行政院國家科學委員會
申請人個人資料表

以下各項資料均將納入國科會「研究人員資料庫」內，以供業務使用。必要時，亦得提供政府機關及學術團體作為學術研究或extend才之用。為尊重個人意願，請圈選（同意、不同意）對外提供您個人資料。（如已往已經表示過意見者，可不必再勾選）。

一、基本資料

簽　　名：＿＿＿＿＿＿

填表日期：

中文姓名	杜立偉	英文姓名	Tu　　Li-Wei (Last Name)　(First Name)　(Middle Name)		
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二、主要學歷

請填學士級以上之學歷或其他最高學歷均可，若仍在學者，請在學位欄填「肄業」。

畢／肄業學校	國別	主修學門系所	學位	起訖年月
西北大學(Northwestern U.)	美國	物理所	博士	1985/09 至 1989/11
西北大學(Northwestern U.)	美國	物理所	碩士	1983/09 至 1985/08
國立清華大學	中華民國	物理系	學士	1976/09 至 1980/06

三、現職及與專長相關之經歷

指與研究相關之專任職務，請依任職之時間先後順序由最近者往前追溯。

服務機關	服務部門／系所	職稱	起訖年月
現職：國立中山大學	物理系	教授	2001/02 至今
經歷：國立中山大學	研發處	研發長	2011/08 至 2014/07
國立中山大學	物理系	系主任	2004/08 至 2006/07
國立中山大學	物理系	副教授	1995/08 至 2001/01
AT&T	Bell Laboratories	MTS	1991/06 至 1995/07
AT&T	Bell Laboratories	PMTS	1990/01 至 1991/05
國立中央大學	物理系	助教	1982/07 至 1983/08
中華民國	陸軍	少尉排長	1980/07 至 1982/06

四、專長

請自行填寫與研究方向有關之專長學門。

1. M3 物理	2. 光電半導體及能源	3. 奈米及生醫	4. 分子束磊晶

五、研究成果目錄

〔一〕論文及著述

(A) SCI 期刊論文

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139. Z. Y. Wu, C. Y. Zeng, C. W. Chang, and **L. W. Tu**, "Characteristics of graphene grown with different substrates by atmospheric pressure chemical vapor deposition (APCVD)", 2013 物理年會，東華大學，花蓮，1 月 29－31 日, 2013.
140. C. Y. Lin, T. Y. Chou, C. W. Chang, Y. T. Lin, and **L. W Tu**, "Characteristics of III-nitride nonpolar LEDs fabricated by plasma-assisted molecular beam epitaxy", Light-Emitting Diodes: Materials, Devices, and Applications for Solid State Lighting, Photonics West, SPIE 2013, Moscone Center, San Francisco, USA, Feb 2－7, 2013.
141. W. T. Hsu, C. C. Tsai, S. Y. Hsu, F. P. Lu, A. C. Li, Jr. H. He, K. H. Cheng, S. Hsieh, H. Y. Wang, K. K. Kuo, Y. Sun, and **L. W. Tu**, "Enhancement of the detection limit of SiNR-FET biosensors by cholic acid treatment", Photonics West, SPIE 2013, Moscone Center, San Francisco, USA, Feb 2－7, 2013.
142. **(Invited Talk) L. W. Tu**, "Growth and Characterizations of Mn Delta-Doped GaN Nanorods Fabricated by Plasma-Assisted Molecular Beam Epitaxy", 中央大學，中壢，10 月 9 日, 2013.
143. **(Invited Talk) L. W. Tu**, "Nitride nanorods solar cells 氮化物奈(納)米柱太陽能電池", 第三屆海峽兩岸奈(納)米光子學研討會，成功大學，台南，1 月 19－21 日, 2014.
144. **(Invited Talk) L. W. Tu**, "Nitride nanorod solar cells", International Conference on Materials and Characterization Techniques 2014, ICMCT2014, VIT University, Vellore, India, March 10－12, 2014.
145. **(Invited Talk) L. W. Tu**, "Diluted Magnetic GaMnN Nanorods Grown by PAMBE", 第四屆海峽兩岸寬能隙半導體研討會, 敦煌, The 4th Cross-Straight Workshop on Wide Band Gap Semiconductors, Dun-Huang, China, 8 月 3－8 日, 2014.
146. **(Invited Talk) L. W. Tu**, "Nitride semiconductors after the Nobel Prize", 2015 物理年會，清華大學，新竹，1 月 28－30 日, 2015.
147. P. H. Chen, W. C. Song, S. H. Wang, H. Y. Wang, K. H. Cheng, S. C. Hsieh, H. Y. Wang, K. K. Kuo, Y. Sun, and **L. W. Tu**, "Detection of Pancreatic Cancer by AlGaN GaN HEMT Based Biosensor in Different Background Fluids", 2015 Symposium on Engineering,

Medicine and Biology Applications, SEMBA2015, 蓮潭國際會館，高雄，2 月 1 日, 2015.

148. Y. J. Cheng, Y. T. Lin, S. S. Guo, C. W. Chang, and **L. W. Tu**, "Characteristics of m-plane GaN:Mn grown by plasma-assisted molecular beam epitaxy", Light-Emitting Diodes: Materials, Devices, and Applications for Solid State Lighting, Photonics West, SPIE 2015, Moscone Center, San Francisco, USA, Feb 7 – 12, 2015.
149. C. W. Chang, P. Wadekar, H. C. Huang, N. J. Ho, Y. F. Hsu, C. Y. Lin, S. H. Wang, and **L. W. Tu**, "III-nitride nanorods photovoltaic on silicon grown by PA-MBE", 11th International Conference on Nitride Semiconductors (ICNS), Beijing, China, Aug. 30 – Sep. 4, 2015.
150. P. H. Chen, S. H. Wang, W. Q. Song, C. W. Chang, K. H. Cheng, S. Hsieh, H. Y. J. Wang, Y. Sun, and **L. W. Tu**, "Nitride-HEMT biosensor detection of CA19-9 antigen in different background solutions", 11th International Conference on Nitride Semiconductors (ICNS), Beijing, China, Aug. 30 – Sep. 4, 2015.
151. C. Y. Pan, L. M. Yang, C. W. Chang, and **L. W. Tu**, "Optical and electrical properties of InGaN-based structures with subwavelength structural array", 11th International Conference on Nitride Semiconductors (ICNS), Beijing, China, Aug. 30 – Sep. 4, 2015.
152. P. H. Chen, C. W. Chang, K. H. Cheng, S. Hsieh, H. Y. J. Wang, Y. Sun, and **L. W. Tu**, "AlGaN/GaN HEMT biosensor detection of CEA antigen", 2016 物理年會，中山大學，高雄，1 月 25 – 27 日, 2016.
153. S. S. Guo, Y. J. Cheng, C. Y. Chang, C. W. Chang, M. X. Ma, W. C. Lai, and **L. W. Tu**, "Investigation of Mn doping in GaN by plasma-assisted molecular beam epitaxy", 2016 物理年會，中山大學，高雄，1 月 25 – 27 日, 2016.
154. C. W. Chang, S. S. Guo, C. Y. Chang, and **L. W. Tu**, "Optical and electrical characteristics of nitride nanorod array with Ti-mask selective-area growth by plasma-assisted molecular beam epitaxy", 2016 物理年會，中山大學，高雄，1 月 25 – 27 日, 2016.
155. P. C. Lin, C. F. Lin, and **L. W. Tu**, "High-efficiency perovskite hybrid photovoltaic devices by LPPET and solution process", 2016 物理年會，中山大學，高雄，1 月 25 – 27 日, 2016.
156. **(Invited Talk) L. W. Tu**, "Diluted magnetic nitride semiconductors: polar and nonpolar", 第三屆國立中山大學-山東大學光電材料科技研討會, 山東大學, Workshop of optical material and photonics (WOP 2016), Shan-Dong University, China, 7 月 29 – 8 月 2 日, 2016.
157. Z. S. Chao, C. W. Chang, P. V. Wadekar, and **L. W. Tu**, "Investigation of PAMBE Grown AlGaN/GaN HEMT Heterostructures", 2016 光電年會 Optics & Photonics Taiwan, the International Conference (OPTIC 2016)，台灣科技大學，台北，12 月 3 – 5 日, 2016.
158. C. Y. Chang, C. W. Chang, P. V. Wadekar, and **L. W. Tu**, "Optical and Electrical Properties of Nanosphere Lithography Facilitated Epitaxial GaN Nanorod", 2016 光電年會 Optics & Photonics Taiwan, the International Conference (OPTIC 2016)，台灣科技大學，台北，12 月 3 – 5 日, 2016.
159. **(Invited Talk) L. W. Tu**, "Nonpolar Nitride Semiconductor Materials for Optoelectronics", Symposium for the Promotion of Applied Research Collaboration in Asia (SPARCA 2017), Asia Pacific Society for Materials Research (APSMR), Okinawa, Japan, 25 – 28 February, 2017.

〔二〕智慧財產權及應用成果

(A) 專利 – 發明

1. **Vertical Cavity Surface Emitting Laser with Electrically Conducting Mirrors**
   USA(5068868, 1991) Taiwan(060509, 1993) Canada(2039068, 1994)

European Patent Office(Britain, France, Germany, Netherlands, 0458493, 1994)
Germany (69105037, 1994) Hong Kong(137195, 1995) Japan(4229688, 1992)
Korea(142585, 1998) Singapore(031195, 1995)

2. **Vertical Cavity Surface Emitting Lasers with Transparent Electrodes**
USA(5115441, 1992) Taiwan(063531, 1993) Canada(2054404, 1994)
European Patent Office(Britain, France, Germany, Netherlands, 0497052, 1992)
Germany(69104342, 1994) Hong Kong(188895, 1994) Japan(4276681,1992)
Korea(127911) Singapore(0497052, 1994)

3. **Elimination of Heterojunction Band Discontinuities**
USA(5170407, 1992) Canada(2076300, 1996)
European Patent Office(Britain, France, Germany, Netherlands, 0536944, 1993)
Germany(69223895) Hong Kong(1002739) Japan(5206588, 1993)
Korea(153781)

4. **Optical Devices with Electron-Beam Evaporated Multilayer Mirrors**
USA(5206871, 1993) Taiwan(075024, 1995) Canada(2083122, 1997)
European Patent Office(Britain, France, Germany, Netherlands, 0549167, 1993)
Germany(69209630) Hong Kong(146096) Japan(5251819, 1993)
Korea(147857)

5. **Light Emitting Diode**
USA(5226053, 1993) Taiwan(059017, 1992) Canada(2083121, 1997)
European Patent Office(Britain, France, Germany, Netherlands, 0550963, 1993)
Germany(69214423) Hong Kong(220496) Japan(5275739, 1993)

6. 氮化鎵/氮化銦鎵量子井發光二極體光學性質改良方法
Taiwan(發明專利權證書號: 009521；公告號: 563260，公告日期: 20031121)

7. 具有機絕緣層之金屬-絕緣體-半導體結構
Taiwan(發明專利權證書號: 182016；公告號: 538478，公告日期: 20030621)

8. 三族-氮奈米結構及其製造方法
III-N Nanostructure and Fabrication Method
Taiwan(patent number 308552, granted 20090411)

9. **GaN Nanorod Arrays Formed by Ion Beam Implantation**
USA(US Patent Pending Number: 60/696,020, filed, 2005)

10. **Multi-Junction Solar Cell**
    USA(US Patent Pending Number: 60/897,542, filed, Jan. 2007)

11. 三族-氮半導體奈米構造及其發光二極體
    III-N Semiconductor Nanostructure and Nano Light-Emitting Diode thereof
    Taiwan(application number: 097116441, granted 20091116)

12. 具類似六角星形之三族－氮半導體奈米柱構造
    III-N SEMICONDUCTOR NANOROD STRUCTURE HAVING A HEXAGRAM-LIKE SHAPE
    Taiwan(application number: 097151316, granted 20100701, 公告日期: 20131121)

13. 具異質結構之矽基太陽能電池及其製造方法
    Silicon-based solar cell having a heterogeneous structure and a manufacturing method
    Taiwan(application number: 099127245, granted 20120301, 公告日期: 20131011)

14. 於藍寶石基板上成長非極性面氮化鎵薄膜方法及其發光二極體構造
    Method for growing a nonpolar GaN layer on a sapphire substrate and a LED structure thereof
    Taiwan(發明專利權證書號: 發明第 I414087 號，公告日期: 20131101)

15. 具影像顯示器之卡片
    GREETING CARD HAVING AN IMAGE DISPLAY
    Taiwan(新型專利權證書號: 新型第 M459989 號;公告號: M459989，公告日期: 20130821)

六、執行及申請中之研究計畫：

計　畫　名　稱 （本會補助者請註明編號）	計畫內擔任工作	起迄年月	補助或委託機構	申請(執行)情形
矽光子晶體應用於高靈敏生物感測器 (1/2) MOST 105-2911-I-110-512	主持人	105/9/1~107/2/28	科技部	執行中
以調制摻雜研究稀磁性氮化物半導體中自由載子媒介之鐵磁性交換耦合 MOST 105-2112-M-110-005 -	主持人	105/8/1~106/7/31	科技部	執行中

非極性稀磁性氮化物半導體之分子束磊晶成長與特性量測 NSC 102-2112-M-110-004-MY3	主持人	102/8/1~105/7/31	國科會	已執行
頂尖第二期(第四-六年)-卓越研究中心-生醫感測器	主持人	103/1/1~105/12/31	教育部	已執行
國科會大專生參與專題研究計畫-利用高電子遷移率場效電晶體應用於大腸癌之抗原感測研究 MOST 103-2815-C-110-032-M	主持人	103/7/1~104/2/28	科技部	已執行
多接面矽晶太陽能電池技術研發-整合型計畫 102-D0606	總主持人	102/7/1~103/12/31	經濟部	已執行
國科會大專生參與專題研究計畫-以螢光標記法測試高電子遷移率場效電晶體在偵測胰臟癌抗原上之可重複性 NSC 102-2815-C-110-012-M	主持人	102/7/1~103/2/28	國科會	已執行
寬能域雙接面異質結構矽晶太陽能電池(2/2)(國家型科技計畫) NSC 101-3113-E-110-004	主持人	101/1/1~101/12/31	國科會	已執行
頂尖第二期(第一-三年)-卓越研究小組-潛力研究群-生醫感測器	主持人	100/4/1~102/12/31	教育部	已執行
寬能域雙接面異質結構矽晶太陽能電池(1/2)(國家型科技計畫) NSC 100-3113-E-110-004	主持人	100/1/1 ~ 101/1/31	國科會	已執行
具磁性氮化物半導體之分子束磊晶成長與特性量測 NSC 99-2119-M-110-005-MY3	主持人	99/8/1 ~102/7/31	國科會	已執行
寬能域雙接面異質結構矽晶太陽能電池(國家型科技計畫) NSC 98-3114-E-110-001	主持人	98/11/1 ~ 99/12/31	國科會	已執行
氮化物奈米柱之奈米光電元件研究(台法) NSC 98-2923-M-110-001-MY3	主持人	98/1/1 ~ 101/6/30	國科會	已執行
非/半極性氮化物成長與研究 NSC 96-2120-M-110-011-MY3	主持人	96/8/1 ~ 99/7/31	國科會	已執行
寬光域高效率太陽能電池	主持人	98/4/1 ~ 98/11/30	工研院	已執行
氮基三五族半導體奈米結構 (奈米國家型科技計畫-學術卓越創新研究) NSC 93-2120-M-110-002, 94-2120-M-110-002, 95-2120-M-110-001	總主持人	93/08/1 ~ 96/7/31	國科會	已執行
氮化銦之分子束磊晶成長與特性量測 NSC 95-2112-M-110-021	主持人	95/8/1 ~ 96/7/31	國科會	已執行
氮基奈米柱發光二極體	主持人	95/1/1 ~ 95/12/31	工研院	已執行
以電漿輔助分子束磊晶成長 III-氮半導體與量測分析 NSC 91-2112-M-110-010, 92-2112-M-110-005, 93-2112-M-110-003	主持人	91/8/1 ~ 94/7/31	國科會	已執行

以分子束磊晶成長 III-氮半導體與量測分析 NSC 90-2112-M-110-007	主持人	90/8/1 ~ 91/7/31	國科會	已執行
金屬/介電層與 III-V 半導體介面之光電物理特性研究(2/2) NSC 89-2112-M-110-040	主持人	89/8/1 ~ 90/7/31	國科會	已執行
金屬/介電層與 III-V 半導體介面之光電物理特性研究(1/2) NSC 89-2112-M-110-012	主持人	88/8/1 ~ 89/7/31	國科會	已執行
半導體光電材料與元件物理研究（三）NSC 88-2112-M-110-016	主持人	87/8/1 ~ 88/7/31	國科會	已執行
半導體光電材料與元件物理研究（二）NSC 87-2112-M-110-003	主持人	86/8/1 ~ 87/7/31	國科會	已執行
半導體光電材料與元件物理研究（一）NSC 86-2112-M-110-007	主持人	85/8/1 ~ 86/7/31	國科會	已執行
半導體光電材料與元件物理研究（一）(中型儀器) NSC 86-2732-M-110-007	主持人	85/8/1 ~ 86/7/31	國科會	已執行

七、其他

1. 中山大學特聘教授(學術研究類)2014 – 2017。

2. 中山大學 103 年度產學激勵績優教師。

3. 榮獲 2014 SPIE Fellow (SPIE 國際光學工程學會會士)。

4. 中山大學 99 年度教學研究獎。

5. 國科會 88、89 學年度甲種研究獎勵。(國科會自 89 學年度以後停止甲種研究獎勵。) 94 學年度第一級研究主持費獎勵。

6. Reviewer of RSC Nanoscale, Applied Physics Letters, ACS Energy Letters, Journal of The Electrochemical Society, Journal of Applied Physics, IEEE Transactions on Nanotechnology, Photonic Technology Letters, Applied Physics Express, Journal of Crystal Growth, Journal of Vacuum Science and Technology, IEEE Transactions on Electron Devices, Nanoscale Research Letters, Semiconductor Science and Technology, Journal of Physics D-Applied Physics, and many other reputable international journals.

7. Symposium Chair, 10^{th} International Symposium on Semiconductor Light Emitting Devices, ISSLED-10, December 14 – 19, NSYSU, Kaohsiung, Taiwan, 2014.

8. Conference Chair, LEDs Conference, International Symposium on Optoelectronics, SPIE's Photonics West, January, 2010 – present, San Francisco, California, USA.

9. Committee member in ANNA – Taiwan, Asian Nanoscience & Nanotechnology Association, 2010 – present.

10. Conference Co-Chair, and/or Program Committee, and/or Invited Session Chair, LEDs Conference, International Symposium on Optoelectronics, SPIE's Photonics West, January, 2000 – 2009, San Jose, California, USA.

11. Evaluator for the Alexander von Humboldt (AvH) Award, Germany, 1999.

12. 國科會自然處物理學門審議委員，2004 – 2006。

13. 經濟部智慧財產局(原中央標準局)專利審查委員，1998 – 2003。

14. 指導碩士生李宜青榮獲 1998 年度國科會最佳碩士論文獎。

15. 指導大學生杜彥潔榮獲 2003 年度國科會大專生專題研究創作獎。

16. 指導博士生王冠儒榮獲 2005 年度國際氮化物會議最佳年輕研究者獎**(Young Researcher Award)**, ICNS-6, The 6th International Conference on Nitride Semiconductors, Bremen, Germany, 8/28 – 9/2, 2005.

17. 指導碩士生杜奕洲榮獲 2009 年物理年會優良壁報論文獎。

18. 指導碩士生鄭凱尹榮獲 2010 年光電年會優良論文獎。

19. 指導碩士生徐詩雅榮獲 2012 年物理年會壁報佳作獎。

20. 指導大學生徐源甫榮獲 2012 年台灣綜合大學大學物理專題研究成果競賽最佳海報獎。

21. 指導博士生張菁文榮獲 2012 光電與通訊工程研討會最佳論文獎。

22. 指導博士生張菁文榮獲 2015 年物理年會優良壁報論文獎。

23. 指導大學生宋偉齊榮獲 2015 年科技部大專學生研究計畫研究創作獎。

24. 指導碩士生林莆洲榮獲 2016 年物理年會優良壁報論文獎。