

HORIBA

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Masao Horiba Awards

20th Anniversary



Blue, Symbol of Excellence and Hope

Since the first award, recipients have worn a blue fresh flower on their chest. This flower symbolizes sincerity and hope for the future, and it is meant to support the challenges of researchers who embody true dedication.



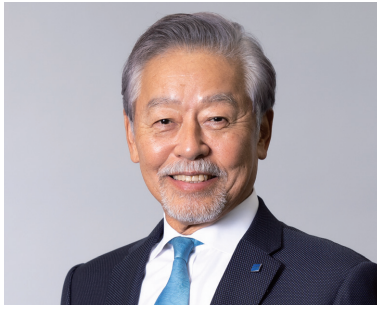
Without the technologies for analysis and measurement, there can be no advancement in science. Yet, in this field, there are still researchers working diligently in the shadows, driven by passion and conviction. If we can offer even a little encouragement to these researchers, I believe it could bring great vitality to science and technology. It was with this belief that I established the Masao Horiba Award. The term “HONMAMON” refers to something so exceptional that no one else can match it, and it is recognized by others. “HONMAMON,” created through steady perseverance and hard work, is imbued with soul. Even inanimate objects carry life within them. No matter how much the world changes, “HONMAMON” will continue to endure. This is my conviction.

“HONMAMON”, derived from the Japanese word “Honmono” (meaning authentic), is an expression used in Kyoto which indicates the highest class of real. “HONMAMON” is born from genuine curiosity and passion, reflecting on others’ needs. “HONMAMON” describes the people, their actions and endeavors, and everything that is born as a result of the continuous pursuit for something better.

Founder of the Awards

Masao Horiba

(1924 - 2015)



Atsushi Horiba

Award Director of the Masao Horiba Awards
Chairman & Group CEO
HORIBA, Ltd.

The Masao Horiba Awards was established in 2003 to celebrate innovative achievements in analysis and measurement technologies. Unraveling the composition and properties of substances leads to a deeper understanding of the significance and impact of various phenomena. This knowledge forms the foundation for scientific discovery, promoting advancements scientific understanding, technological progress, and industrial development. Analysis and measurement technologies are essential tools for scientific and technological exploration and innovation. As we commemorate the 100th anniversary of Masao Horiba birth, founder of HORIBA, Ltd., we hope this award will continue to honor the contributions of researchers dedicated to their fields and emphasize the importance of these technologies.



Masayuki Adachi

Chief of the Organizing Committee for
the 2024 Masao Horiba Awards
President & COO
HORIBA, Ltd.
Dr.Eng.

Thank you for joining us at the 2024 Masao Horiba Award Commemorative Seminar and Award Ceremony. This year, our focus is on "Analytical and Measurement Technologies for a Clean Water Environment and Sustainable Society." We received plentiful innovative applications from researchers and engineers around the world, demonstrating their commitment to advancing technologies for protecting the global water quality. Your participation today is greatly appreciated to enhance the understanding and motivation for our awardees, contributing to the progress of their research. We appreciate the support from all who have made this event possible and wish everyone continuing contributions to the global water environment.

2024 Masao Horiba Awards Ceremony Program

Date : Thursday, October 17, 2024

Venue : Hotel Granvia Kyoto

Commemorative Seminar 15:00-17:00

1. Opening remarks
Hiroshi Nakamura Vice Chief of the Organizing Committee for the 2024 Masao Horiba Awards
 2. Winner's Presentations
Award Winners
Dr. Takuro Ideguchi
Associate Professor, Institute for Photon Science and Technology School of Science, The University of Tokyo
“Development of super-resolution infrared microscopy and ultrafast infrared spectroscopy”
Dr. Chen Qian
Associate Professor, Department of Environmental Science and Engineering, University of Science and Technology of China
“Lab to Lake : Excitation-Emission Matrix's Voyage from Theory to Practice”
Dr. Nobutaka Shirasaki
Assistant Professor, Division of Environmental Engineering, Faculty of Engineering, Hokkaido University
“Investigating of the occurrence of pathogenic viruses in drinking water sources and their reduction efficiencies in drinking water treatment processes by applying novel virus quantification and concentration methods”
Honorable Mention
Dr. Tomoko Takahashi
Researcher, Marine Biodiversity and Environmental Assessment Research Center, Research Institute for Global Change, Japan Agency for Marine-Earth Science and Technology
“Development of in situ continuous in-flow microplastic monitoring techniques using optical and spectroscopic techniques”
Dr. Tania Louise Read
Assistant Professor, Department of Chemistry, University of Warwick
“Development of Boron-Doped Diamond Electrodes for Key Analytes in the Aqueous Environment and Beyond”
- <Break>
3. Special Lecture
Kazunari Yoshimura
Representative of Global Water Japan GWJ, United Nations technical advisor
[Theme] Take on the challenge of DXing water to solve the world's water issues
 4. Poster Session
Poster presentation on award-winning research

Award Ceremony 17:00-17:45

1. Introduction of award-winning research
2. Presentation Ceremony
Screening Committee's comments : **Prof. Susumu Kuwabata**
Professor Emeritus, Osaka University
Presenter : **Atsushi Horiba**
Award Director of the Masao Horiba Awards
3. Introduction of guests
4. Closing remarks
Masayuki Adachi
Chief of the Organizing Committee for the 2024 Masao Horiba Awards

Analytical and Measurement Technologies for a Clean Water Environment and Sustainable Society



2024 Award Winner



Dr. Takuro Ideguchi

Associate Professor

Institute for Photon Science and Technology School of Science,
The University of Tokyo



Title of Research

Development of super-resolution infrared microscopy and ultrafast infrared spectroscopy

Research summary

Chemical analysis of microplastics (MPs)^{*1} is essential for preserving the water environment. Infrared spectroscopy^{*2}, one of the useful chemical analysis methods, has two shortages for MPs analysis: (1) MPs whose size is below one μm cannot be analyzed by this method. (2) Acquisition time tends to be long. Dr. Ideguchi developed mid-infrared photothermal microscopy^{*3} to solve the issue (1). This microscope can visualize finer MPs down to approximately 100 nm in size, enabling analyzing nano plastics, which are known to be difficult to evacuate from the human body. He also developed the fastest infrared spectroscopy, called time-stretch infrared spectroscopy^{*4}, to solve the issue (2) and demonstrated approximately 100 million data acquisition per second. This method allows us to collect a massive amount of chemical data in a short time, showing a possibility for big data analysis of MPs.

Notes ;

1 Microplastics :

Tiny plastic particles found in the environment. There are concerns about their significant adverse effects on the human body and the environment, especially in the marine ecosystem.

2 Infrared Spectroscopy :

A method of irradiating a sample with light in the infrared region and measuring the light absorption of each wavelength. Since the wavelengths absorbed vary depending on the structure of the molecules that make up microplastics, it is possible to determine what molecules are contained in them by measuring the infrared spectrum, with the wavelength on the horizontal axis plotted against the amount of light absorbed or transmitted on the vertical axis.

3 Mid-infrared Photothermal Microscope :

A super-resolution infrared spectroscopic microscope that irradiates a sample with mid-infrared laser light and utilizes the change in refractive index (photothermal effect) caused by the rise in temperature near the molecules that absorb mid-infrared light. In principle, infrared spectroscopy is achieved in a fine analysis area by detecting the change in refractive index with visible light, which has a finer analysis area than mid-infrared light.

4 Time-stretch Infrared Spectroscopy :

An infrared spectroscopic method in which an ultrashort pulse laser light consisting of light of various wavelengths is irradiated onto a sample, and the intensity information (spectrum) of the transmitted light for each wavelength is converted into a time waveform of the pulse light intensity to obtain the spectrum.

* The organization and the title are those when applied.

Theme of 2024 Masao Horiba Awards

Analytical and Measurement Technologies for a Clean Water Environment and Sustainable Society



2024 Award Winner



Dr. Chen Qian

Associate Professor

Department of Environmental Science and Engineering,
University of Science and Technology of China



Title of Research

Lab to Lake: Excitation-Emission Matrix's Voyage from Theory to Practice

Research summary

Dissolved organic matter (DOM) is a key factor in water quality as it provides information on the movement and transformation of pollutants. To better understand DOM in water environment, three-dimensional Excitation Emission Matrix spectroscopy^{*1} is considered an effective tool because of its high precision and speed. However, applying this method in real-world environmental monitoring has been challenging due to (1) interference from water turbidity, (2) its complicated data processing, (3) and traditional lab-based methodology which hinders the onsite real-time analysis. To tackle these challenges, Dr. Qian proposed a novel algorithm that improves accuracy in environmental water quality analysis by providing a better data handling on measurement interference caused by characteristics of natural water environment. Additionally, he invented a portable, miniaturized device that allows real-time water quality analysis. His research work contributes as a package of both software and hardware in providing a rapid and precise analysis in the onsite field monitoring of water environment. The results of this research are expected to lead to significant future applications of three-dimensional Excitation Emission Matrix Spectroscopy for monitoring field and water treatment processes, and implications for policy-making and public health.

Notes ;

¹ Three-dimensional Excitation Emission Matrix Spectroscopy :

A method for analyzing a substance (fluorescent organic material) by shining different wavelength light (excitation), which is absorbed at specific wavelength light and emits as light at longer wavelengths (emission). Scientists create a detailed map of its fluorescent characteristics based on three-dimensional data on excitation, emission, and light intensity data.

* The organization and the title are those when applied.

Analytical and Measurement Technologies for a Clean Water Environment and Sustainable Society



2024 Award Winner



Dr. Nobutaka Shirasaki

Assistant Professor

Division of Environmental Engineering, Faculty of Engineering,
Hokkaido University



Title of Research

Investigating of the occurrence of pathogenic viruses in drinking water sources and their reduction efficiencies in drinking water treatment processes by applying novel virus quantification and concentration methods

Research summary

To control waterborne diseases and to ensure a stable supply of safe drinking water, it is essential to understand the occurrence of pathogenic viruses in drinking water sources and their removal efficiencies in drinking water treatment processes. Dr. Shirasaki improved and optimized a method that combines a photoreactive intercalating dye, which is used to determine whether bacteria are alive or dead, with a PCR method^{*1} for virus quantification, and developed a novel virus concentration method using two membranes, making it possible to investigate the occurrence of pathogenic viruses and to discuss the presence or absence of infectious viruses in drinking water sources. By applying the developed virus concentration method to water samples collected at actual drinking water treatment plants, he successfully evaluated the virus treatment properties in full-scale drinking water treatment processes. Furthermore, he prepared virus-like particles (VLPs)^{*2} of human norovirus, which is difficult to culture, and developed a method to quantify them in high sensitivity, and then successfully evaluated the removal efficiencies of human norovirus particles in drinking water treatment processes. This method is more time-efficient compared to the traditional culture method for human norovirus. In addition, he established a method for producing purified solutions of human sapovirus^{*3} at high concentrations, and a method for evaluating its infectivity. As a result, he succeeded in understanding the removal and inactivation efficiencies of human sapovirus in drinking water treatment processes ahead of the rest of the world.

Notes ;

1 PCR method :

Polymerase chain reaction (PCR) is a technique to amplify specific DNA sequences through the action of an enzyme called heat-resistant DNA polymerase.

2 virus-like particles (VLPs) :

Virus-like particles (VLPs) are particles that are equivalent in size, particle structure, and antigenicity to real viruses. It can be prepared large quantities without cell-based culture.

3 sapovirus :

Sapovirus belongs to the same family of Caliciviridae as norovirus. It causes viral gastroenteritis.

* The organization and the title are those when applied.

Analytical and Measurement Technologies for a Clean Water Environment and Sustainable Society



Honorable Mention



Dr. Tomoko Takahashi

Researcher

Marine Biodiversity and Environmental Assessment Research Center,
Research Institute for Global Change,
Japan Agency for Marine-Earth Science and Technology



Title of Research

Development of in situ continuous in-flow microplastic monitoring techniques using optical and spectroscopic techniques

Research summary

Microplastics (MPs) are serious pollutants in global marine environments, and it is essential to get more specific information of the MPs distribution, composition, and the temporal dynamic change for better understanding. However, the current surveys mainly focus on the surface distribution, and the particle sizes are limited to $>100 \mu\text{m}$. To deal with this problem, Dr. Takahashi developed non-contact, label-free, and real-time monitoring method by integrating Raman spectroscopy and holographic imaging system^{*1}. This novel method enables the accurate classification of MPs and other particles. Continuous monitoring in the deep sea becomes possible with the development and operation of in-situ device which is available in the deep sea ($>1000 \text{ m}$). In addition, the detection and classification of tiny MPs ($<100 \mu\text{m}$) and algae have been successfully performed by applying coherent-anti Stokes Raman scattering^{*2}. These methods will enable dynamic measurements of MPs at much higher spatial and temporal scales than ever, and it will be expected to establish as fundamental techniques for monitoring early stage of marine pollution.

Notes ;

1 Holographic imaging system :

The image acquisition technique with phenomena of interference and diffraction of light. In this research, it applies to the reconstruction focused images of objects existing at an arbitrary location in a large volume space by analyzing scattered light.

2 Coherent-anti Stokes Raman scattering :

A kind of Raman scattering spectroscopy. By irradiating two different types of light, matching the frequencies difference to the frequency from the sample molecules, and interacting with incident light, a weak Raman signal can be forced to be generated.

* The organization and the title are those when applied.

Theme of 2024 Masao Horiba Awards

Analytical and Measurement Technologies for a Clean Water Environment and Sustainable Society



Honorable Mention



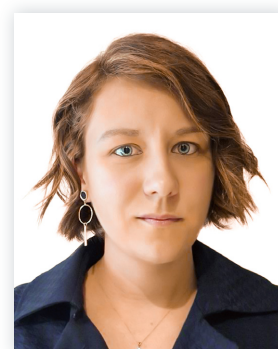
Dr. Tania Louise Read

Assistant Professor

Department of Chemistry, University of Warwick

Title of Research

Development of Boron-Doped Diamond Electrodes for Key Analytes in the Aqueous Environment and Beyond



Research summary

Dissolved oxygen, pH, and heavy metals are important environmental indicators in the measurement of environmental water and drinking water quality, and their rapid and accurate measurement is indispensable. However, conventional sensors have problems with measurement time and durability. To address these issues, Dr. Read developed a sensor that can simultaneously measure dissolved oxygen concentration and pH, and a sensor that can measure heavy metals while controlling the local pH using a Boron Doped Diamond (BDD^{*1}) electrode. Through laser processing of a controlled portion of the BDD electrode surface, she succeeded in developing a robust sensor that can rapidly measure dissolved oxygen concentration and pH simultaneously. Additionally, by developing a ring-disk electrode with a ring-type BDD electrode placed around the disk-type BDD electrode, she succeeded in measuring heavy metals while quantitatively controlling the local pH of the disk electrode by the flux of hydrogen ions generated by the electrolysis of water on the ring electrode surface. This eliminates the need for sample pretreatment required by conventional sensors and enables rapid and accurate real-time monitoring. These technologies can contribute to analysis in a wide range of fields beyond the environment, including the medical field.

Notes ;

¹ Boron Doped Diamond (BDD):

Diamond doped with boron, exhibiting metal-like conductivity. It is physically and chemically stable and has the property of being resistant to degradation even after long-term use, allowing for high-precision measurements even in harsh environments where conventional sensors are challenging to use.

* The organization and the title are those when applied.



Representative of Global Water Japan GWJ,
United Nations technical advisor

Kazunari Yoshimura

Clean water has supported the development of civilization and the survival of humankind. These precious water resources are now facing a global crisis. The world's water problems are very serious and diverse, but the main issues are: 1) Water shortages and unequal access 2) Water pollution 3) Impact of climate change 4) Water waste 5) International Water Resources Management Conflicts (water disputes).

One of the solutions that is attracting attention is "digitalization of water." Specifically, there are the following items. 1) Use of sensor technology and IOT 2) Use of big data and analysis 3) Introduction of automation and remote operation of water treatment facilities 4) Application of machine learning using artificial intelligence (AI) 5) Use of cloud computing. I will explain these above concepts.

Born in Akita Prefecture, in 1948. Graduated from the Faculty of Education (Science) at Akita University and joined Ebara Infilco in 1972. From 1994, held position as a General Manager of Corporate Planning Office at Ebara Corporation Headquarters. From 1998, held position as an Environment Counselor at the Economic and Social Affairs Department, United Nations New York Headquarters. Returned to Japan and rejoined Ebara Corporation in 2001, and then founded Global Water Japan in 2005.

Special committee member of Science and Technology Trends Center, Ministry of Education, Culture, Sports, Science and Technology. Committee member of Water Business International Development Study Group, Ministry of Economy, Trade and Industry. Special committee member of Water Security Strategy Organization, Executive Council and Director of Japan Water Forum. Recently, he has been passionate about educating young people. He has written many books, including "Water Affairs in the World and Japan."

2024 Screening Committee

Chairperson	Susumu Kuwabata	Professor Emeritus, Osaka University
Judges	Paul K. Westerhoff	Professor, School of Sustainable Engineering and the Built Environment, Arizona State University
	Huang Qinghui	Associate Professor, College of Environmental Science and Engineering, Tongji University
	Akio Imai	Research Director, Center for Environmental Science in Saitama
	Madoka Takai	Professor, Department of Bioengineering, School of Engineering, The University of Tokyo
	Yuichi Ichinari	Deputy General Manager, Advanced Technology Development Department, Development Division, HORIBA Advanced Techno Co., Ltd.
	Yuji Nishio	Senior Meister, Advanced Technology Development Department, Development Division, HORIBA Advanced Techno Co., Ltd.



20th Anniversary of the Masao Horiba Awards

The Masao Horiba Awards were established to encourage the researchers who are working diligently in the field of analytical and measurement technologies. Since the first time in 2004, we had a different theme each year and the number of winners has become 82. Each ingenious researches are honored as “HONMAMON” a genuine article, and they have lead young researchers.



At the first Masao Horiba Awards ceremony, 2004



About the logo

The logo of Masao Horiba Awards is combined oval shapes which are based on motifs of “Columbus' Egg” and “Ascending,” with the initials of Masao Horiba, the founder of this awards. It means success of young researchers and technological advancement of analytical and measurement technology.

2004

pH Measurement

2004 Award Winners

Dr. Kiwamu Sue

Research Associate
Graduate School of Environmental Studies,
Tohoku University

Development of Apparatus for
Potentiometric pH Measurement for
Supercritical Aqueous Solutions

Dr. Naoki Sugimoto

Professor, Director of Frontier Institute for
Biomolecular Engineering Research (FIBER) and
Professor of Chemistry
Faculty of Science and Engineering, Konan University

Development of pH sensor in a cell using
DNAs as nanomaterials

Dr. Kiminori Shitashima

Research Engineer
Environmental Science Research Laboratory, Central
Research Institute of Electric Power Industry

Development of an ISFET Sensor for In-
situ pH Measurement in the Ocean

2005

Infrared Related Analysis and
Measurement Technologies

2005 Award Winners

Dr. Harumi Sato

Postdoctoral Fellow
Department of Chemistry, School of Science and
Technology, Kwansai-Gakuin University

Study of C-H...O Hydrogen Bond for
Biodegradable Polymer using Infrared
Spectroscopy and X-ray Diffraction
-Role of the "Weak Hydrogen Bond" toward
Crystal Structure Stabilization and Thermal
Behavior-

Dr. Takeshi Hasegawa

Associated Professor
College of Industrial Technology, Nihon University

Multiple-Angle Incidence Resolution
Spectrometry: Development of a
Measurement Technique Using a Concept
of Virtual Light

Dr. Yasushi Inoue

Associated Professor
Graduate School of Frontier Biosciences, Osaka
University

Near-field vibrational spectroscopy

Honorable Mention

Dr. Michael William George

Professor of Chemistry
School of Chemistry, University of Nottingham

Development of infrared spectroscopy
analyzer with high time resolution
(picosecond) performance.

2006

X-ray Measurement

2006 Award Winners

Dr. Yasuko Terada

Senior Scientist
XAFS-Spectroscopy team leader, Japan Synchrotron
Radiation Research Institute (JASRI)

Development of SR-microbeam in high-
energy X-ray region and its application to
X-ray fluorescence analysis

Dr. Hisashi Hayashi

Associate Professor
Department of Chemical and Biological Sciences,
Faculty of Science, Japan Women's University

Development of new spectroscopic
methods using resonant inelastic X-ray
scattering

Dr. Koen Janssens

Professor of General and Analytical Chemistry,
University of Antwerp

X-ray based speciation of major and trace
constituents in heterogeneous materials of
environmental and cultural heritage origin

Honorable Mention

Dr. Masami Ando

Professor, Tokyo University of Science

System Development on Early Diagnosis
of Breast Cancer

* The organization and the title are those when applied

2007

Bioparticle Measurement

2007 Award Winners

Dr. Yasuhiro Awatsuji

Associate Professor
Kyoto Institute of Technology

Development of technique and system for three-dimensional measurement of moving cells by means of parallel digital holographic microscopy

Dr. Fumiyoshi Abe

Group Leader
Extremobiosphere Research Center, Japan Agency for Marine-Earth Science and Technology(JAMSTEC)

Probing for Dynamics of Membrane and Membrane Proteins Using Hydrostatic Pressure

Dr. Christopher T. Culbertson

Assistant Professor, Department of Chemistry,
Kansas State University

Rapid Analysis of Individual T-Lymphocyte Cells on Microfluidic Devices

2008

Internal Combustion Engines

2008 Award Winners

Dr. Tetsuya Aizawa

Lecturer in Residence
Department of Mechanical Engineering Informatics,
Meiji University

Laser Diagnostics of Soot Formation Processes in Diesel Spray Flame

Dr. Jason Olfert

Assistant Professor, Department of Mechanical Engineering, University of Alberta

A new instrument to measure the mass of nano-particles from an internal combustion engine.

Dr. David A. Rothamer

Assistant Professor, Mechanical Engineering Department, University of Wisconsin-Madison

Simultaneous Imaging of Exhaust Gas Residuals and Temperature During HCCI Combustion

Honorable Mention

Dr. Nobuyuki Kawahara

Assistant Professor, Okayama University

Development of In-Situ Fuel/Residual Gas Concentration Measurement near Spark Plug

2009

Surface Analysis for Semiconductor Related Materials

2009 Award Winners

Dr. Jorge Pisonero

Assistant Professor, Department of Physics,
University of Oviedo

Development and Evaluation of an Innovative "Soft Ionization Technique" based on Atmospheric Pressure Glow Discharges Time-of-flight Mass Spectrometry (AP-GD-TOFMS) for the Determination of Inorganic/organic Contaminants on Semiconductor Surfaces

Dr. Kenji Sakurai

Group Leader, National Institute for Materials Science

A challenge in ultra-trace analysis by X-ray fluorescence
- Instrumentation of novel efficient wavelength-dispersive X-ray spectrometer and the application to TXRF experiments with brilliant synchrotrons -

Dr. Shinya Ohno

Research Associate, Yokohama National University

Study of O₂, NO and CO reaction processes on silicon surfaces by means of surface differential reflectance and reflectance difference spectroscopy

Honorable Mention

Dr. Shinsuke Kunimura

P.h.D candidate(JSPS research fellow (DC2)), Kyoto University

The Development of a Portable Total Reflection X-ray Fluorescence Spectrometer with Picogram Sensitivity

2010

In situ and continuous measurement of harmful airborne substances affecting human health, safety, and security

2011

Ultra high-sensitive or ultra high-speed analytical method and technology using electromagnetic radiation from the NIR to the X-ray

2012

Radiation Detection and Measurement

2010 Award Winners

Dr. Toshihiro Somekawa

Researcher, Institute for Laser Technology

Development of the White Light Lidar using a High Power Femtosecond Laser System

Dr. Gerard Wysocki

Assistant Professor, Electrical Engineering Department, Princeton University

Ultra-sensitive in-situ molecular detection of reactive chemicals based on laser dispersion effects

Dr. Yoshizumi Kajii

Professor, Tokyo Metropolitan University

OH reactivity measurement by laser pump and probe technique and its application to diagnosis of air quality

2011 Award Winners

Dr. Shoichi Yamaguchi

Senior Research Scientist, RIKEN

Spectroscopic Analyses of Liquid Surfaces

Dr. Tamitake Itoh

Chief Researcher

National Institute of Advanced Industrial Science and Technology

Clarification of Surface Enhanced Raman Scattering Mechanism and its Application to Real-time Analysis of Bio-related Molecules on Living Cells

Dr. Manabu Tokeshi

Assistant Professor, Nagoya University

Development of Ultrasensitive and Rapid Analysis Methods by Combining Laser Spectroscopy and Microdevice

2012 Award Winners

Dr. Taiga Yamaya

Team Leader

National Institute of Radiological Sciences (NIRS)

Open PET leading to joint cancer diagnosis and radiotherapy

Dr. Toshiyuki Nakano

Assistant Professor

Nagoya University Graduate School of Science

Research and Development of fully automated Nuclear Emulsion read-out system and its applications

Dr. Masanori Koshimizu

Associate Professor

Tohoku University Graduate school of Engineering

Development of Scintillation Materials having Nanoscale Structure

Honorable Mention

Dr. Yoann Roupioz

Researcher, French National Center for Scientific Research

Label-free Cell - based Biosensors & Biochips: a Gold Mine Toward Diagnostic and Food Safety Issues? -

Honorable Mention

Dr. Steven Pain

Research and Development Associate
Physics Division, Oak Ridge National Laboratory

Development of the Oak Ridge Rutgers University Barrel Array - a detector for studying the single-particle structure of exotic nuclei -

* The organization and the title are those when applied

2013

Water Properties Measurements

2014

Gas Measurements

2015

Nanoparticle Measurements

2013 Award Winners

Dr. Hiroharu Yui

Professor
Department of Chemistry, Faculty of Science Division I,
Tokyo University of Science

Development of Novel Measurement
Methods for Aqueous Solutions utilizing
Electrons and Their Applications

Dr. Takeshi Watanabe

Project Research Associate
Department of Chemistry, Faculty of Science and
Engineering, Keio University

Selective sensing system based on electrode
design using boron-doped diamond

Dr. Parastoo Hashemi

Assistant Professor
Department of Chemistry, Wayne State University,
USA

Fast-scan Cyclic Voltammetry for
Continuous, Ultra-Fast Measurements of
Trace Metals in Natural Water Systems

Honorable Mention

Dr. Shingo Saito

Associate Professor
Graduate School of Science and Engineering,
Saitama University

Electrophoresis for determination of
ultratrace heavy metal ions in radioactive
wastes and environmental microbes using
novel fluorescent probes

2014 Award Winners

Dr. Timothy H. Bertram

Assistant Professor
Dept. of Chemistry and Biochemistry,
University of California, San Diego

High sensitivity chemical ionization mass
spectrometry for the direct measurement of
exchange and reaction at the ocean surface

Dr. Tatsutoshi Shioda

Associate Professor
Dept. of Electrical and Electronic Systems, Saitama
University

Study of high-resolution spectroscopy
using frequency tunable gigahertz optical
frequency comb

Dr. Yasuhiro Sadanaga

Associate Professor
Dept. of Applied Chemistry, Graduate School of
Engineering, Osaka Prefecture University

Continuous concentration measurements
of nitrogen dioxide in the atmosphere with
high accuracy

Honorable Mention

Dr. Weiwei Cai

European Union Marie Curie Fellow
Dept. of Chemical Engineering,
University of Cambridge

Nonlinear tomography: a new imaging
theory for combustion diagnostics

2015 Award Winners

Dr. Tomohisa Norisuye

Associate Professor
Department of Macromolecular Science &
Engineering, Kyoto Institute of Technology

Studies on Dynamics of Microsphere
Suspensions by Means of Dynamic
Ultrasound Scattering Technique

Dr. Masazumi Fujiwara

Assistant Professor
Department of Applied Chemistry for Environment,
School of Science and Technology, Kwansai Gakuin
University

Efficient fluorescence collection of single
nanoparticles using optical nanofibers

Dr. Hiroshi Yukawa

Designated Lecturer
ImPACT Research Center for Advanced
Nanobiodevices, Nagoya University

Development of *in vivo* imaging diagnostic
technique of transplanted stem cells by
fluorescent measurement and elemental
analysis of quantum dots

Honorable Mention

Dr. Yong P. Chen

Associate Professor
Brick Nanotechnology Center, Purdue University

Raman spectroscopy and microscopy of
graphene and other nanomaterials

2016

The Field of Sensing, Data Fusion and Algorithm Development for Automotive Autonomous Vehicle Applications

2017

Water measurement enriches people's lives

2018

Advanced analytical and measurement technology in the semiconductor manufacturing process

2016 Award Winners

Dr. Takuya Sakamoto

Associate Professor
Graduate School of Engineering, Department of Electronics and Computer Science, University of Hyogo
Fast 3-D Imaging of Human Body using Ultra-Wideband Radar

Dr. Naoki Suganuma

Unit Leader, Associate Professor
Institute for Frontier Science Initiative, Future society creation core, Autonomous vehicle research unit, Kanazawa University
Development of high dependable localization method in order to realize fully automated vehicle in urban area

Dr. Pongsathorn Raksincharoensak

Associate Professor
Department of Mechanical Systems Engineering, Tokyo University of Agriculture and Technology
Shared Control in Advanced Driver Assistance Systems Based on Risk Predictive Driving Intelligence Model

Honorable Mention

Dr. Takuma Ito

Project Researcher
Institute of Gerontology The University of Tokyo
Recognition of Driving Environment for Automated Driving by Lean Sensors

Dr. Alper Yilmaz

Associate Professor
Dept. of Civil, Environmental and Geodetic Engineering, The Ohio State University
Ubiquitous Geospatial Positioning via Knowledge Discovery from Geographic Information Systems

2017 Award Winners

Dr. Ryoichi Ishimatsu

Associate Professor
Graduate School of Engineering, Department of Applied Chemistry, Kyushu University
Electrochemical and photometric sensing for some substances in environmental water

Dr. Dai Kato

Senior Researcher
Biomedical Research Institute, National Institute of Advanced Industrial Science and Technology (AIST)
Development of sputtered nanocarbon film-based electrodes with extended analyte zones

Dr. Shiho Tokonami

Associate Professor / Deputy Director of RILACS
Graduate School of Engineering, Department of Applied Chemistry / Research Institute for Light-induced Acceleration System (RILACS), Osaka Prefecture University
Detection of bacteria in water based on a transferring technique of bacterial surface structure

Honorable Mention

Dr. Michael Gonsior

Associate Professor
Chesapeake Biological Laboratory, University of Maryland Center for Environmental Science
Time-resolved photodegradation of natural colored dissolved organic matter (CDOM) and contaminants in fresh- and marine waters using a custom-designed photodegradation system

2018 Award Winners

Dr. Keiichiro Urabe

Assistant Professor
Department of Aeronautics and Astronautics Graduate School of Engineering Kyoto University
Development of laser interferometry methods for high-speed and precise plasma electron-density diagnostics

Dr. Takayoshi Tsutsumi

Assistant Professor
Plasma Nanotechnology Research Center Graduate School of Engineering Nagoya University
Development of substrate temperature monitoring system for high-accuracy plasma process

Dr. Shota Nunomura

Senior Researcher
Research Center for Photovoltaics National Institute of Advanced Industrial Science and Technology (AIST)
Detection of electronic defects in semiconductor thin-films during plasma processing

Honorable Mention

Dr. Tsanko Vaskov Tsankov

Senior Scientist
Chair for Plasma and Atomic Physics, Ruhr University Bochum
Non-invasive plasma characterization through the ion velocity distribution function

* The organization and the title are those when applied

2019

Advanced analytical and measurement technologies to maximize the performance of electric power and battery usage for efficient control systems

2020

Cancelled due to
the COVID-19 pandemic

2021

Optical/spectroscopic measurement technologies for life science

2019 Award Winners

Yoash Levron, Ph.D.

Assistant Professor
Faculty of Electrical Engineering Technion-Israel
Institute of Technology

Optimal Control of Energy Storage
Devices for Future Power Grids and
Electric Vehicles

Nguyen Dinh Hoa, Ph.D.

Assistant Professor
International Institute for Carbon-Neutral Energy
Research, Kyushu University

Machine Learning based and Multi-Agent
System based Control and Optimization
Approaches for Electric Vehicles, Power
Grids, and their Interactions

Ichiro Maruta, Dr. of Informatics

Associate Professor
Department of Aeronautics and Astronautics Graduate
School of Engineering, Kyoto University

Development of Parameter Sensitivity Plot
and Application to Modeling of Lithium-ion
Secondary Batteries

Honorable Mention

Kei Hasegawa, Ph.D.

Assistant Professor
Department of Chemical Science and Engineering,
School of Materials and Chemical Science Tokyo
Institute of Technology

Application and management of hydrogen
energy technology toward the solar cell
based distributed electricity grid

Matthias Preindl, Ph.D.

Assistant Professor
Department of Electrical Engineering,
Columbia University in the City of New York

Data-driven Modeling and Estimation of
Li-Ion Battery Properties

2021 Award Winners

Dr. Takuya Iida

Professor / (Concurrent) Director of RILACS
Department of Physical Science, Graduate School of
Science, Osaka Prefecture University
(Concurrent) Research Institute for Light-induced
Acceleration System (RILACS)

Development of innovative bio-
measurement technology by micro-flow
light-induced acceleration

Dr. Sadao Ota

Associate Professor
Research Center for Advanced Science and
Technology, The University of Tokyo

Development of ultrafast machine vision-
activated cell sorters and its applications

Dr. Kazuhide Sato

Designated Assistant Professor (selected-YLC
program)
Institute for Advanced Research/ School of
Medicine, Tokai National Higher Education and
Research System, Nagoya University

Elucidation of the mechanism of near-
infrared light-induced cell death and
method establishment for measuring
therapeutic effects

Honorable Mention

Dr. Sanghong Kim

Associate Professor
Department of Applied Physics and Chemical
Engineering, Tokyo University of Agriculture and
Technology

Real-time monitoring and control of
pharmaceutical production processes using
spectroscopic data

2022

Analytical and measurement technologies that contribute to the use of hydrogen for a decarbonized society

2023

Analysis and measurement technologies that contribute to the development of next generation semiconductor devices

2024

Analytical and Measurement Technologies for a Clean Water Environment and Sustainable Society

2022 Award Winners

Dr. Katsutoshi Sato

Designated Associate Professor
Department of Chemical Systems, Graduate School of Engineering, Nagoya University

Design of novel nitrogen reduction site led by atomic resolution electron microscopy analysis

Dr. Yasufumi Takahashi

Professor
Department of Electronics, Graduate School of Engineering, Nagoya University

Development of scanning electrochemical cell microscopy for real space catalytic imaging

Dr. Takashi Nakamura

Associate Professor
Institute of Multidisciplinary Research for Advanced Materials, Tohoku University

Development of electrochemical techniques for defect engineering on advanced energy materials

Honorable Mention

Dr. Yukina Takahashi

Associate Professor
International Institute for Carbon-Neutral Energy Research, Kyushu University

Development of Highly Efficient Hydrogen Generation System by Plasmon-Induced Charge Separation Using Sunlight as Energy Source

Dr. Helge Sören Stein

Tenure Track Professor
Institute for Physical Chemistry (IPC) & Helmholtz Institute Ulm (HIU) Karlsruhe Institute of Technology (KIT)

Data driven acceleration of materials discovery and upscaling through correlative spectroscopy and lab-scale manufacturing

2023 Award Winners

Dr. Ryota Ishii

Assistant Professor
Department of Electronic Science and Engineering, Kyoto University

Exploring spatially and temporally resolved deep-ultraviolet spectroscopy toward understanding and controlling optoelectronic properties of ultrawide bandgap semiconductors

Dr. Naresh Kumar

Senior Scientist
Department of Chemistry and Applied Biosciences, ETH Zurich

Nanoscale Chemical Characterization of Novel Semiconductor Materials using Tip-Enhanced Optical Spectroscopy

Dr. Ang-Yu Lu

PhD Student
Department of Electrical Engineering and Computer Science, Massachusetts Institute of Technology

Unraveling the Correlation between Raman and Photoluminescence in Monolayer MoS₂ through Machine Learning Models

Honorable Mention

Dr. Mitsuru Takenaka

Professor
School of Engineering, Department of Electrical Engineering and Information Systems, The University of Tokyo

Electro-photonic Integrated Deep Learning Processor using Si Photonic Integrated Circuits

Dr. Maki Kushimoto

Associate Professor/ Lecturer
Graduate School of Engineering, Nagoya University

Development of a compact deep-ultraviolet laser source for precision microstructure measurement

2024 Award Winners

Dr. Takuro Ideguchi

Associate Professor
Institute for Photon Science and Technology School of Science, The University of Tokyo

Development of super-resolution infrared microscopy and ultrafast infrared spectroscopy

Dr. Chen Qian

Associate Professor
Department of Environmental Science and Engineering University of Science and Technology of China

Lab to Lake: Excitation-Emission Matrix's Voyage from Theory to Practice

Dr. Nobutaka Shirasaki

Assistant Professor
Division of Environmental Engineering Faculty of Engineering, Hokkaido University

Investigating of the occurrence of pathogenic viruses in drinking water sources and their reduction efficiencies in drinking water treatment processes by applying novel virus quantification and concentration methods

Honorable Mention

Dr. Tomoko Takahashi

Researcher
Marine Biodiversity and Environmental Assessment Research Center
Research Institute for Global Change
Japan Agency for Marine-Earth Science and Technology

Development of in situ continuous in-flow microplastic monitoring techniques using optical and spectroscopic techniques

Dr. Tania Louise Read

Assistant Professor, Department of Chemistry
University of Warwick

Development of Boron-Doped Diamond Electrodes for Key Analytes in the Aqueous Environment and Beyond

* The organization and the title are those when applied