2. <b>Image Recognition for Environment Understanding</b> We aim to realize image recognition method for environmental understanding. We especially focus on smoke and fire detection based on machine learning method. 3. <b>Image Understanding based on Human Visual Processing</b> We develop the image understanding system based on the human visual processing.		 Intelligent Digital control DC-DC Converter
Special mention <b>Lab. HP</b> <a href="http://www.eee.nagasaki-u.ac.jp/~www-ecc/kurokawa/index.html">http://www.eee.nagasaki-u.ac.jp/~www-ecc/kurokawa/index.html</a>		
Name Toshifumi Moriyama	Position Associate Professor	Field of Specialty Microwave Remote Sensing
Research Topics 1. Remote sensing using Synthetic Aperture Radar In Japan, the spaceborne and airborne synthetic aperture radars are developed by JAXA and NICT. By using these data, the calibration and data analysis methods are researched. 2. Inverse Scattering Analysis To determine the characteristics of an object using the scattering wave from it, the inverse scattering method is researched under the leadership of Prof. Takenaka.		 Fig.1 RGB composite image of Nagasaki city obtained by Pi-SAR L.
Special mention: The observed SAR data can preferentially be used by the contracts of joint research between JAXA and Nagasaki university(H25,4~) and between NICT and Nagasaki university(H25,6~). <b>Lab. HP</b> <a href="http://www.eee.nagasaki-u.ac.jp/~emlab/">http://www.eee.nagasaki-u.ac.jp/~emlab/</a>		

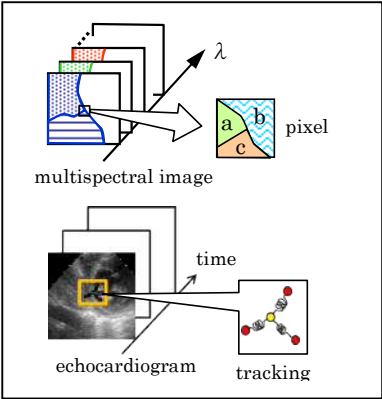
Name Takeshi Yanai	Position Associate Professor	Field of Specialty Magnetic Materials and Their Applications
Research Topics <b>1. Preparation of soft magnetic films using electrodeposition methods</b> Our group is researching on soft magnetic alloys such as Fe, Ni, Fe-Ni, and Fe-Co prepared by means of electrodeposition methods and their applications. <u>Related paper:</u> <i>IEEE Trans. Magn.</i> <b>48</b> , No.11, (2012.11), 2907.		 <p>Fig. Magnetic flux in a IPM (Interior Permanent Magnet) motor.</p>
<b>2. Research on improvement in industrial properties for magnetic devices and equipment</b> Our group is developing simulation methods for magnetic devices and equipment in order to improve their industrial properties such as power efficiency and thermal stability. <u>Related paper:</u> <i>J. Magn. Soc. Jpn.</i> , <b>37</b> , No.3-2, (2013.5), 151., <i>IEEE Trans. Magn.</i> , <b>47</b> , No.10, (2011.10), 4108.		
Special mention <b>Lab. HP</b> <a href="http://www.eee.nagasaki-u.ac.jp/~magnet/">http://www.eee.nagasaki-u.ac.jp/~magnet/</a>		
Name Tomohiro Furusato	Position Assistant Professor	Field of Specialty High Voltage, Discharge Physics, Pulsed Power
Research Topics <b>1. Development of power equipment using supercritical CO<sub>2</sub></b> Supercritical (SC) CO <sub>2</sub> has been focused as an alternative medium for sulfur hexafluoride (SF <sub>6</sub> ) as its physical properties lead to high dielectric strength and strong extinguishing effect. I have studied the pulse arc discharge phenomena in SC CO <sub>2</sub> toward application for a pulsed power switch or a circuit breaker.		 <p>Fig.1. Discharge in SC CO<sub>2</sub></p>  <p>Fig. 2. Pulse creeping discharge on water.</p>
<b>2. Study of creeping discharge on water for water treatment</b> Radicals generated by discharge plasma on water surface can treat the wastewater. I have studied the creeping discharge on water using pulsed power technique to improve the generation efficiency of radicals.		
Special mention Study of discharges in SC CO <sub>2</sub> was supported by Grant-in-Aid for Research Activity Start-up (No. 26889048) and by TEPCO Memorial Foundation. <b>Lab. HP</b> <a href="http://www.eee.nagasaki-u.ac.jp/labs/hv-www/index.html">http://www.eee.nagasaki-u.ac.jp/labs/hv-www/index.html</a>		
Name Yuichi Yokoi	Position Assistant Professor	Field of Specialty Nonlinear Dynamics, Electric Machinery
Research Topics <b>1. Wave energy extraction by parametric pendulum</b> The nonlinear characteristics of the parametric pendulum are applied to wave energy extraction as shown in the figure. The parametric pendulum converts from the vertical vibration of sea wave to its motion in the rotational direction. The wave energy is extracted and converted to electrical energy through the parametric pendulum connected with a generator.		
<b>2. Design and Drive of Electric Machinery</b> System design and drive method are studied for electric machinery to reduce and suppress torque pulsation, which causes noise and vibration in motor drive. Publication: <i>IEICE Trans.</i> <b>96-A</b> (2), 591 (2013). <i>Phys. Lett. A</i> <b>375</b> (17), 1779 (2011). <i>Trans. ISCIE</i> <b>24</b> (3), 54 (2011).		
Special mention <b>Lab. HP</b> <a href="http://www.eee.nagasaki-u.ac.jp/~pec/higuchi-lab/web/index.php">http://www.eee.nagasaki-u.ac.jp/~pec/higuchi-lab/web/index.php</a>		






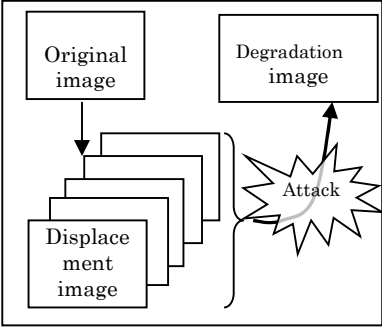


Name Kazutomo Kobayashi	Position Professor	Field of Specialty Computer Networks
Research Topics <b>1. Performance Evaluation for Computer Networks</b> In computer networks, some packets are delayed or lost with some probabilities on the way to their destination. We study on stochastic network calculus for end-to-end evaluation. This study enables to design and control networks for guaranteed communication services. <b>2. New Generation Network ( Future Internet )</b> The internet has come into wide use. At the same time, the Internet causes various information problems. We study on new generation networks for building safe and secure social infrastructure. Patents: <i>Patent Number 5150976, Japan (2012).</i> Papers: <i>IEICE Trans. Comm., 94(5), 1288(2011). Proc. ITC21(2009).</i>		
Special mention <b>Lab. HP</b> <a href="http://nwk.cis.nagasaki-u.ac.jp/kobayashi/">http://nwk.cis.nagasaki-u.ac.jp/kobayashi/</a>		
Name Toru Kobayashi	Position Professor	Field of Specialty Web Technology, Data Mining
Research Topics <b>1. Human Interface based on the next generation Web technologies</b> The system indicated on the right hand side picture allows us to retrieve information without typing-in search key words. It also allows us to see retrieved information via multi-screen environment based on the intuitive user interface. I believe that this system will solve the problem of information retrieval capability differentials among users. <b>2. Information Filtering focused on Data Mining</b> I am focusing on Information Filtering methods targeted in Web viewing histories or terminal operation logs. Papers: <i>COMPSAC, Proc., 208(2013). COMPSAC, Proc., 11(2012). SAINT, Proc., 91(2012). etc.</i>		
Special mention Joint collaboration available in the field of advanced User Interfaces based on Web technologies. <b>Lab. HP</b> <a href="http://www.cis.nagasaki-u.ac.jp/~toru/src/index.html">http://www.cis.nagasaki-u.ac.jp/~toru/src/index.html</a>		
Name Yutaka Sueyoshi	Position Professor	Field of Specialty Number Theory, Cryptography, Combinatorics
Research Topics <b>1. Ideal class groups and the 2-class field tower problem of imaginary quadratic fields</b> I study the 2-class field tower problem of imaginary quadratic fields, by using their ideal class groups. Papers: <i>Far East J. of Math. Sci., 42, pp.175-187(2010), Far East J. of Math. Sci., 34, pp.329-339(2009).</i> <b>2. Acceleration of operations on finite algebraic systems</b> In relation to public key cryptosystems, I study on acceleration of operations on finite algebraic systems, such as multiplicative groups of finite fields, and polynomial rings and elliptic curves over finite fields. Papers: <i>IEICE Trans. Fundamentals, 99-A, pp.1090-1096(2016), IEICE Trans. Fundamentals, 97-A, pp.1378-1381(2014), IEICE Trans. Fundamentals, 96-A, pp.1081-1087(2013).</i> <b>3. Mathematical structures of equitable round-robin tournaments and their scheduling problems</b> I study on the mathematical structure of equitable round-robin tournaments with home-away assignments and their scheduling problems, from the point of view of combinatorial optimization. Papers: <i>Far East J. of Appl. Math., 86, pp.57-91(2014), Far East J. of Appl. Math., 55, pp.1-25(2011).</i>		
Special mention <b>Lab. HP</b> <a href="http://www.cis.nagasaki-u.ac.jp/~harasawa/">http://www.cis.nagasaki-u.ac.jp/~harasawa/</a>		


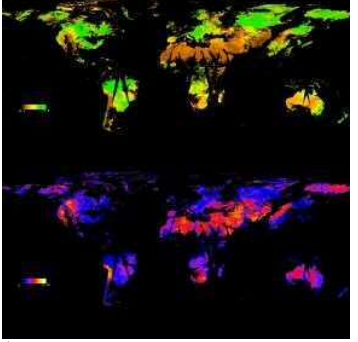
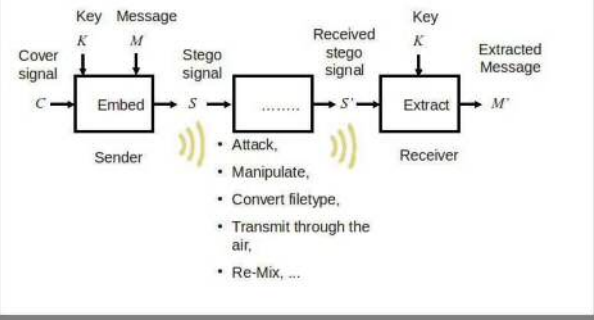
Name Yuichiro Shibata	Position Associate Professor	Field of Specialty Computer Architecture
<p>Research Topics</p> <ol style="list-style-type: none"> <li>1. Reconfigurable computing Aiming at establishing a novel paradigm for computing which makes the best use of flexibility programmable devices such as FPGAs offer, architectures, applications and design methodologies are widely investigated.</li> <li>2. Energy efficient application acceleration Efficient mapping of algorithms to parallel processing architectures such as FPGAs and GPUs is proposed and evaluated to improve an energy performance ration as well as productivity of development.</li> <li>3. Hardwired real-time embedded image processing As one of the most promising applications of FPGA computing, low-power and real-time implementation of various image processing algorithms such as HOG-based human detection are developed. Publication: High-Performance Computing Using FPGAs, Springer (2013)</li> </ol>		
<p>Special mention IEICE Best Paper Award (2004) <b>Lab. HP</b> <a href="http://slab.cis.nagasaki-u.ac.jp">http://slab.cis.nagasaki-u.ac.jp</a></p>		
Name Shuji Narazaki	Position Associate Professor	Field of Specialty Computer Engineering
<p>Research Topics</p> <ol style="list-style-type: none"> <li>1. Development of a fast SAT solver in a functional language SAT Solver is a new tool to solve misc large-scale constraint problems. But <i>funsat</i>, the most famous and fastest solver in functional language Haskell, has poor performance, compared with modern fast SAT solvers. By using new data structures, search algorithms and parallelism, we are developing a new SAT solver in Haskell. And with it, we research on a new approach based on SAT solver for AI problems like routing, planning and gaming.</li> <li>2. Research on MultiAgent Systems (MAS) in functional languages Functional languages are thought as a new tool for building highly parallel, reliable and reusable softwares. Especially Haskell has various libraries for concurrent and parallel programming in present day. So we research on methodologies for building MAS in Haskell, that can be used in MultiAgent simulations or distributed web systems and so on.</li> </ol>		
<p>Special mention <b>Lab. HP</b> <a href="http://www.cs.cis.nagasaki-u.ac.jp">http://www.cs.cis.nagasaki-u.ac.jp</a></p>		
Name Kenichi Arai	Position Assistant Professor	Field of Specialty Information Security, Cryptography
<p>Research Topics</p> <ol style="list-style-type: none"> <li>1. <b>Computer-based Evaluation of Cryptographic Protocol Security</b> The complexity of cryptographic protocols has increased in recent years in response to various requirements. This increase in complexity makes the evaluation of cryptographic protocol security difficult and increases the likelihood of human error. For this reason, the problem has arisen that many studies contain evaluation errors. This study focuses on the effectiveness of computer-based evaluation of cryptographic protocol security and aims to realize a method for rigorously conducting such evaluations. The results of this research will provide an effective solution for the serious problem of the increase in evaluation errors due to the growing complexity of cryptographic protocols.</li> </ol>		
<p>Special mention Grant-in-Aid for Young Scientists(B) ”Computer-based Evaluation of Cryptographic Protocol Security” (H26~H28) <b>Lab. HP</b> <a href="http://www.cis.nagasaki-u.ac.jp/~toru/src/">http://www.cis.nagasaki-u.ac.jp/~toru/src/</a></p>		




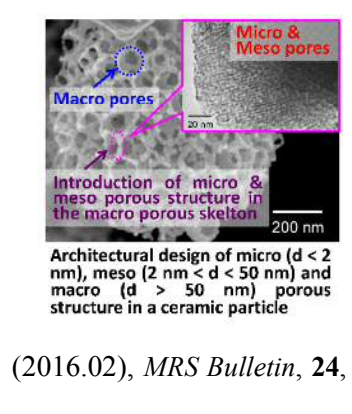
Name Hiroyuki Takada	Position Assistant Professor	Field of Specialty Applied Probability, Queueing Theory
<p>Research Topics</p> <p><b>1. Probability concentrate inequality for extreme order statistics of bounded processes with finite supports and mean bounds.</b> The aim of the study is to obtain the optimal upper bound of the complementary cumulative probability functions of the extreme order statistics of the random variables in terms of the supports and the mean bounds.</p> <p><b>2. Application to non-feedforward network</b> The aim of the study is to evaluate the risk probabilities of the non-feedforward networks with FIFO nodes and regulated traffic resources in terms of the provisioning parameters like the mean bit rates and the burst values. This is the open problem in the theory of network calculus.</p>		
<p>Special mention <b>Lab. HP</b> <a href="http://nwk.cis.nagasaki-u.ac.jp">http://nwk.cis.nagasaki-u.ac.jp</a></p>		
Name Ryuichi Harasawa	Position Assistant Professor	Field of Specialty Computational Number Theory, Cryptography, Discrete Mathematics
<p>Research Topics</p> <p><b>1. Arithmetic operations on finite algebraic systems</b> I study on arithmetic operations on finite algebraic systems, such as finite groups, finite rings, finite fields and Jacobian groups associated to algebraic curves. The theme is a fundamental topic of public key cryptosystems as well as a fundamental topic of computational number theory. I obtained some results on root computations in finite fields, factorization of polynomials over finite fields and arithmetic/pairings on algebraic curves over finite fields. Papers: <i>IEICE Trans. Fundamentals</i>, <b>97-A</b>, pp.1378-1381(2014), <i>IEICE Trans. Fundamentals</i>, <b>96-A</b>, pp.1081-1087(2013), <i>Lecture Notes in Computer Science</i>, <b>7369</b>, pp.225-235(2012).</p> <p><b>2. Mathematical structures of equitable round-robin tournaments and their scheduling problems</b> I study on the mathematical structures of equitable round-robin tournaments with home-away assignments and their scheduling problems (including the consideration on the computational feasibility of getting such a schedule). Paper: <i>Far East J. of Appl. Math.</i>, <b>86</b>, pp.57-91(2014), <i>Far East J. of Appl. Math.</i>, <b>55</b>, pp.1-25(2011) .</p>		
<p>Special mention <b>Lab. HP</b> <a href="http://www.cis.nagasaki-u.ac.jp/~harasawa/">http://www.cis.nagasaki-u.ac.jp/~harasawa/</a></p>		
Name Senya Kiyasu	Position Professor	Field of Specialty Pattern Information Processing & Recognition
<p>Research Topics</p> <p><b>1. Information extraction from multidimensional image</b> We attempt to extract information from pixels of multispectral images which acquired by airplanes or satellites. Algorithms of pixel classification and unmixing are studied.</p> <p><b>2. Analysis of medical image / acoustic data</b> Analysis of echocardiogram is studied for diagnosis of heart diseases. Lung sounds are attempted to be discriminated for medical diagnosis.</p> <p><b>3. Processing of 3D data</b> Methods of acquiring and reconstructing the 3D information from sensor data are developed. Papers: Proc.SICE2014, pp.101-104 (2014), Proc.SICE2013, pp.833-836 (2013), Proc.SICE2011, pp.2402-2405 (2011), Trans. SICE, vol.E-3, no.1, pp.91-97 (2004). etc.</p>		
<p>Special mention <b>Lab. HP</b> <a href="http://www.cis.nagasaki-u.ac.jp/~kiyasu">http://www.cis.nagasaki-u.ac.jp/~kiyasu</a></p>		

Name Shoichi Matsunaga	Position Professor	Field of Specialty Information Processing
Research Topics Spoken Language Processing ① Acoustic and language modeling for spontaneous speech recognition ② Emotion detection in infants' cries ③ Abnormal lung sound detection		
Special mention <b>Lab. HP</b> <a href="http://www.cis.nagasaki-u.ac.jp/~masaru/SPL">http://www.cis.nagasaki-u.ac.jp/~masaru/SPL</a>		
Name Tomoya Sakai	Position Associate Professor	Field of Specialty Pattern Recognition, Signal Processing
<p><b>'Combinatorial' Pattern Recognition = ( Signal Processing + Machine Learning ) × Sparse Modeling</b></p> <p>His project develops comprehensively both techniques of signal processing and machine learning for pattern recognition based on the sparse modeling, which enables to perceive high-dimensional data stream as a concise combination of explanatory data ingredients.</p> <p><b>Research: mathematical optimization, inverse problem</b>  <b>Development: lung-sound analysis, sparse 4D-MRI, video motion analysis, short message classification, dysphagia risk assessment tool, etc.</b></p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>Perceiving motion through a moving camera</p> </div> <div style="text-align: center;">  <p>Computer-Aided Auscultation</p> </div> </div> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>Imaging the invisibles from incomplete data</p> </div> <div style="text-align: center;">  <p>Distilling meaning of short messages</p> </div> <div style="text-align: center;">  <p>Assessing dysphagia risk noninvasively</p> </div> </div>		
<ul style="list-style-type: none"> <li>✓ Offers expert consultation concerning sparse modeling and compressed sensing techniques.</li> <li>✓ Welcomes opportunities for collaborative research/development of data-driven CV/PR/ML applications.</li> </ul> <p><b>Website</b> <a href="http://www.cis.nagasaki-u.ac.jp/~tsakai/">http://www.cis.nagasaki-u.ac.jp/~tsakai/</a>  <b>Profile</b> <a href="http://researchmap.jp/tsakai/?lang=english">http://researchmap.jp/tsakai/?lang=english</a></p>		
Name Makoto Fujimura	Position Associate Professor	Field of Specialty Image Processing
Research Topics <b>1. Copyright protection scheme for image contents</b> Image contents have been spread and developed via internet. But illegal copy problem is raised up. Especially average attack is problem because of eliminating watermarking and refine original signal. We study the scheme of degradation of geometrically-transformed image against the illegal attack.		
<b>2. Pseudo 3 dimensional data derived from 2 dimensional image</b> The 3 dimensional image contents is widespread but the contents take thousands of man-hours. We research pseudo 3 dimensional data structure which is consisted of the elements of 2 dimensional image.		
<div style="display: flex; align-items: center;"> <div style="flex: 1;">  </div> </div>		
Special mention <b>Lab. HP</b> <a href="http://www.cis.nagasaki-u.ac.jp/course/labs/fujimura/fujimura.htm">http://www.cis.nagasaki-u.ac.jp/course/labs/fujimura/fujimura.htm</a>		



Name Tomonari Masada	Position Associate Professor	Field of Specialty Bayesian Data Analytics
<p>Research Topics</p> <p><b>1. Bayesian Data Analytics</b></p> <p>In our laboratory, we use a Bayesian method called <i>topic modeling</i> to analyze a wide variety of data. Topic modeling enables us to discover <i>diversity</i> latent in real-world data, where latent diversity is represented as a set of tens or hundreds of probability distributions called <i>topics</i>.</p> <p>While topic modeling was originally proposed for text analytics, we also utilize it to analyze hyperlink information, microarray data, handwritten digit images, traffic speed data, etc.</p> <p>Further, we parallelize the inference computation for topic modeling with OpenMP, CUDA, and MPI on PC cluster to accelerate computation for achieving a large-scale data analytics.</p>		 <p>Bayesian Topic Analysis of Proceedings of the National Diet of Japan</p>
<p><b>Special mention</b></p> <p>Our papers are accepted for well-known conferences: CIKM (2012, 2009), PAKDD (2011, 2008), etc.</p> <p><b>Web site</b> <a href="http://tmasada.wikispaces.com">http://tmasada.wikispaces.com</a></p>		
Name Masao Moriyama	Position Associate Professor	Field of Specialty Remote Sensing
<p>Research Topics</p> <ol style="list-style-type: none"> <li>1. Remote sensing data analysis: the algorithm development for the land surface reflectance, emissivity and temperature estimation from the satellite detected radiation data.</li> <li>2. Environmental monitoring from space: the temporal trend analysis of the soil moisture and the phenological analysis of the tropical rain forest.</li> <li>3. Provide the satellite based environmental dataset for the forest research scientists, the agricultural scientists and the public health scientists.</li> </ol>		 <p>(U: 2001/08/02 vegetation map, L: Aridity map)</p>
<p><b>Special mention</b></p> <p>The next generation earth observing system development with JAXA, METI. (JAXA/GCOM-C1, METI/HISUI)</p> <p><b>Lab. HP</b> <a href="http://www.rsirc.cis.nagasaki-u.ac.jp">http://www.rsirc.cis.nagasaki-u.ac.jp</a></p>		
Name Kotaro Sonoda	Position Assistant Professor	Field of Specialty Acoustic Engineering, Multimedia Information Hiding
<p>Research Topics</p> <p><b>Audio Signal Enrichment based on Information Hiding Technique</b></p> <p>Data hiding is the strategy to re-encode an original audio signal with embedding some payloads to produce the stego audio signal in advantage of the redundancy and recognize the payloads from deteriorated stego signal. Taking advantage of the data hiding, we embed a watermark into the original audio signal to enrich the contents.</p>		 <p>The diagram illustrates the process of audio signal enrichment based on information hiding. It shows a flow from a Sender to a Receiver. On the Sender side, a Cover signal <math>C</math> is input into an 'Embed' block. A Key <math>K</math> and a Message <math>M</math> are also inputs to the 'Embed' block. The output of the 'Embed' block is a Stego signal <math>S</math>. This Stego signal <math>S</math> is transmitted through a channel, indicated by a double-headed arrow with a list of potential attacks: Attack, Manipulate, Convert filetype, Transmit through the air, and Re-Mix, ... On the Receiver side, the Received stego signal <math>S'</math> is input into an 'Extract' block. A Key <math>K</math> is also an input to the 'Extract' block. The output of the 'Extract' block is the Extracted Message <math>M'</math>.</p>
<p><b>Special mention</b></p> <p><a href="http://www.cis.nagasaki-u.ac.jp/~sonoda/index.html.en">http://www.cis.nagasaki-u.ac.jp/~sonoda/index.html.en</a></p>		

# Division of Chemistry and Materials Science

Name Takamasa Sagara	Position Professor	Field of Specialty Analytical Electrochemistry
<p><b>Main Research Interests:</b> (1) Regulation of Dynamic Self-Organization of Molecules at Electrified Interfaces (<i>e.g.</i> Faradaic phase transition, <i>see upper-right</i>); (2) Design and Construction of Molecular-Robot Sliding Arms as Molecular Assembling Nano-Architecture (<i>e.g.</i> Expansion-Contraction System using Nanoparticles (NPs), <i>see lower-right</i>); (3) Electrochemistry of Viologens: from Ionic Liquid to Self-Assembled Monolayers on Electrode Surfaces; (4) Electroreflectance Spectroscopy; (5) Bioelectrochemistry; (6) Electrochemical Driving of Oil Droplet and Electrochemistry at Solid/Liquid/Liquid Interface.</p> <p><b>Book Chapters:</b> (1) "UV-visible Reflectance Spectroscopy of Thin Organic Films at Electrode Surface" in <i>Advances in Electrochemical Science and Engineering</i>, Vol. 9, Chap. 2 (2006). (2) "Dynamic Behaviors of Molecular Assemblies and Nano-Substances at Electrified Interfaces", in <i>Bottom-up Nanofabrication</i> (ASP), Vol. 3, Chap. 13 (2009).</p>		
<p>Special mention  <i>Editor-in-chief</i>, Review of Polarography (2008-2012)  <b>Lab. HP</b> <a href="http://www.cms.nagasaki-u.ac.jp/lab/douteki/">http://www.cms.nagasaki-u.ac.jp/lab/douteki/</a></p>		
Name Yasuhiro Shimizu	Position Professor	Field of Specialty Functional Material Chemistry, Electrochemistry
<p>Research Topics</p> <p><b>1. Design of High Functional Gas Sensing Materials by Simultaneous Control of Surface Composition and Pore Structure of Semiconductive Metal Oxides:</b> Our efforts have been directed to optimizing the reactivity and diffusivity of target gases for realizing high sensing performance.</p> <p><b>2. Design and Development of Electrolytes and Electrode Materials for High Performance Electrochemical Devices:</b> Materials design are now in progress for developing high performance solid electrolyte gas sensors, lithium secondary batteries, dye-sensitized solar cells and etc.</p> <p><b>Publications:</b> <i>Sens. Actuators B</i>, <b>244</b>, 992–1003 (2017.06), <i>Electrochemistry</i>, <b>85</b>(4), 1-5 (2017.4), <i>J. Electrochem. Soc.</i>, <b>163</b>(7), B300-B308 (2016.07), <i>Chemical Communications</i>, <b>152</b> (16), 3308-3311 (2016.02), <i>MRS Bulletin</i>, <b>24</b>, 18-24 (1999).</p>		
<p>Special mention</p> <p>1) 2008.03: Scientific Achievement Award of the Electrochemical Society of Japan  2) 2015.01~2017.01: President of Japan Association of Chemical Sensors  3) 2017.01~: Manager, Kyushu Branch of the Electrochemical Society of Japan</p> <p><b>Lab. HP:</b> <a href="http://www.cms.nagasaki-u.ac.jp/lab/zaika/zak.htm">http://www.cms.nagasaki-u.ac.jp/lab/zaika/zak.htm</a></p>		
Name Shuji Tanabe	Position Professor	Field of Specialty Catalysis, Chemical process, Inorganic Chemistry
<p>Research Topics</p> <p><b>1. Preparation of Shape Selective Metallic Nano-particles and Its Catalytic applications</b>  Hexagonal or octahedral particles of platinum and palladium could be produced selectively when some surfactants or salts were added during the crystal growth process. It was found that ultrasonic irradiation process was effective to reduce the crystal growth time dramatically. The shape selective nano metallic particles were applied into several catalytic processes.</p> <p><b>2. Hydrogen Production from Biomass using Transition Metal Catalysts</b>  Sawdust as model materials of biomass can be reformed to hydrogen, CO and CO<sub>2</sub> using water vapor and heterogeneous catalysts containing cobalt and/or nickel oxides.</p>		
<p>Special mention  <b>Lab. HP</b></p>		

Name Isamu Moriguchi	Position Professor	Field of Specialty Colloid&Interface Chemistry, Electrochemistry
<p>Research Topics</p> <p><b>1. Creation of novel functions via nano-interface and nano-space control</b>            Synthesis of various nanoparticles, nanoporous materials and nanocomposites of carbons and metal oxides by soft chemical processes to investigate new functions such as adsorption&amp;catalysis, charge-discharge functions and CO<sub>2</sub>-reduction.</p> <p><b>2. Development of next-generation energy storage devices</b>            Development of high performance Li- or Na-ion batteries, all-solid-state batteries, and capacitors, which are applicable to electric vehicles and electric power grid-connection system, and so on.</p> <p><b>References:</b> <i>J. Phys. Chem. C</i> , <b>120</b>, 25717 (2016); <i>Nat. Commun.</i>, <b>6</b>, 1(2015); <i>Chem. Commun.</i>, <b>50</b>, 7143(2014); <i>ACS Nano</i>, <b>8</b>, 3614(2014), etc.</p>		
<p>Special mention</p> <ul style="list-style-type: none"> <li>• Nagasaki University Priority Research Project “<i>Innovative Materials Science for Next-generation Energy-related Technologies</i>”, Project Leader</li> </ul> <p><b>NU-project HP :</b> <a href="http://www.mase.nagasaki-u.ac.jp/MSNGE3/MSNGE.html">http://www.mase.nagasaki-u.ac.jp/MSNGE3/MSNGE.html</a>  <b>Lab HP :</b> <a href="http://www.cms.nagasaki-u.ac.jp/lab/bukka/Bukka/Japanese.html">http://www.cms.nagasaki-u.ac.jp/lab/bukka/Bukka/Japanese.html</a></p>		
Name Takeshi Ohgai	Position Associate Professor	Field of Specialty Metal Surface Finishing, Thin Films, Nanowires
<p>Research Topics</p> <p><b>1. Development of functional nanochannel structures</b>            Using an anodization and an exfoliation technique, aluminum oxide membrane filters with nanochannel structures are synthesized.</p> <p><b>2. Fabrication of multilayered nanowires with CPP-GMR</b>            Using a pulsed current deposition technique, metallic multilayered nanowires array with current perpendicular to the planes giant magnetoresistance effect (CPP-GMR) are fabricated (Fig.1).</p> <p><b>3. Electrodeposition of II-VI semiconductor thin films</b>            ZnTe thin films, which can be applied to novel opto-electronic devices, are developed using an electrodeposition technique from aqueous bath.</p>		
<p>Special mention : D-J. Kim, <i>et al.</i>; <i>Appl. Phys. Lett.</i>, Vol.100, No.16 (2012) art.no.163703 (4 pages)            T. Ohgai, <i>et al.</i>; <i>J. Electrochem. Soc.</i>, Vol.159, No.10 (2012) pp.H800-H804</p> <p><b>Lab. HP</b> <a href="http://www.cms.nagasaki-u.ac.jp/lab/soshiki/">http://www.cms.nagasaki-u.ac.jp/lab/soshiki/</a></p>		
Name Kai Kamada	Position Associate Professor	Field of Specialty Inorganic Materials Chemistry
<p>Research Topics</p> <p><b>1. Synergistic Function of Bio-Inorganic composite materials</b>            Synthesis of novel biomolecules supported on functional inorganic materials and demonstration of improved properties of the biomolecules.</p> <p><b>2. Photochemical/Photoelectrochemical synthesis of inorganic nanomaterials</b>            Development of a new route to produce inorganic materials with a unique microstructure using photon energy as driving force.</p>		
<p>Special mention</p> <p><b>Lab. HP</b></p>		

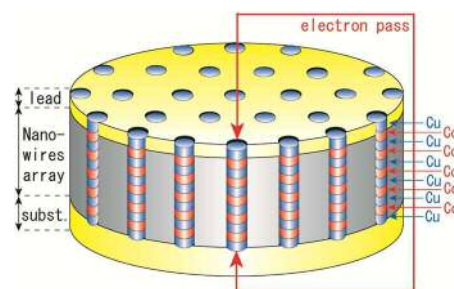
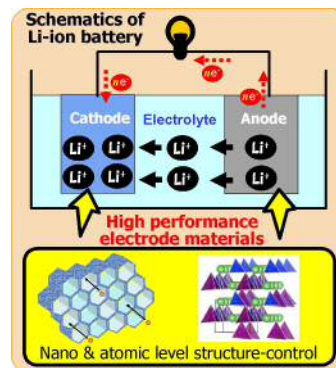
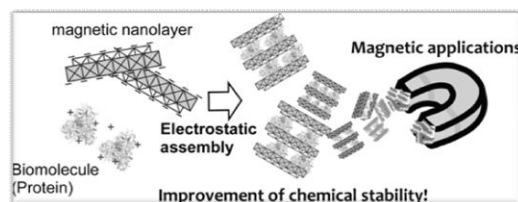


Fig.1 Metallic multilayered nanowires array structure with CPP-GMR (current perpendicular to the planes giant magnetoresistance effect).





Name Takeo Hyodo	Position Associate Professor	Field of Specialty Electrochemistry, Functional Ceramics
<p>Research Topics</p> <p><b>1. Compositional and Microstructural Controls of Various Materials:</b> Functional ceramics and metals have been developed by bottom-up (self-assembly) technique, and their chemical and physical properties have been strictly controlled by the optimization of their composition and macrostructure.</p> <p><b>2. Development of Various Electrochemical Devices:</b> Chemical sensors (semiconductor-type, adsorption/combustion-type, diode-type, solid electrolyte-type and electrochemical gas sensors, ion sensors and biosensors), lithium-ion secondary batteries and dye-sensitized solar cells have been developed by utilizing various functional materials.</p> <p><b>Publications:</b> <i>Sens. Actuators B</i>, <b>187</b>, 495-502 (2013), <i>Electrochim. Acta</i>, <b>82</b>, 19-25 (2012), <i>Sens. Lett.</i>, <b>9</b>, 409-413 (2011), <i>Nano Lett.</i>, <b>6</b>, 193-198 (2006), <i>Sens. Actuators B</i>, <b>83</b>, 209-215 (2002).</p>		
<p>Special mention</p> <p><b>Awards:</b> Sano Award for a young distinguished researcher (Electrochemical Society of Japan), Seiyama Award (Japanese Association of Chemical Sensors), <b>Funds:</b> Grant-in-Aid for Scientific Research B (JSPS), Industrial Technology Research Grant Program (NEDO), etc.</p> <p><b>Lab. HP</b> <a href="http://www.cms.nagasaki-u.ac.jp/lab/zaika/zak.htm">http://www.cms.nagasaki-u.ac.jp/lab/zaika/zak.htm</a></p>		
Name Hirotohi Yamada	Position Associate Professor	Field of Specialty Solid State Electrochemistry
<p>Research Topics</p> <p><b>1. Reduction of Interfacial Resistance on All-Solid-State-Battery</b> For practical use of all-solid-state-battery with lithium ion conducting oxides, interfacial phenomena between electrolytes and active materials, and among electrolyte particles are investigated from fundamental viewpoints. Nano-structured electrodes to reduce the interfacial resistance are fabricated.</p> <p><b>2. Electrochemical reduction of carbon dioxide</b> Electrochemical reduction from carbon dioxide to produce hydrocarbon is studied. Highly effective process is developed by optimizing electrode structure as well as electrocatalyst.</p>		
<p>Special mention</p> <p>JST ALCA H25.7~</p> <p><b>Lab. HP</b> <a href="http://www.cms.nagasaki-u.ac.jp/lab/bukka/Bukka/Japanese.html">http://www.cms.nagasaki-u.ac.jp/lab/bukka/Bukka/Japanese.html</a></p>		
Name Taro Ueda	Position Assistant Professor	Field of Specialty Electrochemistry, Gas Sensor
<p>Research Topics</p> <p><b>1. Solid electrolyte-based gas sensor</b> Solid electrolyte-based gas sensors using metal oxides as a sensing electrode (SE) have been examined. Sensing characteristics is affected by the selection of electrode materials, operating methods and conditions. Thus, the aim is an optimization of the sensing properties for target gases and elucidation of the sensing mechanism. So far, research results on zirconia based amperometric-type NO<sub>x</sub> sensor using La-based perovskite-type oxide as a SE and amperometric-type hydrocarbon sensor using ZnO-SE were reported.</p> <p>Paper: <i>Chemical Sensors</i>, <b>29</b>, 2 (2013), <i>Electrochemistry</i>, <b>81</b>, 74 (2013), <i>Ionics</i>, <b>18</b>, 337 (2012), <i>J. Ceram. Soc. Jpn.</i>, <b>118</b>, 180 (2010).</p>		
<p>Special mention</p> <p>JSPS KAKENHI Grant-in-Aid for Young Scientists (B) , (2012. 04~)</p> <p><b>Lab. HP</b> <a href="http://www.cms.nagasaki-u.ac.jp/lab/zaika/member.htm">http://www.cms.nagasaki-u.ac.jp/lab/zaika/member.htm</a></p>		

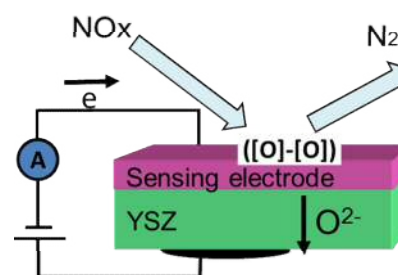
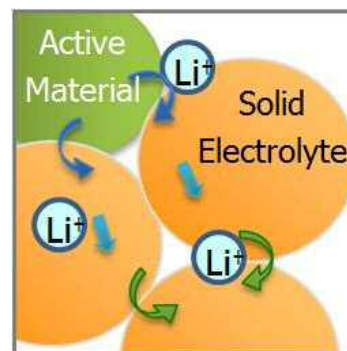
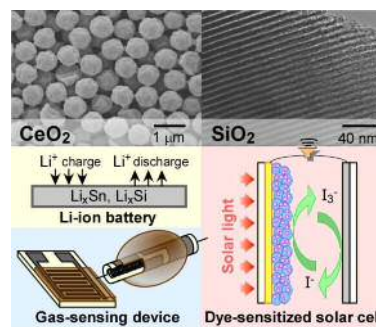
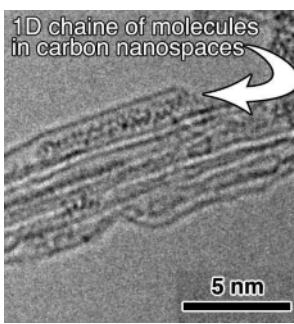
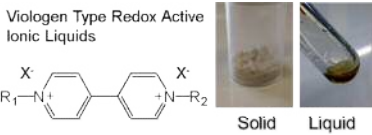
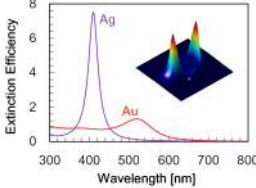
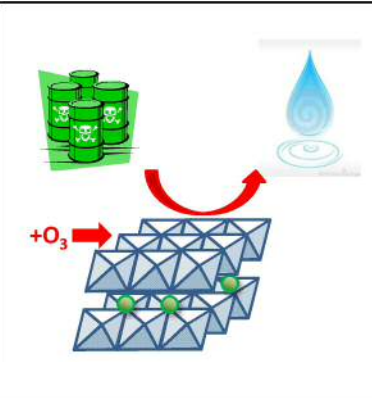
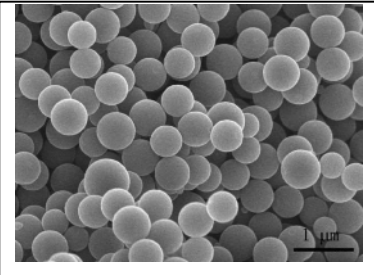

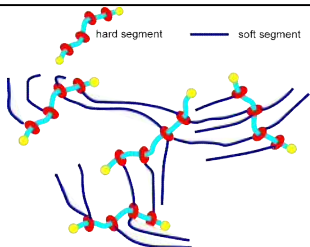


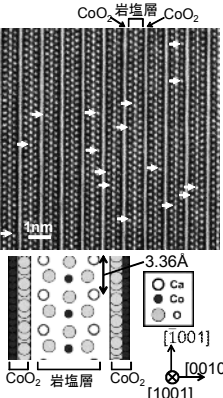
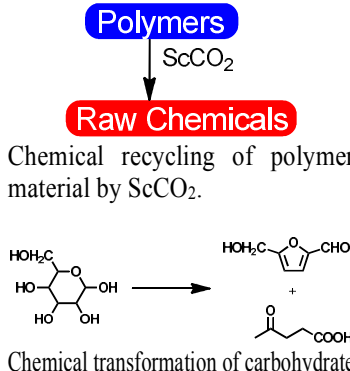
Fig. A schematic view of an amperometric-type NO<sub>x</sub> sensor.


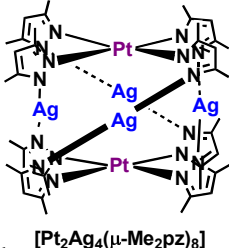
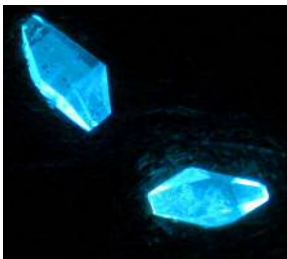
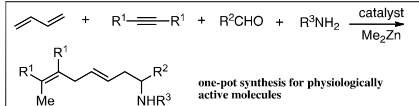
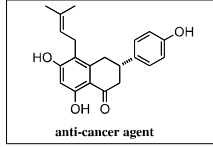
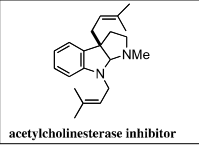
Name Koki Urita	Position Assistant Professor	Field of Specialty Nanomaterial Analysis, Adsorption Science
<p>Research Topics</p> <p><b>1. Clarification of carbon nanopores as new reaction fields</b>            Research for new function of carbon nanopores with the pore width below 2 nm which produce strong potential fields and novel physical properties of molecules confined in the nanopores.</p> <p><b>2. Atomically-resolved structural analysis of energy storage materials</b>            Research for structural changes of electrodes during an electrochemical reaction and charge/discharge mechanism of Li-ion batteries at atomical level for a development of high performance energy storage devices.</p> <p>Articles: <i>Nature Commun.</i>, <b>2162</b>(2013). <i>Chem. Commun.</i>, <b>49</b>, 2939(2013). <i>J. Am. Chem. Soc.</i>, <b>133</b>, 10344(2011). <i>Nano Lett.</i>, <b>9</b>, 3694(2009). <i>Nano Lett.</i>, <b>4</b>, 2451(2004). etc</p>		
<p>Special mention  <b>Lab. HP</b> <a href="http://www.cms.nagasaki-u.ac.jp/lab/bukka/Bukka/Japanese.html">http://www.cms.nagasaki-u.ac.jp/lab/bukka/Bukka/Japanese.html</a></p>		
Name Hironobu Tahara	Position Assistant Professor	Field of Specialty Photo(electro)chemistry, Spin Chemistry
<p>Research Topics</p> <p><b>1. Creation of Redox-Active Ionic Liquids</b>            Redox-active ionic liquids (RAILs), one of a task-specific ionic liquid, are the redox-active materials under a solvent-free and supporting electrolyte-free situation. We have synthesized viologen- and ferrocene-based RAILs, and have investigated the electrochemical properties.</p> <p><b>2. Surface Plasmon Resonance for Photochemistry</b>            Metal nanoparticles and nanostructures interact with external electromagnetic fields and generate quite enhanced electromagnetic fields near the surface. We have investigated interactions between dye molecules and such enhanced fields.</p> <p><b>References:</b> <i>Chem. Commun.</i>, <b>53</b>, 2455-2458 (2017), <i>Cryst. Growth Des.</i>, <b>15</b> 4735-4740 (2015), <i>J. Phys. Chem. C.</i>, <b>119</b>, 1067-1077 (2015), <i>ACS Nano</i>, <b>9</b>, 1895-1904 (2015).</p>		 
<p>Special mention  <b>Lab. HP:</b> <a href="http://www.cms.nagasaki-u.ac.jp/lab/douteki/en/index.html">http://www.cms.nagasaki-u.ac.jp/lab/douteki/en/index.html</a></p>		
Name Osamu Nakagoe	Position Assistant Professor	Field of Specialty Surface Chemistry and Catalysis
<p>Research Topics</p> <p><b>1. Synthesis of shape-controlled nanoparticle and application for catalytic reaction</b>            I synthesize shape controlled noble metal and transition metal oxide nanoparticles from liquid phase, such as ultrasonic reduction and oxidation of metal ion and polyol synthesis. Then, I applied such a synthesized material in catalytic reaction, for example steam reforming reaction, selective hydrogenation, photo catalytic reaction.</p> <p><b>2. Synthesis of mesoporous and layered materials for water treatment</b>            I synthesize mesoporous and layered materials for water treatment. Particularly, I try to decompose harmful material, i.e. carcinogen material, by use of layered double hydroxide with ozone bubbling (see Figure).</p>		
<p>Special mention  <b>Lab. HP</b></p>		

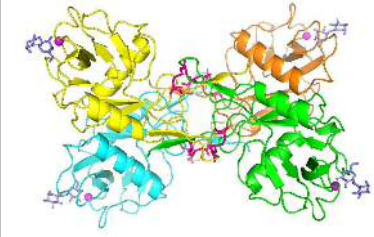
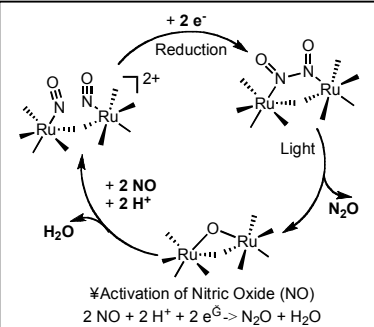
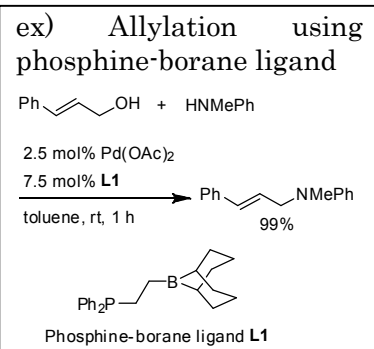
Name Bun Chan	Position Assistant Professor	Field of Specialty Computational quantum chemistry
<u>Research Topics</u> <b>1. Computational Chemistry.</b> We use computational quantum chemistry to model a wide range of processes. Some past highlights include the determination and interpretation of fullerene stabilities [1] and predication of the strongest alkaline substance [2]. <b>2. Quantum Theory.</b> We develop improved quantum chemistry methods to enable highly-accurate computations for large systems. For example, we formulate new DFT with better general accuracy [3] and wavefunction composite protocols with higher efficiency [4].		
<u>References</u> [1] <i>J. Am. Chem. Soc.</i> <b>2016</b> , <i>138</i> , 1420. [2] <i>Proc. Natl. Acad. Sci. U.S.A.</i> <b>2008</b> , <i>105</i> , 7647. [3] <i>J. Chem. Theory Comput.</i> <b>2014</b> , <i>10</i> , 3777. [4] <i>Pure Appl. Chem.</i> <b>2017</b> , <i>89</i> , 699.		
Special mention <b>Lab. HP</b> <a href="http://bit.ly/bunchan-scholar">http://bit.ly/bunchan-scholar</a>		
Name Hisayuki Nakatani	Position Professor	Field of Specialty Polymer Chemistry, Recycling
<u>Research Topics</u> <b>1.</b> Study on rapid photo- and bio-degradation of polymeric materials We have studied about novel photo- and bio-degradation of polymeric materials with reduced load on the natural environment  <b>2.</b> Development of polymer/nanosized filler composite We developed a novel polymer/nanosized filler composite with nanosized cellulose or carbon nanotube fillers.  <b>3.</b> Photo-decomposition of flame retardant We have studied about a novel photo-decomposition of flame retardant system with reduced load on the natural environment.		
Special mention <b>Lab. HP</b> <a href="http://www.cms.nagasaki-u.ac.jp/lab/kobunshi/">http://www.cms.nagasaki-u.ac.jp/lab/kobunshi/</a>		
Name Shin-ichiro Kondo	Position Associate Professor	Field of Specialty Magnetism, Field Theory in Solid State Physics
<u>Research Topics</u> <b>1. Studies of magnetism on melt-spun Cu-base alloy-basic research for further development of GMR</b> We have investigated the magnetic properties of melt spun-Cu base alloy using various measurement methods for the purpose of further development of GMR <b>2. Studies of spinodal-decompositon on melt-spun Cu-base alloy</b> We have investigated the difference of spinodal decomposition between melt spun and solid solution samples <b>3. Application of field theory to solid state physics</b> Using the Heisenberg equation of motion, we have applied this method to various problems in solid state physics.		<p>Figure 1 X ray diffraction profiles(No side band in (B) )</p>
Special mention <b>Lab. HP</b> <a href="http://www.cms.nagasaki-u.ac.jp/lab/kessho/">http://www.cms.nagasaki-u.ac.jp/lab/kessho/</a>		

Name Guobin Zheng	Position Associate Professor	Field of Specialty Carbon Materials, Ceramics
Research Topics <b>1. Synthesis and properties of carbon nanoparticles</b> Monodispersed spherical carbon nanoparticles were synthesized using sol-gel method. Carbon nanoparticles with uniform size of 40 nm to 1 $\mu\text{m}$ and high surface area, which showed good electrochemical properties as electrodes of supercapacitors, were obtained according to the synthesis conditions. <b>2. Nanocomposite materials of carbon</b> Various nanostructured carbon materials like carbon nanotubes and graphene, nanoparticles were synthesized. CNT/SiC composite coating showed much higher oxidation-resistance than single SiC coating. The dispersion of graphene with other nanosubstance could improve the surface area and electric conductivity. Paper : <i>CARBON</i> <b>57</b> , 267 (2013), <i>Composites Part B: Engineering</i> , <b>42</b> , 2158( 2011), <i>CARBON</i> , <b>46</b> , 1808 (2008).		
Special mention The joint researches include three or four themes are performed in our laboratory. We develop not only nano carbon materials and nano ceramic materials but the nanocomposite materials containing these nano carbon and ceramic component. Moreover, the joint research for high performance heat resisting structural materials is performed using the high precision analysis at high temperature oxidation circumstances. <b>Lab. HP</b> <a href="http://www.cms.nagasaki-u.ac.jp/lab/nanocom/">http://www.cms.nagasaki-u.ac.jp/lab/nanocom/</a>		
Name Takahiro Fujioka	Position Associate Professor	Field of Specialty Environmental Engineering, Chemical Engineering
Research Topics <b>1. Development of low-cost water recycling techniques</b> We try to develop innovative membrane-based water treatment systems where membrane bioreactor (MBR) and reverse osmosis (RO) processes can be operated in an energy-efficient fashion with new pretreatment processes and membrane materials. <b>2. Understanding micropollutant removal by RO membranes</b> We try to elucidate the mechanism of micropollutant removal by RO using positron annihilation lifetime spectroscopy (PALS) that can analyse subnanometer free-volumes located in the RO membrane. <b>3. Sewer mining using ceramic nanofiltration (NF) membranes</b> We try to apply NF filtration technique to the sewer mining where municipal wastewater is proactively recycled and reused as a resource.		 <p>Pilot-scale RO filtration system in Nagasaki University</p>
Special mention <b>Lab. HP</b> <a href="http://www.waterenviron.com/">http://www.waterenviron.com/</a>		
Name Hiroto Murakami	Position Associate Professor	Field of Specialty Polymer and Organic Chemistry
Research Topics <b>1. Development of functional molecules and macromolecules incorporating specific structures</b> Molecules and macromolecules possessing novel functions and properties, which come from specific structures incorporated in those, are developed. <b>2. Development of stimuli responsive acrylic PSAs</b> Properties of PSAs whose adhesion changes reversibly by external stimuli such as light and heat are evaluated in detail and high performance PSAs are developed based on those. Papers: <i>Euro. Polym. J.</i> , <b>47</b> , 378-384 (2011) ; <i>J. Am. Chem. Soc.</i> , <b>127</b> , 15891-15899 (2005).		 <p><b>Fig.</b> A polymer where ring crosslink points can slide along a polymer chain.</p>
Special mention I can collaborate in topics of organic and polymer syntheses as well as polymer modification. I have already collaborated in the PSA study with a company. <b>Lab. HP</b> <a href="http://www.cms.nagasaki-u.ac.jp/lab/douteki/">http://www.cms.nagasaki-u.ac.jp/lab/douteki/</a>		



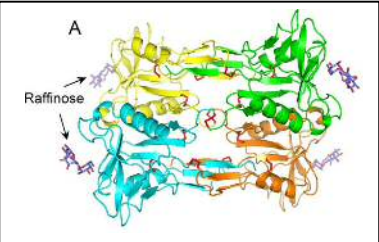
Name Takao Morimura	Position Associate Professor	Field of Specialty Thermoelectric Materials, Electron Diffraction
<p>Research Topics</p> <p><b>1. Physical properties and structure analysis of thermoelectric materials</b> Thermoelectric materials were fabricated by spin-cast and sintered processes etc. The microstructures and thermoelectric properties are investigated using powder X-ray diffraction (XRD) experiment, scanning transmission electron microscopic (STEM) observation, and measurements of Seebeck coefficients, electrical conductivities and dimensionless figures of merit. (Fig. HAADF STEM image of <math>\text{Ca}_{2.7}\text{Sr}_{0.3}\text{Co}_4\text{O}_9</math> and corresponding crystal structure.)</p> <p><b>2. STEM image simulation by Bloch-wave method</b> The simulation of STEM image is important for the quantitative analysis of crystal structures. In the present work, the simulation by Bloch wave method is extended to inhomogeneous crystals including atomic defects.</p> <p>Papers: <i>Jan. J. Appl. Phys.</i>, <b>52</b>, 071101 (2013). <i>J. Electron Microscopy</i>, <b>59</b>, S23 (2010). <i>Ultramicroscopy</i>, <b>109</b>, 1203 (2012). etc.</p>		
Special mention <b>Lab. HP</b> <a href="http://www.cms.nagasaki-u.ac.jp/lab/kessho/">http://www.cms.nagasaki-u.ac.jp/lab/kessho/</a>		
Name Suguru Motokucho	Position Assistant Professor	Field of Specialty Polymer Reactions, Organic Reactions
<p>Research Topics</p> <p><b>1. Polymer and organic synthesis by the using of supercritical carbon dioxide</b> My research object is degradation reaction of polymer materials for chemical recycling by the using super-critical carbon dioxide (<math>\text{ScCO}_2</math>).</p> <p><b>2. Chemical transformation of carbohydrates</b> My research object is preparation of alternative substance from green sustainable compound such as carbohydrates.</p> <p><b>Paper and patents:</b> <i>Nippon Gomu Kyokaishi</i>, 85(5), pp.157-161, <b>2012.</b>, PCT Patent WO 2011145519., JP 2011251931., JP 2011251932., JP 2011251933.</p>		
Special mention <b>Lab. HP</b> <a href="http://www.cms.nagasaki-u.ac.jp/lab/kobunshi/">http://www.cms.nagasaki-u.ac.jp/lab/kobunshi/</a>		
Name Masataka Yamamoto	Position Assistant Professor	Field of Specialty Physical Metallurgy
<p>Research Topics</p> <p><b>1. Mechanism of phase transformation in metal materials</b> The subject of research is martensitic transformation (structural phase transition). Martensitic transformation is widely used for controlling the microstructure of metal materials which play an important role in the infrastructure, and how to control this transformation is very important for designing the materials. In order to control the transformation successfully, a deep understanding of the transformation is needed. Therefore, I investigate the relation between the microstructure and the physical properties related to the martensitic transformation.</p> <p><b>2. Effect of hydrogen absorbed from hydrogen storage alloys on the biological cells</b> In my laboratory, it has been found that the hydrogen absorbed from hydrogen storage alloys have killing effect on cancer cells. I undertake designing the hydrogen storage alloy which is low-cost and biocompatible.</p> <p>Publication: <i>J. Alloys. Compd.</i>, (2012) in Press.</p>		
Special mention Engaging in Life Innovation theme at Research Center for Future Science and Technology, Nagasaki Univ. <b>Lab. HP</b> <a href="http://www.cms.nagasaki-u.ac.jp/lab/soshiki/">http://www.cms.nagasaki-u.ac.jp/lab/soshiki/</a>		

Name Hideaki Sano	Position Research Associate	Field of Specialty Inorganic Material
Research Topics <b>1. Development of nanocomposite materials with various functionality</b> The new materials with high performance mechanical, electric and chemical property are developed by controlling of spatial distribution for the nano carbon material, oxide ceramics, and non-oxide ceramics. <b>2. Research of the efficient reaction process by interface control</b> In order to attain low cost and low energy reaction process for non-oxide ceramics by calcination with low temperature for a short time, we develop the efficient reaction process of using nanocarbon, and the interface reaction using a high specific surface area template. Paper: <i>Composites Part B: Engineering</i> , <b>42</b> , 2158 (2011). <i>Materials Science Forum</i> , <b>761</b> , 83 (2013).		 <p>The ceramic nanocomposite sheet with flexibility at high temperature</p>
Special mention The joint researches include three or four themes are performed in our laboratory. We develop not only nano carbon materials and nano ceramic materials but the nanocomposite materials containing these nano carbon and ceramic component. Moreover, the joint research for high performance heat resisting structural materials is performed using the high precision analysis at high temperature oxidation circumstances. <b>Lab. HP</b> <a href="http://www.cms.nagasaki-u.ac.jp/lab/nanocom/">http://www.cms.nagasaki-u.ac.jp/lab/nanocom/</a>		
Name Keisuke Umakoshi	Position Professor	Field of Specialty Coordination Chemistry, Inorganic Chemistry
Research Topics <b>1. Development of Photofunctional Metal Complexes</b> Our research projects include (1) synthesis and characterization of brightly luminescent platinum complexes and mixed-metal complexes containing platinum and group 11 elements, (2) application of these complexes to organic light-emitting devices, (3) investigation of sensing ability based on the change of luminescent properties such as vapochromism and mechanochromism. We are also interested in elucidating the nature of intermolecular interactions by using a supramolecular chemical approach.		  <p>[Pt<sub>2</sub>Ag<sub>4</sub>(μ-Me<sub>2</sub>pz)<sub>8</sub>]</p>
<b>References:</b> <i>Chem. Commun.</i> , <b>53</b> , 6405 (2017); <i>J. Am. Chem. Soc.</i> , <b>139</b> , 6863 (2017), <i>Chem. Eur. J.</i> , <b>22</b> , 17533 (2016); <i>Dalton Trans.</i> , <b>45</b> , 4978 (2016), <i>RSC Adv.</i> , <b>4</b> , 62186 (2014) ; <i>Inorg. Chem.</i> , <b>51</b> , 7977 (2012); <i>Chem. Eur. J.</i> , <b>15</b> , 15, 4238 (2009); <i>Inorg. Chem.</i> , <b>47</b> , 5033 (2008)		
Special mention <b>Lab. HP:</b> <a href="http://www.cms.nagasaki-u.ac.jp/lab/sakutai/">http://www.cms.nagasaki-u.ac.jp/lab/sakutai/</a>		
Name Masanari Kimura	Position Professor	Field of Specialty Organic Chemistry, Synthetic Chemistry
Research Topics <b>1. Development of Efficient Organic Synthesis</b> Transition-metal Catalyzed Selective Formation of C-C Bonds, Cross-coupling Reaction, Efficient Transformation via C-H Activation of Alkane, Multi-component Coupling Reaction <b>2. Development of Medicinal Chemistry and Functionalized Chemicals</b> Synthesis of <i>anti</i> -Alzheimer Diseases Medicine, <i>anti</i> -Cancer Medicine, Agricultural Chemicals, Symmetrical Functionalized Material <b>3. Development of Synthetic Chemistry for New Generation Energy</b> Utilization of CO <sub>2</sub> as New Carbon Resources, Artificial Photosynthesis <b>Published papers:</b> <i>Organic Letters</i> , <b>17</b> , 600 (2015), <i>Angewandte Chemie International Edition</i> , <b>53</b> , 10434 (2014). <i>Chemistry - A European Journal</i> , <b>18</b> , 8019 (2012). <i>Journal of the American Chemical Society</i> , <b>132</b> , 16346 (2010).		 <p>one-pot synthesis for physiologically active molecules</p>  <p>anti-cancer agent</p>  <p>acetylcholinesterase inhibitor</p>
Special mention <b>Lab. HP</b> <a href="http://www.cms.nagasaki-u.ac.jp/lab/youuki/">http://www.cms.nagasaki-u.ac.jp/lab/youuki/</a>		

Name Tomomitsu Hatakeyama	Position Professor	Field of Specialty Biochemistry, Protein Science
Research Topics 1. Structure-function analyses of biologically active proteins isolated from natural sources to elucidate their mechanism of action. 2. Analyses of carbohydrate-recognition mechanism of lectins and its application for development of novel molecular-recognition proteins. 3. Structure-function analyses of membrane pore-forming proteins, which self-associate to form oligomers in cell membranes through large conformational changes.		 <p>Three-dimensional structure of a lectin from a marine invertebrate</p>
Publications: <i>Biochim. Biophys. Acta</i> , <b>1830</b> , 4211 (2013), <i>Protein Pept. Lett.</i> , <b>20</b> , 796 (2013), <i>J. Biol. Chem.</i> , <b>286</b> , 10305 (2011)		
Special mention <b>Lab. HP</b> <a href="http://www.cms.nagasaki-u.ac.jp/lab/seitai/">http://www.cms.nagasaki-u.ac.jp/lab/seitai/</a>		
Name Yasuhiro Arikawa	Position Associate Professor	Field of Specialty Coordination Chemistry, Organometallic Chemistry
Research Topics <b>Activation of Small Molecules Mediated by Transition Metals</b> 1. Activation of Nitric Oxide (NO) By the use of ruthenium complexes, we have achieved a NO reduction cycle where two NO molecules are converted into one N <sub>2</sub> O and one H <sub>2</sub> O using two electrons and two protons. In the activation, extension to other small molecules is under investigation. 2. Syntheses and Reactivities of Carbene Complexes To activate inert small molecules such as CO <sub>2</sub> and N <sub>2</sub> , metal complexes bearing designed carbene ligands are prepared. Papers: <i>Dalton Trans.</i> , <b>42</b> , 11626(2013), <i>Coord. Chem. Rev.</i> , <b>256</b> , 468(2012), <i>J. Am. Chem. Soc.</i> , <b>129</b> , 14160(2007), etc.		 <p>‡Activation of Nitric Oxide (NO)  <math>2 \text{NO} + 2 \text{H}^+ + 2 \text{e}^- \rightarrow \text{N}_2\text{O} + \text{H}_2\text{O}</math></p>
Special mention The Nagasaki University Priority Research Project “Materials Science for Next-Generation Energy”, Co-Investigator <b>The Research Project HP</b> <a href="http://www.mase.nagasaki-u.ac.jp/MSNGE/MSNGE.html">http://www.mase.nagasaki-u.ac.jp/MSNGE/MSNGE.html</a> <b>Lab. HP</b> <a href="http://www.cms.nagasaki-u.ac.jp/lab/sakutai/">http://www.cms.nagasaki-u.ac.jp/lab/sakutai/</a>		
Name Gen Onodera	Position Associate Professor	Field of Specialty Organometallic Chemistry, Organic Synthesis
Research Topics 1. <b>Development of Novel Catalytic Reaction by Use of Transition-Metal Complex</b> Development of the transition-metal-catalyzed novel synthetic reaction is investigated. Especially, we are interested in the property and ability of phosphine-borane ligand. 2. <b>Synthesis of Novel Transition-Metal Complex</b> New ligands are designed and prepared to use for the research on the novel transition-metal complex. The structure and reactivity of the novel complex are investigated. Original papers: <i>Org. Lett.</i> <b>2017</b> , <i>19</i> , 854, <i>Angew. Chem. Int. Ed.</i> <b>2017</b> , <i>56</i> , 208, <i>Polyhedron</i> <b>2016</b> , <i>112</i> , 43, etc.		ex) Allylation using phosphine-borane ligand  <p>Phosphine-borane ligand L1</p>
Special mention A member of the project in Nagasaki university, “Innovative Materials Science for Next-Generation Energy-Related Technologies”. Project HP: <a href="http://www.mase.nagasaki-u.ac.jp/MSNGE3/MSNGE.html">http://www.mase.nagasaki-u.ac.jp/MSNGE3/MSNGE.html</a> <b>Lab. HP:</b> <a href="http://www.cms.nagasaki-u.ac.jp/lab/yuuki/index.html">http://www.cms.nagasaki-u.ac.jp/lab/yuuki/index.html</a>		

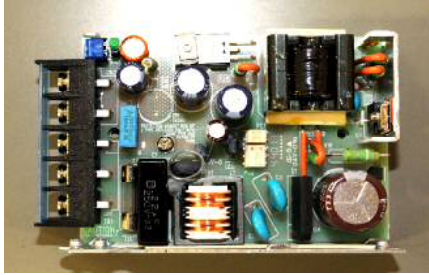
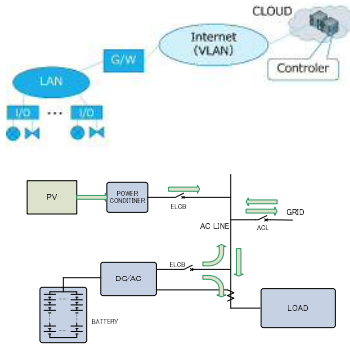
Name Shuichiro Goda	Position Associate Professor	Field of Specialty Protein Science
<p>Research Topics</p> <p>Research in my laboratory focuses on understanding the mechanism of protein misfolding. Protein folds into its intrinsic native conformation to exert its proper function. However, in some cases, proteins fold into other tertiary structure and this misfold cause disease or inactive enzymatic function.</p> <ol style="list-style-type: none"> <li><b>Elucidation of the oligomeric structure and structural change in oligomerization of pore forming toxins.</b> Pore forming toxins associate into oligomer to form a pore in the membrane and cause a disease. Oligomeric structures of the pore forming toxins were determined by X-ray crystallography. Structural change in oligomerization was measured by small-angle x-ray scattering (SAXS).</li> <li><b>Elucidation of the structure and enzymatic activity of the hyperthermophilic enzyme.</b> In some cases, enzyme from hyperthermophiles expressed in <i>Escherichia coli</i> shows much lower activity than that of the native enzyme. Structural change between native and recombinant enzyme was measured by SAXS. <i>Biosci Biotechnol Biochem</i> (2013) <b>77</b>:679, <i>Molecular Biosyst.</i> (2012) <b>8</b>:2050, <i>Journal of Bacteriology</i> (2012) <b>194</b>:3216, <i>Biochem. Biophys. Res. Commun.</i> (2011) <b>414</b>:517</li> </ol>		
<p>Special mention</p> <p>Grant-in-Aid for Scientific Research (C) from the Japan Society for the Promotion of Science (JSPS).  <b>Lab. HP</b> <a href="http://www.cms.nagasaki-u.ac.jp/lab/seitai/index_e.html">http://www.cms.nagasaki-u.ac.jp/lab/seitai/index_e.html</a></p>		
Name Eri Sakuda	Position Associate Professor	Field of Specialty Photochemistry, Analytical Chemistry
<p>Research Topics</p> <ol style="list-style-type: none"> <li>Synthesis and Photophysical Properties of Metal Complex having Main Group Elements Our research topic is synthesis and measurement of photophysical properties of aryl-substituted main group elements (B, Si etc). And we also synthesize the metal complex having aryl-substituted main group elements as a substituent of the ligand.</li> <li>Development of Photocatalytic Reduction of Carbon Dioxide Using Group 13 Elements Derivatives A neutral group 13 elements derivative possesses a planar <math>sp^2</math>-hybridized structure and the vacant p-orbital on the atom. We have studied of light energy conversion reaction, in particular, demonstrated to convert the carbon dioxide into useful carbon resources.</li> </ol>		
<p>Special mention</p> <p><b>Lab. HP</b> <a href="http://www.cms.nagasaki-u.ac.jp/lab/sakutai/index_e.htm">http://www.cms.nagasaki-u.ac.jp/lab/sakutai/index_e.htm</a></p>		
Name Shuji Tanaka	Position Associate Professor	Field of Specialty Biochemistry, Protein chemistry
<p>Research Topics</p> <ol style="list-style-type: none"> <li>Development of the new synthesis method of compounds via enzymes. For enantioselective transformation of organic compounds, modification of enzymes (specially cytochrome P450) by chemical and genetic engineering has been studied.</li> <li>Development of high-throughput screening method for mutagenesis of oxidoreductase.</li> <li>Development of carbon dioxide fixation via enzymes. For enzymatic fixation of carbon dioxide by enzyme, new reaction method and screening of utilizable enzyme has been studied.</li> </ol>		
<p>Special mention</p> <p><b>Lab. HP</b> <a href="http://www.cms.nagasaki-u.ac.jp/lab/yuuki/">http://www.cms.nagasaki-u.ac.jp/lab/yuuki/</a></p>		

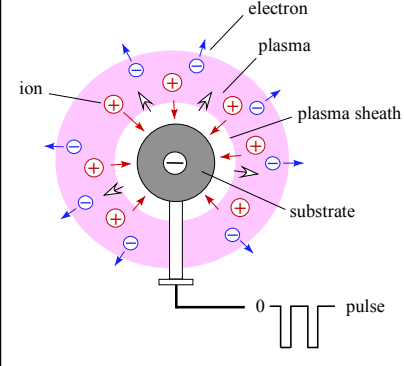



Name Hideaki Unno	Position Assistant Professor	Field of Specialty Protein Crystallography
Research Topics <b>1. Protein crystallography</b> I am trying purification, crystallization, and structural determination of invertebrate lectins for revealing structural basis of the functions. <i>J. Biol. Chem.</i> , <b>286</b> (12) 10305–10315 (2011) <i>Acta Crystallogr.</i> , <b>F69</b> , 416-420 (2013)		 <p>Crystal structure of CEL-IV from <i>Cucumaria echinata</i> (sea cucumber)</p>
<b>2. Exploring of lectins, and its functional and structural analysis.</b> I am exploring new invertebrate lectins from marine animals. The discovered lectins are studied in detail by functional and structural analysis.		
Special mention <b>Lab. HP</b> <a href="http://www.cms.nagasaki-u.ac.jp/lab/seitai/index_e.html">http://www.cms.nagasaki-u.ac.jp/lab/seitai/index_e.html</a>		
Name Tsutomu Fukuda	Position Assistant Professor	Field of Specialty Synthetic Organic Chemistry
Research Topics <b>1. Regioselective lithiation of heterocyclic compounds</b> Development of regioselective lithiation of <i>N</i> -protected indoles and pyrroles and its application to the synthesis of natural products have been carried out.		
<b>2. Synthesis of biologically significant compounds based on natural products</b> Synthesis of biologically significant compound based on natural products has been performed. Publications: <i>Tetrahedron</i> , <b>69</b> , 2782 (2013), <i>Bull. Chem. Soc. Jpn.</i> , <b>85</b> , 133 (2012), <i>Org. Lett.</i> , <b>12</b> , 2734 (2010), <i>Heterocycles</i> , <b>80</b> , 841 (2010), etc.		
Special mention <b>Lab. HP</b> <a href="http://www.cms.nagasaki-u.ac.jp/lab/tennen/publications_e.html">http://www.cms.nagasaki-u.ac.jp/lab/tennen/publications_e.html</a>		
Name Shinnosuke Horiuchi	Position Assistant Professor	Field of Specialty Coordination Chemistry, Supramolecular Chemistry
Research Topics <b>1. Developments of Photoluminescence Properties of Metal Complexes by Noncovalent Interactions</b> We have been investigating controls of aggregation and orientation of metal complexes by noncovalent interactions such as host–guest interactions, $\pi$ – $\pi$ interactions, charge transfer interactions and so on. These interactions can induce unusual structure of their oligomer to show interesting photophysical properties.		
<b>2. A Creation of Organometallic Catalyst Containing a Substrate Binding Site</b> In nature, enzymes perform extremely effective chemical transformations of organic substrates within their active sites. We have been trying a creation of transition metal catalyst showing substrate binding and activation that are reminiscent of substrate activation mechanism in natural enzyme.		
Special mention <b>Lab. HP</b> <a href="http://www.cms.nagasaki-u.ac.jp/lab/sakutai/">http://www.cms.nagasaki-u.ac.jp/lab/sakutai/</a>		



Affiliated Division

Name Akihiko Katsuki	Position Professor	Field of Specialty Power Electronics, Electronic Circuits
<p>Research Topics</p> <p><b>1. High-Density High-Frequency Power Supply</b> Switching regulators can convert electrical energy very efficiently. Especially small-sized built-in converters are studied on resonant converters.</p> <p><b>2. Application of Switching Regulators</b> Power converters contain high frequency switching circuits. We try to apply these converters to communication circuits, for example, transmitters. Papers: <i>Journal of Power Electronics</i>, to be published (2015); <i>IEEE INTELEC</i>, to be presented (2015); <i>International Journal of Renewable Energy Research</i>, <b>4, 3</b>, 641 (2014), and so on.</p>		 <p>Example of switching regulator. Highly efficient and stable power feed of high quality is possible.</p>
<p>Special mention</p> <p>A wired communication system has been developed by our inventions (8 registered patents). This system was used at the sites of Peking Olympics and Shanghai Exposition, and now is spreading to e.g. buildings. <b>Lab. HP</b> <a href="http://www.eng.nagasaki-u.ac.jp/tdk-sw/">http://www.eng.nagasaki-u.ac.jp/tdk-sw/</a></p>		
Name Haruhi Eto	Position Professor	Field of Specialty Control System, Renewable Energy
<p>Research Topics</p> <p>1. Study on cloud computing of control system In order to apply cloud computing, which is expected to be used rapidly in the future, to control equipment, we are studying the influence of latency on control.</p> <p>2. Research on smart grid in emergency power generation facilities A smart grid optimally operated by combining renewable energy with an emergency power source against grid power loss.</p> <p>3. Study on system optimization by modularization of carrier device Study of method to obtain optimal solution of system configuration and operation which is difficult to obtain manually under various restrictive conditions by simulation.</p>		
<p>Special mention</p> <p><b>Lab. HP</b></p>		
Name Masaharu Tanaka	Position Associate Professor	Field of Specialty Artificial Intelligence, Computer Architecture
<p>Research Topics</p> <p><b>1. FPGA-based controller technology</b> For industrial controllers utilizing FPGA (Field Programmable Gate Array), we have developed a new architecture from the viewpoint of responsiveness, reliability, miniaturization, and power consumption.</p> <p><b>2. Cloud based controller virtualization using FPGA</b> Recently, with the progress of IoT (Internet of Things), the control device is expected to be cloud. However, since conventional cloud architecture has problems in responsiveness and communication delay, we have proposed the concept of new controller virtualization using FPGA.</p> <p><b>3. Optimization method of energy management using genetic algorithm</b> In smart grid and renewable energy, there is an increasing need to optimize the equipment configuration and operation method to efficiently utilize energy and to reduce the life cycle cost. We have developed a new method to simultaneously optimize configuration and operation using genetic algorithm.</p>		
<p>Special mention</p> <p><b>Lab. HP</b></p>		

Name Koumei Baba	Position Professor	Field of Specialty Material Science, Surface Finishing
<p>Research Topics</p> <p><b>1. Surface modification of materials by ion implantation</b> Surface modification with ion implantation and analysis of surface are studied to give environmental conscious and excellent mechanical properties to surface of materials.</p> <p><b>2. Preparation of thin films by a plasma source ion implantation</b> A combined method of plasma CVD and ion implantation by an application of high voltage pulse bias to the substrate in a plasma is studied in order to prepare functional thin films. By the transfer of this technology, a coating serves company was established at 2006 in Nagasaki.</p> <p>Papers: <i>Advances Mater. Sci. Engi.</i>, <b>2017</b>, 1(2017), <i>Surf. Coat. Tech.</i>, <b>305</b>, 93(2016), <i>Mat. Lett.</i>, <b>168</b>, 196(2016)</p>		 <p>Principle of plasma source ion implantation</p>
<p>Special mention A member of a research project in the field of titanium-alloy machining for aircraft founded by Ministry of Economy, Trade and Industry.</p> <p><b>Lab. HP</b> <a href="http://www.pref.nagasaki.jp/section/kogyo-c/">http://www.pref.nagasaki.jp/section/kogyo-c/</a></p>		
Name Yasuhiro Shigemitsu	Position Associate Professor	Field of Specialty Computational Chemistry, Quantum Chemistry
<p><b>Research Topics</b></p> <p><b>1.</b> New theory and implementation of computational chemistry</p> <ul style="list-style-type: none"> <li>- Wave function based quantum chemistry</li> <li>- Density functional theory</li> <li>- Extension to huge molecular systems</li> </ul> <p><b>2. In-silico design of molecules and functional materials</b></p> <ul style="list-style-type: none"> <li>- Molecular dynamics simulation for drug design</li> <li>- Fragment-based quantum chemical calculations</li> </ul> <p><b>Recent papers:</b> <i>J.Phys.Chem. A</i>, <b>116</b>, 9100(2012), <i>RSC Advances</i>, <b>4</b>, 59387 (2014), <i>Phys.Chem.Chem.Phys.</i> <b>16(28)</b> 14388 (2014) etc</p>		
<p>Special mention ' Analysis of Organic Reaction Mechanism under Asynchronous Solvation Dynamics'</p> <p>Grant-in-Aids for Scientific Research (C) (15K05434; Japan Society for the Promotion of Science; 2015-2017)</p> <p><b>Website</b> <a href="https://www.pref.nagasaki.jp/section/kogyo-c/">https://www.pref.nagasaki.jp/section/kogyo-c/</a></p>		

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