



Associate Professor

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### Background

2014 Associate professor, Department of Physics and Materials Science, Shimane University

2013 Assistant professor, Department of Physics and Materials Science, Shimane University

2004 Research Assistant, Department of Physics and Materials Science, Shimane University

2004 PhD., Material Science, Kyusyu University, Fukuoka, Japan

2001 MSc., Material Science, Kyusyu University, Fukuoka, Japan

1999 BS., Physics, Kyusyu University, Fukuoka, Japan

### Research

Plasma wall interaction in fusion reactors is very complicated phenomena, because plasma facing materials suffer heavy irradiation of plasma particles, neutrons, impurity deposition and high flux heat load synergistically. In our laboratory, fundamental processes of hydrogen and helium irradiation effects are investigated because they are very important to understand plasma wall interaction in materials. Major research themes are as follows:

- Nano-scale surface modification of plasma facing materials in plasma confinement devices.
- In-situ observation of microstructural evolution under irradiation by TEM with an ion gun.
- Retention properties of hydrogen and helium in plasma facing materials.

### Key papers

1. M. Miyamoto, K. Ono, K. Arakawa, R.C. Birtcher, "Effects of Cascade Damages on the Dynamical Behavior of Helium Bubbles in Cu", *Journal of Nuclear Materials*, 367-370 (2007) 350-354
2. M. Miyamoto, D. Nishijima, Y. Ueda, R.P. Doerner, H. Kurishita, M.J. Baldwin, S. Morito, K. Ono and J. Hanna, "Observations of suppressed retention and blistering for tungsten exposed to deuterium-helium mixture plasmas", *Nuclear Fusion*, 49 (2009) 065035
3. M. Miyamoto, D. Nishijima, M.J. Baldwin, R.P. Doerner, Y. Ueda, K. Yasunaga, N. Yoshida, K. Ono, "Microscopic damage of tungsten exposed to deuterium-helium mixture plasma in PISCES and its impacts on retention property", *Journal of Nuclear Materials*, 415 (2011) S657-S660
4. M. Miyamoto, T. Watanabe, H. Nagashima, D. Nishijima, R.P. Doerner, S.I. Krashennnikov, A. Sagara and N. Yoshida, "In situ transmission electron microscope observation of the formation of fuzzy structures on tungsten", *Physica Scripta*, T 159 (2014) 014028