Dr. Keisuke Fujii
Department of Mechanical Engineering and Science
Graduate School of Engineering, Kyoto University
Kyoto 615-8540, Japan
✉ *fujii@me.kyoto-u.ac.jp*

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Dear the Selection Committee,

I am sending an application of myself to an *Atomic Physics and Plasma Spectroscopy* physicist position at Oak Ridge National Laboratory.

I am now working for atomic physics and plasma physics as an assistant professor in Kyoto University, Japan. My main research interests are
- **High-performance spectroscopic systems** for fusion plasma diagnostics
- **Statistical physics theory** for complex atomic structure and reaction network in plasmas

Through the works (their details can be found in a separate document), I have the following experience,
- Ph.D. degree for hydrogen recycling study in a fusion device
- 16 of lead-authored papers (including **2 PRLs** and **1 Nuclear Fusion**) and 36 co-authored papers
- Two awards won in international conferences
- 13-years' experience of design, development, installation, and maintenance of high-performance spectroscopic systems for a large fusion facility, LHD
- Experience with **atomic database** including `OPEN-ADAS` and simulation with it
- Experience of *ab initio* **simulation of atomic structure** and spectrum with `flexible atomic code`
- Experience with **advanced statistics**, including Bayesian inference (papers 5–8)
- Experience of leading research groups
- A member of international program advisory committee of *IAEA technical meeting on Fusion Data Processing, Validation and Analysis*
- Professional-level programming skills obtained through working as a core development member of `pydata/xarray` (an open-source python library for high-dimensional large-scale data analysis)

I have started my research career as an experimentalist. Based on strong knowledge of instrumentation (optics, detectors, and scientific cameras), I have developed several high-performance spectroscopic systems and applied them to a big fusion device (papers 8, 9, 11, 12, 23). Through these works, I also successfully learned Bayesian statistics to validate experimental and atomic data, as well as the software skills to analyze a variety of large-scale data (papers 4-8).

During these works, I realized that the atomic physics and plasma physics are sometimes too complex to understand in the first-principal manner. I recognized the importance of statistical physics, which helps us to understand complex phenomena in the statistical manner. I decided to be a theorist as well and then I pioneered statistical physics related to atomic structure and reactions (papers 2, 3).

Such deep mathematical considerations often lead non-trivial similarities between completely different fields. Indeed, my finding in plasma spectroscopy propagated to atomic science (paper 2) and nuclear physics (paper 1). As I am an open-minded person, even in such a case I don't find much difficulty in learning new things in other fields. Knowledge from other fields also leads further understandings of the original topic.

As can be seen from my experience above, I am more than capable of fulfilling all the requirements for this position. I believe that I can significantly contribute to burning plasma physics, particularly the edge physics, by applying my instrumentation skills to plasma diagnostics and also the statistical theories to the complex phenomena always seen in edge regions.

Yours sincerely,

Dr. Keisuke Fujii