

**PiAI Seminar Series: Physics informed AI in Plasma Science**  
**10:30-11:00, 20 April 2020 (CEST:UTC+2)**  
**17:30-18:00, 20 April 2020 (JST:UTC+9)**  
**Web Seminar**

Machine learning for PWI and helium-induced nanostructures

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Our plans for re-exploring PWI physics by machine learning will be discussed. We have been studying PWI physics using linear plasma devices and PIC simulations. Recently, efforts have been taken on helium-induced fibrous nanostructure, known as fuzz. This fibrous nanostructure can be a cause of mass erosion of the tungsten wall in a reactor. Also, this new material can be used as a functional material. Thus, a clarification of its formation mechanism is beneficial. Searching hundreds of journal papers, we are developing a database on the formation conditions of fibrous nanostructures for machine learning. We also have experimental and simulation data of sputtering, hydrogen absorption, surface melting, vapor shielding, and tungsten transport in edge plasmas. These topics can also be studied through machine learning. Our research achievements will be briefly summarized and then we show the outline of the database to be created and the machine learning methods to be used. For our lab, it is a preparation phase to start research using machine learning. Any educational comments, technical information, collaboration offers are welcome.