SHUNSUKE YAMADA, Ph.D.

Assistant Professor

Email: yamada@ele.kyutech.ac.jp

ORCID: 0000-0002-9084-2070 | Web of Science ResearcherID: AAQ-5717-2020

Google Scholar: https://scholar.google.co.jp/citations?hl=en&user=NlTHUEwAAAAJ

Webpage: https://yamada-lab-japan.com

Total Citations: 340+ | h-index: 10 | i10-index: 10

RESEARCH STATEMENT

I develop biodegradable ionic materials and devices that disappear after use — enabling a new paradigm of "transient electronics" for medical implants, environmental sensors, and zero-waste IoT. My work bridges iontronics, materials chemistry, and MEMS to address the 50M+ tons/year of electronic waste crisis.

Core Innovation: Bioderived ionic liquids with programmable dissolution (hours to months)

Applications: Self-destructing sensors, transient energy storage, biodegradable soft robotics

RESEARCH INTERESTS

Transient Iontronics, Biodegradable Ionic Materials, Self-Destructing Sensors and Energy Devices

CURRENT POSITION

Assistant Professor (May 2024 – Present)
Department of Electrical and Electronic Engineering, Kyushu Institute of Technology, Japan

EDUCATION

Ph.D. in Engineering (March 2019)
Department of Electrical Engineering and Information Systems, The University of Tokyo, Japan
Dissertation: Self-powered Event Time Acquisition System and Its IoT Applications
Advisor: Prof. Hiroshi Toshiyoshi

M.Eng. in Engineering (March 2015)
Department of Electrical Engineering and Information Systems, The University of Tokyo, Japan
Advisor: Prof. Hiroyuki Fujita

PROFESSIONAL EXPERIENCE

Assistant Professor (April 2020 – April 2024)
Department of Robotics, Tohoku University, Japan

Collaborative Researcher (April 2019 – Present)
Institute of Industrial Science, The University of Tokyo, Japan

CREST/NEDO Researcher (April 2019 – March 2020)
Waseda University, Japan

SELECTED PUBLICATIONS

25 first/corresponding author papers in peer-reviewed journals; 5 most significant below grouped by theme:

Theme 1: Foundation — Bioderived Ionic Liquids

[1] S. Yamada* & H. Toshiyoshi, "A Water Dissolvable Electrolyte with an Ionic Liquid," Small, vol. 14, no. 32, p. 1800937, 2018. (IF: 15.1)

→ Pioneering work on transient electrolytes; 30+ citations in 8 years

[2] S. Yamada*, "Bioderived Ionic Liquids with Alkaline Metal Ions for Transient Ionics," Small, vol. 19, no. 36, p. 2302385, 2023. (IF: 15.1)

→ First alkali metal-based ionic liquid from biomass; basis for all subsequent work

Theme 2: Sensing Applications

[3] S. Yamada* & T. Honda, "Biodegradable Temperature Sensors with Enhanced Sensitivity Using Bioderived Ionic Liquid with Sodium Ions," ACS Applied Materials & Interfaces, vol. 17, no. 28, pp. 40845-40854, 2025. (IF: 9.2)

→ 10× sensitivity improvement over conventional ionic sensors

Theme 3: Energy Storage

[4] S. Yamada*, "Biodegradable Mg-Mo_2C MXene Air Batteries for Transient Energy Storage," ACS Applied Materials & Interfaces, vol. 16, no. 12, pp. 14759-14769, 2024. (IF: 9.2)

→ First fully biodegradable air battery with >200 mAh/g capacity

→ 10+ citations in first year

Theme 4: System Integration

[5] S. Yamada* & T. Honda, "Supramolecular Ionic Gels with Self-Healing and Biodegradability," Nanoscale, 2024. (Invited review, IF: 5.8)

→ Synthesis of material design, sensing, and energy storage

→ Invited as "Emerging Investigator" series (20 authors/year globally)

Complete publication list (25 papers): See Google Scholar (NlTHUEwAAAAJ)

GRANTS & FUNDING

Total: ~$340,000 as PI (2019-2025) | Competitive Success Rate: KAKENHI 100% (5/5 applications funded)

Active Grants (Principal Investigator):

1. KAKENHI Grant-in-Aid for Scientific Research (B) (2024-2027) "Biodegradable Energy Storage Devices Using Bioderived Ionic Liquids and Composite Atomic Layer Materials" Japan Society for the Promotion of Science (JSPS) ¥18,590,000 (~$125,000) Grant No. 24K01313

(Selection rate: 26% in Engineering; ranked "A" in review)

2. KAKENHI Grant-in-Aid for Challenging Research (Exploratory) (2024-2026) "Supramolecular Ionic Gels with Controlled Biodegradability and Self-Healing for Soft Robotics" Japan Society for the Promotion of Science (JSPS) ¥6,500,000 (~$44,000) Grant No. 24K21594

(Selection rate: 12%; only 1/8 awards in iontronics field)

Foundation Grants (Principal Investigator, 2023-2025, selected):

- JKA Foundation (2024): ¥5,000,000 (~$34,000)
- Nikkiso-Saneyoshi Scholarship (2025): ¥2,000,000 (~$14,000)

- Iwatani Naoji Foundation (2023): ¥2,000,000 (~$14,000)
- 3 additional foundations (2023-2024): ~¥3,000,000 (~$20,000)

Past KAKENHI (Principal Investigator, 100% success):

- Early-Career Scientists (2022-2024, 2020-2022): ¥8,840,000 (~$60,000)
- Research Activity Start-up (2019-2021): ¥2,860,000 (~$20,000)

AWARDS & HONORS

International Recognition:

2024 Rising Star in Materials Science
ACS Materials Au, American Chemical Society
→ 19 awardees worldwide from 300+ nominations (top 6% globally)
→ Recognizes "exceptional early-career contributions to sustainable materials"
→ Featured researcher profile published in journal

2023 Peer Review Recognition & Appreciation
ACS Publications, American Chemical Society
→ Official certification for "valuable contribution vital to ensuring ACS journals maintain the highest editorial standards"
→ Certificate signed by ACS Publications President and SVP of Journals

National Recognition (Japan) — 8 competitive research awards, 2019-2024:

2024 Research Encouragement Award, Japan Society of Mechanical Engineers

2023 Research Encouragement Award, Ishida Minoru Memorial Foundation

2022 Satomi Award for Young Researchers, Satomi Scholarship Foundation

2021 Research Encouragement Award, Takayanagi Kenjiro Foundation

2020 Funai Research Encouragement Award, Funai Foundation for Information Technology

2020 R&D Encouragement Award, NF Foundation

2019 Minister of Education Award, Advanced Technology Grand Prize, Sankei Shimbun

2019 Generation Award, INNO-vation Program, Ministry of Internal Affairs

TEACHING & MENTORING

Graduate Student Supervision:

- Ph.D. students: 1 graduated (2023), 0 current
  → Graduate now Assistant Professor at private university (Japan)
- M.S. students: 1 graduated (2024), 0 current
  → Published 2 co-authored papers in ACS AMI during M.S.
- Undergraduate: 3 students (2020-2024)

Courses Taught (Tohoku University, 2020-2024):

- Robotics Laboratory I & II (hands-on project course, 20-30 students/year)
- Creative Engineering Training (design thinking course, 40 students/year)

Current Capacity (Kyushu Institute of Technology, 2024-):

- Accepting 1-2 Ph.D., 2-3 M.S., and 3-4 undergraduate students annually

PROFESSIONAL SERVICE

Certified Peer Reviewer — American Chemical Society (2023)

- Official Certificate of Recognition & Appreciation from ACS Publications

"For valuable contribution vital to ensuring ACS journals maintain the highest editorial standards" — signed by ACS Publications President (James Milne, Ph.D.) and SVP of Journals Publishing (Sarah Tegen, Ph.D.)

- Web of Science ResearcherID: AAQ-5717-2020 (publicly verified review record)

Peer Review for International Journals (31 reviews, 18 journals, 2018-2025):

Elite Reviewer Status: 19 of 31 reviews (61%) for top-tier journals (IF >9)

Top-Tier Journals (IF >25, invitation-only):

- Chemical Reviews (IF 55.8, American Chemical Society) — 1 review

→ World's #1 chemistry review journal; invitation-only reviewers
→ Highest impact factor in chemistry (>50,000 citations/year)

- Chemical Society Reviews (IF 39.3, Royal Society of Chemistry) — 2 reviews

→ World's top 3 chemistry journal; invitation-only reviewers
→ Cited in >95th percentile globally

- Advanced Materials (IF 26.8, Wiley) — 3 reviews

→ Flagship materials science journal; 18% acceptance rate

High-Impact Journals (IF >15):

- Advanced Functional Materials (IF 19.0, Wiley) — 5 reviews

→ Most-reviewed journal; recognized as domain expert by editors

- ACS Nano (IF 16.0, American Chemical Society) — 2 reviews
- Advanced Science (IF 17.5, Wiley) — 1 review

Core Specialty Journals (IF 9-15):

- ACS Applied Materials & Interfaces (IF 9.5, ACS) — 3 reviews
- Small (IF 13.3, Wiley) — 1 review
- ChemSusChem (IF 9.1, Wiley) — 1 review

Additional Journals:

Polymer, Journal of Physical Chemistry (Letters), Advanced Materials Technologies, IEEE Electron Device Letters, IEEE Sensors Journal, IEEE JMEMS, Japanese Journal of Applied Physics, Applied Physics Express (10 reviews total)

Review Impact Metrics:

- 61% of reviews for journals with Impact Factor >9 (elite tier)
- 87% of reviews for journals with Impact Factor >4 (high-impact tier)
- Average Impact Factor of reviewed journals: 14.8 (far above field average of ~4)
- Trusted reviewer for 3 of the world's top 10 materials science journals

Conference Organization & Leadership:

- Program Committee Member, International Conference on Solid State Devices and Materials (SSDM), 2021-2023

  → One of Asia's top 3 electronics conferences; 1,200+ attendees annually

  → Reviewed 15+ technical papers per year

- Technical Program Committee Member, PowerMEMS 2021

  → Leading conference in energy harvesting; reviewed 8 papers

Academic Society Leadership:

- Vice President, Japan Society of Applied Physics, Solar Energy Conversion Research Group, 2022-present

  → Youngest elected officer in group's 15-year history

  → Organizes technical sessions and workshops (200+ members)

- Treasurer, Institute of Electrical Engineers of Japan, Division E, 2023-present

  → Manages division budget and coordinates technical activities

- Vice Treasurer, Japan Society of Applied Physics, Integrated MEMS Research Group, 2021-present

Professional Memberships:

American Chemical Society (ACS), Institute of Electrical and Electronics Engineers (IEEE), Japan Society of Applied Physics (JSAP), Japan Society of Mechanical Engineers (JSME), Institute of Electrical Engineers of Japan (IEEJ)