

Curriculum Vitae

姓名	陳永富	性別	男	出生年月	1968.12.20	電子信箱	yfchen@cc.nctu.edu.tw
服務機構	國立交通大學電子物理系(主聘) 國立交通大學電子工程系(合聘)				職稱	特聘教授 理學院院長	
學術專長	雷射技術、雷射物理、量子物理、近代光學、光電半導體						
通訊處	新竹市大學路1001號電子物理系			聯絡方式	電話 (公)：03-5712121 轉 56106 cell phone: 0918-608-009		
學歷	國立交通大學電子工程系學士(1986.09-1990.06) 國立交通大學電子研究所博士(1990.09-1994.06)						
經歷	服務單位	專/兼任	職稱	起訖年月			
	國科會精密儀器發展中心	專任	副研究員	1994.10-1999.07			
	日本 NEC 橫濱事業場	專任	客座研究員	1996.05-1996.10			
	國立交通大學電子物理系	專任	副教授	1999.08-2002.07			
	國立交通大學理學院	兼任	副院長	2006.08-2007.07			
	國立交通大學理學院碩士專班	兼任	主任	2008.02-2011.07			
	國立交通大學電子物理系	兼任	系主任	2011.08-2013.07			
	國立交通大學理學院	兼任	副院長	2014.08-2017.07			
	國立交通大學理學院	兼任	院長	2017.08-2020.07			
	Optics Express (OSA)	兼任	期刊副主編	2012.03-2018.03			
Applied Physics B: Lasers and Optics (Springer-Verlag)	兼任	期刊共同主編	2014.12-2017.12				

1990年畢業於交通大學電子工程系(全系106位的First prize)，1994年取得交通大學電子研究所博士學位，主要研究低能電子與物質之間的交互作用，於1994-1999年期間在國科會精儀中心服務，研究開發前瞻雷射光電技術，在先進雷射技術的研究上，建立一系列優化理論與實驗技術。其中三篇關鍵論文 IEEE J. Quantum Electron., 33, pp.1424-1429 (1997), IEEE J. Quantum Electron. 35, pp. 234-239 (1999) 已合計被引用超過500次。於1999年進入交通大學電子物理系任職副教授，在研究上將雷射技術應用於量子物理的研究，在 Phys. Rev. Lett.上發表了多篇的創新論文，以及在 Phys. Rev. A、B、E 發表40餘篇論文，研究領域涵蓋雷射物理、量子物理、混沌科學。同時也在國際期刊上發表200餘篇的先進雷射技術論文。研究成果已獲得二次國科會(科技部)傑出研究獎(2004, 2011)。也獲得中山學術著作獎(2008)、「侯金堆傑出榮譽獎」基礎科學(數理)領域(2011)等。

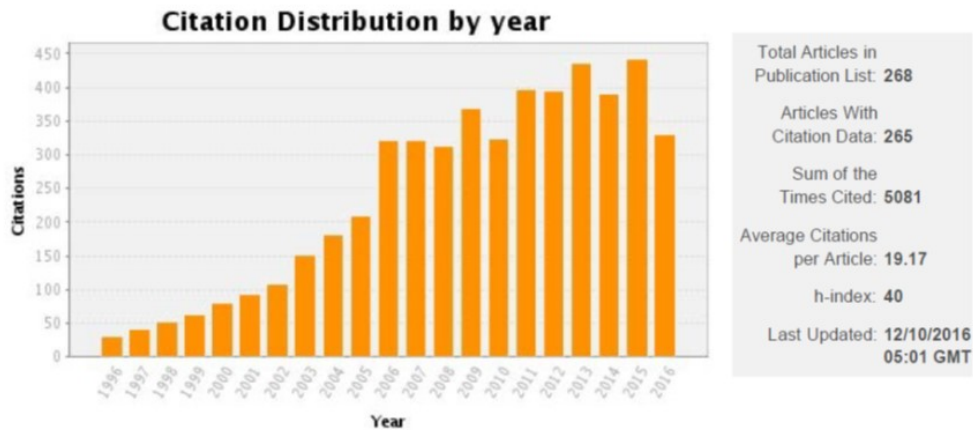
長期的深入研究與成果，經常獲邀於國際重要組織之學術會議擔任 Invited speaker，如：歐洲光電雷射會議(CLEO/Europe)、國際雷射會議(ICL)、亞太光電雷射會議(CLEO/Pacific Rim)、日本光電年會(OPJ)等，表示研究成果的國際影響力。近年來致力於提升我國國際學術地位，目前也擔任美國光學學會頂尖期刊 Optics Express 的 Associate Editor，以及 Springer-Verlag 所出版的經典頂尖期刊 Applied Physics B: Lasers and Optics 的 Co-Editor。

在學術研究過程中落實學以致用，積極協助國內科技公司 (Lightmed Inc.) 研究開發各式眼科醫學用雷射系統，分別於2000年成功研發白內障術後治療用 Nd:YAG 雷射，2002年成功開發眼底視網膜止血用綠光雷射，2006年成功開發治療黃斑部病變用黃光雷射，2009年成功開發治療青光眼用 Nd:YAG 綠光雷射，所有系統皆已獲美國 FDA 認證行銷全球，年產值已超過數億。同時透過國防學術合作計畫，移轉高功率的雷射技術至中山科學院，研發雷射測距系統，雷射追蹤系統，提升國防自主研發能力。

自 1992 年至今，個人所主導的研究工作(第一作者或通訊作者)總共發表 SCI 論文 268 篇，被引用總數達 5081 次， H-index 為 40 (依據 SIS Web of Science 至 2016.12.10 的統計結果)，目前每年的平均被引用總數已超過 350 次，表示論文在國際上被重視的程度與學術上的貢獻。在先進雷射技術的研究方面上，也已建立了一系列優化理論與實驗技術。至今年已發表 200 餘篇具高影響因子的研究論文(皆為通訊作者)，其中關鍵論文皆已被引用超過百次，另有 30 篇論文被引用數超過 50 次。

My Publications: Citation Metrics

This graph shows the number of times the articles on the publication list have been cited in each of the last 20 years.
Note: Only articles from Web of Science Core Collection with citation data are included in the calculations. More information about these data.



主要研究領域包含雷射物理、非線性光學、量子理論、光電技術、散射理論、電腦計算模擬等，已建立具有引導創意的實驗與理論基礎。近年重要學術成果分述如下：

- (1) 首度利用微型固態雷射技術研究近代光學領域中的 singular optics、optical vortex lattice 之產生與物理特徵，提供給廣泛物理領域的科學家許多啟發性思維 (*Phys. Rev. Lett.* **96**, 033901, 2006)。
- (2) 利用非線性光學與雷射技術，研究波函數在缺陷系統中的 weak localization 現象，並藉此現象提出一種評估非線性晶體的缺陷的新穎方法 (*Phys. Rev. Lett.* **96**, 033905, 2006)。

- (3)設計 Large-Fresnel-number 的固態雷射，以光學與力學的理论類比性，研究介觀與巨觀量子系統的波函數之物理特徵，並首度揭露高階雷射模態的 Devil's staircase 現象 (*Phys. Rev. Lett.* **96**, 213902, 2006)。
- (4)以微片固態雷射技術，產生 polarization-entangled 的雷射場，用以研究向量場的 singularity pattern (*Phys. Rev. E.* **75**, 026614, 2007)。
- (5)以大面積面射型半導體雷射技術，產生類似 quantum-billiard 的波圖像，並以理論計算分析重現其波函數，用以研究其統計性質 (*Phys. Rev. E.* **75**, 046202, 2007)。
- (6)首度以理論證明 3D trochoidal coherent state 的存在基礎，並以微型雷射技術，實驗產生具有相同特徵的雷射光波，提供量子科學家對 3D coherent state 在空間分布上的新圖像 (*Phys. Rev. Lett.* **101**, 233901 2008)。
- (7)首度以理論與數值分析 2D 量子彈子球檯的 eigenstates 與 coherent states，經由瞬間釋放後的暫態變化，並以半導體雷射元件產生相同特徵的光波實驗，顯示混沌物質波的基本圖像 (*Phys. Rev. Lett.* **102**, 044101, 2009)。
- (8)首度以 optical mode converter 進行 Lissajous coherent waves 與 trochoidal coherent waves 之間的轉換，以雷射光學實驗顯示 phase 在介觀波函數的幾何物理特徵之神奇角色 (*Phys. Rev. A.* **82**, 043801, 2010)。
- (9)研究大面積面射型半導體雷射在 subthreshold 的 amplified spontaneous emission (ASE)物理現象，首度證實 ASE 的光譜包含大量的 cavity mode 資訊，用以研究 quantum chaos 的 level statistics (*Phys. Rev. E.* **83**, 016208, 2011)。
- (10)利用 SU(2)數學轉換研究古典與量子力學的幾何圖像轉換，將 Lissajous orbits 與 trochoidal orbits 之間的連續轉變，以解析的方式完美的呈現，提供量子科學家對介觀波函數的幾何物理特徵之認識 (*Phys. Rev. A.* **83**, 032124, 2011)。
- (11)以雷射光學技術，完美產生 quasi-nondiffracting quasicrystal beams，對於光子晶體的研究，以及粒子與量子光場交互作用，提供重要的光場來源，可進一步用以研究 optical pattern formation (*Phys. Rev. A.* **83**, 053813, 2011)。

- (12)首度利用光子晶體光纖 (photonic crystal fiber) 實現大範圍波長可調諧的被動調 Q 雷射系統。高輸出能量和峰值功率輸出可運用於自由空間通信，氣體感測，光譜分析和醫療雷射儀器 (*Laser Phys. Lett.* **8**, 678-683, 2011) (IF:9.97)。
- (13)首度使用非齊次的 Helmholtz 方程解出具有波粒雙重性(particle-wave duality)的穩定相干態和與時間相關的量子波包態(quantum wave-packet states)，推導出的分數簡併(fractional degeneracy)量子系統的拓撲特徵，用以瞭解拓撲不變量(topological invariants)所產生的奇妙結果 (*Phys. Rev. A* **88**, 013827, 2013)。
- (14)首度運用自鎖模技術研究出高功率、高重複率的 Yb:YAG 微片鎖模雷射，脈衝重複率可高達 240GHz。是現代所有固態鎖模雷射中，重複率及輸出功率最高的雷射，為學術研究的重要突破。目前正朝向光通的應用發展研究中，將有很高的產業貢獻潛能 (*Laser Phys. Lett.* **10**, 015803, 2013) (IF: 7.714)。
- (15)首度研究出空間與時間的整體自鎖模雷射(total self-mode locked laser)，此結果對於應用微型雷射技術研究量子力學的波粒雙重性(particle-wave duality)與的量子波包態(quantum wave-packet states)，提供了先進的研究平台 (*Laser Phys. Lett.* **10**, 105804, 2013) (IF: 7.714)。
- (16) 首度發現一種產生自鎖模雷射光梳(phase-locked frequency comb) 的新方法，成功地利用自鎖模雷射技術與受激拉曼散射(stimulated Raman scattering) 產生頻寬拓寬為斯托克拉曼光梳(Stokes Raman comb)。此發現開創了產生相位鎖定雷射光梳的研究新領域(*Laser & Photonics Rev.* **8**, 750–755, 2014) (IF: 9.313)。

在上述的研究工作，我主要負責理論模式的建立與實驗的設計，並主筆論文的發表，我所指導的研究生負責實驗的執行與計算分析，並參與實驗結果之討論。這方面的研究已建立具有國際水平之研究能力，培育許多新生代研發人才。目前已指導 20 位博士畢業，分別任職於半導體研發產業(TSMC:張雅婷、陳建誠、黃哲彥、張漢龍;新加坡外商: 黃仕璋)、雷射醫療產業(Lightmed:李易純)、學術界(交大電物系蘇冠暉、師大物理系陸亭樺、海大光電所梁興弛、東吳物理系黃依萍、日本 RIKEN 林毓捷)、及中山科學院(雷射物理組: 陳思武、黃文政、曾映順)。

曾被國際研討會邀請演講(*Plenary lecture or Invited lecture*)之會議名稱及日期。

- (1) Invited Oral presentation with the title “**Generation of temporally and spatially structured laser beams related to Diophantine equations**” at **Optical Manipulation Conference’14** in Yokohama, Japan. (2014)
- (2) Invited Oral presentation with the title “**Self-mode-locked OPSL**” at **Photonics West (SPIE LASE) in San Francisco, California USA.** (2013)
- (3) Invited Oral presentation with the title “**Lissajous and trochoidal beam generation from diode pumped solid state lasers**” at **Conference on Lasers and Electro-Optics Pacific Rim (CLEO-PR) in Kyoto, Japan (2013).**
- (4) Invited Oral presentation with the title “**High-power fiber lasers**” 6th IEEE/ICAIT (**International Conference on Advanced Infocomm Technology**) (2013).
- (5) Invited Oral presentation with the title “**Vortex beams**” at the fifth **Workshop of the Stimulated Brillouin Scattering and Phase Conjugation, Chiba, Japan (2010)**
- (6) Invited Oral presentation with the title “**Design of high-power eye-safe lasers**” at the **Annual Meeting of the Optics and Photonics in Japan (2009)**
- (7) Invited Lecture with the course “**Laser physics and Technology**” presented in the Shandong University, **China (2005, 2008, 2011)**
- (8) Invited Lecture with the title “**Patter formation from diode pumped solid state lasers**” presented in the Chiba University, **Japan (2009)**

其他資料：如擔任國際重要學會理監事、國際知名學術期刊編輯、評審委員或重要民間企業公司擔任諮詢顧問等及其他有利審查之資料。

- (1) **Associate Editor of *Optics Express*** : high rank journal published by OSA (2012-2018)
- (2) **Co-Editor of Applied Physics B: Lasers and optics:** high rank journal published by Springer-Verlag (2014-2016)
- (3) **Sub-committees (Dynamics, Instabilities, and Patterns)** in Conference on Lasers and Electro-Optics/International Quantum Electronics Conference **CLEO/Europe in Munich, Germany (2013)**

- (4) **Sub-committees (Fiber Technology Related Topics including high power fiber lasers)** in 6th *IEEE/ICAIT* 2013 (International Conference on Advanced Infocomm Technology) (2013)
- (5) **Sub-committees (Quantum Electronics)** in Conference on Lasers and Electro-Optics /International Quantum Electronics Conference *CLEO/PR* in Sydney, Australia (2011)
- (6) **Sub-committee members** in Photonics Global Conference (PGC) in Singapore (2010)
- (7) **Sub-committee members** in International Conference on Optics-Photonics Design and Fabrication **ODF** (2008)
- (8) Serve as the referee in international journals including **Phys. Rev. Lett., Phys. Rev. A, Phys. Rev. E, Opt. Lett., Opt. Express, J. Opt. Soc. B, Appl. Opt., Appl. Phys. B, Opt. Commun., etc..**

曾 獲 得 之 學 術 獎 勵 情 形

- (1) 「田家炳先生青年學術獎」 (1997)
- (2) 光學工程學會「技術貢獻獎」(1998)
- (3) 中國工程師學會「優秀青年工程師獎」(1998)
- (4) 國科會精儀中心「個人研究創新獎」、「團隊研究創新獎」(1998)
- (5) 國立交通大學傑出研究獎(2002)
- (6) 國立交通大學傑出教學獎(2004，2010)。
- (7) 國立交通大學特聘教授 (2011)。
- (8) 中山學術著作獎 (2008)。
- (9) 國科會傑出研究獎(2003~2005)。
- (10) 國科會傑出研究獎(2011~2013)。
- (11) 「侯金堆傑出榮譽獎」基礎科學(數理)領域 (2011)。
- (12) 中華民國物理學會會士 Fellow (2015) 。

期刊論文目錄：

1. **Y. F. Chen**, C. M. Kwei, and C. J. Tung (1992) Electron Inelastic Mean Free Paths Versus Attenuation Lengths in Solids, *J. Phys. D 25: Appl. Phys.*, pp. 262-269. (citations: 19)
2. C. M. Kwei, **Y. F. Chen** and C. J. Tung (1992) Reconstruction of the Sum-rule-constrained Classical Binary-collision Model for Inner-shell Ionization, *Phys. Rev. A45*, pp. 4421-4425. (citations: 4)
3. **Y. F. Chen**, C. M. Kwei and C. J. Tung (1993) Analytical Representation of Atomic Shellwise Electron Densities and Applications, *J. Phys. B26: At. Mol. Opt. Phys.*, pp. 1071-1080. (citations: 6)
4. **Y. F. Chen**, C. M. Kwei and C. J. Tung (1993) Analytic Functions for Atomic Momentum Density Distributions and Compton Profiles of K and L Shells, *Phys. Rev. A47*, pp.4502-4505. (citations: 3)
5. **Y. F. Chen**, C. M. Kwei and C. J. Tung (1993) Optical Constants Model for Semiconductors and Insulators, *Phys. Rev. B48*, pp. 4373-4379 (citations: 17)
6. C. M. Kwei, **Y. F. Chen**, C. J. Tung and J. P. Wang (1993) Electron Inelastic Mean Free Paths for Plasmon Excitations and Interband Transitions, *Surf. Sci. 293*, pp. 202-210 (citations: 79)
7. **Y. F. Chen**, P. Su, C. M. Kwei and C. J. Tung (1994) Influence of Surface Excitations of the Elastic Backscattering of Electrons from Copper and Silver Surfaces, *Phys. Rev. B50*, pp. 17547-17555 (citations: 44)
8. C. J. Tung, **Y. F. Chen**, C. M. Kwei and T. L. Chou (1994) Differential Cross Sections for Plasmon Excitation and Reflected Electron-Energy-Loss Spectra, *Phys. Rev. B49*, pp. 16684-16693. (citations: 129)
9. **Y. F. Chen**, C. M. Kwei, and P. Su (1995) Angular Distribution of Electrons Elastically Backscattered from Non-Crystalline Solid Surfaces, *J. Phys. D28: Appl. Phys.*, pp. 2163-2169. (citations: 15)
10. **Y. F. Chen***, C. M. Kwei P. Su, and C. J. Tung (1995) Dependence of Electron Mobility on Doped Impurities, *Jpn. J. Appl. Phys. 34*, pp. 4827-4833. (citations: 0)
11. **Y. F. Chen*** (1995) Effect of Surface Excitations on Determining the Inelastic Mean Free Path (IMFP) by Elastic Peak Electron Spectroscopy, *J. Vac. Sci. Technol. A*, **13** pp.2665-2670. (citations: 36)
12. **Y. F. Chen***, T. S. Liao, C. F. Kao, T. M. Huang, K. H. Lin, and S. C. Wang (1996) Optimization of fiber-coupled laser-diode end-pumped lasers: Influence of pump beam quality, *IEEE J. Quantum Electron.*, **32**, pp.2010-2016. (citations: 46)
13. **Y. F. Chen***, S. C. Wang, C. F. Kao, and T. M. Huang (1996) Investigation of fiber-coupled laser-diode pumped NYAB green laser performance, *IEEE Photon Technol. Lett.*, **8**, pp.1313-1315. (citations: 12)
14. **Y. F. Chen***, S. C. Wang, C. F. Kao, and T. M. Huang (1996) Efficient fiber-coupled laser diode end-pumped NYAB lasers, *Electron. Lett.* **32**, pp.1487-1488. (citations: 0)
15. **Y. F. Chen***, and Y. T. Chen (1996) Background Removal in Surface Electron Spectroscopy: Influence of Surface Excitations, *Phys. Rev. B53*, pp. 4980-4988. (citations:41)

16. **Y. F. Chen***, and Y. T. Chen (1996) Role of Surface Effects in the Inelastic Background of X-ray Photoelectron Spectroscopy, *Surf. Interface Anal.* , **24**, pp. 490-496. (citations: 2)
17. **Y. F. Chen***, and C. M. Kwei (1996) Electron Differential Inverse Mean Free Path for Surface Electron Spectroscopy, *Surf. Sci.*, **364**, pp131-140. (citations: 43)
18. **Y. F. Chen*** (1996) Quantitative Analysis in X-ray Photoelectron Spectroscopy: Influence of Surface Excitations, *Surf. Sci.*, **345** pp. 213-221. (citations: 38)
19. S. G. Shiue, T. S. Liao, S. T. Chang, C. F. Kao, and **Y. F. Chen***, (1996) An Apparatus for Measuring the Curvature of Spherical and Cylindrical Surfaces, *Rev. Sci. Instrum.* **67**, pp. 1688-1689. (citations: 0)
20. J. P. Wang, C. J. Tung, **Y. F. Chen**, and C. M. Kwei (1996) The Surface Effect on Au-4f X-Ray Photoelectron Spectra, *Nucl. Instrum. Methods B* **108**, pp.331-338. (citations: 10)
21. **Y. F. Chen***, C. F. Kao, T. M. Huang, C. L. Wang, L. J. Lee, and S. C. Wang (1997) Single-mode oscillation of compact fiber-coupled laser-diode pumped Nd:YVO4/KTP green laser, *IEEE Photon Technol. Lett.*, **9**, pp.740-743 . (citations: 18)
22. **Y. F. Chen***, T. M. Huang, C. F. Kao, C. L. Wang, and S. C. Wang (1997) Generation of Hermite Gaussian modes in fiber-coupled laser-diode end-pumped lasers, *IEEE J. Quantum Electron.*, **33**, pp.1025-1031. (citations: 25)
23. **Y. F. Chen***, C. F. Kao, T. M. Huang, C. L. Wang, and S. C. Wang (1997) Influence of thermal effect on output power optimization in fiber-coupled laser-diode end-pumped lasers, *IEEE J. Select. Topics Quantum Electron.*, **3**, pp.29-34. (citations: 30)
24. **Y. F. Chen***, T. M. Huang, K. H. Lin, C. F. Kao, C. L. Wang, and S. C. Wang (1997) Analysis for the effect of pump position on transverse modes in fiber-coupled laser-diode end-pumped lasers, *Optics Comm.*, **136**, pp. 399-404. (citations: 5)
25. **Y. F. Chen***, (1997) Angular distribution of photoelectrons emitted from noncrystalline solids, *Phys. Rev.* **B55**, pp. 5478-5484. (citations: 6)
26. **Y. F. Chen***, (1997) Monte Carlo simulation of photoelectron angular distribution, *Surf. Sci.* , **380**, pp.199-209. (citations: 38)
27. **Y. F. Chen***, C. F. Kao, and S. C. Wang (1997) Analytical model for design of fiber-coupled laser-diode end-pumped lasers, *Optics Comm.*, **133**, pp. 517-524. (citations: 27)
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專利 請填入目前仍有效之專利。「類別」請填入代碼：(A)發明專利(B)新型專利。

專利發明名稱	專利號碼	審核機關	公佈日期
一種高穩定性二極體激發式固態雷射裝置,	新型 1 1 4 8 3 1	中華民國	85.11.25
串接式雙光量差轉換脈沖寬度調變裝置	新型 1 1 4 1 0 5	中華民國	85.09.10
一種並接式雙光量差轉換脈沖寬度調變裝置	新型 1 2 9 0 9 9	中華民國	87.02.04
光纖耦合二極體緊貼激發式單模固態雷射裝置	新型 297 08 086.5	德國	86.05.05
光纖耦合二極體緊貼激發式單模固態雷射裝置	新型 3 0 4 3 6 4 5	日本	86.09.10
光纖耦合二極體緊貼激發式單模固態雷射裝置	發明 5 9 6 6 3 9 2	美國	88.10.12
高功率二極體激發式腔內	新型 298 05 497.5	德國	87.10.08

倍頻單模雷射			
光纖耦合二極體緊貼激發式單模固態雷射裝置	新型 1 4 2 3 8 9	中 華 民 國	87.12.21
高功率二極體激發式固態雷射及其製造方法	新型 298 23 241.3	德 國	87.12.30
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