## PHOTON TUNNELING MICROSCOPY

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The Photon Tunneling Microscope is used to provide high resolution (subnanometer vertical), quantifiable, real-time, 3-D (with continuously variable viewpoint) imaging and profilometry of homogenous dielectric samples, whether transparent or absorbing. A partial list of these includes: thin films (microroughness, damage evaluation, step height) optical storage media (pit depth and shape measurement), magnetic media (microroughness, wear tracks), polymers (surface characterization), optical surfaces (microroughness, damage, polishing evaluation), diamond-turned optical surfaces (tool and machine characteristics from surface topography), binary optic surfaces, porous silicon structure, photographic grain analysis, replicas of metal surfaces, microlithography evaluation, and manufacturing web evaluation (film base, magnetic media base).

The instrument transports the observer down into microtopography with an immediacy that no other microscope or profiler can match. By first employing photon tunneling in a powerful non-scanning height sensor and innovatively combining it with video photometry displayed on a three-axis oscilloscope, the microtopography is completely revealed; the observer is able to explore and collect more information, like an astroaut flying over the lunar terrain, and this results in better understanding of the surface and the processes that created it. Full profilometry functions such as cross sectioning, height measurement and, with an optional personal computer, roughness parameters are readily accomplished on the 3-D image. Fidelity is assured by the non-invasive Photon Tunneling Microscope - the absence of damaging electrons, scanning probes, oil immersion, high vacuum, sample coating or shadowing, physical cross sectioning, and time delay required by other products allows the Photon Tunneling Microscope to look at more kinds of surfaces in their natural state, and in real-time. Sub-nanometer vertical resolution, lateral resolution better than oil-immersion microscopy (yet the sample is dry), real-time imaging, full quantitative profilometry, 3-D display with real-time continuous viewpoint control (without costly computer memory), and the ability to image samples in their natural state all combine to expand our knowledge of microsurfaces on a way not possible before the introduction of the Photon Tunneling Microscope.

### *JUST FOR FUN, WE WILL HAVE A CONTEST!*

*Question #1: What last name is most common on our U.S. list of over 9,500 individuals with an interest in microscopy?*

*Question #2: And how many are there with that name?*

*The individual which gets the closest on Question #1, then the closest on Question #2, wins a $50 U.S. Savings Bond.*

*Our list is made up of the current membership and recent conference/school attendance from 42 sources.*

*Your guess is as good as anyone's - and your chances of winnning are an order of magnitude better than winning a lottery. Entries by Fax, mail or phone - before the end of August.*