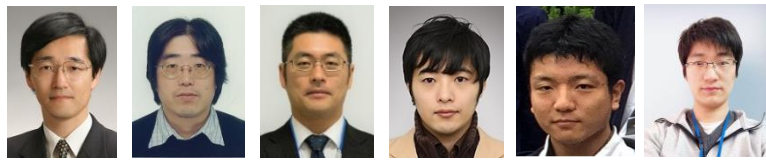
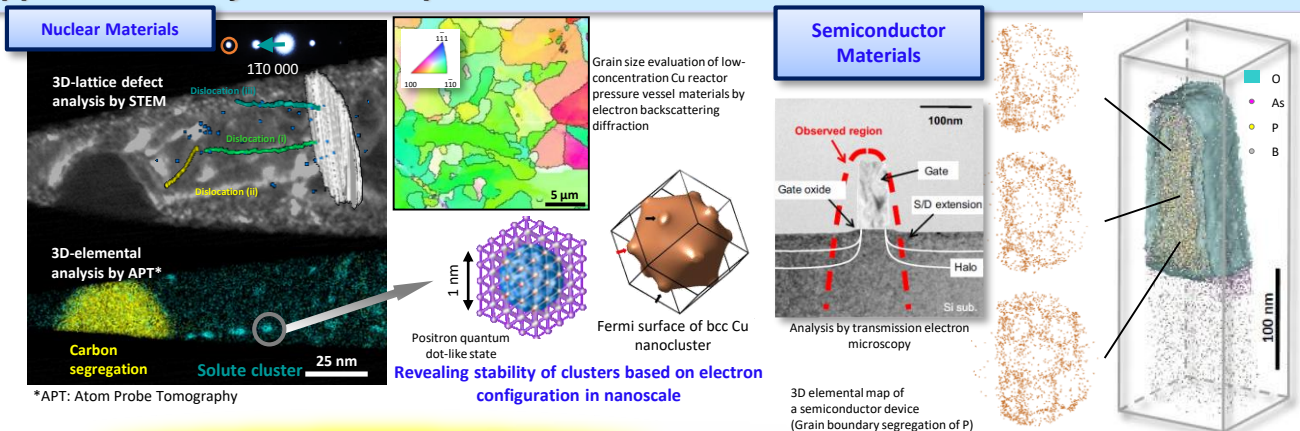


Energy Materials Engineering Irradiation Effects in Nuclear and Their Related Materials



Prof. NAGAI Yasuyoshi Assoc. Profs. INOUE Koji, TOYAMA Takeshi, YOSHIDA Kenta
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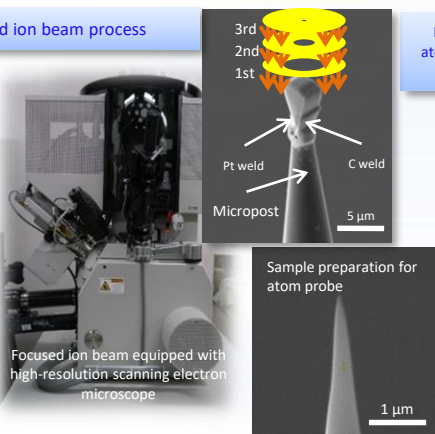
Study of Irradiation-Induced Defects — Formation Mechanism and Function —
We are employing state-of-the-art nanoanalysis techniques, such as **transmission electron microscope** for observing tiny defects, **positron annihilation** for detecting vacancies and nanoscale clusters and **atom probe tomography** for visualizing three-dimensional mapping, in order to reveal the formation mechanism and the function of irradiation-induced lattice defects and impurity clusters, which contributes to various application study and developments.



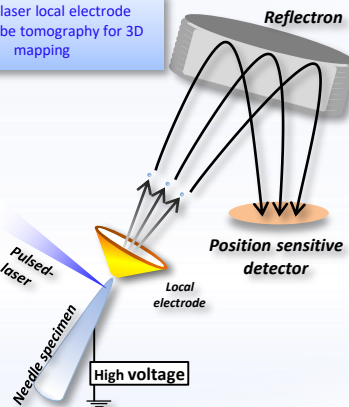
Materials Research using state-of-the-art nanoanalysis techniques

Revealing impurity segregation in semiconductor materials

Focused ion beam process



Pulsed-laser local electrode atom probe tomography for 3D mapping



Research Topics

- **Degradation mechanism & prediction in nuclear materials.**
 - Embrittlement of reactor pressure vessels and stress corrosion cracking of the overlay cladding
 - Development of next-generation fuel cladding tube, etc.
- **Nano-scale dopant distribution analysis for developing semiconductor devices.**
- **Developing state-of-the-art nanoanalysis techniques, positron annihilation and atom probe tomography, transmission electron microscope, etc.**
- **Theoretical calculations based on quantum mechanics combined with experimental methods shown above.**