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Inprentus to Provide NASA with Ultra-high Precision Diffraction Gratings for the Advancement of Solar Science

Inprentus to provide NASA's Heliophysics Technology and Instrument Development for Science (H-TIDeS) program with high line density, ultra-low micro roughness, blazed gratings for the advancement of solar science instrumentation

Champaign, Illinois, USA, November 7th, 2017: NASA Goddard Space Flight Center, through its Heliophysics Technology and Instrument Development for Science, or H-TIDeS, program has chosen Inprentus to provide mechanically ruled, high line density, ultra-low micro roughness, blazed gratings to observe extreme ultraviolet (EUV) radiation environments such as the solar corona. Inprentus will provide four iterations of diffraction gratings for evaluation to establish the mechanical ruling parameters necessary to make significant progress toward the goal of a 6000 line/mm diffraction grating with < 0.4 nm RMS surface micro roughness. Ultimately, if successful, the optimized diffraction grating would be provided to NASA's H-TIDES program in support of its goal of developing Heliophysics Instrumentation to be flown on suborbital sounding rockets, stratospheric balloons, the International Space Station, CubeSats or other Low Earth Orbit (LEO) experimental missions.

Inprentus was chosen based on its unique capabilities to manufacture diffraction gratings with high line densities on extremely smooth mirror surfaces through a proprietary nano-scale scribing process. The H-TIDeS requirement for ultra-low micro roughness and high line density gratings is driven by the spatial constraints placed upon the experiment by the relatively small vehicles delivering these experiments into low-earth orbit. High line densities provide greater dispersion of the observed light which in turn provides greater resolution of the signal at the detector. Greater resolution at the detector provides more accurate measurements of the solar corona and will lead to a greater understanding of the sun and its interactions with Earth and the solar system.

"This opportunity to work with NASA on this technical challenge fits well with Inprentus' goal of advancing the current state of diffraction grating technology. It will more than double the current line density specifications of industry standard gratings." Said the company's CEO, Ron van Os, *"The goal of the company is to evolve mechanically ruled grating specifications so that they can reach into a variety of new markets and applications. This opportunity with NASA sets the company on that path."*

NASA's H-TIDeS program

NASA's heliophysics programs support a wide array of research to study the interconnected system linking the sun to Earth, to the planets, and the particles and magnetic energy

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coursing through space itself. NASA's heliophysics strategic objective is to understand the sun and its interactions with Earth and the solar system, including space weather and to advance our understanding of the connections between the sun, Earth, the planetary space environments, and the outer reaches of our solar system. NASA's **Heliophysics Technology and Instrument Development for Science** program seeks Low Cost options to Access Space to investigate key heliophysics science questions by addressing the best possible science and technology investigations that can be carried out with instruments that have the potential to be flown on suborbital vehicles in the future.

Inprentus Inc.

Inprentus designs, manufactures and sells X-ray and EUV diffraction gratings for synchrotron radiation facilities that are used for a variety of scientific and commercial applications by many Fortune 500 companies, academic institutions and government laboratories around the world. Inprentus was founded in June 2012 to commercialize an innovative, nano-scale lithography technology using mechanical deformation of metallic surfaces.