ABSTRACTS

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Future Fabrication Technologies for X-Ray Telescope Mirrors

Yoshiharu Namba, Anthony Beaucamp

Abstract: The ASTRO-H satellite equipped with 4 sets of X-ray imaging telescopes is scheduled for launch in 2015 by JAXA, as a collaboration with NASA and ESA. Two sets of hard X-ray telescope mirrors were made in Nagoya University and two sets of soft X-ray telescope mirrors were made in NASA/GSFC. The thousands of thin foil Al mirrors have a conical shape, replicated from glass pipes. For now, this is to be the last X-ray telescope project to have been approved in the world. There are many plans to establish future X-ray telescopes after the ASTRO-H project. But X-ray mirrors have to become more accurate, lighter and cheaper. We will explain such improved mirror fabrication technologies in this talk.

New Technology for Bio-Functional Interface Creation utilizing Powder Jet Deposition

Tsunemoto Kuriyagawa, Masayoshi Mizutani, Keita Shimada

Abstract: We are promoting innovations of powder jet deposition method at the frontier of manufacturing technology for a smart functional interface. Our goal is to create new principle and technology for the next-future bio-medical interface and devices. In my presentation, a new dental treatment utilizing powder jet deposition of hydroxyapatite and the applications will be introduced.

Developments of "CMP/P-CVM Fusion Processing Systems" combining CMP and plasma processing

Toshiro Karaki Doi, Yasuhisa Sano, Syuhei Kurowaka, Hideo Aida, Osamu Ohnishi, Michio Uneda, Tsutomu Yamazaki, Koki Ohyama, Seongwoo Kim, Hideaki Nishizawa

Abstract: We propose a novel ultra-precision machining process of hard-to-process materials used as a substrate for green devices including SiC, GaN and diamond as an "ultimate" semiconductor substrate. The fundamental approach is to divide the process into two steps, a pre-treatment step and a finishing step.

The pre-treatment step attempts to form pseudo-radical sites in the substrate so that the surface is more readily processed and finished. In the finishing step, we not only conduct flattening process using ultra-precision polishing/CMP with an assistance of continuously formed pseudo-radical sites (in-situ forming of pseudo-radical sites and flattening process) but also introduces a processing method combining a stress-free (damage-free) P-CVM (Plasma-Chemical Vaporization Machining) utilizing high-efficiency plasma etching. It is worth noting that the combination of CMP and P-CVM is not a simple addition. Rather, our goal is to attain an innovative fusion processing technology through a synergistic effect of these two processes.