Fundamental and Applications of Materials via Control of Ground and Excited State Properties

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I would like to present the exploitation of molecular design and spectroscopic technique, together with the theoretical approach, to probe several cutting-edge issues regarding the structure/excited-state properties relationship. I will focus on the morphology dependent and the associated exciton coupling will be presented using emerging compounds as prototypes. Also, I would like to present a series of phenazine derivatives that undergo excited-state structural transformation. Depending on the substituents and external stimulus such as viscosity, the ratiometric emission has been successfully applied in bio-sensing and imaging. Finally, I will talk about recent progress on the excited-state proton transfer, for which the reaction dynamics and thermodynamics can be fine-tuned via the hydrogen bonding (H-bond) strength, including those non-classic sulfur H-bond and their potential application in sensing bio-waters. A summary of my current focus will be presented at the end of the talk.

Selected publication (2017-2019):

1. *J. Am. Chem. Soc.* **2019**, *141(13)*, 5535–5543, **2.** *J. Am. Chem. Soc.*, **2019**, *141 (26)*, 10324–10330, **3.** *J. Am. Chem. Soc.*, **2019**, 1*41 (25)*, 9885–9894, **4.** *Angew. Chem. Int. Ed*. **2019**, *58*, 13297–13301, **5.** *Angew. Chem. Int. Ed.* **2019**, 58 (30), 10158–10162, **6.** *Angew. Chem. Int. Ed.* **2019**, *58,*13456–13465, **7.** *Nature Commun.* **2018,** 9, 3111, **8.** *Nature Review Chemistry,* **2018**, *2,* 131–143, **9.** *Angew. Chem. Int. Ed.* **2018**, *57 (31)*, 9880 – 9884, **10.** *Angew. Chem. In. Ed.* **2018,** 57, 5020 –5024, **11.** *J. Am. Chem. Soc.*, **2018**, 140 (43), pp 14357–14366., **12.** *Adv. Mater.* **2018**, 30 (20), 1706592, **13.** *Chem. Rev.* **2017**, 117, 13353−13381, **14.** *Nature Photonics*. **2017**, *11*, 63–68, **15.** *J. Am. Chem. Soc.* **2017**, *139*, 1636–1644. **16.** *J. Am. Chem. Soc.*, **2017,** 139, 6396-640

Biography

Prof. Pi-Tai Chou earned his Ph.D. in Chemistry and Biochemistry from The Florida State University, postdoctoral fellow in University of California at Berkeley, and is currently an NTU distinguished chair professor of chemistry department and director of Center for Emerging Material and Advanced Devices in National Taiwan University. Prof. Chou is an expert in molecular spectroscopy and ultrafast chemical phenomena. He is currently the associate editor of ACS Applied Materials and Interfaces. He has published ~540 SCI papers with an h-index of 87.

Curriculum Vitae

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Education:
1979 B.S. Chemistry, The Fu-Jen University, Taipei, Taiwan
1980-1984 Ph.D., Physical and Biophysical Chemistry, The Florida State University. Advisor: Professor Michael Kasha

Professional:
2001- Professor, Department of Chemistry, National Taiwan University
1994-2000 Professor, Department of Chemistry, National Chung-Cheng University.
1987-1994 Assistant Professor, Department of Chemistry and Biochemistry, University of South Carolina, Columbia
1985-1987 DOE Postdoctoral Fellow, Department of Chemistry, University of California, Berkeley. Advisors : Professors George Pimentel and Heinz Frei

Working Experiences:
1988-1990 Foreign Student Advisor, University of South Carolina
1990-1992 Advisor, Chinese Student Association, South Carolina, USA
1996-1999 Chairman, Department of Chemistry, National Chung-Cheng University.
2001-2005 Convener, Division of Chemistry, National Science Council
2007-2010 Chairman, Department of Chemistry, National Taiwan University.
2011-2013 Program Director (National Program on Nano Technology)
2011- Director of Center for Emerging Material and Advanced Devices
2014-2018 Program Coordinator (Program on New Generation Photovoltaic Cells)
2014- Associate Editor, ACS Applied Materials and Interfaces

Research Areas:
1. Ultrafast laser spectroscopy and technology
2. Spectroscopic and dynamic studies of photooxygenation, photorearrangement and excited-state proton/electron transfer reactions of bioorganic molecules.
3. Spectroscopy/dynamics of singlet oxygen and its biological role
4. Bio-molecular recognition, syntheses and application of fluorescence probes
5. Synthesis/characterization, relaxation dynamics and applications of II-V semiconductor nanomaterials
6. Second and third row transition metal complexes, the associated OLED and photophysics
7. Solar energy devices; strategic design and applications

Awards and Honors:

1989 Young Investigator Award, The South Carolina State, USA
1991 Best Teaching Award, University of South Carolina, Columbia
1993 Research Invention Award "Proton Transfer Laser Dyes" Research Corp.
1997 Outstanding Research Award, National Chung-Cheng University
1997-1998 Outstanding Research Award, National Science Council, Taiwan
1999-2000 Outstanding Research Award, National Science Council, Taiwan
2001-2002 Outstanding Research Award, National Science Council, Taiwan
2001-2004 Distinguished Chair Professor, National Taiwan University
2002-2007 Distinguished Research Fellow, National Science Foundation
2002-2004 Scientific achievement award, Foundation of Chinese Education and Culture
2003- 46th Ministry of Education Award, Taiwan
2004 Outstanding Teaching Award, National Taiwan University
2006 “Ho Chin Tui” Outstanding Honorary Research Award
2007 Distinguished Chair Professor, National Taiwan University
2007 Alumni Achievement Award, 2007, The Fu Jen Catholic University
2008-2011 National Chair Professor, Ministry of Education Taiwan
2009 Distinguished Research Award, National Science Council
2009 Fellow of the Royal Society of Chemistry (FRSC), UK.
2011 Distinguished Chair Professor, National Taiwan University
2012 Y. Z. Hsu Scientific Award Scientific Chair Professor
2012 Asian and Oceanian Photochemisty Association (APA) Award, Osaka, Japan
2013 Academic Achievement Award, Chinese Chemical Society
2014 Distinguished Chair Professor, National Taiwan University
2015 Author Profile (Angew. Chem. Int. Ed. 2015): to honor the publication of at least 10 papers in Angew. Chem. Int. Ed. during the past 10 years.
2015 TWAS (The World Academy of Science) PRIZE, Vienna, Austria
2015 Outstanding Contribution Award in Chemistry and Chemical Engineering, Tasco Chemical Corporation
2017 Distinguished Chair Professor, National Taiwan University

Editorial Honor:
Associate Editor:
Associate Editor, ACS Applied Materials and Interfaces **2014**, June-Present
Associate Editor, Material Express (American Scientific Publishers) **2011-2014**
Guest Editor, J. Phys. Chem. B, Volume 119, **2015**. “Photoinduced Proton Transfer in Chemistry and Biology”
Editorial Advisory Board Member
ACS Applied Materials and Interfaces **2009-2014**
J. Phys. Chem. A, B and C. **2014-2017**
J. Phys. Chem. Letts. **2014-2017**
J. Chinese Chemical Society **1997-**
THE OPEN CHEMICAL PHYSICS, articles, reviews and letters **2007-2014**