


Requests for Collaboration

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<p>Research Interests</p> <ul style="list-style-type: none"> • Development of novel ion and electron sources for surface analysis/fabrication in nano-scale • Sub-atomic scale analysis of surface electronic structure • Electron tunneling process through the gas/solid interface including electron spin 	
<p>Creative Achievements in The Application of New and Existing Science and Technology</p> <p>(1) Ion and electron sources have had substantial impacts on modern science and industry, and have now become ubiquitous in a variety of areas such as spectroscopy, microscopy and lithography. Recently, we have succeeded to build trimer-terminated tips as well as single atom tips (SATs) of polycrystalline tungsten by utilizing a gas and field assisted etching and evaporation process. These “nano”-tips are greatly useful as field-emission electron sources as well as gas field ion sources due to their high brightness and coherence.</p> <p>(2) We have newly developed a novel microscopic technique which enables us to derive electrostatic potentials (or barrier height) of metal surfaces in sub-atomic scale by analyzing the data of field ionization rate obtained with a home-made micro probe-hole field ion microscope (μPH-FIM). This technique presents a detailed understanding of the relationship between the atom arrangement and the electronic structure at specific surface sites of interest, which has never been obtained with ever existing conventional methods of surface analysis.</p>	
<p>Technology (Product, Process, Device, Service etc.) That I Want to Request for Collaboration</p> <ul style="list-style-type: none"> • Development of a new microscope by utilizing a μPH-FIM for surface electronic states analysis • Development of a new gas field ion source producing spin-polarized helium ion He^+ (1^2S) for surface spin analysis 	
<p>A List of 5 Key Publications</p> <ul style="list-style-type: none"> • Local barrier height measurement at a step site on W(111) surface with a μPH-FIM, Y. Ohta, A. Kobayashi, Proceedings of the 8th International Symposium on Surface Science (ISSS-8) (2017). • Anisotropy of local Ne field ion yield distributions at W(112) plane edge site, Y. Oota, T. Wakimura, A. Kobayashi, Proceedings of Atom Probe Tomography and Microscopy (the 55th International Field Emission Symposium: IFES) • APT-072 (2016). • The gas distribution of He and Ne at metal surface in the field ion microscope, K. Saito, A. Kobayashi, Proceedings of the 7th International Symposium on Surface Science (ISSS-7) • 3PN-74 (2014). • Study on the mechanism of field adsorption of helium and neon above a single tungsten atom with a pulse counting analysis of field ions, A. Kobayashi, K. Tetsumoto, H. Kumagai, Journal of The Surface Science Society of Japan • 34 • p.409-p.414 (2013). • Tunable picosecond THz-wave generation based on trapezoidal MgO:LiNbO₃ crystal in novel pentagram-shaped pump-enhancement cavity, Y.Takida, Y. Tadokoro, H. Kumagai, S. Nashima, A. Kobayashi, Proceedings of SPIE • 8604 • 86041F:p.1-p.6 (2013). 	