



## Inter-American Photochemical Society Newsletter

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This newsletter is available in PDF format from the website.

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# Letter from Frederick D. Lewis

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May 30, 2002

Dear Colleagues:

There are several important items of news from the Society that I want to share with you.

First, the results of our recent election of officers are in. Our new Vice President (President elect) is Peter Ford. He will serve two years as VP and then become President for a two year term. New members of the Advisory Board are Brad Arnold, William Jenks, and Mitch Winnik. Their four year terms of office begin July 1, 2002. Continuing members of the Advisory Board are Pedro Aramendia, Mary Boyd, and Jerry Meyer. Ed Hilinski will succeed me as President. I am confident that the future leadership of the Society is in excellent hands.

Second, it gives me special pleasure to announce that Josef Michl will be awarded the Porter Medal at the IUPAC Symposium on Photochemistry this July in Budapest. Josef has been an active member of I-APS and received the I-APS Award in 1994. He is the fourth I-APS member to receive the Porter Medal, following Michael Kasha, Nick Turro, and Tito Scaiano. Kasha is an I-APS Fellow and Turro and Scaiano are recipients of the I-APS Award. Their accomplishments lend luster to the Society.

Third, please save the dates January 2-5, 2003 and plan to attend the 14<sup>th</sup> I-APS Winter Conference in Clearwater Beach, Florida. Further information should be forthcoming shortly from the co-chairs, Dan Falvey and Jerry Meyer.

I want to take this opportunity to thank the members of the Advisory Board whose terms are ending, Cornelia Bohne, Ian Gould, and Irene Kochevar. Their good counsel and many contributions to the Society are greatly appreciated. It has been my privilege to work with a dedicated group of officers and board members during my term as President.

Sincerely,

Fred

# Letter from Edwin F. Hilinski

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September 16, 2002

Dear Colleagues:

I thank Fred Lewis for the fine job that he did serving as President for the past two years. His leadership was exemplary. I am looking forward to working with Vice President Peter Ford and the members of the Advisory Board for the next two years.

Picking up from Fred's May 30, 2002 outgoing letter, I want to highlight several items. The death of George Porter, Lord Porter of Luddenham, on August 31 is a sad event about which Fred Lewis writes in this Newsletter. The contributions of Lord Porter have made a great impact on the members of this Society.

We had an informal reception for Josef Michl in honor of his being awarded the Porter Medal during the XIX<sup>th</sup> IUPAC Symposium on Photochemistry. It was great seeing members of the Society, along with friends from around the world, gathering to congratulate Josef personally. For some photos, check out the album on the I-APS web site. In Budapest, I learned more about the RSC journal *Photochemical & Photobiological Sciences*; it looks to be off to a good start. More institutional subscriptions will help. This journal will become part of the RSC Journal Package *option A*. If your library does subscribe to *option A*, you can look forward to on-line access through your library's subscription.

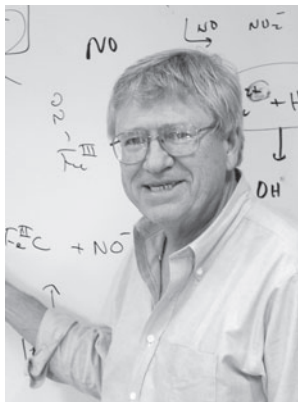
I commend Ian Gould and Peter Ford, co-chairs of the 13<sup>th</sup> I-APS Winter Conference in Tempe, Arizona, and all the members of the organizing committee for jobs extremely well done. Plans for the 14<sup>th</sup> Winter Conference to be held January 2 – 5, 2003 in Clearwater Beach, Florida are proceeding well. Co-chairs Dan Falvey and Jerry Meyer along with the members of their organizing committee are putting together a fine program. I hope that many of you are planning to participate and that you will encourage your students and postdocs to present their work. Look for announcements of award winners who will speak at Conference and for information updates on the I-APS web site. Please call this Conference to the attention of colleagues who are not traditional participants and are working in the photosciences. The stimulating interdisciplinary aspects of this meeting always have been striking to me. If these colleagues are not I-APS members, please direct them to the I-APS web site so that they can learn more about the Society and become a member.

I am very much looking forward to the 14<sup>th</sup> Winter Conference; I hope to see you there.

Sincerely,

## Biographical Sketch — Peter C. Ford

Peter C. Ford was born in California in 1941. His undergraduate work at Caltech was followed by graduate study at Yale with Kenneth Wiberg (Ph.D. 1966) and a year as a NSF Postdoctoral Fellow at Stanford with Henry Taube. In 1967 he joined the Chemistry faculty of the University of California, Santa Barbara, where he has held the rank of Professor since 1977 and has served as Department Chair (1994–6). He has supervised the research of 45 students who completed their Ph.D. theses as well as a number of B.S., M.S. and postdoctoral students. He has been honored as a Dreyfus Foundation-Teacher Scholar, as a Senior Fulbright Fellow, with an Alexander von Humboldt-Stiftung US Senior Scientist Research Prize, with the 1992 Richard C. Tolman Medal of the American Chemical Society, and with election as a Fellow of the AAAS. His current research interests include the photochemistry/physics of coordination and organometallic compounds, biomedical applications of metal complex photoreactions, modern kinetics techniques and time-resolved spectroscopy for the study of homogeneous catalysis mechanisms, and the bioinorganic chemistry of the nitrogen oxides.



## Josef Michl Receives 2002 Porter Medal

Josef Michl was awarded the 2002 Porter Medal during the XIX<sup>th</sup> IUPAC Symposium on Photochemistry in Budapest, Hungary on July 19, 2002. Michl is the 9<sup>th</sup> recipient of the Medal which is named for the late George Porter, winner of the 1967 Nobel Prize in Chemistry for the development, with Ronald G. W. Norrish, of flash photolysis. Previous winners of the Porter Medal include George Porter (founding medal) and IAPS members J. C. Scaiano and N. J. Turro. The Porter Medal is the latest recognition of Michl's scientific accomplishments. Among his numerous awards are the 1994 IAPS Award and the Cope Scholar and James Flack Norris Award in Physical Organic Chemistry from the American Chemical Society.



Michl's award address was presented to a large and enthusiastic audience in the main lecture hall of the historic Academy of Sciences in Budapest. The evening prior to his address, Josef and his wife Sara were the guests of honor at a reception hosted by IAPS and attended by IAPS members attending the Symposium, as well as a number of non-IAPS guests.

The Porter Medal was presented by Jacek Waluk, current president of the European Photochemical Association. Josef was introduced by Jakob Wirz, past president of the EPA, who provided a detailed account of Michl's scientific career. I am asking Jakob for permission to post his introduction on the IAPS web site. Other sources of information concerning Michl's personal history and scientific accomplishments include his web site [[www.Colorado.edu/Chemistry/faculty/Michl/cv](http://www.Colorado.edu/Chemistry/faculty/Michl/cv)] and a fascinating article he wrote for the November, 1992 IAPS Newsletter entitled "Reflections on the Early Days of My Involvement in Organic Photochemistry." For those of you without back issues of the Newsletter, this article is available on the web site of former editor V. Ramamurthy [[www.Tulane.edu/~murthy/indexpundits.html](http://www.Tulane.edu/~murthy/indexpundits.html)].

Rather than repeat the information available in the above sources, I would like to share a few personal reflections. I first met Josef at the 1970 IUPAC Symposium on Photochemistry which was held in St. Moritz, Switzerland. Josef had just joined the faculty at the University of Utah, and had been invited to talk about his work on the photochemical generation of pleiadene. This talk and his contributions to the scientific discussions

made it clear that Josef was a force to be reckoned with. Shortly thereafter, Josef introduced his ideas about excited state potential energy surfaces, which were of great importance in guiding my own thinking about cycloaddition reactions. At Gordon Research Conferences and IUPAC Symposia I have continued to seek out Josef's company and advice over meals, on hikes, or on the bus rides from Logan to New Hampshire.

Josef is an experienced, multilingual world traveler and thus proved to be an ideal roommate for this monolingual Yankee at IUPAC Symposia in Europe. In preparing to attend the 1984 Symposium in Interlaken, Switzerland, he suggested we stay at one of the budget hotels rather than a more expensive one. The hotel was nice, except for the location of our room right above the main road up the valley, which rendered sleep problematic. At the 1986 Symposium in Lisbon, I prevailed upon Josef to share a room in a modern, air conditioned hotel — a fortunate choice. At the most recent IUPAC Symposium in Budapest, the presence of our wives kept us from being roommates. However, we did enjoy the company of Josef and Sara at a marvelous Hungarian dinner, ordered by Josef — in Hungarian. As Josef reports, he taught himself Hungarian as a high school senior in Prague in preparation for an exchange visit with students from Budapest — so that he could talk to the Hungarian girls. We can be certain that they were impressed.

As Josef's colleagues are well aware, his passion for science is balanced by his devotion to his family, his affection for his native Czechoslovakia, his love of travel — particularly mountain trekking, and his loyalty to his many friends. We applaud the award of the 2002 Porter Medal and extend to Josef and Sara our very best wishes on behalf of all of the members of IAPS.

**F. D. Lewis**  
September 9, 2002

## Sir George Porter, Nobel Laureate, Dies at 81

**Lord Porter**, who shared the Nobel Prize for Chemistry in 1967 with Ronald G. W. Norrish and Manfred Eigen, died on August 31 at the age of 81. Porter and Norrish developed the technique of flash photolysis at Cambridge University during the 1940's and 1950's. Their work led to a revolution in the study of photochemical reactions.



Porter was born in Stainforth, England and received his undergraduate degree from the University of Leeds. Following his graduate work at Cambridge, he served as professor of chemistry at Sheffield from 1955 to 1966, at which time he became director of the Royal Institution. His annual Christmas Lectures were broadcast on the BBC.

Porter was knighted in 1972 and elevated to the Baron of Luddenham in 1990. Following his retirement in 1985 his students and friends established the Porter Medal in his honor. He was awarded the Founding Medal in 1988. He was a frequent participant in the Porter Medal award ceremonies held during the IUPAC Symposium on Photochemistry. He is survived by his wife, Stella Brooke, and two sons, John and Andrew.


**F. D. Lewis**  
adapted from the New York Times,  
September 4, 2002

# Third Asian Photochemistry Conference, January 6–11, 2002

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The third Asian Photochemistry Conference (APC-2002) was held recently at Hotel Centaur Juhu Beach, Mumbai, India, during January 6–11, 2002. The two earlier APC's were held at Hong Kong (1997) and Taejon, Korea (1999). The conference was organized by BRNS, Bhabha Atomic Research Centre, in collaboration with Indian Society for Radiation & Photochemical Sciences (ISRAPS). The APC-2002 also incorporated the sixth biennial Trombay Symposium on Radiation & Photochemistry (TSRP), a popular national symposium with good international participation. APC-2002 was formally inaugurated on 7<sup>th</sup> January and Nobel Laureate Prof. **Yuan T. Lee** from Taiwan delivered the key note address. Nearly 220 delegates from eight different countries participated in APC-2002 (Germany: 4, France:1, UK: 1, Japan: 25, Korea: 5, China: 2, Hong Kong: 2, Sri Lanka: 1, Russia: 1, India 165). A total of 65 talks (Key note Address: 1, Plenary: 9, invited: 28, Invited Oral: 27) and 140 posters were presented during the conference. Diverse topics in the areas of photo and radiation chemistry such as photoinduced electron transfer, ultrafast phenomena, photochemistry & spectroscopy in supersonic jets, photo & radiation chemical studies for the generation and detection of metal nanoparticles, pulse radiolysis, subpicosecond accelerator technology, were covered in various sessions of APC. Prominent among the speakers were **Keitaro Yoshihara** (JAIST, Japan), **Hiroshi Masuhara** (Osaka, Japan), **Vivian W.W. Yam** (Hong Kong), **S.H. Lin** (Taipei, Taiwan) and **Yuri N. Molin** (Russian Federation), **Osamu Ito** (Tohoku, Japan), **Fanao Kong** (Beijing, China).



A cultural programme of traditional Indian Kathak dances was arranged on the evening of 8<sup>th</sup> January for the Conference Delegates. Indian Society for Radiation & Photochemical Sciences (ISRAPS) gave six cash awards

and eight merit certificates for the best poster presentations from young researchers below age 32.

The fourth APC will be held at Taipei, Taiwan and will be organized by Prof. S.H. Lin of the Institute of Atomic and Molecular Physics, Taipei, in 2004.



## Asian & Oceanic Photochemistry Association (APA)

The formation of APA was formally announced during the APC-2002 at Mumbai, India. The objectives of APA is to promote and encourage the international development of photochemistry with special reference to Asian and Oceanic countries, particularly by

1. promotion of co-operation between universities, research institutes and industries through international contacts and exchange meetings in Asia
2. coordination of photochemistry meetings, including that of Asian Photochemistry Conference
3. promotion of photochemical literature.

Four office bearers were announced at the meeting

1. **Prof. Horishi Masuhara**, Osaka, Japan  
President
2. **Dr. Jai Pal Mittal**, Mumbai, India  
Vice-President
3. **Prof. S.H. Lin**, Taipei, Taiwan  
Vice-President

# Summary of the 13<sup>th</sup> Annual I-APS Winter Conference, Tempe, AZ January 2–5, 2002

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For the first time ever, the Annual I-APS Winter Conference was held west of the Mississippi, in scenic Tempe, Arizona, on the Arizona State University campus. The co-chairs for this interesting and stimulating meeting were Ian Gould (ASU) and Peter Ford (UCLA). The program consisted of 27 invited and contributed talks, including presentations from the Closs award winner, Tracy Morkin (McMaster U.), this year's I-APS award winner, Paul Barbara (U. T. Austin), last year's awardee, Peter Wagner (Michigan State U.), and the Cilento award winner, Claudio Borsarelli (U. National de Santiago del Estero). Rounding out the program was a lively and well-attended poster session, conveniently located near the bar of the conference hotel.

The program began Wednesday evening with a lecture by **Nick Turro** (Columbia U.) who described how control of chemical reactions can be achieved using super-molecular chemistry, such as cage-like effects of radicals in zeolites and other size-, shape-, or chirality-selective pores, and what he called super-duper molecular chemistry, which is the use of spin and external magnetic fields to determine reaction outcomes. Nick gave an example of photolyzing a molecule to produce radicals and finding that different reactions occur depending on whether the radicals can diffuse freely in solution or are trapped in a size-selective zeolite pore.

**Marion Thurnauer** (Argonne) next told the audience about experiments in time-resolved EPR to examine electron transfer in the photosynthetic reaction center and in titanium oxide particles with adsorbed organic molecules. A major goal of the design of latter system is to achieve long-lived charge separation.

The final talk of this session was on atmospheric chemistry, delivered by **Veronica Vaida** (U. Colorado). Her focus was on how the presence of water complexes and aerosols in the atmosphere affects the photochemistry that occurs because of the ability of these species to absorb large portions of the available solar radiation. She presented studies showing that water dimers and clusters may have a significant effect on the frequencies of light absorbed by clouds because that have an increased number

of vibrational modes relative to the monomer and hence absorb in different regions.

Thursday morning began with two talks on surface photochemistry. The first, by **Nate Lewis** (CalTech) focused on strategies to chemically modify the silicon (111) surface by alkylating it using a Grignard reaction to make it more oxygen stable for electrochemical cells. This was successful as the methyl terminated silicon surface showed stable I-V curves with time while the un-methylated surface showed evidence of degradation. Moreover, the important electrical properties such as electron-hole recombination velocities are unchanged by methylation. Future efforts will be to change the chemical identity of the surface passivation layer and determine the effects on the electrical properties of Si.

The second talk, by **Ross Hill** (Simon Fraser U.) described an elegant method of using photolysis of lead compounds, instead of chemical vapor deposition, to deposit lead oxide onto silicon. This method may be readily combined with masks to perform photolithography and spin coating to form layered nano-structured materials.

The next talk of the morning was by **Bo Hong** (UC Irvine) who is making cage-like structures using polymers linked with phosphorous and Os atoms. Depending on the structure, one can get strong electronic communication between the metals within the structures. Because these molecules are luminescent, she is investigating their potential as size and shape dependent molecular sensors.

**Elia Tfouni** (U. de Sao Paulo) reported on the use of ruthenium-NO compounds as a photo-delivery method for NO in patients. NO is involved in blood pressure regulation, inflammation, oncology, septic shock and a host of other physiological processes and diseases and it is important to be able to deliver it in precise doses to patients. The delivery agent must also have a long shelf life and both it and the products must be non-toxic. The molecules described had all of the desired biological activity in hypertensive rats and were non-toxic as well.



In the final talk of the morning, **Christian Reber** (U. de Montréal) described studies of molecules having electronic states that are coupled *via* vibrational modes of the molecule. This phenomenon arises in the area of electron transfer, for example. He examined the effect of this coupling on absorption and emission spectra using pressure as the means of altering the coupling strength.

The first of three talks in the afternoon on biologically-relevant systems was given by **Steve Boxer** (Stanford University). He described two systems, green fluorescent protein (GFP) and a novel non-natural amino acid, Aladan, that can both be used to probe the internal polarity of proteins and their solvation response. Mutant GFP's that undergo excited state proton transfer at physiological pH's have recently been isolated in the Boxer lab. These can be used as cellular pH sensors because of their dual emissive properties. Studies of the time-dependent Stokes shift of the emission of the non-natural amino acid Aladan were presented that probed the interior polarity and dynamics of the G protein.

**Pill-Soon Song** (Kumho Life and Environmental Science Lab, Korea, and U. of Nebraska) next presented his studies of the biochemical mechanism of shade avoidance in plants. This phenomenon is one in which plants become long and thin to avoid overlapping neighboring plants, is regulated by phytochrome and by a small molecular weight G protein, Pra2, that complexes with a novel P450 in plants to ultimately regulate stem elongation. From a biotechnology standpoint, it would be desirable to mutate the proteins involved in shade avoidance to 'fool' plants into growing shorter and denser stalks as this would minimize the amount of irrigation and fertilizer (and lawn mowing!) required.

The final talk of this session was given by **Jane Vanderkooi** (U. of Pennsylvania) who spoke on elegant studies of the linewidth and lineshape of the Q band of cytochrome c and horseradish peroxidase as a means of probing the internal dynamics and electric fields of proteins. The results were modeled using molecular dynamics in explicit solvent to generate protein conformers and Zindo/SCI to model the resulting effects on the electronic transitions of the porphyrin.

After the break, **Claudio Borsarelli** delivered his Cilento award talk on the role of carotenoids as quenchers of singlet oxygen—a role which gives them high potential importance in inhibiting cancer, preventing macular degradation and cataracts, and in enhancing the immune response. Claudio's studies probed the kinetics of this quenching in micellar systems.

The final talk of the evening was given by **Bob Blankenship** (ASU) on energy and electron transfer in photosystem I. In this pigment, photochemical electron transfer occurs from a dimer of chlorophylls to a primary

acceptor chlorophyll. Subsequent electron transfer reactions then take place to reduce ferredoxin. Antenna chlorophylls surround the dimer to feed light energy into that complex. The studies described elucidated the dynamics of these coupled processes.

Friday morning began with a presentation by **Tracy Morkin**, this year's Closs award winner. Tracy has previously won numerous awards and has published seven papers. She conducts research in the lab of Willie Leigh at McMaster University. Tracy spoke on her work elucidating the chemistry of silenes using steady-state and flash photolysis.

Next, **Mark Workentin** (U. Western Ontario) spoke on the properties of 'small molecule' self assembled monolayers (SAMS) that have photo-reactive moieties close to the metal surface rather than attached to alkyl chains. Interestingly, some of the systems investigated can even lead to the photochemical formation of a polymer on the surface that could have important technological applications.

**Josef Michl** (U. of Colorado) then described experiments designed to test whether dual emission in so-called TICT (twisted intramolecular charge transfer) donor acceptor benzene substituted compounds is associated with twisting or syn-anti isomerization about the C-N bond of the donor substituted amine group. This issue has been extensively debated in the photochemical literature. By looking at the NMR spectrum of an asymmetric compound having two different substituents on the amine and a nitrogen substitution for the carbon ortho to the amine in the benzene ring before and after flash photolysis, Josef was able to show that the dual emission was indeed associated with twisting in the amine moiety.

Next, **James Pincock** (Dalhousie U.) described substituent effects on the photo-Claisen cleavage of substituted aryl ethers. These reactions show significant acceleration of the reaction rate with electron-donating substituents and a substantial decrease with electron withdrawing substituents.

The final speaker of this session was **Peter Wagner** (Michigan State U.) who delivered his IAPS award lecture from the year 2000 at this meeting. His subject was the effect of solvent, molecular conformation, steric effects and other factors on the product ratios of reactions involving triplet bi-radicals. Several of these effects can be successfully predicted and understood using electronic structure calculations.

The conference banquet was held on Friday evening in the beautiful setting of the Desert Botanical Garden, nearby to the conference site. Conferees toured the site and partook of a buffet dinner.

The last day of the conference, Saturday, was quite full. For the first talk of the session, **Linda Johnston** (Steacie Institute for Molecular Sciences-NRC) described her new studies of lipid rafts in model membranes using fluorescence and atomic force microscopy (AFM). The goal of this work is to understand how lipid organization in the form of rafts or segregated domains, may control and modulate important cellular processes. These rafts were imaged using fluorescent dyes.

Next, **Masahiro Irie** (Kyushu U.) spoke about some fascinating single crystalline diarylethenes that exhibit strong photochromism (change in absorption maximum with light absorption) that may have applications as optical switches and memory storage. These are reactive in the single crystal form and show dichroism in the crystal. The process responsible for the photochromism is the light reversible opening and closing of a ring within the molecule that shifts the absorption maximum dramatically. The stability of these systems is extremely high as well.

After the break, **Linda Peteanu** described some of her group's studies on the electroabsorption spectroscopy of the polymer MEH-PPV and its oligomers. These species are important for the construction of light emitting diode (LED) devices. The results were compared to INDO calculation in order to gain insight into the effect of structural and environmental disorder on the electronic properties of these molecules.

Next, **Carlos Chesta** (U. Nacional de Río Cuarto) described his studies on the exciplex emission of a 1-cyanonaphthalene/triethylamine designed to understand the effect of medium and temperature effects on the optical electron transfer. This emission of this complex in the gas phase and in solvents of low and medium polarity is used to determine the relevant thermodynamic parameters and the effects of solvent reorganization energy on electron transfer.

In the final talk of the morning session, **Mitch Winnick** (U. Toronto) spoke about experiments designed to understand how micelles solubilize large organic molecules. By doping micelles with pyrene, which is a fluorescent probe that insoluble in the bulk solution, the kinetics of solute exchange between micelles can be monitored. This allows the mechanism of exchange (i.e. fusion-fragmentation versus fragmentation-growth) to be uncovered. The relevant mechanism depends on whether the micelle used is ionic or not.

**Bern Kohler** (Ohio State U.) opened the afternoon session with his talk on the ultra-fast dynamics of internal conversion in DNA bases. These studies are relevant to the question of how energy migrates in DNA and therefore to the mechanism of photo-damage. By excited state absorption, the sub-ps lifetimes of the various nucleic

acids were measured. The rapid internal conversion that is observed gives rise to highly vibrationally excited ground state bases. This thermal excitation may be the origin of the photo-damage observed in polymeric DNA.

Next, **Charles Harris** (U. C. Berkeley) described elegant femtosecond infra-red studies of the activation of C-H, C-Cl, and Si-H activation by organometallic compounds. The time resolution of this technique allows the direct observation of the initial steps of bond activation. By studying the Si-H activation, a comparison of the rate of activation as a function of excitation for the triplet state versus that of the singlet state was made.

**James McCusker** (Michigan State U.) discussed how femtosecond spectroscopy may be used to probe the evolution of MLCT to ligand field states in  $[\text{Fe}(\text{tren}(\text{py})_3)]^{2+}$  complexes. Rapid dynamics ( $< 100$  fs) accompanied this process, followed by slow (8 ps) vibrational cooling of the ligand field state. McCusker showed how the low- and high-spin "crossover" complexes ( $[\text{Fe}(\text{tren}(\text{py})_3)]^{2+}$  and  $[\text{Fe}(\text{tren}(6\text{-Mepy})_3)]^{2+}$ , respectively, may be used to aid in spectral assignments.

**Benjamin Schwartz** (UCLA) described his work using ultrafast spectroscopy to obtain a detailed microscopic look at photo-induced electron transfer. Excitation of the sodium anion (produced from sodium metal in the presence of a crown ether) at 800 nm resulted in solvated electron formation within 200 fs. The decay of the electron was characterized by a fast ( $< 2$  ps) recombination within the immediate contact pair and a slower ( $> 100$  ps) recombination within the solvent separated pair. Schwartz showed that the degree of electron localization is controlled using variable energy pump excitation or two photon techniques.

**Paul Barbara** (U. Texas at Austin) – 2002 IAPS Award Winner – In the IAPS award lecture, Paul provided an overview of his contributions to studying delocalized charges in water and organic thin films. In the first part of his lecture, Paul described how geminate recombination processes are suppressed upon excitation of a solvated electron to the p or conduction band. As in the previous talk, it was demonstrated that the distance of photoelectron is modified using 2-photon IR or 1-photon. Similarly, he described experiments where  $\text{Cd}^{2+}$  scavenges the solvated electron, and the rate constant for the electron transfer reaction may be modified using a second pump pulse to excite the solvated electron into the p or conduction band. In the last part of his talk, Paul described the single molecule spectroscopy of a conjugated polymer (MEH-PPV), where photo-induced generation of cationic sites (hole polarons) quench the polymer fluorescence. Electronic bias at the near field tip was shown to attract or repel the hole polaron, resulting in a modification of polymer fluorescence.

# Symposium Report $\Phi$ otociencias, 2002 January 28 – February 2, 2002, Universidad de La Habana, Cuba

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This was the second symposium of this type, held in Havana, Cuba. The first took place in February 1999 and we hope, together with the organizers, that the series will be continued on a regular basis. The Symposium was wonderfully organized by Elena Vigil and a group of Cuban scientists, who managed to collect most of the Cuban scientists doing work related to the interaction of light with matter.

There were several invited lectures, as follows: “*Electron Transfer Dynamics in Dye Sensitized Solar Cells*” (James Durrant; Imperial College, London), “*Photocatalyzed Reduction of Cr(VI) over TiO<sub>2</sub> in the Presence of Reducing Donors: Mechanistic and Kinetic Evidences*” (Marta Litter; Comisión Nacional de Energía Atómica, Buenos Aires), “*Biological Photoreceptors: Time-Resolved Thermodynamic Parameters Derived from Optoacoustic Measurements*” (Silvia Braslavsky; MPI Strahlenchemie, Mülheim), “*Function of Carotenoids in Artificial Photosynthesis*” (Ana L. Moore; Arizona State University, Tempe), “*Waste Water Treatment by the Photochemically Enhanced Fenton Reaction: Modelling and Optimization using Experimental Design and Artificial Neural Networks*” (Esther Oliveros; Universität Karlsruhe), “*Theoretical Studies of Spectral Hole Burning, Photon Echoes and Single Molecule Spectroscopy*” (Robert J. Silbey; MIT), “*Excimer Lamps — A Decisive Step Forward in Photochemical Technology*” (André Braun; Universität Karlsruhe), “*New Developments on Laser Equipment*” (Luis Ponce; Universidad de la Habana), “*New Solid State Polymeric Dye Lasers*” (Roberto Sastre; Instituto de Ciencia y Tecnología de Polímeros, CSIC, Madrid), and “*Spectroscopy and Photophysics of Dyes Supported onto Solid Matrices*” (Enrique San Román; Instituto de Química de Materiales, Agua y Energía, Buenos Aires).

In addition, there were three Courses on (1) “*New Advances on Water Treatment: Advanced Oxidation Technologies*” presented by Esther Oliveros, Marta Litter, André Braun, and Xavier Doménech (Universidad Autónoma de Barcelona); (2) “*Fotosensitization and Detection of Transient Species*” presented by Enrique San Román, and (3) “*Lasers and their Applications*” presented by Luis Ponce (CICATA-Mexico), Mayo Villagrán

(Universidad Autónoma de México), Germán Muñiz (ISPJAE, Havana) and Juana Rassi (Delegación Habana, CITMA).

The Symposium was sponsored by the Faculties of Physics and Chemistry and the Institute of Materials and Reagents, as well as by the newly created Chair on Solar Energy of the Universidad de La Habana, and by Cubasolar and the Cuban Optical Society. Organizations from abroad that endorsed the meeting and encouraged attendance or their members were: the International Union of Photobiology (IUPB), the Centro Latinoamericano de Física (CLAF), the Inter-American Photochemical Society (I-APS), the European Society of Photobiology (ESP), and the International Commission on Optics (ICO). The external financial support of IUPB and CLAF permitted supporting the participation of young researchers from other Ibero-American Countries, such as several from Mexico as well as some from Colombia, Perú, Spain and Chile. The young scientists from these countries as well as from the labs in Cuba presented their contributions as posters in a wide variety of subjects such as ecological questions related to the survival of various algae, tomato photomorphogenesis, sugar cane photosynthesis, development of laser instruments, phototreatment of waste water and of soils, photophysics of and photochemistry with semiconductors, teaching of Photobiology, synthesis and characterization of new near-IR dyes, theoretical calculations of molecules in their excited states, spectroscopic analysis of sugar contaminants, development of solar cells, improvement of solar collectors, photolithography, photodynamic therapy, medical uses of lasers, photoinduced fluorescence in dyes used in medicine, and several other photo-areas.

Attending the two very lively poster sessions it was interesting to realize how creative and conscientious of the needs of their Country our Cuban colleagues are, since many contributions showed application-oriented subjects combined with good basic science. Many of the contributions were the result of joint efforts between the Cuban groups and foreign labs from Mexico (several), Spain, and Britain. The afternoon poster sessions were a good opportunity for the local colleagues to plan future

projects with the visiting speakers in areas much needed of development in a Country so well bathed by the Sun and yet so dependent on foreign import of fossil energy sources for the survival of its industry and transport. The foreign speakers had the opportunity of visiting several research centers to learn about their plans, the difficulties of the country and the great optimism of the Cuban people. We also had the opportunity of drinking mojitos without losing our self-control (we think) while following the rhythm of rumbas, boleros, and calypsos, when visiting the wonderful old Havana.

A third Symposium is already planned for 2005. There was some thinking about alternating and/or complementing these North-Latin-American Symposia with the more established ELAFOT (Encuentro Latinoamericano de Fotoquímica), held regularly every two years in the southern cone of the American continent (so far in Argentina, Brazil, and Chile).

All Countries south of the Rio Grande share a generous sunshine, share the urgent need of developing an independent science linked to and supporting an independent industry, and share the language(s) (Spanish-speaking and Portuguese-speaking researchers can understand each other in that mixture called Portunol). Photosciences should play a decisive role in helping finding the ways of worshipping the Sun, thus replacing in these Countries, at least in part, the oil-worshipping and war-producing economy.

# Conference Report; The XIX<sup>th</sup> IUPAC Symposium on Photochemistry, Budapest, Hungary, 14–19 July 2002

Daniel E. Falvey

University of Maryland  
College Park MD 20742

The XIX<sup>th</sup> IUPAC symposium on photochemistry was held in the beautiful city of Budapest from July 14–19<sup>th</sup>, 2002. The scientific program took place in the historic Hungarian Academy of Sciences Building in the center of the city. The meeting was organized by the Hungarian Chemical Society and **József Nyitrai** was the chairman of the local organizing committee. **Heinz Roth** headed up the international scientific committee. The meeting featured a number of superb scientific presentations and a very extensive poster session. In fact between the posters and the talks, approximately 350 scientists presented work at the meeting.

The conference officially began on Monday July 15 with introductory remarks by Prof. Roth, Nyitrai and **Sylvia Braslavsky** as well as **Sándor Görög**, President of the Chemical Sciences Section of the Hungarian Academy of Sciences. **Rudolf Rigler** gave the first scientific lecture, which presented an overview and recent results on single molecule studies of various enzymatic processes. The next invited lecture was given by **Eric Vauthey** (U. Geneva, Switzerland). He described femto-second studies of electron transfer dynamics using transient grating detection methods. This was followed by **László Biczók** (Hungarian Academy of Sciences) who lectured on the effects of hydrogen bonding on electron transfer reactions. The morning session was concluded with a plenary lecture by **Wolfgang Lubitz** (MPI-Mülheim) on pulsed EPR studies on photosystem II particles.

Monday afternoon began with **Thomas Bally's** (U. Fribourg, Switzerland) plenary lecture on matrix isolation studies of nitrenes and nitrenium ions. This was followed by **Jochen Mattay** (U. Bielefeld, Germany) who presented an invited lecture on the photoinduced electron transfer reactions of silylenol ethers and related species. The afternoon session concluded with my lecture on nitrenium ions.

The first half of Tuesday morning was devoted to three parallel sessions, on organic photochemistry, supramolecular photochemistry, and spectroscopy. These were followed by two invited lectures. The first was by **O. A. Fedovora** (Russian Academy of Sciences) on

photochromic molecules modified with cation binding groups such as crown ethers, etc. The second was by **Piotr Piotrowiak** (U. Rutgers-Newark, USA) on energy and electron transfer through carcerands and other supramolecular hosts, as well as some results on TiO<sub>2</sub> particles. The morning session concluded with a plenary lecture by **Hideo Tomioka** (Mie U, Japan) on persistent and stable triplet carbenes.

Tuesday afternoon consisted of three talks. The first was a plenary lecture by **Sylvia Braslavsky** (MPI Mülheim) on the use of laser-induced acousto-optic spectroscopy on the study of biomolecules and solvent effects on their relaxation. This was followed with an invited lecture by **Chi-Ming Che** (U. Hong Kong, China) on luminescent Pt complexes. **Mostafa A. El-Sayed's** (Georgia Tech, USA) invited lecture on the photophysics of nanoparticles completed the afternoon's program.

The first part of Wednesday morning was devoted to two parallel workshops, one on ultra-fast spectroscopy in biological systems, and one on theory and calculations in photochemistry. The second part of the morning consisted of two invited lectures. **Klaas Zachariasse** (MPI Göttingen) discussed his continuing efforts to understand geometry changes accompanying anomalous fluorescence. **A. M. "Fred" Brouwer** (U. Amsterdam, Netherlands) presented his recent studies of photochemical "motors" based on the migration of rotaxane loops.

Wednesday afternoon was dedicated to a conference excursion, which was a boat trip up the Danube River to the historic town of Szentendre. There, participants were treated to a display of Hungarian folk music and dancing at the open-air ethnographic museum, and several walking tours of the town.

The first part of Thursday morning consisted of three parallel sessions in the areas of organic photochemistry, applied photochemistry, and physical photochemistry. The second part of Thursday morning saw invited lectures by **Hermenegildo García** (U. Valencia, Spain) on donor-acceptor photochemistry in zeolites, and **Fred Lewis** (Northwestern U. USA) on the photochemistry of styrene derivatives. This was followed by a plenary lecture by **Seth Marder** (U. Arizona USA) on the design and

synthesis of chromophores and sensitizers for two-photon absorption.

The first half of the afternoon consisted of a panel discussion on the “Future of Photochemistry” The panelists were **Ed Chandross** (Bell Labs, USA), **Frans DeSchryver**, (Leuven, Belgium), **Hiroshi Masuhara** (Osaka, Japan), and **Josef Michl** (U. Colorado, USA). Chandross led off with a list of discussion of photochemical applications and a frank assessment of accomplishments and disappointments in photochemical research over the last few decades. Among the accomplishments he cited the development of photosensitization in imaging and photo-polymerization, as well as photo-resists and photo-dynamic therapy. He argued that the application of photochemistry to organic synthesis, information storage and solar energy conversion (through valence isomerization) have failed to live up to their promises. Promising future applications, according to Chandross include two photon processes, organic photo-voltaics, photo-mechanical, effects, and photobiology. DeSchryver stressed the value of interdisciplinary research in photochemistry, including collaborations with other specialists, and the development of University courses designed to teach non-chemists about the uses of photochemistry. Masuhara discussed the evolution of the field from the study of simple systems (e.g. small molecules in the gas phase, time resolved spectroscopy) to more complex areas (biological systems and time resolved imaging). He also cited the application of photochemistry to macroscopic changes in materials properties as a promising area of future endeavors. Michl stressed fundamental problems that have yet to be solved, such as the quantitative prediction of quantum yields. There was no discussion of these issues. In addition, Michl and Masuhara presented recent results from their own laboratories.

The remainder of the afternoon consisted of two invited lectures on organic photochemistry. **Kazuhiko Mizuno** (Osaka Prefecture U., Japan) presented studies of photo-induced electron transfer reactions with allylsilanes and **Katsuya Ishiguro** (Yamaguchi U., Japan) discussed results on the cation radical reactions of quadicyclane derivatives.

Friday morning began with three parallel sessions of contributed talks. The topic areas were organic photochemistry, physical photochemistry, and coordination photochemistry. The second part of the Friday morning was devoted to the presentation of the Porter Medal to Josef Michl. Michl then presented his award lecture on the photophysics and electronic structure of sigma bonds, particularly those involving Si-Si linkages.

The Emperor of Japan paid a visit to the Hungarian Academy of Sciences during the lunch break. It is not known if he attended any photochemistry lectures. Following lunch **Dan Nocera** (MIT, USA) presented a plenary lecture on his investigations into solar energy conversion using bivalent metal complexes and hangman porphyrins. **Kazuhito Hashimoto** (Gunma College of Tech, Japan) then presented a plenary lecture on photochemistry on applications of TiO<sub>2</sub> photo-catalysis. **Dirk Guldi** (U. Notre Dame, USA) then gave an invited lecture on photo-induced electron transfer involving fullerenes and nanotubes. The scientific program was concluded with a lecture by **Bob Liu** (U. Hawaii, USA) on the “Hula Twist” mechanism for polyene isomerization mechanism.



## 14<sup>th</sup> Inter-American Photochemical Society Meeting, January 2–5, 2003



**Hot photochemistry under the sun!**

**Clearwater Beach, Florida  
Abstracts due November 20<sup>th</sup>**

### **Organizers:**

**Daniel E. Falvey**, University of Maryland,  
df37@umail.umd.edu

**Gerald J. Meyer**, Johns Hopkins University,  
meyer@jhu.edu

### **Invited Speakers So Far:**

Dan Nocera (MIT)

Ian Gould (Arizona State)

John Simon (Duke)

Devens Gust (Arizona State)

Fred Lewis (Northwestern)

Russ Schmehl (Tulane)

Cornelia Bohne (University of Victoria)

Kirk Schanze (University of Florida)

### **More details at:**

<http://www.chemistry.mcmaster.ca/~iaps>



# Call For Papers

## XIV<sup>th</sup> Winter Meeting of the Inter-American Photochemical Society Clearwater Beach, Florida January 2-5, 2003

The conference will consist of invited and contributed papers. A limited number of contributed papers will be selected for oral presentation, the others will be presented in poster sessions. To submit a paper for consideration for oral presentation, send a one page abstract to reach conference co-chair Daniel Falvey by October 25, 2002. Students who want to be considered for travel awards are to have their abstracts reach Daniel Falvey by October 1, 2002. Abstracts for poster presentations must be received by November 20, 2002. Closs Award and Cilento Award applicants are directed to the web <[http://www.chemistry.mcmaster.ca/~iaps/call\\_for\\_nominations.html](http://www.chemistry.mcmaster.ca/~iaps/call_for_nominations.html)> for information.

Please clearly indicate whether your paper should be considered for oral presentation.

**Dr. Daniel E. Falvey**  
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University of Maryland  
Bldg 091  
University of Maryland  
College Park MD 20742.

email: [falvey@umd.edu](mailto:falvey@umd.edu)

Contributors will be notified by November 1, 2002 if their paper has been selected for oral presentation.

Type each abstract on 8.5 x 11 inch paper with 1-inch margins all around. Use "Times" or "Times New Roman" 12-point or 10-point font. Place the title in bold centered horizontally at the top followed by the author's(s') name(s) and address(es) also centered horizontally. Underline the presenting author's name. Full-justify and single-space the body of the abstract. The complete abstract including any schemes, figures, and references cannot be longer than one page.

Please mail two copies and make sure they do not fold during mailing. You may also email abstracts to the above address, but they must be in the form of PDF's.



**MEETING REGISTRATION FORM**  
**INTER-AMERICAN PHOTOCHEMICAL SOCIETY -- 14th WINTER CONFERENCE**  
Clearwater Beach, Florida January 2 - 5, 2003

Mail this completed form with a check made payable to I-APS to:

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I-APS Member @ \$ 150 each \_\_\_\_\_  
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Postdoc Member @ \$75 each \_\_\_\_\_  
Student Member @ \$50 each \_\_\_\_\_  
Accompanying person @ \$ 70 each \_\_\_\_\_  
Late Fee @ \$ 25 per person after November 20, 2002 \_\_\_\_\_  
TOTAL \_\_\_\_\_

The registration fee includes charges for the banquet, abstract book, coffee breaks, etc. In case one wants to include accompanying persons for only the banquet, please report this to the Conference Registrar at the time of on-site registration. The cost of the banquet alone (unknown presently) will be charged.

**Roommate Service.** We will provide the names of prospective roommates to those indicating an interest in sharing a room. Please provide the following information:

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