

*Special Issue Reprint*

## **Advanced Strategies in Thin Film Engineering by Magnetron Sputtering**

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Recent years have witnessed the flourishing of numerous novel strategies based on the magnetron sputtering technique aimed at the advanced engineering of thin films, such as HiPIMS, combined vacuum processes, the implementation of complex precursor gases or the inclusion of particle guns in the reactor, among others. At the forefront of these approaches, investigations focused on nanostructured coatings appear today as one of the priorities in many scientific and technological communities: The science behind them appears in most of the cases as a "terra incognita", fascinating both the fundamentalist, who imagines new concepts, and the experimenter, who is able to create and study new films with as of yet unprecedented performances. These scientific and technological challenges, along with the existence of numerous scientific issues that have yet to be clarified in classical magnetron sputtering depositions (e.g., process control and stability, nanostructuring mechanisms, connection between film morphology and properties or upscaling procedures from the laboratory to industrial scales) have motivated us to edit a specialized volume containing the state-of-the art that put together these innovative fundamental and applied research topics. These include, but are not limited to: • Nanostructure-related properties; • Atomistic processes during film growth; • Process control, process stability, and in situ diagnostics; • Fundamentals and applications of HiPIMS; • Thin film nanostructuring phenomena; • Tribological, anticorrosion, and mechanical properties; • Combined procedures based on the magnetron sputtering technique; • Industrial applications; •

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