Kentaro Yumigeta

Postdoctoral Research Associate, Materials Science and Engineering

University of Arizona | Tucson, AZ | kyumiget@arizona.edu

Profile

I am a materials scientist and experimental physicist specializing in the synthesis, characterization, and device integration of low-dimensional quantum materials. At the University of Arizona, I study atomically precise graphene nanoribbons and develop transfer, deposition, and nanofabrication strategies for high-performance nanoelectronic devices. My work combines fundamental studies of van der Waals and carbon-based materials with practical expertise in scalable processing and device fabrication, positioning me to contribute immediately to collaborative research in nanoelectronics, optoelectronics, and sensing.

Education

PhD in Physics Aug 2016–May 2023

Arizona State University, Tempe, AZ

- Thesis: "Charge Density Wave Engineering in Rare-Earth Tritellurides: Investigating Stability and Related Phenomena for Novel Applications." Advisor: Dr. Seth Ariel Tongay.

MEng in Electrical and Electronics Engineering Apr 2014–Jul 2016

Chiba University, Chiba, Japan

- Thesis: "Improved Luminescent Properties by Annealing of Eu-Doped GaN and AlN Films Prepared via Sputtering." Advisors: Dr. Yoshihiro Ishitani, Dr. Ken Morita, and Dr. Bei Ma.

BE in Electrical and Electronics Engineering Apr 2010–Mar 2014

Chiba University, Chiba, Japan

- Thesis: "Characterization of Absorption Spectra of Rare Earth and Transition Metal-Doped GaN and AlN in the Visible and Ultraviolet Regions." Advisors: Dr. Yoshihiro Ishitani, Dr. Ken Morita, and Dr. Bei Ma.

Academic Appointment

Postdoctoral Research Associate Apr 2024–Present

Department of Materials Science and Engineering, University of Arizona

- Supervisor: Dr. Zafer Mutlu. Research on atomically precise graphene nanoribbons, scalable transfer and deposition methods, nanoelectronic devices, radiation sensing concepts, and surface acoustic wave device platforms.

Publications

Metrics: 31 publications; 3,260 citations; h-index 19; i10-index 24 (Google Scholar, as of April 2026).
Google Scholar: `https://scholar.google.com/citations?user=cuItojgAAAAJ&hl=en`

Journal Articles

1. **Yumigeta, K.**, Yusufoglu, M., Federici, J. G., Hughes, E. T., Degirmenci, A. M., Njardarson, J. T., Simmons-Potter, K., Potter, B. G., & Mutlu, Z., "Electrical and Structural Response of Nine-Atom-Wide Armchair Graphene Nanoribbon Transistors to Gamma Irradiation," ACS Appl. Mater. Interfaces 18, 25103 (2026). **[Front Cover]**

2. **Yumigeta, K.**, Yusufoglu, M., Sarker, M., Raj, R., Daluisio, F., Holloway, R., Yawit, H., Sweepe, T., Battaglia, J., Janssen, S., Welch, A. C., DiPasquale, P., Mkhoyan, K. A., Sinitskii, A., & Mutlu, Z., "Scalable Etch-Free Transfer of Low-Dimensional Materials From Metal Films to Diverse Substrates," Adv. Mater. Interfaces 13, e00630 (2026).
3. **Yumigeta, K.**, Kopaczek, J., Banerjee, R., Moosavy, S. T. R., Yarra, A., Povilus, B., Ruddick, H., Sailus, R., Kumar, M., Lakhavade, S., Ou, Y., Mutlu, Z., & Tongay, S. A., "Schottky barrier formation and band realignment of rare-earth tritelluride charge density wave material–semiconductor interfaces," Appl. Phys. Lett. 126, 151602 (2025).
4. Banerjee, R., Uppala, S., Kopaczek, J., Ahmed, S., Wu, C. L., Kumar, M., **Yumigeta, K.**, Celano, U., & Tongay, S. A., "Controllable synthesis of environmentally stable vdW antiferromagnetic oxyhalide CrOCl," Nanoscale 17, 5472 (2025).
5. Dinh, C., Yusufoglu, M., **Yumigeta, K.**, Kinikar, A., Sweepe, T., Zeszut, Z., Chang, Y., Copic, C., Janssen, S., Holloway, R., Battaglia, J., Kuntubek, A., Zahin, F., Cosmi, Y. L., Vandenberghe, W. G., LeRoy, B. J., Mullen, K., Fasel, R., Barin, G. B., & Mutlu, Z., "Atomically Precise Graphene Nanoribbon Transistors with Long-Term Stability and Reliability," ACS Nano 18, 22949 (2024).
6. **Yumigeta, K.**, Kopaczek, J., Attarde, Y., Sayyad, M., Blei, M., Rajaei Moosavy, S. T., Yarra, A., Ruddick, H., Povilus, B., Banerjee, R., Ou, Y., & Tongay, S., "Alloying Effect of Rare-Earth Tritellurides on the Charge Density Wave and Magnetic Properties," Appl. Phys. Rev. 11, 011407 (2024). **[Featured in Journal]**
7. Shan, H., Drawer, J. C., Sun, M., Anton-Solanas, C., Esmann, M., **Yumigeta, K.**, Watanabe, K., Taniguchi, T., Tongay, S., Hofling, S., Savenko, I., & Schneider, C., "Second-Order Temporal Coherence of Polariton Lasers Based on an Atomically Thin Crystal in a Microcavity," Phys. Rev. Lett. 131, 206901 (2023).
8. Sayyad, M., Qin, Y., Kopaczek, J., Gupta, A., Patoary, N., Sinha, S., Benard, E., Davis, A., **Yumigeta, K.**, Wu, C. L., Li, H., Yang, S., Esqueda, I. S., Singh, A., & Tongay, S., "Strain Anisotropy Driven Spontaneous Formation of Nanoscrolls from 2D Janus Layers," Adv. Funct. Mater. 33, 2303526 (2023). **[Front Cover]**
9. Kopaczek, J., **Yumigeta, K.**, Ibrahim, A., Sayyad, M., Sinha, S., Sailus, R., Hays, P., Moosavy, S. T. R., Ataca, C., Kudrawiec, R., & Tongay, S., "Experimental and theoretical studies of the surface oxidation process of Rare-Earth Tritellurides," Adv. Electron. Mater. 9, 2201129 (2023).
10. **Yumigeta, K.**, Attarde, Y., Kopaczek, J., Sayyad, M., Shen, Y., Blei, M., Rajaei Moosavy, S. T., Qin, Y., & Tongay, S., "The Phononic and Charge Density Wave Behavior of Entire Rare-Earth Tritelluride Series with Chemical Pressure and Temperature," APL Mater. 10, 111112 (2022).
11. Zhang, Z., Regan, E. C., Wang, D., Zhao, W., Wang, S., Sayyad, M., **Yumigeta, K.**, Watanabe, K., Taniguchi, T., Tongay, S., Crommie, M., Zettl, A., Zaletel, M. P., & Wang, F., "Correlated interlayer exciton insulator in heterostructures of monolayer WSe_2 and moire WS_2/WSe_2," Nat. Phys. 18, 1214 (2022).
12. Naik, M. H., Regan, E. C., Zhang, Z., Chan, Y.-H., Li, Z., Wang, D., Yoon, Y., Ong, C. S., Zhao, W., Zhao, S., Utama, M. I. B., Gao, B., Wei, X., Sayyad, M., **Yumigeta, K.**, Watanabe, K., Taniguchi, T., Tongay, S., da Jornada, F. H., Wang, F., & Louie, S. G., "Intralayer charge-transfer moire excitons in van der Waals superlattices," Nature 609, 52 (2022).
13. Kopaczek, J., Li, H., **Yumigeta, K.**, Sailus, R., Sayyad, M. Y., Moosavy, S. T. R., Kudrawiec, R., & Tongay, S., "Pressure-induced suppression of charge density phases across the entire rare-earth tritellurides by optical spectroscopy," J. Mater. Chem. C 10, 11995 (2022).
14. Kopaczek, J., Zelewski, S., **Yumigeta, K.**, Sailus, R., Tongay, S., & Kudrawiec, R., "Temperature Dependence of the Indirect Gap and the Direct Optical Transitions at the High-Symmetry Point of the Brillouin Zone and Band Nesting in MoS_2, $MoSe_2$, $MoTe_2$, WS_2, and WSe_2 Crystals," J. Phys. Chem. C 126, 5665 (2022).
15. Shan, H., Iorsh, I., Han, B., Rupprecht, C., Knopf, H., Eilenberger, F., Esmann, M., **Yumigeta, K.**, Watanabe, K., Taniguchi, T., Klembt, S., Hofling, S., Tongay, S., Anton-Solanas, C., Shelykh, I. A., & Schneider, C., "Brightening of a dark monolayer semiconductor via strong light-matter coupling in a

cavity," Nat. Commun. 13, 1 (2022).

16. Benson, G., Zurdo Costa, V., Border, N., **Yumigeta, K.**, Blei, M., Tongay, S., Watanabe, K., Taniguchi, T., Ichimura, A., Kc, S., Salavati-fard, T., Wang, B., & Newaz, A., "Giant Effects of Interlayer Interaction on Valence-Band Splitting in Transition Metal Dichalcogenides," J. Phys. Chem. C 126, 8667 (2022).
17. Shan, H., Lackner, L., Han, B., Sedov, E., Rupprecht, C., Knopf, H., Eilenberger, F., Beierlein, J., Kunte, N., Esmann, M., **Yumigeta, K.**, Watanabe, K., Taniguchi, T., Klembt, S., Hofling, S., Kavokin, A. V., Tongay, S., Schneider, C., & Anton-Solanas, C., "Spatial coherence of room-temperature monolayer WSe_2 exciton-polaritons in a trap," Nat. Commun. 12, 1 (2021). **[Top 25 Physics Articles]**
18. Li, H., Li, S., Naik, M. H., Xie, J., Li, X., Wang, J., Regan, E., Wang, D., Zhao, W., Zhao, S., Kahn, S., **Yumigeta, K.**, Blei, M., Taniguchi, T., Watanabe, K., Tongay, S., Zettl, A., Louie, S. G., Wang, F., & Crommie, M. F., "Imaging moire flat bands in three-dimensional reconstructed WSe_2/WS_2 superlattices," Nat. Mater. 20, 945 (2021).
19. Lorchat, E., Selig, M., Katsch, F., **Yumigeta, K.**, Tongay, S., Knorr, A., Schneider, C., & Hofling, S., "Excitons in Bilayer MoS_2 Displaying a Colossal Electric Field Splitting and Tunable Magnetic Response," Phys. Rev. Lett. 126, 037401 (2021).
20. **Yumigeta, K.**, Qin, Y., Li, H., Blei, M., Attarde, Y., Kopas, C., & Tongay, S., "Advances in Rare-Earth Tritelluride Quantum Materials: Structure, Properties, and Synthesis," Adv. Sci. 8, 2004762 (2021). **[Invited Review]**
21. Li, H., Li, S., Naik, M. H., Xie, J., Li, X., Regan, E., Wang, D., Zhao, W., **Yumigeta, K.**, Blei, M., Taniguchi, T., Watanabe, K., Tongay, S., Zettl, A., Louie, S. G., Crommie, M. F., & Wang, F., "Imaging local discharge cascades for correlated electrons in WS_2/WSe_2 moire superlattices," Nat. Phys. 17, 1114 (2021). **[News & Views (Nature)]**
22. Li, J., Goryca, M., **Yumigeta, K.**, Li, H., Tongay, S., & Crooker, S. A., "Valley relaxation of resident electrons and holes in a monolayer semiconductor: Dependence on carrier density and the role of substrate-induced disorder," Phys. Rev. Mater. 5, 044001 (2021). **[Editor's Suggestion]**
23. Li, H., Wines, D., Chen, B., **Yumigeta, K.**, Sayyad, M. Y., Kopaczek, J., Yang, S., Ataca, C., Sargent, E. H., & Tongay, S., "Abnormal Phase Transition and Band Renormalization of Guanidinium-Based Organic–Inorganic Hybrid Perovskite," ACS Appl. Mater. Interfaces 13, 44964 (2021).
24. Li, H., Li, S., Regan, E. C., Wang, D., Zhao, W., Kahn, S., **Yumigeta, K.**, Blei, M., Taniguchi, T., Watanabe, K., Tongay, S., Zettl, A., Crommie, M., & Wang, F., "Imaging two-dimensional generalized Wigner crystals," Nature 597, 650 (2021). **[News & Views (Nature)]**
25. Zhao, W., Regan, E. C., Wang, D., Jin, C., Hsieh, S., Wang, Z., Wang, J., Wang, Z., **Yumigeta, K.**, Blei, M., Watanabe, K., Taniguchi, T., Tongay, S., Yao, N. Y., & Wang, F., "Dynamic tuning of moire excitons in a WSe_2/WS_2 heterostructure via mechanical deformation," Nano Lett. 21, 8910 (2021).
26. Regan, E. C., Wang, D., Jin, C., Bakti Utama, M. I., Gao, B., Wei, X., Zhao, S., Zhao, W., Zhang, Z., **Yumigeta, K.**, Blei, M., Carlstrom, J. D., Watanabe, K., Taniguchi, T., Tongay, S., Crommie, M., Zettl, A., & Wang, F., "Mott and generalized Wigner crystal states in WSe_2/WS_2 moire superlattices," Nature 579, 359 (2020).
27. **Yumigeta, K.**, Kopas, C., Blei, M., Hajra, D., Shen, Y., Trivedi, D., Kolari, P., Newman, N., & Tongay, S., "Low-temperature synthesis of 2D anisotropic $MoTe_2$ using a high-pressure soft sputtering technique," Nanoscale Adv. 2, 1443 (2020). **[Front Cover]**
28. Chu, Z., Regan, E. C., Ma, X., Wang, D., Xu, Z., Utama, M. I. B., **Yumigeta, K.**, Blei, M., Watanabe, K., Taniguchi, T., Tongay, S., Wang, F., & Lai, K., "Nanoscale Conductivity Imaging of Correlated Electronic States in WSe_2/WS_2 Moire Superlattices," Phys. Rev. Lett. 125, 186803 (2020).
29. **Yumigeta, K.**, Brayfield, C., Cai, H., Hajra, D., Blei, M., Yang, S., Shen, Y., & Tongay, S., "The synthesis of competing phase GeSe and $GeSe_2$ 2D layered materials," RSC Adv. 10, 38227 (2020).
30. Hajra, D., Sailus, R., Blei, M., **Yumigeta, K.**, Shen, Y., & Tongay, S., "Epitaxial Synthesis of Highly Oriented 2D Janus Rashba Semiconductor BiTeCl and BiTeBr Layers," ACS Nano 14, 15626 (2020).
31. Iff, O., Tedeschi, D., Martin-Sanchez, J., Moczala-Dusanowska, M., Tongay, S., **Yumigeta, K.**, Taboada-Gutierrez, J., Savaresi, M., Rastelli, A., Alonso-Gonzalez, P., Hofling, S., Trotta, R., & Schneider, C., "Strain-Tunable Single Photon Sources in WSe_2 Monolayers," Nano Lett. 19, 6931 (2019).

Conference Papers

1. M. Yusufoglu, **K. Yumigeta**, and Z. Mutlu, "Direct Dielectric Deposition on Graphene Nanoribbon FETs," TECHCON, Austin, TX, USA, September 2025.

Patent Applications

1. Z. Mutlu, B. G. Potter, K. Simmons-Potter, **K. Yumigeta**, and M. Yusufoglu, "Integrable, nano-electronic neutron detectors based on graphene nanoribbons and associated chemical and structural derivatives", Submitted.
2. Z. Mutlu, **K. Yumigeta**, and M. Yusufoglu, "Development of Single-Crystalline 2D Gate Dielectrics for GAAFET Technologies", UA25-257.
3. Z. Mutlu, **K. Yumigeta**, and M. Yusufoglu, "Bottom-Up Low-Temperature Synthesis of Graphene Interconnects for GAAFETs", UA25-258.
4. **K. Yumigeta**, Z. Mutlu, and M. Yusufoglu, "Wafer-Scale Synthesis and Deposition of One-Dimensional Materials with Precisely Controlled Intervals on Thermally Treated Substrates", UA25-012.

Research Funding and Proposals

- **[PI]** Center for Integrated Nanotechnologies (CINT) User Proposal: Defect-Based Radiation Sensing Enhanced by Quantum Confinement in Atomically Precise Graphene Nanoribbons.
- **[PI]** New Frontiers of Sound (NewFoS) STC Seed Project, University of Arizona, $50,000, 2025–2026: Topological Terahertz Acoustic Laser in Graphene: Device Development to Interactive Educational Platform for Visualizing Acoustic Waves.
- **[PI]** Postdoctoral Research Development Grant, University of Arizona, $2,000, 2025–2026: Advancing Radiation Monitoring via Atomically Precise Graphene Nanoribbon-Based Sensors.
- Lawrence Berkeley National Laboratory User Proposal, 2024: Scalable Enhancement of Graphene Nanoribbon-Based Field Effect Transistor via Atomic Layer Deposition for Emerging High-K Dielectrics and N-Type Doping.

Awards and Honors

- Outstanding Postdoctoral Scholar Award, University of Arizona, 2026.
- Sigma Xi, The Scientific Research Honor Society, Full Member, 2026–Present.
- University of Arizona Sursum Fellow, University of Arizona, 2025.
- Summer University Graduate Fellowship, Arizona State University, 2019.

Presentations

Talks

1. **Yumigeta, K.**, Yusufoglu, M., Takeda, W., Holloway, R., Welch, A. C., Battaglia, J. R., Yawit, H. J., Ellersick, L. F., and Mutlu, Z., "Vapor-Phase Synthesis of Atomically Precise Graphene Nanoribbons." MRS Spring Meeting & Exhibit, Honolulu, HI, USA, April 30, 2026.
2. **Yumigeta, K.**, "Integrating Atomically Precise Graphene Nanoribbons into Electronic Devices." Department of Materials Science and Engineering seminar, University of Arizona, Tucson, AZ, USA, March 23, 2026.
3. **Yumigeta, K.**, "Research on Graphene Nanoribbon Devices for Low-Power, High-Performance Computing." Invited talk, Chiba University, Chiba, Japan, January 20, 2026.
4. **Yumigeta, K.**, Yusufoglu, M., Daluisio, F., Holloway, R., Mutlu, Z., "Scalable Etchant-Free Transfer

Technique for Low-Dimensional Materials from Metal Thin Film Surfaces." MRS Spring Meeting & Exhibit, Seattle, WA, USA, April 10, 2025.

Poster Presentations

1. **Yumigeta, K.**, Yusufoglu, M., Potter, B. G., and Mutlu, Z., "Gamma-Ray-Induced Electronic Modulation in Atomically Precise Graphene Nanoribbons." MRS Spring Meeting & Exhibit, Honolulu, HI, USA, April 29, 2026.
2. **Yumigeta, K.**, Yusufoglu, M., Sarker, M., Daluisio, F., Holloway, R., Yawit, H., Sweepe, T., Battaglia, J., Janssen, S., Welch, A., Sinitskii, A., Mutlu, Z., "Wafer-scale etch-free transfer of carbon nanostructures from metal thin films to diverse substrates." 39th North American Molecular Beam Epitaxy Conference & Workshop on MBE for Emerging Emitter Technologies (NAMBE 2025), Santa Ana Pueblo (Albuquerque), NM, August 25, 2025.
3. **Yumigeta, K.**, "Alloying Effect of Rare-Earth Tritellurides on the Charge Density Wave and Magnetic Properties." MRS Fall Meeting & Exhibit, Boston, MA, USA, December 4, 2024.

Contributed Presentations

1. **[Oral]** H. J. Yawit, T. Gustafson, F. Najmi, W. Takeda, **K. Yumigeta**, Y. Kandelchy, K. Kraseman, P. Deymier, P. Lucas, K. Muralidharan, and Z. Mutlu, "Phase-Change Material Integration on Surface Acoustic Wave Delay Lines for Reconfigurable Topological Acoustic RF Devices," MRS Spring Meeting & Exhibit, Honolulu, HI, USA, April 29, 2026.
2. **[Poster]** T. Gustafson, H. Yawit, Y. Kandelchy, K. Kraseman, **K. Yumigeta**, and Z. Mutlu, "Phononic Crystals for Surface Acoustic Wave Devices," Emerging Researchers National (ERN) Conference, Atlanta, GA, March 19–21, 2026.
3. **[Poster]** K. Kraseman, H. Yawit, T. Gustafson, Y. Kandelchy, **K. Yumigeta**, and Z. Mutlu, "Design and Fabrication of Chip-scale Surface Acoustic Wave Devices for Advanced RF Technologies," Emerging Researchers National (ERN) Conference, Atlanta, GA, March 19–21, 2026.
4. **[Poster]** Y. Kandelchy, H. Yawit, T. Gustafson, K. Kraseman, **K. Yumigeta**, and Z. Mutlu, "Characterization of Surface Acoustic Wave Devices for Advanced Radio Frequency Technologies," Emerging Researchers National (ERN) Conference, Atlanta, GA, March 19–21, 2026.
5. **[Poster]** H. J. Yawit, T. Gustafson, F. Najmi, W. Takeda, **K. Yumigeta**, Y. Kandelchy, K. Kraseman, P. Deymier, P. Lucas, K. Muralidharan, and Z. Mutlu, "Laser-Written Periodic Phononic Structures for Chip-Scale Topological Acoustic Wave RF Devices," MRS Spring Meeting & Exhibit, Honolulu, HI, USA, April 28, 2026.
6. **[Poster]** H. Yawit, T. Gustafson, F. Najmi, W. Takeda, **K. Yumigeta**, Y. Kandelchy, K. Kraseman, K. Runge, P. Deymier, P. Lucas, K. Muralidharan, and Z. Mutlu, "Laser-Patterned Phononic Lattices on Lithium Niobate for Surface Acoustic Wave Devices," MRS Fall Meeting & Exhibit, Boston, MA, December 2, 2025.
7. **[Oral]** M. Yusufoglu, **K. Yumigeta**, and Z. Mutlu, "Direct Dielectric Deposition on Graphene Nanoribbon FETs," TECHCON Conference, Austin, TX, September 2025.
8. **[Poster]** T. Gustafson, H. Yawit, K. Kraseman, Y. Kandelchy, **K. Yumigeta**, and Z. Mutlu, "Design of Phononic Crystals for Surface Acoustic Wave Devices," NSF NewFoS Center REM Program Student Symposium, Tucson, AZ, July 25, 2025.
9. **[Poster]** Y. Kandelchy, H. Yawit, T. Gustafson, K. Kraseman, **K. Yumigeta**, and Z. Mutlu, "Characterization of Surface Acoustic Wave Devices for Advanced Radio Frequency Technologies," NSF NewFoS Center REM Program Student Symposium, Tucson, AZ, July 25, 2025.
10. **[Poster]** K. Kraseman, H. Yawit, Y. Kandelchy, T. Gustafson, **K. Yumigeta**, and Z. Mutlu, "Design of Surface Acoustic Wave Devices for Advanced Radio Frequency Technologies," NSF NewFoS Center REM Program Student Symposium, Tucson, AZ, July 25, 2025.
11. **[Poster]** Holloway, R., **Yumigeta, K.**, Yusufoglu, M., Janssen, S., Mutlu, Z., "Nanoscale Metrology of Gate Dielectrics for Graphene Nanoribbon Transistors." VIP and CURE Spring 2025 Poster Session, Tucson, AZ, April 24, 2025.
12. **[Poster]** Daluisio, F., **Yumigeta, K.**, Yusufoglu, M., Holloway, R., Mutlu, Z., "Wafer-Scale Fabrication

of Nano-Scale Steps with Controlled Pitch on Gold Thin Films Using Thermally Treated Single-Crystal Substrates." VIP and CURE Spring 2025 Poster Session, Tucson, AZ, April 24, 2025.

13. **[Poster]** Janssen, S., Yusufoglu, M., **Yumigeta, K.**, Mutlu, Z., "Long-term Stability of Atomically Precise Graphene Nanoribbon Transistors." VIP and CURE Spring 2025 Poster Session, Tucson, AZ, April 24, 2025.
14. **[Poster]** Janssen, S., Yusufoglu, M., **Yumigeta, K.**, Mutlu, Z., "Long-term Stability of Atomically Precise Graphene Nanoribbon Transistors." MRS Spring Meeting & Exhibit, Seattle, WA, USA, April 9, 2025.
15. **[Poster]** Holloway, R., **Yumigeta, K.**, Yusufoglu, M., Janssen, S., Mutlu, Z., "Nanoscale Metrology of Gate Dielectrics for Graphene Nanoribbon Transistors." MRS Spring Meeting & Exhibit, Seattle, WA, USA, April 9, 2025.
16. **[Poster]** T. Sweepe, **K. Yumigeta**, M. Yusufoglu, and Z. Mutlu, "Electrical Transport in Atomically Precise Graphene Nanoribbon Transistors with Transferred Electrodes," MRS Spring Meeting & Exhibit, Seattle, WA, USA, April 9, 2025.
17. **[Oral]** Mutlu, Z., Belviranli, M. E., Kose, S., **Yumigeta, K.**, & Yusufoglu, M., "Towards High Performance and Scalable Graphene Nanoribbon-Based Logic Devices," Semiconductor Research Corporation (SRC) GRC 2024 Logic and Memory Devices Annual Meeting, Intel Gordon Moore Park, Hillsboro, OR, USA, September 2024.
18. **[Poster]** Janssen, S., Yusufoglu, M., **Yumigeta, K.**, Mutlu, Z., "Long-term Stability of Atomically Precise Graphene Nanoribbon Transistors." TECHCON 2024, Austin, TX, September 8, 2024.

Teaching Experience

Guest Lecturer *University of Arizona*

- Course: MSE 110: Solid State Chemistry.

Teaching Assistant *Arizona State University*

- Courses: PHY 101: Introduction to Physics Lab; PHY 122: General Physics Lab I; PHY 132: General Physics Lab II.

Teaching Assistant *Chiba University*

- Course: TE 331: Electrical and Electronics Engineering Lab.

Mentoring

Current Group Members

- PhD students: Muhammed Yusufoglu and Howard Yawit, Department of Materials Science and Engineering, University of Arizona.
- Master's student: Liam Fox Ellersick, Department of Materials Science and Engineering, University of Arizona.
- Undergraduate students: Richard Holloway and Alex Charles Welch, Department of Materials Science and Engineering, University of Arizona; Michael Wegner, Department of Chemical and Environmental Engineering, University of Arizona.

Former Group Members

- Master's students: Thomas Sweepe (University of Arizona); Sushant Lakhavade and Yashika Attarde (Arizona State University).

- Undergraduate students: Paul DiPasquale and Shelby Brooke Janssen, Department of Materials Science and Engineering, University of Arizona; Franco Osvaldo Daluisio, Department of Chemical and Environmental Engineering, University of Arizona.

Professional Service and Outreach

- Journal referee for *Nature Communications*, *Applied Physics Letters*, *Carbon*, *Nano Letters*, *Small*, *Electrochimica Acta*, and *Sensing and Bio-Sensing Research*.
- Reviewer for the University of Arizona Postdoctoral Research Development Grant (PRDG), 2026.
- Featured in an MRS TV film (April 2024) highlighting semiconductor research and education initiatives at the University of Arizona and the Center for Semiconductor Manufacturing.
- Volunteer interpreter for Japanese high school students at the International Science and Engineering Fair (2021–2022 and 2026).