

CURRICULUM VITAE

PUI-TAK LEUNG (梁培德)

(July, 2023)

Education

| <u>Degree</u> | <u>Year</u> | <u>Subject and institution</u> |
|---------------|-------------|---|
| Ph.D. | 1982 | Physics, State University of New York (SUNY) at Buffalo, U.S.A. |
| M.A. | 1979 | Physics, SUNY at Buffalo, U.S.A. |
| M.Ed. | 1979 | Science Education, SUNY at Buffalo, U.S.A. |
| B.Sc. | 1976 | Physics, The Chinese University of Hong Kong, H.K. |

Employment

| <u>Title and institution</u> | <u>Dates</u> |
|---|---------------------------------|
| Professor of Physics Portland State University, Oregon | September, 1996 - present |
| Affiliate Staff Scientist Pacific Northwest National Laboratories, Washington | December, 1994 - December, 1997 |
| Associate Professor of Physics Portland State University, Oregon | September, 1991 - August 1996 |
| Visiting Scientist IBM Almaden Research Center, California | June, 1991 - June, 1992 |
| Consultant Amersham International plc Buckinghamshire, England | May, 1989 - May, 1992 |
| Assistant Professor of Physics Portland State University, Oregon | September, 1988 - August, 1991 |
| Postdoctoral Research Fellow Department of Physics, SUNY at Buffalo, New York | August, 1985 - August, 1988 |
| Associate Professor of Physics Tamkang University, Taiwan | August, 1982 - July, 1985 |
| Teaching Assistant Department of Physics, SUNY at Buffalo, New York | September, 1977 - July, 1982 |

Research Areas

- Plasmonics and Metamaterials
- Theoretical Optical and Atomic Physics
- Theoretical Surface Physics
- Numerical Modeling
- Semiconductor Surface Cleaning and Processing
- Sensors and Device Design

Significant Professional Development Activities

- (1) **Outstanding Referee**, recognition from American Physical Society, 2012.
- (2) **Visiting Professor** at National Taiwan Ocean University, 2008, 2009, 2010, 2011, 2012.
- (3) **Visiting Scholar** at National Taiwan University, R. O. C.: summer, 2010; summer, 2011, summer, 2012.
- (4) **Fulbright Scholar and Visiting Professor** at National Taiwan University, R. O. C. : August 1, 2008 to July 31, 2009.
- (5) **National Research Council Panelist** : March, 2001; March, 2002; March, 2003; March, 2005; March 2006; March 2007; March 2008.
- (6) **Affiliate Staff Scientist** at Pacific Northwest National Laboratories (PNNL), Washington : December, 1994 – December 1997
- (7) **Visiting Lecturer** at Tohoku University in Sendai, Japan : August 1 - 4, 1994
- (8) **Visiting Scholar** at Academia Sinica of Taiwan, R. O. C. : July, 2014, August, 2013, September, 2003; August, 2001; August, 2000; August 1, 1999 – March 31, 2000; July 16 - August 15, 1997; July 1 – August 31, 1996; June 4 - 30, 1994
- (9) **Visiting Scientist** at the IBM Almaden Research Center, California : June, 1991 - June,1992.
- (10) **Consultant** to the Amersham International public limited company, Buckinghamshire, England : May, 1989 - May 1992.
- (11) **Invited visitor** to the Pollards Wood Laboratories, England - the central research facilities of Amersham International plc : September, 1989.
- (12) **Invited speaker** at the SPIE (Society of Photo-Optical Instrumentation Engineers) International Conference in Los Angeles, California : January, 1989.

Grants, Fellowships, and Awards

- (1) John Eliot Allen Outstanding Teaching Awards, \$500, 2017.

- (2) Sigma Xi Outstanding Researcher Award, \$500, 2014.
- (3) M.J.Murdock Charitable Trust Grant for proposal entitled " New directions in optical research: Plasmonics with metallic nanoparticles and Metamaterials ", \$15,000, 2014-16.
- (4) Research support for sabbatical leave at NTU from the National Research Council of Taiwan, NTD 197,0000 (~ \$66,000), 2008-09.
- (5) Fulbright Research Scholarship for studies in theoretical plasmonics, on my sabbatical visit at National Taiwan University, NTD 400,000 (~ \$13,500), 2008-09.
- (6) John Eliot Allen Outstanding Teaching Awards, \$500, 2008.
- (7) Portland State University Faculty Enhancement Program for proposal entitled "Computational Studies of the Quantum Effects in Plasmonics with Metallic Nanoparticles ", \$2,250, 2008-09.
- (8) Intel Corporation Research Grant for proposal entitled " Modeling Microscopic Optical Properties of Nanostructures: Applied computational approach ", \$50,000, 2005-06.
- (9) Portland State University Faculty Development Grant for proposal entitled "Theoretical Studies of the Optical Properties of Metallic Nanostructures ", \$2,700, 2005-06.
- (10) John Eliot Allen Outstanding Teaching Awards, \$500, 2005.
- (11) Portland State University Faculty Development Grant for proposal entitled "Studies of the Theoretical and Computational Aspects of Field Emission from Carbon Nanotubes ", \$7,614, 2002-03.
- (12) John Eliot Allen Outstanding Teaching Awards, \$500, 2002.
- (13) M.J.Murdock Charitable Trust Grant for proposal entitled " Quantum Mechanics and Nanoparticle Sciences", \$14,000, 2001-03.
- (14) Portland State University Faculty Development Grant for proposal entitled "Proposed New Directions in the of Research of Nano-particle Sciences ", \$2,250, 2000-01.
- (15) John Eliot Allen Outstanding Teaching Awards, \$400, 1999.
- (16) Portland State University Faculty Development Grant for proposal entitled "Studies of Energy-Deposition from Particle Beams for Cancer Radiotherapy ", \$6,622, 1998-99.
- (17) Portland State University Faculty Development Grant for proposal entitled "Studies of Photo-molecular Processes at Structured Metal Surfaces ", \$2,500, 1997-98.
- (18) Research Grant received from Oregon Medical Systems for proposal entitled "Computational Electrodynamic Modeling of a Cardiac Monitoring Device ", \$ 39,658, 1997.
- (19) US Department of Energy Faculty Fellowship for research in "Near Field Optics ", \$ 8,876, 1995.
- (20) Portland State University Faculty Development Grant for proposal entitled "Optimization of the Laser Cleaning Technique for Treatment of Contaminated Surfaces ", \$2,250, 1994-95.

- (21) IBM Equipment Grant for proposal entitled " Opto-thermal Processing at Solid Surfaces ", estimated market value : \$ 4,250, 1992.
- (22) Portland State University Research and Scholarship Grant Program for proposal entitled " Optical Biosensing and Opto-thermal Processing at Solid Surfaces ", \$4,000, 1992-1993.
- (23) Portland State University Outstanding Junior Faculty Award for proposal entitled " Optical Biosensing and Opto-thermal Processing at Solid Surfaces ", \$4,000, 1992-1993.
- (24) IBM Visiting Scientist Fellowship, (\$64,000 + \$5,000 allowance), 1991-1992, to perform research in " Laser Cleaning of Surfaces " at the Almaden Research Center.
- (25) Award of a complete set of computation equipment (valued at \$ 7,000) by Amersham International plc (1989) for the joint venture in research and development of " the Surface Plasmon based Biosensor ".
- (26) Portland State University Research and Publications Committee for proposal entitled " Investigation of Possible Novel Photophysical and Photochemical Processes at Corrugated Metal Surfaces and Thin Films ", \$700, 1990-1991.

List of Publications and Recent Presentations

Refereed Journal Articles (in reversed chronological order) :

- (139) R. Chang, H. Y. Xie and **P. T. Leung**, " Electromagnetic radiation from a spherical static current source coupled to harmonic axion field " **Phys. Lett. A** **481**, 128991 (2023).
- (138) R. Chang, H. Y. Xie and **P. T. Leung**, " Plasmonic hybridization in the presence of topological insulators " **J. Opt. Soc. Am. B** **39**, 452-458 (2022).
- (137) R. Chang, H. Y. Xie and **P. T. Leung**, " Surface plasmon resonance in the presence of topological insulators " **Optik** **251**, 168424 (2022).
- (136) H. Y. Xie, R. Chang and **P. T. Leung**, " Dipole emission characteristics near a topological insulator sphere coated with a metallic nanoshell " **Results in Physics** **23**, 104014 (2021).
- (135) **P. T. Leung**, " The gauge principle from the Schrodinger-Born wave mechanics " **J. Found. App. Phys.** **7**, 53-58 (2020).
- (134) **P. T. Leung** and G. J. Ni, " A new look at the quantum Liouville theorem " **J. Found. App. Phys.** **7**, 25-31 (2020).
- (133) H. Y. Xie and **P. T. Leung**, " Electromagnetic reciprocity in the presence of topological insulators " **J. Phys. Commun.** **4**, 095014 (2020).
- (132) R. Chang, H. Y. Xie, Y. C. Wang, H. P. Chiang, and **P. T. Leung**, " Topological magnetoelectric effect as probed by nanoshell plasmonic modes " **Results in Physics** **15**, 102744 (2019).

- (131) Edin Sijercic and **P. T. Leung**, “ Enhanced Terahertz emission from quantum dot by graphene coated nanoparticle ” **Appl. Phys. B** **124**, 141 (2018).
- (130) T. Bian, X. Gao, S. Yua, L. Jiang, J. Lua, and **P. T. Leung**, " Scattering of light from graphene-coated nanoparticles of negative refractive index " **Optik** **136**, 215-221 (2017).
- (129) R. Chang, H. Y. Chung, C. W. Chen, H. P. Chiang, and **P. T. Leung**, “ Optical effects of charges in colloidal solutions ” **Opt. Materials** **66**, 43-47 (2017).
- (128) E. Sijercic and **P. T. Leung**, “ Effects of surface charge on the anomalous light scattering from metallic nanoparticles ” **Opt. Commun.** **370**, 198-202 (2016).
- (127) T. Bian, R. Chang, and **P. T. Leung**, “ Förster resonance energy transfer between molecules in the vicinity of graphene-coated nanoparticles ” **Plasmonics** **5**, 1239-1246 (2016).
- (126) C. W. Chen, T. Bian, H. P. Chiang, and **P. T. Leung**, " Nonlocal optical effects on the Goos-Hänchen shifts at multilayered hyperbolic metamaterials ” **J. Opt.**, **18**, 025104 (2016).
- (125) T. Bian, R. Chang, and **P. T. Leung**, “ Optical interactions with a charged metallic nanoshell ” **J. Opt. Soc. Am. B** **33**, 17-26 (2016).
- (124) H. Hajian, I. D. Rukhlenko , **P. T. Leung**, H. Caglayan, E. Ozbay, “ Guided Plasmon Modes of a Graphene-Coated Kerr Slab ” **Plasmonics** **11**, 735-741 (2016).
- (123) **P. T. Leung**, “ On Maxwell’s discovery of electromagnetic waves and the gauge condition ” **Eur. J. Phys.** **36**, 025002 (2015).
- (122) R. Chang, **P. T. Leung**, and D. P. Tsai, “ Effects of gain medium on the plasmonic enhancement of Forster resonance energy transfer in the vicinity of a metallic particle or cavity ” **Optics Express** **22**, 27451-27461 (2014).
- (121) R. Chang and **P. T. Leung**, “ Generalized reciprocal relations for transmission and reflection of light through a 1D stratified anisotropic metamaterial ” **Optics Commun.** **329**, 125-128 (2014).
- (120) H. Hajian, A. Soltani-Vala, M. Kalafi, and **P. T. Leung**, “ Surface plasmons of a graphene parallel plate waveguide bounded by Kerr-type nonlinear media ” **J. Appl. Phys.** **115**, 083104 (2014).
- (119) H. Y. Chung, **P. T. Leung**, and D. P. Tsai, “ Molecular fluorescence in the vicinity of a charged metallic nanoparticle ” **Optics Express** **21**, 26483–26492 (2013).
- (118) M. L. Tseng, C. M. Chang, B. H. Cheng, P. C. Wu, K. S. Chung, M. K. Hsiao, H. W. Huang, D. W. Huang, H. P. Chiang, **P. T. Leung**, and D. P. Tsai “ Multi-level surface enhanced Raman scattering using AgO_x thin film ” **Optics Express** **21**, 24460-24467 (2013).

- (117) A. Caccavano and **P. T. Leung**, " Atomic spectroscopy and the photon mass: effects on the 21 cm radiation " **Phys. Letts. A** **377**, 2777-2779 (2013).
- (116) J. H. Huang and **P. T. Leung**, " Nonlocal optical effects on the Goos-Hänchen shift at an interface of a composite material of metallic nanoparticles " **J. Opt. Soc. Am. A** **30**, 1387-1393 (2013).
- (115) H. Y. Chung, **P. T. Leung**, and D. P. Tsai, " Effects of extraneous surface charges on the enhanced Raman scattering from metallic nanoparticles " **J. Chem. Phys.** **138**, 224101 (2013).
- (114) E. Knox and **P. T. Leung**, " Constraints on the reciprocal propagation of a quantum particle through a 1D localized complex potential " **Can. J. Phys.** **91**, 246-250 (2013).
- (113) H. Y. Chung, **P. T. Leung**, D. P. Tsai, " Decay rates of molecule in the vicinity of a spherical surface of an isotropic magnetodielectric material " **Phys. Rev. B** **86**, 155413 (2012).
- (112) H. Y. Chung, **P. T. Leung**, and D. P. Tsai, " Equivalence between the mechanical model and energy-transfer theory for the classical decay rates of molecules near a spherical particle " **J. Chem. Phys.** **136**, 184106 (2012).
- (111) C. W. Chen, H.-P. Chiang, D. P. Tsai, and **P. T. Leung**, " Temperature dependence of the surface-plasmon-induced Goos-Hanchen shifts " **Appl. Phys. B** **107**, 111-118 (2012).
- (110) H. Y. Chung, **P. T. Leung**, and D. P. Tsai, "An effective medium approach to the dynamic optical response of a graded index plasmonic nanoparticle" **J. Opt. Soc. Am. B** **29**, 970-976 (2012).
- (109) H. Y. Chung, **P. T. Leung**, D. P. Tsai, " Fluorescence characteristics of a molecule in the vicinity of a plasmonic nanomatryoska: nonlocal optical effects " **Opt. Commun.** **285**, 2207-2211 (2012).
- (108) H. Y. Chung, **P. T. Leung**, and D. P. Tsai, " Modified long wavelength approximation for the optical response of a graded index plasmonic nanoparticle" **Plasmonics** **7**, 13-18 (2012).
- (107) C. W. Chen, Y. W. Gu, H.-P. Chiang, E. J. Sanchez, and **P. T. Leung**, " Goos-Hanchen shift at an interface of a composite material: effects of particulate clustering " **Appl. Phys. B** **104**, 647-652 (2011).
- (106) H. Y. Chung, G. Y. Guo, H. P. Chiang, D. P. Tsai, and **P. T. Leung**, " Accurate description of the optical response of a multilayered spherical system in the long wavelength approximation " **Phys. Rev. B** **82**, 165440 (2010).
- (105) H. Y. Chung, **P. T. Leung**, and D. P. Tsai, " Enhanced intermolecular energy transfer in the vicinity of a plasmonic nanorice " **Plasmonics** **5**, 363-368 (2010).
- (104) C. W. Chen, H. Y. Chung, H. -P. Chiang, J. Y. Lu, R. Chang, D. P. Tsai, and

- P. T. Leung**, “ Nonlocality and particle-clustering effects on the optical response of composite materials with metallic nanoparticles ” **Appl. Phys. A** **101**, 191 (2010).
- (103) C. W. Chen, L. S. Liao, H. P. Chiang, and **P. T. Leung**, “ Temperature effects on the polarizability of mesoscopic metallic nanoparticles ” **Appl. Phys. B** **99**, 223 (2010).
- (102) **P. T. Leung** and K. Young, “ Gauge invariance and reciprocity in quantum mechanics ” **Phys. Rev. A** **81**, 032107 (2010).
- (101) H. Y. Xie, **P. T. Leung**, and D. P. Tsai, “ Reciprocity theorem for nonlocal optics: completion of proof and application to spectroscopic analysis ” **J. Opt. A** **12**, 035006 (2010).
- (100) H. Y. Xie, H. Y. Chung, **P. T. Leung**, and D. P. Tsai, “ Plasmonic enhancement of Forster energy transfer at a metallic nanoparticle: nonlocal optical effects ” **Phys. Rev. B** **80**, 155448 (2009).
- (99) H. Y. Chung, H. Y. Xie, **P. T. Leung**, and D. P. Tsai, “ Optical properties of metallic nanoshell composites: effects of temperature and particle-clustering ” **Solid State Commun.** **149**, 2151-2154 (2009).
- (98) H. Y. Chung, **P. T. Leung**, and D. P. Tsai, “ Dynamic modifications of polarizability for large metallic spheroidal nanoshells ” **J. Chem. Phys.** **131**, 124122 (2009).
- (97) H. Y. Xie, **P. T. Leung**, and D. P. Tsai, “ Clarification and extension of the optical reciprocity theorem ” **J. Math. Phys.** **50**, 072901 (2009).
- (96) H. Y. Xie, **P. T. Leung**, and D. P. Tsai, “ Molecular decay rates and emission frequencies in the vicinity of an anisotropic metamaterial ” **Solid State Commun.** **149**, 625-629 (2009).
- (95) J. H. Huang, R. Chang, **P. T. Leung** and D. P. Tsai, “ Nonlinear dispersion relation for surface plasmon at a metal-Kerr medium interface ” **Opt Commun.** **282**, 1412-1415 (2009).
- (94) **P. T. Leung** and G. J. Ni, " Reply to comment on 'A note on the formulation of the Maxwell equations for a macroscopic medium" **Eur. J. Phys.** **30**, L17-L18 (2009).
- (93) H. Y. Xie, **P. T. Leung** and D. P. Tsai, “ General proof of optical reciprocity for nonlocal electrodynamics ” **J. Phys. A.** **42**, 045402 (2009).
- (92) H. Y. Xie, **P. T. Leung**, and D. P. Tsai, “ General validity of reciprocity in quantum mechanics ” **Phys. Rev. A** **78**, 064101 (2008).
- (91) C. W. Chen, H.-P. Chiang, **P. T. Leung**, and D. P. Tsai, “ Temperature dependence of enhanced optical absorption and Raman spectroscopy from metallic nanoparticles” **Solid State Commun.** **148**, 413-416 (2008).
- (90) P. Dragulin and **P. T. Leung**, “Green dyadic for the Proca fields” **Phys. Rev. E** **78**, 026605 (2008).
- (89) **P. T. Leung** and G. J. Ni, “A note on the formulation of the Maxwell equations for a macroscopic medium ” **Eur. J. Phys.** **29**, N37-N41 (2008).

- (88) **P. T. Leung** and R. Chang, "Reciprocity in nonlocal nanooptics" **J. Opt. A.**, **10**, 075201 (2008).
- (87) **P. T. Leung**, Z. W. Chen and H. P. Chiang, "Addendum to 'Large negative Goos Hanchen shift at metal surfaces' " **Opt. Commun.** **281**, 1312-1313 (2008).
- (86) **P. T. Leung**, " Singular behaviour of the electrodynamic fields of an oscillating dipole " **Eur. J. Phys.** **29**, 137-141 (2008).
- (85) Z. E. Goude and **P. T. Leung**, " Surface Enhanced Raman Scattering from Metallic Nanoshells with Nonlocal Dielectric Response" **Solid State Commun** **143**, 416-420 (2007).
- (84) C. W. Chen, C. H. Lin, H. P. Chiang, Y. -C. Liu, **P. T. Leung** and W. S. Tse, "Temperature Dependence of the Sensitivity of a Long-Range Surface Plasmon Optical Sensor" **Appl. Phys A** **89**, 377-380 (2007).
- (83) C.-W. Chen, W.-C. Lin, L.-S. Liao, Z.-H. Lin, H.-P. Chiang, **P. T. Leung**, E. Sijercic and W. S. Tse, "Optical Temperature Sensing Based on the Goos-Hanchen Effect" **Appl. Optics** **46**, 5347-5351 (2007).
- (82) **P. T. Leung**, Z. W. Chen and H. P. Chiang, " Large negative Goos Hanchen shift at metal surfaces " **Opt. Commun.** **276**, 206-208 (2007).
- (81) J. Vielma and **P. T. Leung**, " Nonlocal optical effects on the fluorescence and decay rates for admolecules at a metallic nanoparticle " **J. Chem. Phys.** **126**, 194704 (2007).
- (80) H.-P. Chiang, Z. W. Chen, J. J. Wu, H. L. Li, T. Y. Lin, E. J. Sánchez and **P. T. Leung**, " Effects of temperature on the surface plasmon resonance at the metal-semiconductor interface of a Schottky barrier " **Thin Solid Films** **515**, 6953-6961 (2007).
- (79) H. Sinky and **P. T. Leung**, " Relativistic corrections to a generalized sum rule " **Phys. Rev. A** **74**, 034703 (2006).
- (78) **P. T. Leung** and G. J. Ni, " On the singularities of the electrostatic and magnetostatic dipole fields" **Eur. J. Phys.** **27**, N1-N3 (2006).
- (77) R. Chang and **P. T. Leung**, " Nonlocal optical effects on the optical and molecular interactions with metallic nanoshells" **Phys. Rev. B** **73**, 125438 (2006); *ibid* **75**, 079901(E) (2007).
- (76) H. P. Chiang, J. L. Lin, R. Chang, Z. W. Chen and **P. T. Leung**, " High resolution angular measurement using surface-plasmon-resonance heterodyne interferometry at optimal incident wavelengths " **Proc. SPIE** vol. **6002**, 600218: 1-10 (2005).
- (75) R. Chang and **P. T. Leung**, " Theoretical study of nonlocal effects in the optical response of metallic nanoshells" **Proc. SPIE** vol. **6002**, 60020V: 1-10 (2005).
- (74) H. P. Chiang, J. L. Lin, R. Chang, S. Y. Su and **P. T. Leung**, " High resolution angular measurement using surface-plasmon-resonance via phase interrogation at optimal incident wavelengths " **Opt. Lett.** **30**, 2727-2729 (2005).

- (73) Railing Chang, H.-P. Chiang, **P. T. Leung**, D. P. Tsai and W. S. Tse, " Nonlocal effects in the optical response of composite materials with metallic nanoparticles " **Solid State Commun.** **133**, 315-320 (2005); erratum: *ibid.* **137**, 343 (2006).
- (72) H. P. Chiang, H. T. Yeh, C. M. Chen, J. C. Wu, S. Y. Su, R. Chang, Y. J. Wu, D. P. Tsai, S. U. Jen, and **P. T. Leung**, " Surface plasmon resonance monitoring of temperature via phase measurement" **Opt. Commun.** **241**, 409-418 (2004)
- (71) **P. T. Leung**, " A note on the 'system-free' expressions of Maxwell's equations " **Eur. J. Phys.** **25**, N1-N4 (2004).
- (70) R. Chang, H. P. Chiang, **P. T. Leung**, and W. S. Tse, " Nonlocal electrodynamic effects in the optical excitation of the surface plasmon " **Opt. Commun.** **225**, 353-361 (2003).
- (69) H. P. Chiang, Y. C. Wang, and **P. T. Leung**, " Effect of temperature on the incident angle-dependence of the sensitivity for surface plasmon resonance spectroscopy " **Thin Solid Films** **425**, 135-138 (2003).
- (68) M. H. Hider and **P. T. Leung**, " Nonlocal electrodynamic modeling of fluorescence characteristics for molecules in a spherical cavity ", **Phys. Rev. B** **66**, 195106 (2002).
- (67) H. P. Chiang, A. H. La Rosa, **P. T. Leung**, K. P. Li, and W. S. Tse, " Optical spectroscopy for single-molecules near a microstructure at varying substrate temperatures " **Opt. Commun.** **205**, 343-350 (2002).
- (66) R. L. Hartman and **P. T. Leung**, " Dynamical theory for modeling dipole-dipole interactions in a microcavity: The Green dyadic approach " **Phys. Rev. B** **64**, 193308 (2001).
- (65) H. P. Chiang, Y. C. Wang, **P. T. Leung**, and W. S. Tse, " A theoretical model for the temperature-dependent sensitivity of the optical sensor based on surface plasmon resonance " **Opt. Commun.** **188**, 283-289 (2001).
- (64) R. Chang, **P. T. Leung**, S. H. Lin and W. S. Tse, " Surface-enhanced Raman scattering at cryogenic substrate temperatures " **Phys. Rev. B** **62**, 5168-5173 (2000).
- (63) R. L. Hartman, **P. T. Leung** and S. M. Cohen, " Molecular fluorescence in the vicinity of a gradient-index medium " **J. Opt. Soc. Am. A** **17**, 933-936 (2000).
- (62) H. P. Chiang, **P. T. Leung** and W. S. Tse, " Remark on the substrate-temperature dependence of surface-enhanced Raman scattering " **J. Phys. Chem. B** **104**, 2348-2350 (2000).
- (61) **P. T. Leung**, " Addendum : 'Bethe stopping-power theory for heavy target atoms' " **Phys. Rev. A** **60**, 2562-2564 (1999); **A** **63**, 069902 (2001) (E).
- (60) S. M. Cohen and **P. T. Leung**, " Comment on 'Relativistic correction of the generalized oscillator strength sum rules' " **Phys. Rev. A** **59**, 4847 (1999).
- (59) R. L. Hartman, S. M. Cohen and **P. T. Leung**, " A note on the Green Dyadic calculation of the decay rates for admolecules at multiple planar interfaces " **J. Chem. Phys.** **110**, 2189-2194 (1999).
- (58) S. M. Cohen and **P. T. Leung**, " General formulation of the semirelativistic approach to atomic sum

- rules ” **Phys. Rev. A** 57, 4994-4997 (1998).
- (57) H. P. Chiang, **P. T. Leung** and W. S. Tse, “ The surface plasmon enhancement effect on adsorbed molecules at elevated temperatures ” **J. Chem. Phys.** 108, 2659-2660 (1998).
- (56) W. L. Blacke and **P. T. Leung** , “ Molecular fluorescence at a rough surface : the orientation effects ” **Phys. Rev. B** 56, 12625-12631 (1997).
- (55) **P. T. Leung** , “ Emission frequency of single molecules at a metallic aperture : the applicability of the image theory ” **Opt. Commun.** 136, 360-364 (1997); 139, 336 (1997).
- (54) H. P. Chiang, **P. T. Leung** and W. S. Tse, “ Optical properties of composite materials at high temperatures ” **Solid State Commun.** 101, 45-50 (1997).
- (53) **P. T. Leung**, M. H. Hider and E. J. Sanchez, “ Surface enhanced Raman scattering at elevated temperatures ” **Phys. Rev. B** 53, 12659-12662 (1996).
- (52) R. X. Bian, R. C. Dunn, X. S. Xie and **P. T. Leung**, “ Single molecule emission characteristics in near-field microscopy ” **Phys. Rev. Letts.** 75, 4772-4775 (1995).
- (51) **P. T. Leung** and W. S. Tse, " Nonlocal electrodynamic effect on the enhancement factor for surface enhanced Raman scattering " **Solid State Commun.** 95, 39-44 (1995).
- (50) T. Xiong, **P. T. Leung** and T. F. George, “ Modeling of decay rates for molecules at an island surface ” **J. Chin. Chem. Soc.** 42, 249-254 (1995).
- (49) **P. T. Leung** and T. F. George, " Molecular fluorescence spectroscopy in the vicinity of a microstructure " **J. de Chim. Phys. (France)** 92, 226-247 (1995).
- (48) **P. T. Leung**, " Magnetic monopole and Poynting's theorem " **Euro. J. Phys.** 16, pp. 43-44 (1995).
- (47) **P. T. Leung**, D. Pollard-Knight, G. P. Malan and M. F. Finlan, " Modelling of particle - enhanced ensitivity of the surface-plasmon-resonance biosensor " **Sensors and Actuators B** 22, pp. 175-180 (1994).
- (46) M. J. Pliska, E. D. Sanchez, **P. T. Leung** and T. F. George, " Effect of particle-clustering on decay rates of admolecules at the interface of a composite material substrate " **Solid State Commun.** 89, pp. 397-401 (1994).
- (45) N. Do, L. Klees, A. C. Tam, **P. T. Leung** and W. P. Leung, " Photodeflection probing of the explosion of a liquid film in contact with a solid heated by pulsed excimer laser irradiation " **J. App. Phys.** 74, pp. 1534-1538 (1993).
- (44) H. K. Park, X. Xu, C. P. Grigoropoulos, N. Do, L. Klees, **P. T. Leung** and A. C. Tam, " Transient optical transmission measurement in excimer-laser irradiation of amorphous silicon films " **J. Heat Transfer** 115, pp. 178-183 (1993).
- (43) **P. T. Leung** and M. H. Hider, " Nonlocal electrodynamic modeling of frequency shifts of molecules at rough metal surfaces " **J. Chem. Phys.** 98, pp. 5019-5022 (1993).
- (42) E. Bodegom and **P. T. Leung**, " A surprising twist to a simple capacitor problem "

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Presentations at Research Institutions/Professional Meetings
(Including Publicaton of Abstracts)

- (47) "Molecular plasmonics with neutral and charged metallic nanoparticles" --- invited talk presented at the Research Center of Applied Science of the Academia Sinica in Taipei, Taiwan (July, 2014).
- (46) "Optics and spectroscopy with metallic nanoparticles" --- invited talk presented at the Research Center of Applied Science of the Academia Sinica in Taipei, Taiwan (August, 2013).
- (45) "Classical modeling of the plasmonic Purcell effect"--- presented at the Physics Department of National Taiwan University in Taipei, Taiwan (August 17, 2012).
- (44) "Optical properties of inhomogeneous metallic particles"—presented at the Center for Theoretical Sciences of National Taiwan University in Taipei, Taiwan (August 12, 2011).

- (43) “Plasmonic effects on the lateral displacements of light beam at material interfaces”—presented at the National Center for Theoretical Sciences in Taipei, Taiwan (July 23, 2010).
- (42) “Nonlinear and nonlocal effects on dispersion relation for surface plasmon at a metal/Kerr medium interface” presented with J. H. Huang and R. Chang in the American Physical Society meeting in Portland, Oregon (March, 16, 2010).
- (41) “ Plasmonic enhancement of Forster energy transfer at a metallic nanoshell: nonlocal optical effects ” presented with H. Y. Xie, H. Y. Chung and D. P. Tsai in the American Physical Society meeting in Portland, Oregon (March, 17, 2010).
- (40) “Dynamic modifications of polarizability for large metallic spheroidal nanoshells” presented with H. Y. Chung and D. P. Tsai in the American Physical Society meeting in Portland, Oregon (March, 19, 2010).
- (39) “Unusual lateral displacements of light beam at material interfaces” – presented at the Institute of Optoelectronic Sciences at the National Taiwan Ocean University, Keelung, Taiwan (June 11, 2009).
- (38) “Research in plasmonics and surface optics: Two roles of a theoretical physicist” – presented at the Physics Department of the National Sun Yat San University, Kaoshiung, Taiwan (May 7, 2009).
- (37) “Molecular processes via plasmonic interactions with metallic nanoparticles” - **invited talk** at *Nanophotonics and Metamaterials International Conference* in Taipei, Taiwan (May 1, 2009).
- (36) “Electromagnetic fields with finite photon mass” – presented at the Physics Department of the National Taiwan University, Taipei, Taiwan (November 4, 2008).
- (35) Theoretical research in plasmonics and surface optics” – presented at the Physics Department of the National Taiwan University, Taipei, Taiwan (October 20, 2008).
- (34) “Effects of temperature on the surface plasmon resonance at a metal-semiconductor interface” - presented with H. P. Chiang et al, at the International Workshop on Plasmonics and Applications for Nanotechnologies," Singapore (Dec. 5-7, 2006).
- (33) " Theoretical studies of nonlocal effects in the optical response of metallic nanoshells " and “High resolution angular measurement using surface-plasmon-resonance heterodyne interferometry at optimal incident wavelengths ” – presented with R. L. Chang and H.-P. Chiang et al, at the SPIE (Society of Photo-Optical Instrumentation Engineers) OpticsEast Conference in Boston, Massachusetts (October, 2005).
- (32) " Molecular fluorescence at surfaces: an overview " – presented at the Physics Department of Zhongshan University in Guangzhou, China (September, 2003).
- (31) “ Theoretical studies on the substrate temperature dependence of surface-enhanced Raman scattering” **invited paper** co-presented at the XVIIth International Conference On Raman Spectroscopy (ICORS 2000), in Beijing, China (August, 2000). Abstract published in *Proceedings of The XVIIth International Conference on Raman Spectroscopy*, pp 656-657 (John Wiley & Sons, New York, 2000).

- (30) “ Bethe stopping power theory for heavy target elements ” – presented with S. M. Cohen and H. Sinky at the Centennial meeting of the American Physical Society (March, 1999). Abstract published in the Bulletin of the American Physical Society 44, 635 (1999).
- (29) “ Molecular fluorescence in the vicinity of inhomogeneous environments ” - presented at the solid-state seminar of the Physics Department at Oregon State University (April, 1998).
- (28) “ Molecular fluorescence at a rough surface : the orientation effects ” - presented with W. L. Blacke at the Annual Meeting of the Oregon Academy of Science, Portland, Oregon (February, 1997).
- (27) " Dual possibility for the variation of molecular lifetimes in the vicinity of a nontrivial environment " presented at the Battelle Memorial Institute - the Pacific Northwest Laboratory in Richland, Washington (August, 1995).
- (26) " Molecular fluorescence and near field optics ” - presented at Portland State University (October, 1994).
- (25) “ Molecular fluorescence spectroscopy in the vicinity of a microstructure “ - presented at the Battelle Memorial Institute - the Pacific Northwest Laboratory in Richland, Washington (August, 1994).
- (24) “ Molecular fluorescence at metal surfaces “ - presented at Tohoku University in Sendai, Japan (August, 1994).
- (23) " Modeling of a sensitivity-enhancement mechanism for the optical biosensor based on surface plasmon resonance " – presented with T. Xiong at the Annual Meeting of the Oregon Academy of Science, Corvallis, Oregon (February, 1994).
- (22) " Theoretical studies of the surface-plasmon-resonance enhanced quantum efficiency for a metal-semiconductor junction at elevated temperatures " - presented with E. J. Sanchez at the Annual Meeting of the Oregon Academy of Science, Corvallis, Oregon (February, 1994).
- (21) Nonlocal electrodynamic modeling for molecular excitations at rough metal surfaces " - presented with M. H. Hider at the Meeting of the American Physical Society in Seattle, Washington (March, 1993). Abstract published in the Bulletin of the American Physical Society 38, 827 (1993).
- (20) " Effect of particle-clustering on decay rates of admolecules at the interface of a composite material substrate " - presented with M. J. Pliska and E. D. Sanchez at the Meeting of the American Physical Society in Seattle, Washington (March, 1993). Abstract published in the Bulletin of the American Physical Society 38, 828 (1993).
- (19) " Some inquisitive questions of physics " - presented with E. Bodegom at the American Association of Physics Teachers - Oregon Section Meeting at Pacific University in Forest Grove, Oregon (October, 1992).
- (18) " Optical phenomena at interfaces : biosensing, optothermal processing, and molecular fluorescence " - presented at the Battelle Memorial Institute - the Pacific Northwest Laboratory in Richland, Washington (September, 1992).

- (17) "Optical probing of the temperature and pressure in an exploding liquid film on an opaque substrate due to pulsed laser irradiation" - presented with A. C. Tam et al at the American Physical Society (joint meeting with the Optical Society of America), Albuquerque, New Mexico (September, 1992). Abstract published in the Bulletin of the American Physical Society 37, 1213 (1992).
- (16) "Mechanism of laser ablation of a thin liquid film on an opaque surface" - presented with L. Klees et. al. at the Conference on Lasers and Electro-Optics, CLEO 1992 in Los Angeles, California (May, 1992). Abstract published in CLEO '92 Conference Digest, p.502.
- (15) "Temperature dependence of the refractive indices and optical band gap of thin amorphous silicon films" - presented with N. Do et. al. at the Conference on Quantum Electronics and Laser Science, QELS 1992 in Los Angeles, California (May, 1992). Abstract published in QELS '92 Conference Digest, p.212.
- (14) "Optical biosensing based on surface plasmon resonance" - presented at the Oregon Advanced Science & Technology Institute Executives Conference in Portland, Oregon (May, 1992).
- (13) "Pulsed laser ablation of a transparent liquid film for removal of surface particulates" - presented with A. C. Tam et al at the Meeting of the American Physical Society in Indianapolis, Indiana (March, 1992). Abstract published in the Bulletin of the American Physical Society 37, 559 (1992).
- (12) "Interface temperature measurements in explosive vaporization of a liquid film by pulsed laser irradiation" - presented at the Meeting of the American Physical Society in Indianapolis, Indiana (March, 1992). Abstract published in the Bulletin of the American Physical Society 37, 84 (1992).
- (11) "Transient thermodynamics of a laser-induced exploding liquid film on an opaque surface with application to microscopic particulate removal" - presented at the IBM Almaden Research Center in San Jose, California (March, 1992).
- (10) "Surface plasmon resonance : from molecular fluorescence to biosensing" - presented at the Physics Department of the Chinese University of Hong Kong, Hong Kong (June, 1991).
- (9) "Surface plasmon resonance : from molecular fluorescence to biosensing" - presented at the Physics Department of the South Dakota School of Mines and Technology in Rapid City, South Dakota (May, 1991).
- (8) "Optical sensing based on surface plasmon resonance" - presented at the Oregon Advanced Science & Technology Institute Executives Conference in Eugene, Oregon (April, 1991).
- (7) "Surface plasmon resonance : from molecular fluorescence to biosensing" - presented at the IBM Almaden Research Center in San Jose, California (March, 1991).
- (6) "Frequency shifts of molecules at rough metal surfaces" - presented with M. H. Hider at the Annual Meeting of the Oregon Academy of Science, Monmouth, Oregon (February, 1991).
- (5) "Surface plasmon resonance : from molecular fluorescence to biosensing" - presented at the

Physics Department of Oregon State University, Corvallis, Oregon (November, 1990).

- (4) "Fluorescence of molecules in the vicinity of a rough metal surface : the island surface model" - presented at the Oregon Conference on Modern Optics Research, Corvallis, Oregon (September, 1990).
- (3) "A journey into the surface plasmons" - presented at the Physics Department of Portland State University, Portland, Oregon (October, 1989).
- (2) "Fluorescence of molecules at corrugated thin metal films" - presented at the Oregon Academy of Science Annual Meeting, Portland, Oregon (February, 1989).
- (1) "Photochemistry at corrugated thin metal films : a phenomenological approach" - **invited talk** at the SPIE (Society of Photo-Optical Instrumentation Engineers) International Conference in Los Angeles, California (January, 1989).

Professionally-related Service

Served as referees for many highly-ranked academic journals (e.g. *Physical Review A and B*, *Physical Review Letters*, *Journal of Physical Chemistry B*, *Journal of Chemical Physics*,...etc). I estimated I have reviewed ~ 200 submissions for these journals over the past 30 years. I received a recognition by the American Physical Society via an "Outstanding Referee Award" in 2012 (see item #1 in the above list for "Significant professional development activities").

National Research Council panelist: 2001, 2002, 2003, 2005, 2006, 2007, 2008 (see #5 in the above list in Significant professional development activities).