

Masazumi Fujiwara, PhD

Research Professor / Associate Professor (PI)

Faculty of Life, Environmental, Natural Science and Technology
 (Nanochemistry Group, Department of Chemistry)
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Email: masazumi@okayama-u.ac.jpWeb: www.nanochem-okayama-u.net**Current Position**

2022-	Research Professor
2021-	Associate Professor
	Faculty of Life, Environmental, Natural Science and Technology, Okayama University (Department of Chemistry, Graduate School of Life, Environmental, Natural Science and Technology)
2023-	Visiting Scholar
	Institute of Physics, Humboldt University of Berlin, Berlin, GERMANY

Previous Position

2016-2021	Lecturer, Osaka City University, Sumiyoshi, Osaka, JAPAN
2015-2016	Assistant Professor, Kwansai Gakuin University, Sanda, Hyogo, JAPAN
2015	Project Assistant Professor, Osaka City University, Sumiyoshi, Osaka, JAPAN
2013-2015	Humboldt Research Fellow, Humboldt University of Berlin, Berlin, GERMANY
2009-2014	Assistant Professor, Hokkaido University, Sapporo, Hokkaido, JAPAN

Education

Dec. 2008	Doctor of Science (PhD), Osaka City University, Sumiyoshi, Osaka, JAPAN
March 2006	Master of Science, Osaka City University, Sumiyoshi, Osaka, JAPAN
March 2004	Bachelor of Science, Osaka City University, Sumiyoshi, Osaka, JAPAN

Awards & Fellowship

2022	Research Professorship (Okayama University)
2021	Osaka City University Young Researcher Award (Nambu Yoichiro Award)
2016	Fellow of Leading Initiative for Excellent Young Researcher (LEADER) of MEXT, Japan
2015	Horiba Masao Award
2013-2015	Postdoctoral Research Fellowship of Alexander von Humboldt Foundation
2007-2008	Research Fellowships of the Japan Society for the Promotion of Science (JSPS) for Young Scientists, DC2

Grants (selected)

The Japan Society for the Promotion of Science (JSPS)

2024-2028	Grant-in-Aid for Scientific Research (A) Development of quantum-grade nanodiamonds and its applications for biological thermometry
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Japan Science and Technology Agency (JST)

2023-2026	ASPIRE for Rising Scientists
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PI: Prof. Yutaka Shikano: Infrastructure development on diamond quantum information technology

The New Energy and Industrial Technology Development Organization (NEDO)

2022-2023 **Intensive Support for Young Promising Researchers Program**

Development of temp. measurement and thermal analysis technology using a ND quantum thermometer

The Japan Agency for Medical Research and Development (AMED)

2021-2025 **Moonshot Research & Development Program**

PI: Prof. Hiroaki Murakami: Development of pre-symptomatic treatment by quantum technology neuromodulation medication targeting micro-inflammation around blood vessels leading to disease

Japan Science and Technology Agency (JST)

2021-2025 **MIRAI project: Full-scale R&D Project**

PI: Prof. Takuya Iida: Development of Minimally Invasive High-throughput Optical Condensation System

The Japan Society for the Promotion of Science (JSPS)

2021-2024 **Fund for the Promotion of Joint International Research (Fostering Joint Intl Res. (A))**

Multimodal quantum sensing thermometers for reliable nanoscale temperature measurements

The Japan Society for the Promotion of Science (JSPS)

2020-2024 **Grant-in-Aid for Scientific Research (A)**

In-vivo sub-cellular thermometry toward quantitative thermal biology

Osaka City University

2018 - 2020 **Strategic Research Project for Top-Priority Projects**

Spin-photonics Imaging for instrumentation and diagnosis

The Japan Society for the Promotion of Science (JSPS)

2017 - 2021 **Grant-in-Aid for Scientific Research (B)**

Efficient fluorescence detection of single molecules in liquid by using optical nanofibers

Ministry of Education, Culture, Sports, Science and Technology (MEXT)

2016 - 2021 **LEADER program**

Innovative nanoscale measurement and analytic tools based on quantum nanophotonics

The Japan Society for the Promotion of Science (JSPS)

2014- 2017 **Grant-in-Aid for Young Scientists (A)**

Diamond scanning probe microscope for magnetic imaging at room temperature

Selected Publications

1. Y. Zou, Y. Shikano, Y. Nishina, N. Komatsu, E. Kage-Nakadai, and **M. Fujiwara**, "Size, polyglycerol grafting, and net surface charge of iron oxide nanoparticles determine their interaction and toxicity in *Caenorhabditis elegans*", [Chemosphere 358, 142060 \(2024\)](#).
2. K. Oshimi, Y. Nishimura, T. Matsubara, M. Tanaka, E. Shikoh, L. Zhao, Y. Zou, N. Komatsu, Y. Ikado, Y. Takezawa, E. Kage-Nakadai, Y. Izutsu, K. Yoshizato, S. Morita, M. Tokunaga, H. Yukawa, Y. Baba, Y. Teki, and **M. Fujiwara**, "Glass-patternable notch-shaped microwave architecture for on-chip spin detection in biological samples", [Lab Chip 22, 2519-2530 \(2022\)](#).
3. **M. Fujiwara** and Y. Shikano, "Diamond quantum thermometry: From foundations to applications", [Nanotechnology 32, 482002 \(2021\)](#).
4. **M. Fujiwara**, A. Dohms, K. Suto, Y. Nishimura, K. Oshimi, Y. Teki, K. Cai, O. Benson, and Y. Shikano, "Real-time estimation of the optically detected magnetic resonance shift in diamond quantum thermometry toward

- biological applications”, *Phys. Rev. Research* **2**, 043415 (2020).
5. **M. Fujiwara**, S. Sun, A. Dohms, Y. Nishimura, K. Suto, Y. Takezawa, K. Oshimi, L. Zhao, N. Sadzak, Y. Umehara, Y. Teki, N. Komatsu, O. Benson, Y. Shikano, and E. Kage-Nakadai, “Real-time nanodiamond thermometry probing in-vivo thermogenic responses”, *Sci. Adv.* **6**, eaba9636 (2020).
 6. **M. Fujiwara**, K. Toubaru, T. Noda, H.-Q. Zhao, and S. Takeuchi, “Highly Efficient Coupling of Photons from Nanoemitters into Single-Mode Optical Fibers”, *Nano Lett.* **11**, 4362-4365 (2011).
 7. **M. Fujiwara**, K. Toubaru, and S. Takeuchi, “Optical transmittance degradation in tapered fibers” *Opt. Express* **19**, 8596-8601 (2011).
 8. **M. Fujiwara**, K. Yamauchi, M. Sugisaki, A. Gall, B. Robert, R. J. Cogdell, and H. Hashimoto, “Energy dissipation in the ground-state vibrational manifolds of β -carotene homologues: a sub-20-fs time-resolved transient grating spectroscopic study”, *Phys. Rev. B* **77**, 205118 (2008).
 9. **M. Fujiwara**, K. Yanagi, M. Maruyama, M. Sugisaki, K. Kuroyanagi, H. Takahashi, S. Aoshima, Y. Tsuchiya, A. Gall, and H. Hashimoto, “Second order nonlinear optical properties of the single crystal of N-benzyl 2-methyl-4-nitroaniline: anomalous enhancement of the d333 component and its possible origin”, *Jpn. J. Appl. Phys.* **45**, 8676-8685 (2006).

See Google Scholar for more detail:

<https://scholar.google.com/citations?user=JPsfmcAAAAJ&hl=en&authuser=1>

Invited Talks

Jun. 2024	Seminar at National Physical Laboratories (NPL, Dr. Alex Jones), UK
May 2024	Invited talk at Japanese Society for Medical and Biological Engineering (JSMBE)
Mar. 2024	Seminar at Max Planck Institute for Polymer Research, DE (Prof. T. Weil, Dr. Y. Wu)
Dec. 2023	Prof. Widera’s group at Technische Universität Kaiserslautern, DE
Nov. 2023	Seminar at ENS de Paris-Saclay, FR (Host: François Treussart)
Nov. 2023	Workshop for optical materials and their applications in Japan
Nov. 2023	Private seminar at Prof. Helena Knowles at Cambridge University, UK
Nov. 2023	Symposium at The Society of Electron Spin Science and Technology in Japan
Oct. 2023	Invited Seminar at FH Münster, DE (Host: Prof. Marcus Gregor)
Sep. 2023	Seminar at Prof. Dominik Bucher group at Technical University of Munich, DE
May 2023	Colloquium at Integrative Research Institute for the Sciences at Humboldt Univ. Berlin, DE
Mar. 2023	2023 conference of Hokkaido area of The Spectroscopy Society of Japan
Feb. 2023	Satellite seminar of 2022 JAIST International Symposium
Jan. 2023	Seminar at solid-state quantum sensor society in Japan
Nov. 2022	Workshop on Quantum/Nano tech. for Biomedical Application, R031 Committee of JSPS
Oct. 2022	62 nd Sensor/Actuator Tech Symp., Japan Society of Next Generation Sensor Technology
Sep. 2022	Lecture Seminar at Department of Physics, Strathclyde University, Glasgow, UK
Aug. 2022	Lecture Seminar at Institute of Physics, Humboldt University of Berlin, Berlin, DE
May 2022	4 th Annual Meeting of Quantum Biology Society in Japan, Kobe, Japan
Feb. 2022	Optics, Applied Optics Special Workshop at The University of Tokyo, Online, Japan
Dec. 2021	Biothermology Workshop 2021, Online, Japan
Mar. 2021	JSAP Spring Meeting, Symposium, Virtual Meeting, Japan
Nov. 2020	MRS Spring/Fall Virtual Meeting, USA
Jan. 2020	Seminar at Institute for Frontier Life and Medical Sciences, Kyoto University, Kyoto, Japan
Nov 2019	The 13th Japanese-Russian Workshop, Awaji-Island, Japan
Apr. 2018	Seminar at Department of Hepatology, Osaka City University, Osaka, Japan
Mar. 2018	Life-science seminar at Graduate School of Medicine, Osaka City University, Osaka, Japan
Sep. 2017	Quantum Optics Seminar at Niels Bohr Institute, Copenhagen, Denmark

Apr. 2016	Young researcher seminar of light science, Kyoto, Japan
Oct. 2015	Award lecture of 2015 Horiba Masao Award, Kyoto, Japan
Dec. 2014	Seminar at Max-Planck Institute for The Science of Light, Erlangen, Germany
Sept. 2012	Photon 12, Durham, UK
May 2012	Seminar at University of Oregon, Prof. Hailin Wang's Group, Eugene, USA
Jul. 2011	20th International Laser Physics Workshop, Sarajevo, Bosnia & Herzegovina,

Patents

1. 特許出願 2023-120722 「スピンセンサ、それを備える治具、およびそれを備える装置」
岡山大学、住友電気工業株式会社、出願日：2023年7月25日、発明者：藤原正澄、押味佳裕、西林良樹、辻拡和、寺本三記
2. 特許出願 2023-106835 「プラズマ照射下の対象物の温度測定方法」岡山大学（2023年6月29日）
出願日：2023年6月29日、発明者：藤原正澄、押味佳裕
3. 特許出願 2019-124578, PCT/JP2020/024945
「リアルタイム生体内温度計測装置」大阪市立大学
出願日：2019年7月3日、発明者：藤原正澄
4. 特許出願 2018-085225, 「容器、及び光学顕微鏡の温度調整装置」大阪市立大学・名古屋大学
出願日：2018年4月26日、発明者：藤原正澄、湯川博、馬場嘉信
5. 特許出願 2017-073456, 「拡散反射スペクトル測定装置」花王株式会社
出願日：2017年4月3日、発明者：宮里遼、橋本秀樹、藤原正澄
6. 特許出願 2017-073457, 「光触媒活性の評価方法」花王株式会社
出願日：2017年4月3日、発明者：宮里遼、橋本秀樹、藤原正澄

Book Chapter

1. 藤原正澄, 中台（鹿毛）枝里子, 湯川博, 馬場嘉信, 『量子センシング技術最前線』（根来誠編）：「NV センタを用いた温度計測と生体応用」, 株式会社エヌ・ティー・エス, 東京, 2021年3月
2. 藤原正澄, Readout (HORIBA Technical Reports) 2015 年増刊号：「ナノ光ファイバを用いた蛍光性ナノ粒子の一粒計測」, 堀場製作所, 京都, 2015年10月
3. 藤原正澄, 竹内繁樹, 化学工業：「ナノテーパ光ファイバを駆使した光量子デバイス」, 化学工業社, 東京, 2012年9月号
4. 高橋宏典, 黒柳和良, 青島紳一郎, 藤原正澄, 橋本秀樹, 光アライアンス：「極超短パルス光を利用したテラヘルツ波の発生・計測」日本工業出版, 東京, 2006年3月号

Social Activities

Committee

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| 2019 | International Workshop on Quantum Sensing and Biophotonics 2019 (IWQSB2019), Sept. 30, 2019, Osaka, Japan. |
| 2013 | The International Workshop on New Science and Technologies using Entangled Photons (NSTEP 2013), July 8-9, 2013, Osaka, Japan. |

Academic Society

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| 2023-present | Committee for Academic Cooperation, Quantum Life Science Society of Japan |
| 2022-2023 | Steering Committee for Field 1 (AMO research) in Japan Physical Society |
| 2020-2022 | Member of S&T Experts Network of National Institute of Science and Technology Policy |

(NISTEP)

2017-2021 Committee for Gender Equality Promotion of Japan Physical Society

Peer-reviewing

Nature Comm., ACS Appl. Mater. Interface, Phys.Rev.B, Cryst.Grow.Des., Car.Sci., Jpn.J.Appl.Phys., Opt.Exp., J.Cryst.Grow., Appl.Opt., Opt.Mat.Exp., Appl.Phys.Exp., Mod.Phys.Lett.B, Opt.Lett., IEEE-Photon.Tech.Lett., Chem.Lett., Carbon, Photon.Rev., JOSA-B, Sci.Rep. JPSJ, NWO funding (Dutch Research Council), JPSJ funding (Japan Society for the Promotion of Science), Research Grants Council Funding (Hong Kong)

Outreach

2014 Scientific staff of "Die Lange Nacht der Wissenschaften am Berlin und Potsdam (The long night of science in Berlin and Potsdam)", May 10, 2014, Berlin, Germany

2012 Invited to the open campus of Osaka City University as distinguished alumni (2012. Aug.)

Teaching

2022-present	Inorganic Chemistry 6, 3 rd year undergrad. (Okayama University)
2021-present	Inorganic Chemistry 4, 2 nd year undergrad. (Okayama University)
2021-present	Experiments in Chemistry for 3 rd year undergrads (Okayama University)
2021-present	Basic Experiments in Chemistry for 1 st year undergrads (Okayama University)
2021-present	Basic Modern Chemistry, 1 st -2 nd year undergraduates (Okayama University)
2019-2021	Quantum Chemistry 2 for 3 rd year undergraduates (Osaka City University)
2019-2021	Advanced Experiments in Chemistry II for 3 rd year undergraduates (Osaka City University)
2018-2021	Practice in Physical Chemistry for 3 rd year undergraduates (Osaka City University)
2017-2021	Basic Experiments in Chemistry II for 2 nd year undergraduates (Osaka City University)
2015-2016	Laboratory Work of General Chemistry, 1 st year undergraduates (Kwansei Gakuin University)
2012-2013	Freshman's seminar, 1 st year undergraduates (Hokkaido University)
