



Editorial: special issue “ultraprecision 2019”

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This special issue focuses on the interdisciplinary knowledge among “Ultraprecision machining, Nanomanufacturing, Nanoscience and Nanotechnology”. It was jointly initiated by Prof. Zhenyu Zhang at Dalian University of Technology, and Dr. Yang Lu at City University of Hong Kong. The special issue accepted the submissions from 1 April to 31 July, 2019. It provides a platform for the communication among academics, technicians, engineers, and entrepreneurs in the fields of ultraprecision machining, nanomanufacturing, nanoscience and nanotechnology. The special issue presents the latest advances and cutting-edge developments on the nano-related fields for manufacturing and industries. It consists of innovative works of leading scientists and young researchers, as well as PhD candidates, highlighting the vitality in the fields of interdisciplines, including advanced manufacturing, materials, physics, chemistry, mechanics, tribology, etc.

High-performance devices are widely used in aviation, spaceflight, ship, ocean, power, energy, semiconductor, optoelectronics and microelectronics industries. High-performance components determine the properties of high-performance devices. They require micron, sub-micron, or nanoscale accuracies of form and position, nanometer or sub-nanometer surface roughness, and ultralow damage or damage-free subsurface. Such stringent requirements are extremely difficult or cannot be performed by conventional machining, manufacturing and industries. It is a challenge to satisfy the machining demands conducted by traditional techniques. Even for the emerging science and technologies,

such as ultraprecision machining, nanomanufacturing, nanoscience and nanotechnology, each is difficult to be qualified for the strict requirements of high performance components. To overcome this challenge, highly interrelated ultraprecision machining, nanomanufacturing, nanoscience and nanotechnology should be considered integrally. This special issue is proposed according to the cutting-edge research for the pragmatic use in high-performance components and devices.

This special issue reports mainly, but not limited to follow research directions: Ultraprecision machining, ultraprecision grinding, single point diamond turning, nanotribology, nanomechanics, ab initio simulations, molecular dynamics simulations, focused ion beam machining, electron beam machining, chemical mechanical polishing, nanomachining, in situ TEM mechanics, nanoparticles, nanomembranes, nanotubes, graphene and nanomaterials used in manufacturing and devices, nanomaterials with excellent mechanical and physical properties, NEMS, nanomanufacturing, nanoscience and nanotechnology used in manufacturing and devices.

The special issue presents the state-of-the-art developments of ultraprecision machining, nanomanufacturing, nanoscience and nanotechnology. It promotes the integrative developments for the four aspects, which is beneficial for the creation and development of the high-performance components and devices. This special issue disseminates the significance on considering the four aspects as an integer to meet the rigorous asks suggested by the high-performance components and devices. It also provides a platform for the communication and discussion between leading experts and your researchers for their collaboration and better research career.

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Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.