

1. Record Nr.	UNINA9910300550903321
Autore	Thompson Matt
Titolo	Helium Nano-bubble Formation in Tungsten : Measurement with Grazing-Incidence Small Angle X-ray Scattering / / by Matt Thompson
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2018
ISBN	3-319-96011-3
Edizione	[1st ed. 2018.]
Descrizione fisica	1 online resource (XVII, 112 p. 40 illus., 6 illus. in color.)
Collana	Springer Theses, Recognizing Outstanding Ph.D. Research, , 2190-5053
Disciplina	548
Soggetti	Crystallography Nuclear fusion Plasma (Ionized gases) Materials science Force and energy Nanoscience Nanostructures Crystallography and Scattering Methods Nuclear Fusion Plasma Physics Energy Materials Nanoscale Science and Technology
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Introduction -- Developing a GISAXS Model to Enable Study of Nano-bubble Formation -- Validation of GISAXS Model with TEM Data -- Effect of He Fluence on Nano-bubble Growth -- Effect of Sample Temperature and Transient Heat Loading on Nano-bubble Growth -- Investigating Synergistic Effects on W Performance with Magnum-PSI -- Conclusion.
Sommario/riassunto	This PhD thesis characterises the damage that occurs in tungsten when it is exposed to a fusion-like environment. The book presents pioneering work on the use of grazing-incidence small-angle X-ray

scattering (GISAXS) to measure nano-bubble formation in tungsten exposed to helium plasma. The phenomenon of nanoscale bubble formation within metals during helium plasma exposure can lead to undesirable changes in the material properties, such as complex nanoscale surface modification or a reduction in thermal conductivity. As a result of this work, it is now possible to quantify how nanobubble behaviour changes within different materials, and under different plasma conditions. In 2015 the author published the first GISAXS study of helium-induced nanobubble formation in tungsten, demonstrating the viability of using GISAXS for this work. This paper has generated significant interest from the international fusion community and was selected as one of the highlights for the journal Nuclear Fusion.
