AVVISO DI SEMINARIO

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A journey in photoacoustics and photothermal research and else

In this talk, I outline the path I've navigated over the years within the realms of photoacoustics and photothermal research. My journey commenced during my Ph.D. studies (2000-2004) under the guidance of Prof. Gerry Diebold at Brown University, where I first studied thermal diffusion, the Soret effect, in suspensions under a sinusoidal optical field. The effect is non-linear, and we expected to see the shock front of mass build-up in the process which we observed via self-diffraction effect. A few years later, in 2008, I joined Prof. Oliver B. Wright at Hokkaido University, where my research took a new direction. I conducted a pump-probe experiment focused on the rectification of surface acoustic waves utilizing an asymmetric structure—an array of triangles. This approach allowed us to deduce the transmission and reflection coefficients through the image reconstruction of optical signals. By 2014, my interests had broadened to encompass the mechanical properties of biological cells, including endothelial and fat cells, explored through picosecond ultrasonics. This collaborative effort at Hokkaido University with Prof. Oliver Wright and his team enabled us to determine the Brillouin oscillation frequency, facilitating the deduction of sound speed propagating through cells. Such findings allowed for the spatial mapping of cell sound speeds, further permitting estimates of their bulk moduli and spatial ultrasonic attenuation.

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