

Unit Name

Organic Optoelectronics Unit

Collaborations

Akimitsu Narita, Organic and Carbon Nanomaterials Unit, OIST, Japan, Spectroscopic analysis of nanographene

Yanqiong Zheng, Shanghai University, China, Organic semiconductor devices utilizing nanopore structures

Kiyoshi Miyata, Kyushu University, Japan, Observation of charge separation behavior by transient absorption

Chihaya Adachi, Kyushu University, Japan, Development of organic long persistent luminescence systems

Masanori Koshimizu, Shizuoka University, Japan, Development of organic dosimeters

Mischa Bonn and Xiaomin Liu, Max Planck Institute for Polymer Research (MPIP), Germany, Blinking mechanism of super-resolution microscopes

Toshinori Matsushima, Kyushu University, Japan, Analysis of the hole transport layer in perovskite solar cells

Research Personnel

Kirill Mitrofanov, Staff Scientist

Dominik Madea, Postdoctoral Scholar

Liliia Moshniaha, JSPS Fellow

Ruttapol Malatong, Postdoctoral Scholar

Sri Lakshmi Venkata Narayana Yemini, Postdoctoral Scholar, Assistant Professor at Vignan's Foundation for Science, Technology, and Research from October

Ryoko Oyama, Postdoctoral Scholar, Assistant Professor at NAIST from May

Jiahao Zhang, PhD Student

Dmitry Kovalevskiy, PhD Student

Kaede Kawaguchi, PhD Student

Yuxiang Guan, PhD Student

Rengo Yoshioka, PhD Student

Scholarly Contributions and Creative Productions (by Faculty)

Book Chapter

1. Kabe, R.

第 36 章 光誘起電荷分離を利用した有機蓄光システム. 有機半導体の開発と最新動向
Chapter 36: Organic Persistent Luminescence Systems Using Photoinduced Charge Separation
In Development and Recent Trends in Organic Semiconductors; CMC Publishing Co. Ltd., 2024.

Journal Article

1. Yang, Q.; Failla, A. V. V.; Turunen, P.; Mateos-Maroto, A.; Gai, M.; Zuschmitter, W.; Westendorf, S.; Gelléri, M.; Chen, Q.; Goudappagouda; Zhao, H.; Zhu, X.; Morsbach, S.; Scheele, M.; Yan, W.; Landfester, K.; Kabe, R.; Bonn, M.; Narita, A.; Liu, X.
Reactivatable Stimulated Emission Depletion Microscopy Using Fluorescence-Recoverable Nanographene. *Nature communications* 2025, 16, 1341.
2. Lin, Z.; Ye, J.; Shinohara, S.; Tanaka, Y.; Yoshioka, R.; Chan, C.-Y. Y.; Lee, Y.-T. T.; Tang, X.; Mitrofanov, K.; Wang, K.; Ouchi, H.; Moshniaha, L.; Narayana, Y. S. L. V.; Ishii, H.; Zhang, X.-H. H.; Adachi, C.; Chen, X.-K. K.; Kabe, R.
Blue Organic Long-Persistent Luminescence via Upconversion from Charge-Transfer to Locally Excited Singlet State. *Nature communications* 2025, 16, 2686.
3. Xu, X.; Moshniaha, L.; Vasylevskiy, S.; Kabe, R.; Ohto, T.; Narita, A.
Synthesis and Characterizations of Dibenzo-Fused Perioctacene. *Angewandte Chemie International Edition* 2025, 64, e202418334.
4. Marae, I. S.; Tan, J.; Yoshioka, R.; Ziadi, Z.; Khaskin, E.; Vasylevskiy, S.; Kabe, R.; Xu, X.; Narita, A.
Synthesis and Characterizations of Highly Luminescent 5-Isopropoxybenzo[*rst*]pentaphene. *Beilstein journal of organic chemistry* 2025, 21, 270–276.
5. Kabe, R.
光誘起電荷分離を利用した蓄光・刺激応答発光
Persistent and Stimulated Luminescence Based on Photoinduced Charge Separation
Chemistry and Chemical Industry 2024, 77, 668.
6. Zheng, Y.; Li, C.; Zhao, B.; Zhang, S.; Yang, X.; Zhang, Q.; Kabe, R.; Li, X.
In-Situ Fabricated Hexagonal PDMS Microsphere Arrays for Substrate-Mode Light Extraction in Blue Fluorescent Organic Light Emitting Diodes. *Polymer* 2024, 315, 127796.
7. Hu, Y.; Yang, X.; Huang, Z.; Xie, Q.; Chen, Y.; Zheng, Y.; Kabe, R.; Zhang, D.; Huang, J.; Qu, Y. i.; Zhang, Z.
D-A-D-Type Bipolar Hosts Incorporating N-Phenylcarbazole and Quinoline at Various Connection Sites with High Electron Mobility for Red Electrophosphorescence. *Synthetic Metals* 2024, 308, 117712.
8. Zheng, Y.; Zhang, Q.; Yang, X.; Chen, Y.; Zhao, B.; Zheng, H.; Li, X.; Kabe, R.; Chen, L.
Performance Improvement of Blue Thermally Activated Delayed Fluorescence Organic Light Emitting Diodes via in-Situ Fabricated Honeycomb Porous Polystyrene Pattern. *Optics and Lasers in Engineering* 2024, 177, 108137.
9. Zhao, H.; Guillaud, L.; Emily, M. F. F.; Xu, X.; Moshniaha, L.; Hanayama, H.; Kabe, R.; Terenzio, M.; Narita, A.
Nanographene-Based Polymeric Nanoparticles as near-Infrared Emissive Neuronal Tracers. *ACS nano* 2024, 18, 34730–34740.
10. Zhao, H.; Muñoz-Mármol, R.; Moshniaha, L.; Yang, Q.; Bonn, M.; Liu, X.; Kabe, R.; Paternò, G. M. M.; Narita, A.
Acid-Induced Fluorescence Enhancement of Piperazinylphenyl-Substituted Nanographene. *Chemical communications* 2024, 60, 14645–14648.
11. Kabe, R.
安定電荷分離状態を利用した有機光機能材料. 光化学
Optical Functional Materials That Utilize Stable Charge Separation States. *Journal of Photochemistry and Photobiology* 2024, 62, 91–94.

Patent and Intellectual Property

1. Kabe, R.; Adachi, C.

蓄光体および蓄光素子

Phosphorescent Substance and Phosphorescent Element. 7642219, WO/2018/105633, 2025.

2. Kazuya, J.; Kabe, R.; Chihaya, A.
Persistent Luminescence Emitter. US12096685, 2024.
3. Qi, Y.; Narita, A.; Wu, T.; Xu, X.; Kabe, R.; Ono, L. K.; Mariotti, S.; Raj, S.; Yoshioka, R.
Hole-Selective Contact Material, Photoelectric Conversion Device and Polycyclic Aromatic Hydrocarbon Compound. WO2024181467A1, 2024.
4. Kabe, R.; Tachikawa, T.
Composition, Organic Photostimulated Luminescent Device, Luminescent Method and Method for Designing Composition for Photostimulated Luminescence. US12071576, 2024.

Poster Presentation at Conference

1. Kabe, R.
Development of Organic Afterglow Materials. JST FOREST Workshop
創発自発的な融合の場-第3回分子生命反応創発討論会 2024.

Presentation at Conference

1. Kabe, R.
安定な有機電荷の光機能
Stable Organic Charge Optical Function. 2025.
2. Kabe, R.
OISTでの研究活動(若手研究者へのメッセージ)
Research Activities at OIST (message to Young Researchers). 2025.
3. Kabe, R.
有機発光材料中の電荷蓄積と再結合. 2024年度光化学検討会・シンポジウム「動的エキシトンによる新しい分子科学/デバイス物性の開拓」
Charge Accumulation and Recombination in Organic Light-Emitting Materials. Annual Meeting on Photochemistry 2024 Symposium 2024.
4. Kabe, R.
Emissions from Persistent Charge Carriers in Organic Semiconductors. SSDM2024 2024.
5. Kabe, R.
有機材料中の電荷蓄積と光機能. 物性研究所研究会-新物質開発・システム創成研究・最前線:分子・クラスターがもたらす物性と機能
Charge Accumulation and Photofunction in Organic Materials. The Institute for Solid State Physics Research Meeting 2024.
6. Kabe, R.
Light-Emitting Systems Utilizing Accumulated Charge Carriers in Organic Materials. STAC-14 International Conference on the Science and Technology for Advanced Ceramics 2024.
7. Kabe, R.
Persistent and Stimulated Luminescence of Organic Semiconductors. Optics & Photonics Taiwan International Conference (OPTIC) 2024.
8. Kabe, R.
Persistent and Stimulated Luminescence from Organic Materials. 12th Singapore International Chemistry Conference (SICC-12), Symposium 14: Functional Luminescent Materials 2024.
9. Kabe, R.

Photophysical Properties of Persistent Charges in Organic Semiconductors. Ming Chi University of Technology Department of Materials Engineering International Seminar 2024.

10. Kabe, R.

Persistent Charge Carriers of Organic Emitters. The 1st OIST-OU Joint Symposium on Emergent Functional Materials and Reactions 2024.

11. Kabe, R.

Stimulated Luminescence from Stable Charges of Organic Semiconductors. International Conference on Science and Technology of Synthetic electronic Materials (ICSM24) 2024.

12. Kabe, R.

Optical Functions of Persistent Charge Carriers in Organic Materials. EU-Japan Symposium on Emerging Nanomaterials for Photonics and Catalysis 2024.

13. Kabe, R.

Organic Semiconductors Showing Photoinduced Carrier Accumulation. OIST x UCSB mini symposium-"Materials of Tomorrow: Harnessing Responsiveness, Intelligence, and Sustainability" 2024.

14. Kabe, R.

Persistent and Stimulated Luminescence Based on Charge Transfer of Organic Molecules. The 104th CSJ Annual Meeting 2024 2024.

15. Kabe, R.

Optoelectronic Properties of Stable Organic Charge Carriers. OIST-Kyudai Joint Symposium series 1 Bio-Inspired Wonders and Energy Innovations 2024.

16. Kabe, R.

Stable Organic Charge Carriers Accumulated by Photoexcitation. I2CNER Thrust Workshop: Toward Carbon Neutrality, Advanced Energy Conversion Systems Thrust (AECS) 2024.

Scholarly Contributions (by Unit Members)

Name of Unit Member	Type	Title	Outlet
Rengo Yoshioka	Poster Presentation at Conference	Organic long Persistent luminescence materials with oxidation stable donor molecules	The 13th International Symposium on Dynamic Exciton (ISDyEx)
Liliia Moshniaha	Poster Presentation at Conference	Organic long-persistent luminescence enabled by long-lived excited state of photoredox catalysts	2024 年度光化学検討会 Annual Meeting on Photochemistry 2024
Rengo Yoshioka	Poster Presentation at Conference	Organic long Persistent luminescence materials with oxidation stable donor molecules	2024 年度光化学検討会 Annual Meeting on Photochemistry 2024
S.L.V. Narayana Yemini	Poster Presentation at Conference	Dendrimer as the charge-separation site of organic long-persistent luminescence systems	2024 年度光化学検討会 Annual Meeting on Photochemistry 2024
Ryoko Oyama	Presentation at Conference	遅い過渡発光を利用した有機材料の電荷蓄積メカニズム解析 Analysis of the charge accumulation mechanism in organic materials using slow transient luminescence	2024 年光化学討論会 Annual Meeting on Photochemistry 2024

Outreach Activities (For Unit Members Only)

2025-03-13

Dmitry Kovalevskiy, Okayama Prefectural Tsuyama High School visit

2025-1-29	Dmitry Kovalevskiy, Innovative Science Festa (SSH schools, joint presentation)
2024-12-11	Dmitry Kovalevskiy, Nagasaki Prefectural Nagasaki Minami High school visit
2024-10-9	Dmitry Kovalevskiy, Yokohama Science Frontier High School visit
2024-8-21	Dmitry Kovalevskiy, Tokyo Musashi Gakuen High School visit
2024-7-29	Dmitry Kovalevskiy, OIST-KEIO Summer Camp 2024
2024-7-18	Rengo Yoshioka, Guide for the OIST lab tour for attendees of the 52nd symposium on visualization, 一般社団法人 可視化情報学会
2024-6-12	Dmitry Kovalevskiy, Ibaraki Prefectural Seishin Gakuen High School visit
2024-5-9	Dmitry Kovalevskiy, Tokyo Metropolitan Yamawaki Gakuen High School visit
2024-5-2	Rengo Yoshioka, Talk on his research and career for students from Naha Municipal Kyohara Junior High School

Workshops and Seminars (Organized and Hosted by Faculty/Units)

Speaker Name(s)	Title	Location	Co-Organizers	Date
Prof. Kiyoshi Miyata (Kyushu U.)	[Seminar] Elucidation and Control of Advanced Photofunctions based on Triplet Excited States in Molecular Materials	OIST Seminar Room L4F01		2025-3-7
Dr. Fabrice Mathevet (CNRS)	[Seminar] Self-organized organic and hybrid materials for optoelectronic applications	OIST Seminar Room L5D23		2025-2-28
Prof. Chihaya Adachi (OPERA, Kyushu U.)	[Seminar] Precise Control of CT States Pioneering Advanced Organic Devices	OIST Seminar Room L4E48		2025-2-27
	[Workshop] 13th International Symposium on Dynamic Exciton (ISDyEx)	OIST Sydney Brenner Lecture Theater	Prof. Hiroshi Imahori (Kyoto U.), Christine Luscombe (OIST), Akimitsu Narita (OIST)	2025-1-28
Prof. Zhanglin Guo (Kyushu U.), Dr. Tianhao Wu (Kyushu U.)	[Seminar] Perovskite Photovoltaics for Outdoor and Indoor Applications	OIST Seminar Room L5D23		2024-10-17
Prof. Yuko Goda, Takanori Fukushima	[Workshop] JST FOREST Meeting	OIST Sydney Brenner Lecture Theater	Yosuke Katasuda (Kumamoto U.), Tomohide Saio (Tokushima U.), Reina Komiya (OIST), Tomomi Kiyomitsu (OIST), Minako Ito (Kyushu U.)	2024-6-17