



Professor

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Background

2019	Shimane University, Academic Assembly, Institute of Science and Engineering, Professor
2018	Shimane University, Academic Assembly, Institute of Science and Engineering, Associate Professor
2012	Shimane University, Faculty of Science & Engineering, Associate professor
2009-2010	Okinawa Institute of Science and Technology Promotion Corporation, Visiting Researcher
2008-2011	Osaka University, Research Center for Ultra-High Voltage Electron Microscopy, Associate professor
2004-2008	Osaka University, Research Center for Ultra-High Voltage Electron Microscopy, Assistant professor
1997-2004	Shimane University, Faculty of Science & Engineering, Assistant professor
1997	Nagoya University, Department of Crystalline Materials Science, PhD (Engineering)
Award Totally 12 (The Japan Institute of Metals and Materials Meritorious Award, etc.)	

Research

Primarily, I have examined structure and dynamics of lattice defects in metals and semiconductors, using in-situ transmission electron microscopy, such as (a) directly visualized nanoscale point defect clusters and invisible atomic scale point defects produced upon irradiation and hydrogen loading, etc. (b) dynamics of dislocations under deformation, etc. I have delivered 23 invited and plenary talks at international conferences related to nuclear-fusion and fission materials, extreme environmental materials, and electron microscopy, as the first author.

In this project, I will contribute to reveal the atomic to nano-scale deformation and failure processes of superalloys (aircraft) and amorphous materials (motor), using cutting-edge electron microscopy.

Key papers

1. K. Arakawa, M.-C. Marinica, S. Fitzgerald, L. Proville, D. Nguyen-Manh, S.L. Dudarev, et al.: "Quantum de-trapping and transport of heavy defects in tungsten", *Nature Materials*, (2020).
2. K. Arakawa, T. Amino, and H. Mori: "Direct Observation of the Coalescence Process between Nanoscale Dislocation Loops with Different Burgers Vectors", *Acta Materialia*, 59, 141-145 (2011).
3. K. Arakawa, K. Ono, M. Isshiki, K. Mimura, M. Uchikoshi, and H. Mori: "Observation of the One-Dimensional Diffusion of Nanometer-Sized Dislocation Loops", *Science*, 318, 956-959 (2007).
4. K. Arakawa, M. Hatanaka, E. Kuramoto, K. Ono, and H. Mori: "Change in the Burgers Vector of

Perfect Dislocation Loops without Contact with the External Dislocations”, Physical Review Letters, 96, 125506-1 – 125506-4 (2006).