Hirotaka Sakaue, PhD

Associate Professor
Department of Aerospace and Mechanical Engineering
University of Notre Dame
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Education

Jan. 2000 – Dec. 2003 **Doctor of Philosophy, Aeronautics and Astronautics**
School of Aeronautics and Astronautics, Purdue University
West Lafayette, IN
Advisor: Prof. John P. Sullivan

Aug. 1996 – Dec. 1999 **Master of Science, Engineering**
School of Aeronautics and Astronautics, Purdue University
West Lafayette, IN
Advisor: Prof. John P. Sullivan

Apr. 1992 – Mar. 1996 **Bachelor of Science**
School of Bioscience and Biotechnology, Tokyo Institute of Technology
Tokyo, Japan

Research Interests based on Interdisciplinary Studies on Fluid Dynamics and Chemistry

- Thermo-Fluid System
- Unsteady Aerodynamics
- Flight and Flow Control (Chemical Flow Control)
- Environmental and Energy Engineering
- Advanced Flow Diagnostics by Molecular Sensors and Optics
- Wind Tunnel Testing (Low-Speed, Transonic-Speed, High-Speed, and High Reynolds-Number Flows)
- Two Phase Flows
- Compressible and Incompressible Flows
- Heat Transfer in Hypersonic Flow
- Shock Physics
- Fluid-Thermal-Structure Interactions
- Medical and Biological Applications

Professional Experience

Jan. 2015 – **Associate Professor, Department of Aerospace and Mechanical Engineering, University of Notre Dame**
Indiana, USA

Affiliations:
Institute for Flow Physics and Control (FlowPAC)
Notre Dame's Center for Nano Science and Technology (NDnano)
Center for Sustainable Energy at Notre Dame (ND Energy)
Advanced Diagnostics and Therapeutics (ADT)

- Research and development on luminescent imaging methods using pressure- and temperature-sensitive paints for unsteady flow fields
- Research and development on chemical flow control using functional molecules
- Research and development on chemical coatings for anti-icing and de-icing applications

Professional Experience (*continued*)

Sep. 2003 – Dec. 2014 **Researcher, Institute of Aeronautical Technology, Japan Aerospace Exploration Agency (JAXA)**
Tokyo, Japan
- Research and development on luminescent imaging methods using pressure- and temperature-sensitive paints for unsteady flow fields
- Research and development on chemical flow control using functional molecules
- Research and development on chemical coatings for anti-icing and de-icing applications
- Organizing the molecular-imaging related interdisciplinary symposium

Sep. 2007 **Honorary Visiting Researcher, School of Mechanical, Aerospace, and Civil Engineering, The University of Manchester**
Manchester, UK
- Research on unsteady lifetime imaging system

Jul. 2000 – Oct. 2000 **Visiting Researcher, Institute of Aerodynamics and Flow Technology German Aerospace Center (DLR)**
Göttingen, Germany
- Development of fast responding PSP

Jan. 2000 – Aug. 2003 **Ph.D. Graduate Research Assistant, School of Aeronautics and Astronautics Purdue University**
West Lafayette, IN
- Development and application of fast responding PSP in unsteady aerodynamic fields
- Development of luminescence based hydrogen sensor

Mar. 1997 **Visiting Researcher, Fluid Science Research Center National Aerospace Laboratory (NAL)** – JAXA at present
Tokyo, Japan
- Development and application of anodized aluminum PSP in cryogenic wind tunnel measurements

Jan. 1997 – Dec. 1999 **MS Graduate Research Assistant, School of Aeronautics and Astronautics Purdue University**
West Lafayette, IN
- Development and application of porous PSP in cryogenic wind tunnel measurements

Grants Received

1. Principal Investigator, National Science Foundation (NSF), "Collaborative Research: Ice melting-induced flows by an adjacent heated immiscible liquid layer," January 2020 to December 2022, ($238,133).
2. Co-Principal Investigator, Notre Dame International, "Numerical and Experimental Approaches to Aerodynamic Heating in Hypersonic Flow," May 2020 to March 2021, ($19,000).
3. Principal Investigator, ANSYS Inc., "Simulation of Supercooled Droplet Icing using Luminescent Imaging," November 2019 to November 2020, ($65,000).
4. Co-Principal Investigator, ANSYS Inc., "Simulation of Fluid-Structure Interaction," November 2019 to November 2020, ($65,000).
5. Principal Investigator, Tanaka Ai, "Parametric Study of Microfiber Coating in a Pipe Flow," September 2019 to August 2020, ($50,000).
6. Co-Principal Investigator, General Electric Aviation, "Comprehensive Literature Review on Ice Formation," April 2019 to December 2019, ($36,856).
7. Co-Principal Investigator, Department of Navy, "A High-Speed Camera for High-Speed Flows," June 2019 to May 2020, ($135,210).
8. Principal Investigator, Tohoku University, "Surface Pressure Measurement of a Re-Entry Model in Ballistic Range Facility using Motion-Capturing Pressure Sensitive Paint Method," April 2019 to March 2020, ($555).
9. Principal Investigator, Notre Dame International, "Luminescent Chemical Sensor over Free Flight Object in Ballistic Range Facility for Capturing Temporal and Spatial Pressure – An international collaboration initiative leveraging world-class flow physics," January 2019 to December 2019, ($9,980).

Grants Received (*continued*) [*1]

10. Principal Investigator, Sandia National Laboratory, "Improving Fast Response Pressure Sensitive Paint for Acoustic and Blast Tube Test Applications," October 2018 to September 2020, ($100,000).
11. Principal Investigator, Tanaka Ai, "Drag Reduction in a Pipe using Micro-Fiber Coating," September 2018 to August 2019, ($50,000).
12. Principal Investigator, ANSYS Inc., "Experimental Simulation of Supercooled Droplet Icing using Luminescent Imaging," September 2018 to June 2019, (35,000).
13. Co-Principal Investigator, ANSYS Inc., "Validation of the Fluid-Structure Interaction Code," August 2018 to August 2019, (85,000).
14. Principal Investigator, North Carolina State University, "Rapid Assessment of Weapon Separation," July 2018 to July 2019, (25,000).
15. Principal Investigator, Tohoku University, "Surface pressure measurement over free flight object in ballistic range facility using motion-capturing pressure-sensitive paint method," April 2018 to March 2019, ($1,959).
16. Principal Investigator, Osaka Gas, "Turbulence Control using Hairy Chemical Coating," November 2017 to March 2018, ($10,000).
17. Principal Investigator, Japan Aerospace Exploration Agency (JAXA), "ICE-WIPS – hybrid icephobic coating and electrothermal heating wing ice protection system," September 2017 to March 2018, ($387,915).
18. Co-Principal Investigator, Center for the Advancement of Science in Space (CASIS), "The Impact of Nanostructure Geometry on Photo-Thermal Evaporation Processes," November 2017 to December 2020, (420,221).
19. Principal Investigator, National Aeronautics and Space Administration (NASA), "NASA AS & STAR Fellowship," September 2017 to January 2019, ($47,000).
20. Principal Investigator, Mitsubishi Heavy Industries, Inc., "Development of pressure fluctuation measurement technique for evaluation of flow induced vibration using pressure-sensitive paint technique," May 2017 to December 2017, ($142,502).
21. Principal Investigator, Ohio Aerospace Institute, "Engineered Surface, Materials and Coatings (ESMC) for Drag Reduction," May 2017 to November 2017, ($20,298).
22. Principal Investigator, Tohoku University, "Surface pressure measurement over free flight object in ballistic range facility," April 2017 to March 2018, ($1,331).
23. Principal Investigator, Mitsubishi Heavy Industries, Inc., "Development of Two Color Pressure Sensitive Paint," January 2017 to August 2017, ($147,457).
24. Principal Investigator, Osaka Gas, "Drag Reduction Technology using Hairy Chemical Coating for Wind Turbines," October 2016 to March 2017, ($5,000).
25. Principal Investigator, Japan Aerospace Exploration Agency (JAXA), "ICE-WIPS – hybrid icephobic coating and electrothermal heating wing ice protection system," September 2016 to March 2017, ($110,293).
26. Principal Investigator, National Aeronautics and Space Administration (NASA), "NASA AS & STAR Fellowship," September 2016 to August 2017, ($55,000).
27. Principal Investigator, Ohio Aerospace Institute, "Engineered Surface, Materials and Coatings (ESMC) for Drag Reduction," December 2016, ($1,947).
28. Principal Investigator, Ohio Aerospace Institute, "Engineered Surface, Materials and Coatings (ESMC) for Drag Reduction," April 2016 to December 2016, ($106,454).
29. Principal Investigator, Ohio Aerospace Institute, "ESMC by Hairy Chemical Coating for Drag Reduction of USAF Legacy Aircrafts," October 2015 to December 2016, ($10,000).
30. Principal Investigator, Osaka Gas, "Development of Luminescent Imaging Technique and its Application for Gas-Element Diagnostics," June 2015 to March 2016, ($17,000).
31. Principal Investigator [Japan], JAXA Grants for Symposium, "The 10th Interdisciplinary Forum on Molecular Imaging," Japan, April 2014 to March 2015, ($7,350).
32. Principal Investigator [Japan], JAXA Grants for Symposium, "The 9th Interdisciplinary Forum on Molecular Imaging," Japan, June 2013 to March 2014, ($7,350).
33. Principal Investigator [Japan], JAXA Grants in Exploratory Research, "Surface Pressure and Temperature Measurement for Ballistic Range using Luminescent Imaging," June 2013 to March 2015, ($47,300).

***1** Japanese research organizations do not cover students' costs. Hirotaka Sakaue received these type of grants during his career in JAXA (up to 2014). Grants awarded during this time is indicated as [Japan].

Grants Received (*continued*)

34. Principal Investigator [Japan], Grant-in-Aid for Scientific Research C, "Differential Pressure-Measurement Method of Fast Responding Pressure-Sensitive Paint System," Research Project Number: 25420140, April 2013 to March 2016, ($52,000).
35. Co-Investigator [Japan], Grant-in-Aid for Scientific Research C, "Development of a compact and versatile activity monitoring device for Mauna Kea summit workers," April 2013 to March 2016, ($49,400).
36. Co-Investigator [Japan], Aeronautics and Air Transport Research 7th Framework Programme 2007 – 2013 (FP7-AAT-2012-RTD-JAPAN), "Japanese-European De-Icing Aircraft Collaborative Exploration (JEDI-ACE)" European Commission, November 2012 to April 2016, ($400,000 ($4,500,000 all the participants)).
37. Principal Investigator [Japan], JAXA Grants for Symposium, "The 8th Interdisciplinary Forum on Molecular Imaging," June 2012 to March 2013, ($7,750).
38. Principal Investigator [Japan], JAXA Grants for Symposium, "The 7th Interdisciplinary Forum on Molecular Imaging," June 2011 to March 2012, ($7,750).
39. Principal Investigator [Japan], JAXA Grants in Exploratory Research, "Development of Global Temperature Measurement System for Characterizing Super-Cool Water Droplets in Icing Conditions," June 2011 to March 2013, ($50,100).
40. Principal Investigator [Japan], Grants-In-Aid for Young Scientists B, "Development of Temperature-Cancelled Pressure-Sensitive Paint System for Capturing Unsteady Motions," Research Project Number: 23760776, April 2011 to March 2013, ($45,500).
41. Principal Investigator [Japan], JAXA Grants for Symposium, "The 6th Interdisciplinary Forum on Molecular Imaging," August 2010 to March 2011, ($7,750).
42. Principal Investigator [Japan], JAXA Grants for Symposium, "The 5th Interdisciplinary Forum on Molecular Imaging," August 2009 to March 2010, ($7,600).
43. Principal Investigator [Japan], Grants-In-Aid for Young Scientists B, "Development of Simultaneous Reference- and Signal-Image Acquisition System using Two-Color Unsteady Pressure-Sensitive Paint," Research Project Number: 21760660, April 2009 to March 2011, ($45,500).
44. Principal Investigator [Japan], JAXA Grants in Exploratory Research, "Development of Unsteady Measurement System using Two-Color Luminescence," August 2008 to March 2010, ($44,000).
45. Principal Investigator [Japan], JAXA Grants for Symposium, "The 4th Interdisciplinary Forum on Molecular Imaging," August 2008 to March 2009, ($8,600).
46. Principal Investigator [Japan], JAXA Grants in Promotion of JAXA Patent, "Development of Differential Measurement System combined with Two-Color Pressure-Sensitive Paint," October 2007 to March 2008, ($20,000).
47. Principal Investigator [Japan], Grants-In-Aid for Young Scientists B, "Development of Fast Responding Pressure-Sensitive Coating using Combination of Functional Molecules for Temperature Cancellation," Research Project Number: 19760574, April 2007 to March 2009, ($35,900).
48. Principal Investigator [Japan], JAXA Grants for Symposium, "The 3rd Interdisciplinary Forum on Molecular Imaging," April 2007 to March 2008, ($8,000).
49. Principal Investigator [Japan], JAXA Grants in Exploratory Research, "Research on Drag Reduction Method using Functional Molecules," April 2006 to March 2008, ($140,000).
50. Co-Investigator [Japan], JAXA Grants in Promotion of JAXA Patent, "Development of Oxygen Leakage Sensor using Oxygen-Sensitive Coating," October 2006 to March 2007, ($40,000).
51. Principal Investigator [Japan], JAXA Grants for Symposium, "The 2nd Interdisciplinary Forum on Molecular Imaging," April 2006 to March 2007, ($6,000).
52. Co-Investigator [Japan], Grants-In-Aid for Scientific Research C, "Imaging Technology of Surface Pressure Distribution using Luminescent Coatings," Research Project Number: 70262243, April 2005 to March 2007, ($36,000).
53. Principal Investigator [Japan], Grants-In-Aid for Young Scientists B, "Cancellation of Temperature Dependency of Surface Pressure Coating using Combination of Functional Molecules," Research Project Number: 17760641, April 2005 to March 2007, ($34,000).
54. Principal Investigator [Japan], JAXA Grants for Symposium, "The 1st Interdisciplinary Forum on Molecular Imaging," April 2005 to March 2006, ($5,000).
55. Principal Investigator [Japan], JAXA Grants in Exploratory Research, "Development of Pressure-Sensitive Paint System for Unsteady- and Cryogenic-Applications," April 2004 to March 2006, ($147,000).

Publications

Legends

Double underline: Hirotaka Sakaue

Single underline: supervised/supervising student

Dotted underline: university supervisor for degree-seeking student at JAXA

Journal Papers

1. Leite, H., Claucherty, S. L., Avelar, A., daSilva, R., Sakaue, H., "A Luminescent Temperature Sensor Based on Rhodamine B on a Polymer-Ceramic for Aerothermal Measurement," *Measurement Science and Technology*, IOP Science; Vol. 32, No. 3, DOI.org/10.1088/1361-6501/abc89d. 2020.
2. Claucherty, S. L., Sakaue, H., "An optical-chemical sensor using pyrene-sulfonic acid for unsteady surface pressure measurements," *Sensors and Actuators A: Physical*, Elsevier; DOI.org/10.1016/j.sna.2020.112359. 2020.
3. Kurihara, D., Gonzales, J. P., Claucherty. S. L., Kiritani, H., Fujita, K., Jemcov, A., Nagai, H., Sakaue, H., "Sub-Millimeter Resolution Pressure Measurement on Free Flight Model at Mach 1.5 Using Novel Non-Intrusive Optical Technique," *Experimental Thermal and Fluid Science*, Elsevier, Vol. 120, No. 1, 110243; DOI:10.1016/*j.expthermflusci.2020.110243*. 2020.
4. Morita, K., Kimura, S., Sakaue, H., "Hybrid system combining ice-phobic coating and electrothermal heating for wing ice protection," *Aerospace*, Molecular Diversity Preservation International, Vol. 7, No. 102; DOI:10.3390/aerospace7080102, 2020.
5. Hayashi, T., Sakaue, H., "Temperature effects on polymer-ceramic pressure-sensitive paint as a luminescent pressure sensor," *Aerospace*, Molecular Diversity Preservation International, Vol. 7, No. 6, 80; DOI:10.3390/aerospace7060080, 2020.
6. Hasegawa, M., Sakaue, H., "Development of Microfiber Coating for Flow Control: Effects on Microfiber Length in Orientation Control," *Sensors and Actuators A: Physical*, Elsevier, Vol. 312, 112125; DOI:10.1016/j.sna.2020.112125, 2020.
7. Kurihara, D., Saitoh, K., Sakaue, H., "Uncertainty Analysis of Motion-capturing Pressure-Sensitive Paint Method using Unsteady Surface-Pressure Measurement on Fluttering Airfoil," *Aerospace Science and Technology*, Elsevier, Vol. 103, 105878; DOI:10.1016/j.ast.2020.105878, 2020.
8. Gonzales, J. P., Suzuki, K., Sakaue, H., "Temporally and Spatially Resolved Pressure and Temperature Maps in Hypersonic Flow," *International Journal of Heat and Mass Transfer*, Elsevier, Vol. 156, 119782; DOI:10.1016/j.ijheatmasstransfer.2020.119782, 2020.
9. Hasegawa, M., Morita, K., Sakaue, H., Kimura, S., "Pinned Droplet Size on a Superhydrophobic Surface in Shear Flow," *Aerospace*, Molecular Diversity Preservation International, Vol. 7, No. 34; DOI:10.3390/aerospace7030034, 2020.
10. Hayashi, T., Sakaue, H., "Differential Luminescent Imaging Method," *Journal of Applied Physics*, American Institute of Physics, Vol. 127 No. 9, DOI: 10.1063/1.5131752, 2020.
11. Hirai, Y., Kotani, A., Sakaue, H., Kitagawa, Y., Hasegawa, Y., "Lifetimes of Lanthanide(III) Triboluminescence Excited by Aerodynamic Shock Waves," *Journal of Physical Chemistry C*, ACS Publications, Vol. 123 No. 44, 27251-27256; DOI: 10.1021/acs.jpcc.9b08349, 2019.
12. Hasegawa, M., Sakaue, H., "Microfiber coating for flow control over a blunt surface," *Coatings*, Molecular Diversity Preservation International, Vol. 9, No. 10, 664; doi:10.3390/coatings9100664, 2019.
13. Gonzales, J. P., Kurihara, D., Maeda, T., Yamazaki, M., Saruhashi, T., Kimura, S., Sakaue, H., "Novel superhydrophobic surface with solar-absorptive material for improved de-icing performance," *Materials*, Molecular Diversity Preservation International, Vol. 12, No. 17; doi:10.3390/ma12172758, 2019.
14. Hayashi, T., Houpt, A., Leonov, S., Sakaue, H., "Motion-Capturing Pressure-Sensitive Paint Method under Transient Illumination by Plasma Source," *Journal of Physics D: Applied Physics*, Vol. 52, No. 32; doi:10.1088/1361-6463/ab2581, 2019.
15. Running, C. L., Sakaue, H., Juliano, T. J., "Hypersonic Boundary-Layer Separation Detection with Pressure-Sensitive Paint for a Cone at High Angle of Attack," *Experiments in Fluids*, Vol. 60, No. 23; doi:10.1007/s00348-018-2665-26, 2019.
16. Hirai, Y., Mallette, A., Nishio, Y., Patterson, W. C., Hasegawa, Y., Sakaue, H., "Visualization of icing of supercooled water using Tb(III)-based temperature-sensitive paint," *Sensors and Actuators A: Physical*, Elsevier, doi: 10.1016/j.sna.2018.11.051, Vol.285, pp. 599 – 602, 2019.
17. Hasegawa, M., Sakaue, H., "Microfiber Coating for Drag Reduction by Flocking Technology," *Coatings*, Vol. 8, No. 424; doi:10.3390/coatings8120424, 2018.

Publications (*continued*)

18. Morita, K., Gonzales, J. P., Sakaue, H., "Effect of PTFE Particle Size on Superhydrophobic Coating for Supercooled Water Prevention," *Coatings*, Vol. 8, No. 426; doi:10.3390/coatings8120426, 2018.
19. Claucherty. S. L., Sakaue, H., "Phenol-formaldehyde resin for optical-chemical temperature sensing," *Sensors*, Molecular Diversity Preservation International, Vol. 18, No. 1756; doi:10.3390/s18061756, 2018.
20. Ishii, M., Miyazaki, T., Sakaue, H., "Uniformity study of two-functional luminescent dyes adsorbed over an anodized-aluminum coating for motion-capturing pressure- and temperature-sensitive paint imaging," *Sensors*, Molecular Diversity Preservation International, Vol. 18, No. 26; doi:10.3390/s18010026, 2018.
21. Sano, S., Yuuki, T., Hyakutake, T., Morita, K., Sakaue, H., Arai, S., Matsumoto, H., Michinobu, T., "Temperature Compensation of Pressure-Sensitive Luminescent Polymer Sensors," *Sensors and Actuators B: Chemical*, Elsevier, doi: 10.1016/j.snb.2017.08.221, Vol.255 Part2, pp. 1960 – 1966, 2017.
22. Claucherty. S. L., Sakaue, H., "Temperature characterization of an optical-chemical tunable-peak sensor using CdSe/ZnS quantum-dots applied on anodized-aluminum for surface temperature measurement," *Sensors and Actuators B: Chemical*, Elsevier, doi: 10.1016/j.snb.2017.05.093, 2017.
23. Hayashi, T., Sakaue, H., "Dynamic and Steady Characteristics of Polymer-Ceramic Pressure-Sensitive Paint with Variation in Layer Thickness," *Sensors*, Molecular Diversity Preservation International, Vol. 17, No. 5, 1125; doi:10.3390/s17051125, 2017.
24. Claucherty. S. L., Sakaue, H., "An optical-chemical sensor using rhodamine B on anodized-aluminum for surface temperature measurement from 150 to 500K," *Sensors and Actuators B: Chemical*, Elsevier, doi: 10.1016/j.snb.2016.09.053, 2016.
25. Sakaue, H., Morita, K., Kimura, S., "Dual-luminescence imaging for capturing time-resolved temperature distributions of two-phase flow," *Journal of Multiphase Flow*, doi:10.1016/j.ijmultiphaseflow.2016.06.002, Vol. 85, pp. 173 – 176, 2016.
26. Morita, K., Sakaue, H., "Characterization Method of Hydrophobic Anti-Icing Coatings," *Review of Scientific Instruments*, American Institute of Physics, Vol. 86, No. 11, 115108, 2015.
27. Sakaue, H., "Motion-Capturing Pressure-Sensitive Paint Method and its Applications to Unsteady Fluid-Dynamic Measurements," *Journal of the Visualization Society of Japan*, Visualization Society of Japan, Vol. 34 No. 132, pp. 22 – 27, 2014.
28. Gregory, J. W., Sakaue, H., Liu, T., Sullivan, J. P., "Fast Pressure-Sensitive Paints for Flow and Acoustic Diagnostics," *Annual Reviews of Fluid Mechanics*, Annual Reviews, doi: 10.1146/annurev-fluid-010313-141304, 2014.
29. Sakaue, H., Morita, K., Iijima, Y., Sakamura, Y., "Response Time Scales of Anodized-Aluminum Pressure-Sensitive Paints," *Sensors and Actuators A: Physical*, Elsevier, Vol. 199, No. 1, pp. 74 – 79, 2013.
30. Sakaue, H., Hayashi, T., Ishikawa, H., "Luminophore Application Study of Polymer-Ceramic Pressure-Sensitive Paint," *Sensors*, Molecular Diversity Preservation International, Vol. 13, No. 6, pp. 7053 – 7064, 2013.
31. Sakaue, H., Aikawa, A., "Thermal Stability Characterization for Practical Use of Quantum-Dot based Global Optical Sensor on Anodized-Aluminum," *Sensors and Actuators B: Chemical*, Vol. 185, pp. 174 – 178, 2013.
32. Sakaue, H., Kodama, H., Morita, K., Ishikawa, H., "Super-Hydrophobic Porous Pressure-Sensitive Paint for Global Unsteady Flow Measurements," *Sensors and Actuators B: Chemical*, Elsevier, Vol. 185, pp. 154 – 158, 2013.
33. Sakaue, H., Miyamoto, K., Miyazaki, T. "A motion-capturing method of pressure-sensitive paint system," *Journal of Applied Physics*, American Institute of Physics, Vol. 113, No. 8, pp. 084901-084901-8, 2013.
34. Sakaue, H., Dan, R., Shimizu, M., Kazama, H. "*In vivo* pH Imaging System using Luminescent Indicator and Color Camera," *Review of Scientific Instruments*, American Institute of Physics, Vol. 83, 076106, 2012.
35. Iijima, Y., Sakaue, H., "Platinum Porphyrin and Luminescent Polymer for Pressure- and Temperature-Sensing Probes," *Sensors and Actuators A: Physical*, Elsevier, Vol. 184, pp. 128 – 133, 2012.
36. Sakaue, H., Kuriki, T., Miyazaki, T., "A temperature-cancellation method of pressure-sensitive paint on porous anodic aluminum," *Journal of Luminescence*, Elsevier, Vol. 132, No. 2, pp. 256 – 260, 2012.
37. Sakaue, H., Kakisako, T., Ishikawa, H., "Characterization and Optimization of Polymer-Ceramic Pressure-Sensitive Paint by controlling Polymer Content," *Sensors*, Molecular Diversity Preservation International, Vol. 11, No. 7, pp. 6967 – 6977, 2011.
38. Sakaue, H., Huang, C. Y., Sullivan, J. P. "Optical Hydrogen Sensing Method using Temperature-Sensitive Luminophores on Porous Palladium," *Sensors and Actuators B: Chemical*, Elsevier, Vol. 155, No. 1, pp. 372 – 374, 2011.

Publications (*continued*)

39. Iijima, Y., Sakaue, H., "Development of Electro-Luminescence based Pressure-Sensitive Paint System," *Review of Scientific Instruments*, American Institute of Physics, Vol. 82, No. 1, 015107 – 015107-5, 2011.
40. Sakaue, H., Ishii, K., "Dipping Duration Study for Optimization of Anodized-Aluminum Pressure-Sensitive Paint," *Sensors*, Molecular Diversity Preservation International, Vol. 10, No. 11, pp. 9799 – 9807, 2010.
41. Sakaue, H., Aikawa, A., Iijima, Y., "Anodized Aluminum as Quantum-Dot Support for Global Temperature Sensing from 100 to 500 Kelvin," *Sensors and Actuators B: Chemical*, Elsevier, Vol. 150, No. 2, pp. 569 – 573, 2010.
42. Hyakutake, T., Navrotskiy, A., Morita, K., Kato, J., Sakaue, H., Novakov, I., Nishide, H., "Poly(*N*-isopropylacrylamide)-Grafting on Al to Actively Switch its Surface Drag in Water," *Polymer International*, Vol. 59, No. 10, pp. 1436 – 1440, 2010.
43. Sakaue, H., Ishii, K., "Optimization of Anodized-Aluminum Pressure-Sensitive Paint by Controlling Luminophore Concentration," *Sensors*, Molecular Diversity Preservation International, Vol. 10, No. 7, pp. 6836 – 6847, 2010.
44. Sakaue, H., Ozaki, T., Ishikawa, H., "Global Oxygen Detection in Water Using Luminescent Probe on Anodized Aluminum," *Sensors*, Molecular Diversity Preservation International, Vol. 9, No. 6, pp. 4151 – 4163, 2009.
45. Hyakutake, T., Taguchi, H., Sakaue, H., Nishide, H., "Polypyridylpropyne-Pd and -Pt Porphyrin Coating for Visualization of Oxygen Pressure," *Polymers for Advanced Technologies*, Willey, Vol. 19, No. 9, pp. 1262 – 1269, 2008.
46. Sakaue, H., Tabei, T., Kameda, M., "Hydrophobic Monolayer Coating on Anodized Aluminum Pressure-Sensitive Paint," *Sensors and Actuators B: Chemical*, Elsevier, Vol. 119, No. 2, pp. 504 – 511, 2006.
47. Mochizuki, S., Mitsuo, K., Takiura, K., Sakaue, H., Abe, Y., Imachi, K., "Image of Flow Velocity on Impeller Surface of Centrifugal Blood Pump with Pressure Sensitive Paint (PSP)," *ASAIO Journal Vol. 52, No. 2, 44A*, American Society for Artificial Internal Organs, 2006.
48. Kameda, M., Tabei, T., Nakakita, K., Sakaue, H., Asai, K., "Image Measurement of Unsteady Pressure Fluctuation by a Pressure-Sensitive Coating on Porous Anodized Aluminum," *Measurement Science and Technology*, Institute of Physics, Vol. 16, pp. 2517 – 2524, 2005.
49. Sakaue, H., "Luminophore Application Method of Anodized Aluminum Pressure Sensitive Paint as a Fast Responding Global Pressure Sensor," *Review of Scientific Instruments*, American Institute of Physics, Vol. 76, No. 8, 084101 – 084101-6, doi: 10.1063/1.1988007,2005.
50. Kameda, M., Tabei, T., Hangai, T., Kawakami, T., Nakakita, K., Sakaue, H., Asai, K., "Image Measurement of Surface Pressure Distribution on a Model in a Unsteady Flow using an Anodized Aluminum Pressure-Sensitive Coating," *Transactions of the Japan Society of Mechanical Engineers*, The Japan Society of Mechanical Engineers, Vol. 71, No. 710, pp. 2486 – 2493, 2005.
51. Sakaue, H., Mitsuo, K., Nakakita, K., "Recent Topics of Pressure-Sensitive Paint Technology," *Journal of the Visualization Society of Japan*, Visualization Society of Japan, Vol. 24 No. 95, pp. 218 – 223, 2004.
52. Sakaue, H., Gregory, J. W., Sullivan, J. P., "Porous Pressure Sensitive Paint for Characterizing Unsteady Flow Fields," *AIAA Journal*, American Institute for Aeronautics and Astronautics, Vol. 40, No. 6, pp. 1094 – 1098, doi: 10.2514/2.1757, 2002.
53. Sakaue, H., Sullivan, J. P., "Time Response of Anodized Aluminum Pressure Sensitive Paint," *AIAA Journal*, American Institute for Aeronautics and Astronautics, Vol. 39, No. 10, pp. 1944 – 1949, doi: 10.2514/2.1184, 2001.

Book Chapters, Featured Articles, and Proceedings Editor

1. Yamada, Y., Miyazaki, T., Nakagawa, M., Tsuda, S., Sakaue, H., "Part VII: Global Pressure- and Temperature-Measurements in 1.27-m JAXA Hypersonic Wind Tunnel," *29th International Symposium on Shock Waves 1, Vol 1*, Editor: Bonazza, R., and Ranjan, D., Springer International Publishing, ISBN 978-3-319-16834-0, pp. 545 – 550, DOI: 10.1007/978-3-319-16835-7, 2015.
2. Sakaue, H., "Chapter 10, Dipping Deposition Study of Anodized-Aluminum Pressure-Sensitive Paint for Unsteady Aerodynamic Applications," *Optical Sensors – New Developments and Practical Applications*, Editor: Yasin, M., InTech, ISBN 978-953-51-1233-4, DOI: 10.5772/57416, 2014.
3. Sakaue, H., Aikawa, A., Iijima, Y., Kuriki, T., Miyazaki, T. "Chapter 7, Quantum Dots as Global Temperature Measurements," *Quantum Dots – A Variety of New Applications*, Editor: Al-Ahmadi, A., InTech, ISBN 978-953-51-0483-4, DOI: 10.5772/35536, 2012.

Publications (*continued*)

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191. Sato, Y., Sakaue, H., Iijima, Y., Mochizuki, S., "AA-PSP Calibration in Water for Medical Application," *Proceedings of the 3rd Interdisciplinary Forum on Molecular Imaging*, Japan Aerospace Exploration Agency, JAXA-SP-07-024, Waseda, November, 2007.
192. Morita, K., Sakaue, H., Goto, M., Shimizu, M., Hyakutake, T., Nishide, H., "Chemical Flow Control using Hydrophilic and Hydrophobic Coatings," Proceedings of the *7th International Symposium on Advanced Fluid Information and The 4th International Symposium on Transdisciplinary Fluid Integration*, Tohoku University, W6-10-P pp. 246 – 247, 2007.
193. Morita, K., Sakaue, H., Hyakutake, T., Nishide, H., "Development of Flow Control Method using Hydrophilic and Hydrophobic Coatings," *Proceedings of 2007 Annul Meeting*, The Japan Society of Fluid Mechanics, 2007 (*in Japanese*).
194. Iijima, Y., Sakaue, H., Morita, K., "Development of Luminophore-Pendant Temperature-Sensitive Paint and its Application to Pressure-Sensitive Paint for Aerodynamic Measurements," *Proceedings of the International Congress on Instrumentation in Aerospace Facilities*, International Congress on Instrumentation in Aerospace Facilities, 2007.
195. Taguchi, H., Hyakutake, H., Nishide, H., Sakaue, H., "Synthesis of Polymerized Porphyrin Complex and its Oxygen Quenching Characteristics," *Proceedings of the 2nd Interdisciplinary Forum on Molecular Imaging*, Japan Aerospace Exploration Agency, JAXA-SP-06-017, Waseda, November, 2006.
196. Takezawa, T., Sakaue, H., "Development of Two-Color based Unsteady Pressure-Sensitive Paint for Temperature Cancellation," *Proceedings of the 2nd Interdisciplinary Forum on Molecular Imaging*, Japan Aerospace Exploration Agency, JAXA-SP-06-017, Waseda, November, 2006.
197. Iijima, Y., Sakaue, H., "Characterization of PTMST based Pressure-Sensitive Paint," *Proceedings of the 2nd Interdisciplinary Forum on Molecular Imaging*, Japan Aerospace Exploration Agency, JAXA-SP-06-017, Waseda, November, 2006.
198. Sakaue, H., Mitsuo, K., Iijima, Y., Morita, K., Hyakutake, T., Taguchi, H., Nishide, H., Kojima, T., Nagai, H., Asai, K., "Application of Luminophore-Pendant Pressure-Sensitive Paint to Fluid Dynamic Measurements," *Proceedings of the 12th International Symposium on Flow Visualization*, International Symposium on Flow Visualization, 2006.
199. Kojima, T., Nagai, H., Asai, K., Mitsuo, K., Iijima, Y., Sakaue, H., "Application of Lifetime Imaging Method to a Cryogenic Wind Tunnel," *AIAA paper2006-1044*, American Institute for Aeronautics and Astronautics, 2006.
200. Sakaue, H., Sakakibara, R., Morita, K., "Drag Reduction Method using Combination of Hydrophobic and Hydrophilic Coatings," *Bulletin of the American Physical Society, 58th Annual Meeting of the Division of Fluid Dynamics*, The American Physical Society, Vol. 50 No. 9 p. 227, 2005.
201. Kameda, M., Tabei, T., Nakakita, K., Sakaue, H., Asai, K., "Image Measurement of Unsteady Pressure Fluctuation on a Delta Wing by an Anodized Aluminum PSP," *21st International Congress on Instrumentation in Aerospace Simulation Facilities*, A0018, Sendai, August, DOI: 10.1109/ICIASF.2005.1569921, 2005.

Publications (*continued*)

202. Kojima, T., Nagai, H., Asai, K., Mitsuo, K., Iijima, Y., Sakaue, H., "Application of Lifetime PSP Imaging Method to a Cryogenic Wind Tunnel," *Proceedings of the 33rd Symposium on Visualization*, Journal of the Visualization Society of Japan, Vol. 25, No. 1, B311, 2005.
203. Kameda, M., Tabei, T., Hangai, T., Kawakami, T., Nakakita, K., Sakaue, H., Asai, K., "Image Measurement of Surface Pressure Distribution on a Model in a Unsteady Flow using AA-PSP," *Proceedings of the 33rd Symposium on Visualization*, Journal of the Visualization Society of Japan, Vol. 25, No. 1, B309, 2005.
204. Mochizuki, S., Mitsuo, K., Sakaue, H., Takiura, K., "PSP Measurements for Impeller Surface of Blood Centrifugal Pump," *Proceedings of the 33rd Symposium on Visualization*, Visualization Society of Japan, Vol. 25, No. 1, B307, 2005.
205. Sakaue, H., Iijima, Y., Kitamura, M., Sakamura, Y., Tabei, T., Kameda, M., "Response Time Characterization of Anodized Aluminum Pressure Sensitive Paint," *Proceedings of the 11th International Symposium on Flow Visualization*, International Symposium on Flow Visualization, paper No. 173, 2004.
206. Iijima, Y., Sakaue, H., Egami, Y., Nishizawa, A., Asai, K., Fey, U., Engler, R. H., "Development of Temperature Sensitive Paint Formulation for Large Scale Cryogenic Wind Tunnels," *Proceedings of the 32nd Visualization Symposium*, Visualization Society of Japan, P06-004, 2004.
207. Sullivan, J. P., Gregory, J. W., Huang, C. Y., Sakaue, H., "Flow Visualization Applications of Luminescent Paints," *Proceedings of the 10th International Symposium on Flow Visualization*, International Symposium on Flow Visualization, F0452, 2002.
208. Matsumura, S., Huang, C. Y., Choi, Y. S., Salyer, T. R., Sakaue, H., "Feasibility of Detecting Streamwise Vortices from Roughness Elements using Temperature Sensitive Paint in a Mach 4 Ludwieg Tube," *AIAA paper 2002-3238*, American Institute for Aeronautics and Astronautics, 2002.
209. Sakaue, H., Matsumura, S., Schneider, S. P., Sullivan, J. P., "Anodized Aluminum Pressure Sensitive Paint for Short Duration Testing," *AIAA paper 2002-2908*, American Institute for Aeronautics and Astronautics, 2002.
210. Gregory, J. W., Sakaue, H., Sullivan, J. P., "Fluidic Oscillator as a Dynamic Calibration Tool," *AIAA paper 2002-2701*, American Institute for Aeronautics and Astronautics, 2002.
211. Huang, C. Y., Sakaue, H., Gregory, J. W., Sullivan, J. P., "Molecular Sensor for MEMS," *AIAA paper 2002-0256*, American Institute for Aeronautics and Astronautics, 2002.
212. Gregory, J. W., Sakaue, H., Sullivan, J. P., "Unsteady Pressure Measurements in Turbomachinery using Porous Pressure Sensitive Paint," *AIAA paper 2002-0084*, American Institute for Aeronautics and Astronautics, 2002.
213. Sakaue, H., Sullivan, J. P., Egami, Y., Iijima, Y., Asai, K., Engler, R. H., Beifuss, U., Döring, F., "Open-System Pressure Sensitive Paint for Surface Pressure Measurements in a Cryogenic Wind Tunnel," *Proceedings of the International Congress on Instrumentation in Aerospace Facilities*, International Congress on Instrumentation in Aerospace Facilities, 2001.
214. Gregory, J. W., Sakaue, H., Sullivan, J. P., Raghu, S., "Characterization of Miniature Fluidic Oscillator Flow Fields using Porous Pressure Sensitive Paint," *Proceedings of AMSE FEDSM*, American Society of Mechanical Engineers, 2001.
215. Sakaue, H., Gregory, J. W., Sullivan, J. P., Raghu, S., "Porous Pressure Sensitive Paint for Unsteady Flow Fields," *AIAA paper 2001-0554*, American Institute for Aeronautics and Astronautics, 2001.
216. Sakaue, H., Sullivan, J. P., "Fast Response Time Characteristics of Anodized Aluminum Pressure Sensitive Paint," *AIAA paper 2000-0506*, American Institute for Aeronautics and Astronautics, 2000.
217. Sakaue, H., Sullivan, J. P., Asai, K., Iijima, Y., Kunimasu, T., "Anodized Aluminum Pressure Sensitive Paint in a Cryogenic Wind Tunnel," *Proceedings of the 45th International Instrumentation Symposium*, Instrument Society of America, pp. 345 – 354, 1999.

Invited Presentations and Lectures

1. "Benchmark for Unsteady PSP/TSP Measurement," January 7, 2020 presented at the 58th *AIAA Aerospace Sciences Meeting, AIAA Science and Technology Forum and Exposition,* American Institute for Aeronautics and Astronautics.
2. "Introduction to Interdisciplinary Study combing Fluid Mechanics and Chemistry: Luminescent Imaging and Chemical Flow Control," December 12, 2019 presented at Department of Mechanical Engineering-Engineering Mechanics, Michigan Technological University.
3. "Interdisciplinary Study on Fluid Mechanics and Functional Chemistry: Chemical Coating for Flow Measurement and Control," November 15, 2019 presented at Department of Mechanical, Industrial and Manufacturing Engineering, University of Toledo.

Publications (*continued*)

4. "Introduction to Interdisciplinary Engineering for Fluid Mechanics: Luminescent Imaging and Chemical Flow Control," October 24, 2019 presented at Department of Aeronautics and Astronautics. National Cheng Kung University, Taiwan.
5. "Introduction to Interdisciplinary Engineering for Fluid Mechanics: Luminescent Imaging and Chemical Flow Control," October 22, 2019 presented at Department of Power Mechanical Engineering, National Tsing Hua University, Taiwan.
6. "Introduction to Interdisciplinary Engineering for Fluid Mechanics: Luminescent Imaging and Chemical Flow Control," October 21, 2019 presented at Department of Mechanical Engineering, National Chiao Tung University, Taiwan.
7. "Luminescent imaging technique by interdisciplinary study," by Hayashi, T., Sakaue, H., July 26, 2019 presented at Center for Socio-Robotic Synthesis, Kyushu Institute of Technology
8. "Interdisciplinary Study on Fluid Mechanics and Functional Chemistry for Flow Measurement and Control," October 11, 2019 presented at Saint Mary's College.
9. "Interdisciplinary Study on Functional Chemistry and Fluid Mechanics," May 31, 2019 presented at Department of Mechanical Engineering, Tokyo University of Science.
10. "Luminescent Imaging for Fluid Dynamics," May 28, 2019 presented at Department of Aeronautics and Astronautics, The University of Tokyo.
11. "Plan for ICI Simulation for engines," by Sakaue, H., Jemcov, A., Morris, S., November 29, 2018 presented at EIWG, GE Aviation Learning Center.
12. "Interdisciplinary Study on Fluid Mechanics and Chemistry – Luminescent Imaging and Chemical Flow Control," July 24, 2018 presented at ANSYS, Montreal Office, Canada.
13. "International Project Summary of ICE-WIPS – a hybrid aircraft ice-protection system using an icephobic coating and an electric heater," June 26, 2018 presented at the AIAA Aviation and Aeronautics Forum and Exposition, American Institute for Aeronautics and Astronautics.
14. "Functional Chemistry for Flow Diagnostics and Control," May 15, 2018 presented at 29th U.S.-Japan Technology Forum, Vanderbilt University.
15. "Recent Achievements and Challenges of Fast Pressure-Sensitive Paint Technology for Rotating Machinery," December 7, 2017 presented at United Technologies Research Center.
16. "Interdisciplinary Study on Fluid Mechanics and Functional Chemistry: Chemical Coating for Flow Measurement and Control," August 1, 2017 presented at Institute of Fluid Science, Tohoku University, Japan.
17. "Pressure- and Temperature-Sensitive Paints as Interdisciplinary Study on Aerospace and Chemistry," May 16, 2017 presented at Division of Aerodynamics, Instituto de Aeronáutica e Espaço, São José dos Campos, Brazil.
18. "Micro-Fiber Coating for Wind Energy," March 13, 2017 presented at Energy Technology Laboratories, Osaka Gas Co. Ltd., Japan
19. "Chemical Coating for Flow Measurement and Control," February 9, 2017 presented at Department of Mechanical and Aerospace Engineering, Western Michigan University.
20. "Flow Measurement and Control using Functional Molecules," August 19, 2016 presented at Department of Mechanical and Aerospace Engineering, North Carolina State University.
21. "Flow Measurement and Control by Chemistry," August 3, 2016 presented at Japan Society for The Promotion of Science, Washington D. C.
22. "Introduction of Interdisciplinary Engineering for Aerospace," July 25, 2016 presented at International Engineering Program at University of Notre Dame.
23. "Fast Pressure- and Temperature-Sensitive Paints and Luminescent Imaging for Fluid Mechanics Application," June 6, 2016 presented at NASA Ames Research Center.
24. "Luminescent Imaging and Chemical Flow Control for Fluid Mechanics Application," March 23, 2016 presented at Advanced Diagnostics & Therapeutics, University of Notre Dame.
25. "Application of Functional Molecules for Icing Research" March 3, 2016 presented at NASA Glenn Research Center.
26. "Application of Functional Molecules for Flow Mechanics and Control" June 29, 2015 presented at Department of Physical and Inorganic Chemistry, Universitat Rovira Virgili, Spain.
27. "Optical Diagnostic Technology (TSP/PSP) and Chemical Flow Control" June 19, 2015 presented at The Air Force Research Laboratory, Wright-Patterson Air Force Base.

Publications (*continued*)

28. "Interdisciplinary Study on Experimental Fluid Dynamics and Chemistry, Part I: Pressure-/Temperature-Sensitive Paint and Luminescent Imaging, Part II: Chemical Flow Control," March 12, 2015 presented at NASA Langley Research Center.
29. "Interdisciplinary Study on Chemistry and Fluid Dynamics," January 21, 2015 presented at Center for Nano Science and Technology (NDnano), University of Notre Dame.
30. "PSP/TSP and Icing Protection Studies by Interdisciplinary Study on Fluid Mechanics and Chemistry," June 2, 2014, presented at School of Engineering, University of Glasgow, UK.
31. "Interdisciplinary Study on Experimental Fluid Mechanics and Chemistry: Luminescent Imaging and Chemical Flow Control," May 12, 2014, presented at Mechanical and Aerospace Engineering, University of Central Florida.
32. "Interdisciplinary Study on Experimental Fluid Dynamics and Chemistry: Luminescent Imaging and Chemical Flow Control for Fluid Dynamic Problems," March 25, 2014, presented at Aerospace and Mechanical Engineering, University of Notre Dame.
33. "Dual-Luminescent Imaging for Capturing Time-Resolved Icing Process of a Supercooled Water Droplet," November 18, 2013, presented at Institute of Aerodynamics and Flow Technology, German Aerospace Center (DLR), Germany.
34. "Flow Visualization and Control using Chemistry," November 9, 2013, presented at JSME 2013 12th Dreams of Flow Contest, Kyushu University, Japan.
35. "Application of Functional Molecules for Turbulence Visualization," October 1, 2013, presented at Mechanical & Aerospace Engineering, University of Texas at Arlington.
36. "An Interdisciplinary Study on Fluid Mechanics and Chemistry: Application of Functional Molecules for Global Pressure Measurement on a Fluttering Airfoil," September 30, 2013, presented at Department of Aerospace Engineering and Engineering Mechanics, The University of Texas at Austin.
37. "An Interdisciplinary Study on Fluid Mechanics and Chemistry: Application Functional Molecules for Global Pressure/Temperature Measurement," November 16, 2012, presented at Department of Aerospace Engineering and Mechanics, University of Minnesota.
38. "Motion Capturing PSP Method," September 3, 2012, presented at Japanese-German Seminar, JAXA, Japan.
39. "Anodized Aluminum based Sensors," June 22, 2012, presented at Department of Mechanical and Aerospace Engineering, Ohio State University.
40. "Experimental Thermal Management using Functional Molecules," April 18, 2012, presented at Department of Aerospace Engineering, Iowa State University.
41. "Anodized-Aluminum Pressure-Sensitive Paint," February 23, 2012, presented at Japanese-German Seminar, Tohoku University, Japan.
42. "An Interdisciplinary Study on Fluid Dynamics and Chemistry: Application of Functional Molecules for Global Pressure/Temperature Measurement and Flow Control," November 21, 2011, presented at School of Engineering and Applied Science, George Washington University.
43. "An Interdisciplinary Study on Fluid Dynamics and Chemistry: Application of Functional Molecules for Flow Measurement and Control," November 19, 2010, presented at Department of Aeronautics and Astronautics, University of Washington.
44. "Anti- and De-Icing Research Activities for Aeronautics at Japan Aerospace Exploration Agency," September 27, 2010, presented at Annual Seppyo Meeting of The Japanese Society of Snow and Ice, Japan.
45. "Development of Fast Responding Pressure-Sensitive Coatings and their Applications to Unsteady Flow Fields," September 8, 2010, presented at Annual Meeting of The Japan Society of Mechanical Engineers, Japan.
46. "Unsteady Flow Field Measurement using Fast Responding Pressure-Sensitive Coating," October 31, 2009, presented at The School of Architecture and Wind Engineering, Graduate School of Engineering Global COE Program, Tokyo Polytechnic University, Japan.
47. "Functional Molecules for Flow Measurement and Control in Japan Aerospace Exploration Agency," December 1, 2008, presented at Department of Mechanical and Materials Engineering, Portland State University.
48. "Application of Functional Molecules for Flow Measurement and Control," July 14, 2008, presented at Institute of Aerodynamics and Flow Technology, German Aerospace Center (DLR), Germany.
49. "Application of Functional Molecules for Flow Measurement and Control," June 30, 2008, presented at Fundamental and Experimental Aerodynamics (DAFE), French Aerospace Laboratory (ONERA), France.
50. "Application of Functional Molecules for Flow Measurement and Control," June 26, 2008, presented at School of Mechanical, Aerospace and Civil Engineering, The University of Manchester, UK.

Publications (*continued*)

51. "Supervision and Progresses of Internships at Fundamental Research Division, Japan Aerospace Exploration Agency," January 29, 2008, presented at Internship Progress Seminar, The University of Electro-Communications, Japan.
52. "Development of Pressure-Sensitive Paints for Unsteady and Cryogenic Applications," February 15, 2007, presented at School of Mechanical, Aerospace and Civil Engineering, The University of Manchester, UK.
53. "Development of Pressure-Sensitive Paints for Unsteady and Cryogenic Applications," February 14, 2007, presented at School of Electrical Engineering, KTH, Sweden.
54. "Development and Application of Unsteady and Cryogenic Pressure-Sensitive Paints," September 20, 2006, presented at Institute of Analytical Chemistry, Chemo- and Biosensors, University of Regensburg, Germany.
55. "The Development and Application of Anodized-Aluminum Pressure-Sensitive Paint," August 24, 2004, presented at Department of Chemistry, University of Washington.

Media

1. *The NHK News 7,* Oct. 4, 2020. *News Web link;* https://www3.nhk.or.jp/news/html/20201004/k10012648001000.html
2. "U. S. Air Force Tackles Fuel-Burn Reduction On Legacy Aircraft," *Aviation Week & Space Technology*, Jan. 26, 2017.
3. Sakaue, H., Iijima, Y., Morita, K., *The Hokkaido Shimbun Press Evening Paper*, Feb. 10, 2014.
4. Sakaue, H., Iijima, Y., Morita, K., Okada, T., Kanda, A., *Flight Path*, JAXA news release, No. 3, 2013.
5. Kamada, R., Morita, K., Okamoto, K., Akihito, A., Kimura, S., Sakaue, H., "Creating a Coating of Water-repellant Microscopic Particles to Keep Ice off Airplanes," *2012 Press Releases,* Division of Fluid Dynamics, The American Physical Society, San Diego, California, November 18 – 20, 2012.
6. Sakaue, H., Nishide, H., *Daily Aviation News*, Japan Aviation News, No. 13699, Nov. 22, 2007.

Fellowship and Award

1. Best Paper Award, *Annual Meeting of Visualization Society of Japan*, "Visualization of Water Droplet Temperature by using Dual-Luminescent Imaging," Aizu, Japan, September 2013.
2. JAXA Executive Director Award, "Optical Instrumentation for Unsteady Flow Field Measurements", December 2012.
3. The Daiwa Anglo-Japanese Foundation, "Grassroots Exchanges on the Lifetime-based Unsteady Imaging System as the Next Generation Pressure Measurement Tool," September 2007, ($2,000).
4. Paper Award, AIAA GTTC 2000, 1st place "Feasibility of Detecting Streamwise Vortices from Roughness Element using Temperature-Sensitive Paint in Mach 4 Ludwieg Tube," 2000.

Patents/Inventions

1. Hasegawa, H., Sakaue, H., "FIBERS FOR REDUCING DRAG," International Publication Number WO2020032995A2.
2. Sakaue, H., "Simultaneous Measurement Method of Capturing Unsteady Pressure/Temperature Distribution and Velocity Field," Japanese Patent No. 5896444.
3. Morita, K., Sakaue, H., "Super-Hydrophobic Luminescent-Global Sensor," Japanese Patent No. 6049006.
4. Sakaue, H., "Simultaneous Measurement of Flow Field and Surface Flow using Pressure-Sensitive Paint/Coating and Particle Image Velocimetry," Japanese Patent No. 5354676.
5. Sakaue, H., Huang, C. Y., "Hydrogen Sensor, Hydrogen Detection System and Method," US Patent No. US8409869.
6. Sakaue, H., Huang, C. Y., "Hydrogen Sensing Probe, System and Method," Taiwan Patent No. I403716.
7. Sakaue, H., Hyakutake, T., Nishide, H., "Flow Control by using Coatings," Japanese Patent No. 5229774.
8. Sakaue, H., Hyakutake, T., Nishide, H., "Co-Polymerized Pressure-Sensitive Paint," Japanese Patent No. 4098308.

Teaching Experience

Teaching Courses

Introduction to Aeronautics (AME20211)

- University of Notre Dame
  Fall Semester 2020
  Fall Semester 2019
  Fall Semester 2018
  Fall Semester 2017
  Fall Semester 2016

Aerospace Design (AME40462)

- University of Notre Dame
  Spring Semester 2021

Advanced Aerodynamics (AME60639)

- University of Notre Dame
  Spring Semester 2020
  Spring Semester 2018
  Spring Semester 2017
  Spring Semester 2016
  Spring Semester 2015

Surface Flow Measurement (AME60731)

- University of Notre Dame
  Spring Semester 2019
  Fall Semester 2021

Part-Time Lecturer

- Course Title: Interdisciplinary Study for Engineering Student

May 2014	Course taught for undergraduate students (senior level) **Department of Mechanical Systems Engineering, Toyama Prefectural University** Toyama, Japan
Apr. 2012	Course taught for undergraduate students (junior level) **Department of Mechanical Engineering, Kanagawa Institute of Technology** Kanagawa, Japan
Dec. 2011	Course taught for graduate students **Department of Energy and Environmental Engineering, Interdisciplinary Graduate School of Engineering Sciences, Kyushu University** Fukuoka, Japan
Apr. 2011	Course taught for undergraduate students (senior level) **Department of Mechanical Systems Engineering, Toyama Prefectural University** Toyama, Japan
May 2010	Course taught for undergraduate students (senior level) **Department of Mechanical Systems Engineering, Toyama Prefectural University** Toyama, Japan
Apr. 2009	Course taught for undergraduate students (senior level) **Department of Mechanical Systems Engineering, Toyama Prefectural University** Toyama, Japan
Oct. 2007 – Mar. 2010	**Part-Time Lecturer for Supervising Waseda Students in Fluid Dynamic Research** **Faculty of Science and Engineering, Waseda University** Tokyo, Japan

Teaching Experience (*continued*)

Instructor

- Course Title: The 8th Pressure-Sensitive Paint Course

Feb. 2019 **German Aerospace Center (DLR)**
Göttingen, Germany

- Course Title: The 2nd Pressure-Sensitive Paint Course

Jun. 2009 **German Aerospace Center (DLR)**
Göttingen, Germany

Supervisor at University of Notre Dame

PhD candidate: 3 supervisions and 7 as a committee member

- Mr. Masafumi Yamazaki
  Aug. 2020 – present
- Mr. Joseph P. Gonzales
  Jun. 2019 – present
  - The Graduate Research Fellowship Program recipient, National Science Foundation: March 30, 2020
  - Qualifying exam passed: May 13, 2020
- Mr. Daiki Kurihara
  Jun. 2018 – present
  - Qualifying exam passed: May 21, 2019
- Mr. Mitchell Lozier – committee member
  Oct. 2020 – present
  Advisor: Prof. Stanislav Gordeyev, University of Notre Dame
- Mr. Govinda Anantha Padmanabha – committee member
  Oct. 2020 – present
  Advisor: Prof. Nicholas Zabaras, University of Notre Dame
- Mr. Dazhao Huang – committee member
  Mar. 2020 – present
  Advisor: Profs. Tengfei Luo and Eungkyu Lee, University of Notre Dame
- Mr. Brian Catron – committee member
  May 2019 – present
  Advisor: Profs. Robert Rennie and Eric Jumper, University of Notre Dame
- Mr. Jonathan Wells – committee member
  May 2019 – present
  Advisor: Profs. Robert Rennie and Eric Jumper, University of Notre Dame
- Mr. Barry Pawlowski – committee member
  Aug. 2018 – present
  Advisor: Prof. Mark Rennie, University of Notre Dame
- Mr. Jacob Morrida – committee member
  Oct. 2016 – present
  Advisor: Prof. Stanislav Gordeyev, University of Notre Dame

Postdoctoral: 2 supervision and 1 co-supervision

- Dr. Mitsugu Hasegawa
  Jan. 2021 – present
- Dr. Tatsunori Hayashi
  Jun. 2020 – present
- Dr. Yuichi Hirai
  Jun. 2017 – Mar. 2018
  Hokkaido University

Teaching Experience (*continued*)

PhD completed: 3 as supervisor and 7 as a committee member

- Dr. Mitsugu Hasegawa
  Jan. 2015 – Dec. 2020
  - The Graduate Student Union Conference Presentation Grant recipient, The Graduate Student Union, University of Notre Dame: Dec. 2019
  - The Graduate Student Travel Award recipient, Department of Aerospace and Mechanical Engineering, University of Notre Dame: Dec. 2019
  - 2020 Patrick and Jana Eilers Graduate Student Fellowship for Energy Related Research, ND Energy, University of Notre Dame: Dec 2019
- Dr. Steven Claucherty
  Jul. 2015 – Aug. 2020
  - The Graduate Student Union Conference Presentation Grant recipient, University of Notre Dame: Dec. 2019
  - Notebaert Professional Development Award recipient, The Graduate School, University of Notre Dame: Dec. 2019, May, 2019 and Dec., 2018
- Dr. Tatsunori Hayashi
  Jan. 2016 – May 2020
  - The Graduate Student Union Conference Presentation Grant recipient, The Graduate Student Union, University of Notre Dame: Dec. 2019
  - The Graduate Student Travel Award recipient, Department of Aerospace and Mechanical Engineering, University of Notre Dame: Dec. 2019
- Dr. Daniel J. Simmons – committee member
  Oct. 2018 –Jul. 2020
  Advisor: Prof. Flint Thomas, University of Notre Dame
- Dr. Carson L. Running – committee member
  Jun. 2015 –Jul. 2020
  Advisor: Prof. Thomas Juliano, University of Notre Dame
- Dr. Brian Hilbert – committee member
  Feb. 2015 – May 2017
  Advisor: Prof. Scott Morris, University of Notre Dame
- Dr. Jesse Coffman – committee member
  Jun. 2016
  Advisor: Prof. Scott Morris, University of Notre Dame
- Dr. Michael Johnson – committee member
  Mar. 2016 – Apr. 2016
  Advisor: Prof. David Go, University of Notre Dame
- Dr. Christopher Kleven – committee member
  Jan. 2015 – Apr. 2016
  Advisor: Prof. Thomas Corke, University of Notre Dame
- Dr. John Dantonio – committee member
  Jul. 2015
  Advisor: Prof. Scott Morris, University of Notre Dame

MS completed: 1 as supervisor and 2 as a committee member

- Mr. Wesley Patterson
  Jun. 2016 – May 2020
- Mr. Aaron Roeder – committee member
  Jan. 2019 – May 2020
  Advisor: Prof. Stanislav Gordeyev, University of Notre Dame
- Mr. Matthew Kane – committee member
  Apr. 2017
  Advisor: Prof. Scott Morris, University of Notre Dame

Teaching Experience (*continued*)

Visiting Scholar and Student

- Mr. Yusuke Hirose
  Chiba University, Japan, Apr. 2019 – Jul. 2019
- Mr. Henrique Fanini Leite under **Coordenação de Aperfeicoamento de Pessoal de Nível Superior (CAPES)**, **Brazil**
  Instituto Tecnológico de Aeronáutica, Brazil, Aug. 2018 – Jul. 2019
- Mr. Adam Matteson
  Aug. 2018 – Oct. 2018
- Mr. Teppei Kuwata
  Toyota Institute of Technology, Japan, Aug. – Oct. 2018
- Mr. Takeshi Fujimoto
  Yokohama National University, Japan, Mar. 2018
- Mr. Yusaku Nishio
  The University of Electro-Communications, Japan, Sep. 2017 – Mar. 2018
- 2 Lieutenant Tatsuya Yamada
  National Defense Academy, Japan, Jul. 2017 – Aug. 2017
- Prof. Akira Kotani
  National Institute of Technology at Toyota Collage, Jun. 2017 – Feb. 2018
- Mr. Daiki Kurihara
  Mar. 2017 – Dec. 2017
- Mr. Mio Tanaka
  Tokyo University of Science, Japan, Oct. 2015 – Dec. 2015
- Miss. Miki Shimura
  Tokyo University of Science, Japan, Oct. 2015 – Dec. 2015
- Mr. Tatsunori Hayashi
  Feb. 2015 – Dec. 2015
- Mr. Kazunobu Kobayashi
  Osaka Gas, Japan, Jan. 2015 – Nov. 2015

Undergraduate Student: 6 students

- Mr. Nicholas Slusher under **undergraduate part-time research assistant**
  Feb. 2021 – present
- Mr. Vincent DiFilippo under **undergraduate part-time research assistant**
  Feb. 2021 – present
- Miss. Allison Taylor under **undergraduate part-time research assistant**
  Aug. 2020 – present under **Slatt Fellowship**, **ND Energy Notre Dame**
- Mr. Brendan Kane under **undergraduate part-time research assistant**
  Aug. 2020 – present under **Slatt Fellowship**, **ND Energy Notre Dame**
- Mr. Yi-Chung Chen under **undergraduate part-time research assistant**
  Jan. 2019 – present
  Jan. 2020 – Dec. 2020 under **Slatt Fellowship**, **ND Energy Notre Dame**
- Mr. Andrew Kwon under **Building Bridges Program, Notre Dame**
  Aug 2020 – present (class of 2024)

Undergraduate Student supervised: 29 students

- Miss. Gabrielle Beach under **undergraduate part-time research assistant**
  Aug. 2020 – Nov. 2020
- Ms. Diana Linares Mendes under **Building Bridges Program, Notre Dame**
  Aug 2016 – May 2020 (class of 2020)
- Miss. Marta Kernan under **undergraduate part-time research assistant**
  Jan. 2019 – May 2020
- Mr. Frank Byrd under **undergraduate part-time research assistant**
  Feb. 2020 – May 2020

Teaching Experience (*continued*)

- Mr. Neil Niere under **research credit**
  Jan. 2019 – May 2020
- Mr. Jacob Shapiro under **undergraduate part-time research assistant**
  Sep. 2019 – May 2020
- Miss. Dawn Kelly under **Naughton Fellowship for Research Experience for Undergraduates (REU)**
  Trinity College Dublin, Ireland, May 2019 – Jul. 2019
- Mr. Michael Rogers under **undergraduate part-time research assistant**
  Jan. 2018 – Dec. 2019
- Mr. Wenxi Chen under **iSURE (International Summer Undergraduate Research Experience) program**, **Notre Dame**
  Huazhong University of Science and Technology, Jul. 2019 – Aug. 2019
- Mr. Jack Gorman
  Jan. 2019 – May 2019 under **Slatt Fellowship**, **ND Energy Notre Dame**
  Aug. 2018 – Dec. 2018 under **research credit**
  Jun. 2018 – Aug. 2018 under **undergraduate part-time research assistant**
  Jan. 2018 – May 2018 under **research credit**
- Mr. Joseph Sutton under **undergraduate part-time research assistant**
  Jan. 2019 – May 2019
- Mr. Joseph Gonzales under **research credit**
  May 2018 – Apr. 2019 under **Slatt Fellowship**, **ND Energy Notre Dame**
  Jan. 2017 – May 2019
- Mr. Alexandre Boueri Alvarez under **research credit**
  Aug. 2018 – Dec. 2018
  Jan. 2018 – May 2018
  Sep. 2017 – Dec. 2017 under **undergraduate part-time research assistant**
- Mr. Hanbin Qiu under **iSURE (International Summer Undergraduate Research Experience) program**, **Notre Dame**
  Tsinghua University, Jul. 2018 – Aug. 2018
- Mr. Adam Matteson under **research credit**
  Aug. 2017 – Nov. 2018
- Mr. William Gothard under **NURF Fellowship**, **NDnano Notre Dame**
  North Carolina State University, Jun. 2018 – Aug. 2018
- Mr. Alfredo Duarte Gomez under **research credit**
  Jan. 2018 – May 2018 under **undergraduate part-time research assistant**
  Aug. 2017 – Dec. 2017 under **research credit**
  May 2017 – Jul. 2017 under **NURF Fellowship**, **NDnano Notre Dame**
- Mr. Matthew Hennessy under **undergraduate part-time research assistant**
  Oct. 2017 – May 2018
- Mr. Adam Mallette under **research credit**
  Aug. 2017 – Dec. 2017
- Mr. Jens Rataczak under **undergraduate part-time research assistant**
  Sep. 2017 – Dec. 2017
- Miss. Kelly Prussack under **undergraduate part-time research assistant**
  Aug. 2017 – Dec. 2017
- Mr. Qiaochu Wang under **iSURE (International Summer Undergraduate Research Experience) program**, **Notre Dame**
  Zhejiang University, Jul. 2017 – Aug. 2017
- Mr. Shane Combs under **undergraduate part-time research assistant**
  Jan. 2017 – Aug. 2017
- Mr. Ryan Dixon under **undergraduate part-time research assistant**
  Jan. 2017 – Aug. 2017
- Mr. Kevin Warten under **undergraduate part-time research assistant**
  Aug. 2016 – May 2017

Teaching Experience (*continued*)

- Mr. Hengfei Wang under **iSURE (International Summer Undergraduate Research Experience) program**, **Notre Dame**
  Tsinghua University, Jul. 2016 – Aug. 2016
- Miss. Kamolthita Ruengthong under **iSURE (International Summer Undergraduate Research Experience) program**, **Notre Dame**
  Chulalongkorn University, Jun. 2016 – Jul. 2016
- Mr. Arnau Rodríguez under **NURF Fellowship**, **NDnano Notre Dame**
  Universitat Rovira i Virgili, Jun. 2016 – Aug. 2016
- Mr. Senay A. Tilahun under **undergraduate part-time research assistant**
  Feb 2016 – May 2017
- Mr. Daiki Kurihara under **NURF Fellowship**, **NDnano Notre Dame**
  Tokyo University of Science, May 2015 – Jul. 2015

K-12 Outreach and Other Student related Activities

- Mr. Maximilian Neiber, **Saint Joseph High School, South Bend IN**
  Research Assignment, Jan. 2020 – May 2020
- Miss. Olivia White under **Marian High School Research Project, South Bend IN**
  Research Assignment, Nov. 2019 – Jan. 2020
- Miss Grace Boehm under **8th grader project at Discovery Middle School, Granger IN**
  Interviewed, Mar 8, 2019
- Mr. Anthony Garatoni under **Marian High School Research Project, South Bend IN**
  Research Assignment, Sep. 2018 – Jan. 2019
  Awarded in Nov. 2018: Indiana Academy of Science Junior Grant ($300.00)
- Miss. Mary Guinan under **Marian High School Research Project, South Bend IN**
  Research Assignment, Sep. 2017 – May 2018
  Awarded in Nov. 2017: Indiana Academy of Science Junior Grant ($285.00)
- Mr. Henric Zhang under **8th grader project at Hyde Middle School, Cupertino CA**
  E-mail discussion, Mar 28, 2017
- Miss Anna Wong under **8th grader project at Discovery Middle School, Granger IN**
  Laboratory visit and discussion, Feb 22, 2017
- Miss Emily Burbedge under **8th grader project at Discovery Middle School, Granger IN**
  Laboratory visit and discussion, Feb 6, 2017
- Invited by Mr. Shane Combs for **Faculty and Staff Appreciation Baseball Game**
  May 5, 2017

Supervisor for Degree-Seeking Student [*2] and Internship Student at JAXA

During his career in JAXA, Hirotaka accepted and supervised forty-five students as degree-seeking to complete their academic degrees and forty-two internship students with a broad spectrum in country, gender, and academic field. The academic field includes Mechanical Engineering, Aerospace Engineering, Environmental Engineering, Advanced Energy, Ocean Engineering, Applied Chemistry, Biology, Electrical Engineering, Systems Engineering, Physics, Chemistry, Astronomy, Information Technology, Civil Engineering, Manufacturing, Law, and Asia Pacific Studies.

***2** Degree-seeking student comes JAXA in year basis to complete his/her bachelor degree, master degree, or PhD degree. They have their supervisors at school to finish their degrees.

Professional Activities

International Paper Review

- Applied Physics Letters
- Sensors and Actuators B: Chemical
- Sensors and Actuators A: Physical
- International Journal of Heat and Mass Transfer
- Aerospace Science and Technology
- International Journal of Heat and Fluid Flow
- Journal of Physics D: Applied Physics
- Journal of Micromechanics and Microengineering
- Journal of Luminescence
- PLOS One
- Sensors
- Optics Lasers Engineering
- Experiments in Fluids
- Physic of Fluids
- Coatings
- Measurement Science and Technology
- Experimental Thermal and Fluid Science
- AIAA Journal
- Journal of Aircraft
- Journal of Mechanics
- Measurement
- Journal of Visualization
- The Japan Society for Aeronautical and Space Sciences

Scientific and Intellectual Review

- Proposal Review, Advanced Diagnostics & Therapeutics, University of Notre Dame
- Proposal Review, Division of Thermal Transport Processes, National Science Foundation
- Proposal Review, Army Research Laboratory
- Proposal Review, Office of Intellectual Property Management, University of Houston
- Proposal Review, Canada Foundation for Innovation

Scientific Review Committee

- Aerodynamic Measurement Technology Committee, American Institute for Aeronautics and Astronautics (AIAA) (since May 2017)
- 14th International Conference on Fluid Control, Measurements and Visualization (FLUCOME) (2017)
- The 16th International Symposium on Flow Visualization (ISFV16) (2014)
- The 59th ASME Turbo Expo, The ASME International Gas Turbine Institute (IGTI) (2014)
- The 28th International Symposium on Shock Waves (ISSW28) (2011)

Conference Contributions

- Chair, Aerodynamic Measurement Technology Committee, the AIAA Science and Technology Forum and Exposition, AIAA (2020)
- Organizer of Pressure-Sensitive Paint Workshop, the AIAA Science and Technology Forum and Exposition, AIAA (2020)
- Co-Chair, Aerodynamic Measurement Technology Committee, the AIAA Science and Technology Forum and Exposition, AIAA (2019)
- Organizer of Pressure-Sensitive Paint Workshop, the AIAA Science and Technology Forum and Exposition, AIAA (2019)
- Organizer of Pressure-Sensitive Paint Workshop, the AIAA Science and Technology Forum and Exposition, AIAA (2018)
- Session Chair, the AIAA Aviation and Aeronautics Forum and Exposition, AIAA (2017)
- Session Chair, International Workshop on Surface Icing and Assessment of De-Icing / Anti-Icing Technologies (2017)

Professional Activities (*continued*)

- Session Chair, Experimental Techniques – Scalar, Division of Fluid Dynamics, American Physical Society (APS) (2016)
- Organization Committee, Molecular Imaging for Interdisciplinary Research (2005 – 2014)
- Organization Committee, The 21st International Congress on Instrumentation in Aerospace Simulation Facilities (ICIASF) (2005)
- Organization Committee, International Workshop on Molecular Imaging for Interdisciplinary Research (2004)
- Organization Committee, Molecular Sensors for Aero-Thermodynamic Research (MOSAIC) International Workshop (2003)

Academic Society Member

- Associate Fellow, American Institute for Aeronautics and Astronautics (AIAA)
- Member, American Physical Society (APS)
- Member, American Society of Mechanical Engineers (ASME)