

Colloquium Notice

James Wynne

IBM Research Laboratory, Yorktown Heights

Illuminating My Career: From Flash Gordon to Laser Surgery

The ruby laser first "lased" in May, 1960. It was used for retinal surgery in late 1961. Over the next two decades, many laser surgical procedures were developed to remove undesirable tissue or seal bleeding ulcerated tissue, but they all left "therapeutic" scar tissue.

In Nov-Dec, 1981, my IBM colleagues and I discovered that the short pulses of energetic ultraviolet light from an ArF excimer laser, emitting at 193nm (6.4 eV), could produce ultra-clean incisions in animal tissue, in vitro. We conceived that this laser could incise living tissue, which might heal without scarring, because there would be minimal damage to the tissue underlying and adjacent to the incision. Collaboration with ophthalmologists led to the laser refractive surgical procedures known as LASIK and PRK, which have improved the vision of more than 40 million people.

In 1983, my colleagues and I discovered that blood absorbed the 6.4 eV light from the ArF excimer laser via a non-thermal process. We thought this meant that we could not use the laser to treat deep skin lesions. 26 years later, in 2009, my dermatologist colleague and I conceived of using the laser as a "smart scalpel" to debride necrotic lesions of the skin, such as burn eschar, leaving the underlying and adjacent viable skin undamaged, resulting in faster healing, less pain, and minimizing scar tissue formation, when compared to "cold steel" debridement. I will report on the latest results of my collaboration with dermatologists at Stony Brook University, where we burn live pigs, debride the necrotic tissue with the ArF excimer laser, and see enhanced healing. Our first peer-reviewed paper, "ArF excimer laser debrides burns without destruction of viable tissue: A pilot study," is In Press, available online, and will be published In Print in the next issue of BURNS.

Monday
March 19, 2018
Starts at 12:15 PM
Coffee at 12:00 PM
Physics Conference Room, SB B326