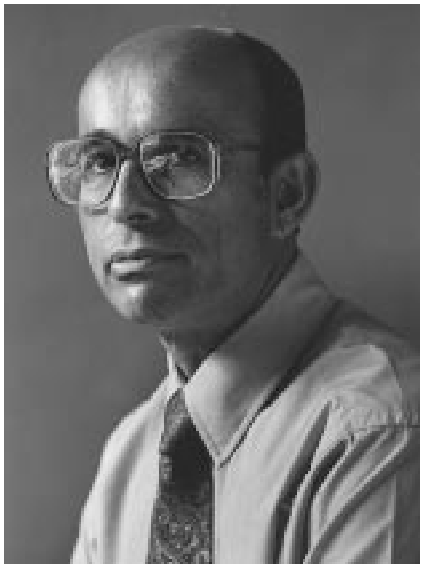
Jack Saltiel



Photograph taken by Steve Leukanech

Jack Saltiel was born in Thessaloniki, Greece, in 1938. In 1951 he immigrated with his family to Houston, Texas, where he attended San Jacinto High School. Jack majored in Chemistry at then tuition-free, Rice University, where, under the tutelage of E. S. Lewis, he was introduced to research in physical organic chemistry. Graduate studies brought Jack to Caltech and he joined Professor George S. Hammond's research group.

In those exciting times, as the foundations of mechanistic photochemistry were being laid, serendipity focused Jack's inquiries on the mechanism of photoisomerization of the stilbenes. Time has not diminished the significance of Jack's graduate work, and that period set the stage for much of his independent research on the elucidation of the mechanisms of excited state reactions. For instance, in the course of careful studies of the photosensitized isomerization of the stilbenes (the Saltiel plots), Saltiel and Hammond noticed a very unusual effect: Energy transfer to *cis*-stilbene is efficient even for donors having spectroscopic or vertical triplet energies that are smaller than the spectroscopic energy of *cis*-stilbene. Saltiel and Hammond coined the term nonvertical energy transfer to describe the effect. In the ensuing years, nonvertical energy transfer has been recognized as a general phenomenon and Saltiel and others have been engaged in a lively debate concerning its precise mechanism.

In 1965, after a year as an NSF Postdoctoral fellow in Professor William Dauben's lab at UC Berkeley, Jack moved to Tallahassee as an Assistant Professor at Florida State University. Notable strengths of FSU's Chemistry Department in the areas of spectroscopy and physical organic chemistry with Kasha, DeTar, Leffler, and Walborsky there offered fertile ground for the launching of Jack's independent career. With Hammond's blessing, Jack continued his research on the mechanism of cis−trans photoisomerization. His research group focused on uncovering the precise pathways of photoisomerization via the singlet and triplet manifolds. In the course of this work, Jack has mapped out the potential energy surfaces for the singlet and triplet states of stilbene. These results have broad implications for several reasons. First, stilbene is a prototypical olefin, so Saltiel's findings are readily extended to other olefins. Second, and perhaps more important, the methods which Saltiel used to delineate the properties of excited state olefins (photosensitization, quenching, photostationary state measurements, deuterium and heavy atom effects, etc.) are widely applicable to other reactions. His papers are outstanding examples of the application of classical methods of experimental physical organic chemistry to elucidate mechanisms and to determine experimentally the energetic landscapes of potential energy surfaces of electronically excited states. They serve as excellent resources for chemists interested in learning the fundamentals of mechanistic photochemistry. The significance of Saltiel's work on photoisomerization is clearly recognized by the physical organic community in that it appears in almost all textbooks of intermediate and advanced organic chemistry.

Jack was promoted to Full Professor at FSU in 1975. In the 1970s, while maintaining a strong interest in olefin photophysics and photochemistry, Jack's attention turned to exciplexes formed between polynuclear aromatics and aliphatic dienes. This work examined mechanistic pathways involved in photocycloaddition reactions, including direct reaction of the singlet and triplet exciplexes and pathways involving radical ion pairs. Another strong component of his research concerns the role of spin statistical factors in controlling the efficiency of diffusion-controlled reactions. A notable example of this work is the photodimerization of anthracene via triplet−triplet annihilation. Since the 1980s, Jack's interest in conformer specific photochemistry led him to principal component analysis with self-modeling (PCA-SM). His group has been developing a powerful arsenal of methods that allow resolution of pure component spectra from matrices of spectra of complex mixtures. The reward has been enhanced understanding of ground and excited state equilibria and excited state kinetics. Jack has applied PCA-SM to analyze the complicated photophysics and photochemistry of arylolefins, dienes, and trienes.

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Moreover, in recent collaborative studies, he is applying this approach to what is possibly the most mathematically objective analysis to date of the transient spectral changes that occur in the bacteriorhodopsin photocycle.

In addition to his prolific scientific career, Jack Saltiel is a leader in science education. This part of his career may be less visible to the broad scientific community, but it is clearly worthy of note. In addition to graduate students and postdoctoral fellows, Jack has mentored over 50 undergraduates in his lab during his 30+ year tenure at FSU. Many of these students have continued on to illustrious careers in chemistry and have been strongly influenced by the time they spent in Jack's group. One former undergraduate who became a photochemist of great distinction is Professor Mark Wrighton. In an interview shortly after taking the leadership of Washington University, Wrighton pointed out Jack's pivotal influence during the early stages of his career.

I can say from my own experience that Jack is a top-notch mentor and research advisor. The primary objective in everything that he does, from teaching to research and administration, is to strive for excellence. I think that his professional colleagues agree that Jack's work is among the most excellent in the area of organic photochemistry and modern physical organic chemistry. He has made an indelible mark on the field through his insightful research and his mentoring of students.

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