



*materials*



*Special Issue Reprint*

## **In-Situ X-Ray Tomographic Study of Materials**

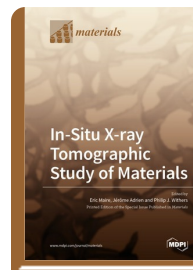
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This book illustrates the exciting possibilities being opened up by X-ray computed tomography (CT) to follow the behavior of materials under conditions as close as possible to those encountered during their manufacture or in operation. The scientific chapters selected for this book describe results obtained using synchrotron or laboratory devices during in situ or ex situ experiments. They characterize microstructures across length scales ranging from tens of nanometers to a few tens of micrometers. In this collection, X-ray CT shines a light on the mechanical properties of engineering materials, such as aluminum or magnesium alloys, stainless steel, aluminum, polymer composites, or ceramic foam. In these experiments, X-ray CT is able to image and quantify the damage occurring during tensile, compression, indentation, or fatigue tests. Of course, X-ray CT can illuminate the structure and behavior of natural materials too. Here it is applied to bone or natural snow to study their mechanical behavior, as well as materials from the agri-food sector. Its versatility is exemplified by analyses of topics as diverse as the removal of olive oil from kitchen sponges by squeezing and rinsing, to the effect of temperature changes on the structure of ice cream.



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