December 20, 2025

Curriculum Vitae

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Chair Professor

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Profile

Professor Rong F. Huang was born in 1955 in Taiwan. He received his Ph.D. degree in Aerospace & Mechanical Engineering from the University of Oklahoma, USA in 1987. Subsequently, he worked as the manager of the Thermal Fluid Research Division, D. C. Inc., New Jersey, USA, and became a professor at the National Taiwan University of Science and Technology, Taipei, Taiwan since 1991. His research interests are in the areas of Fluid Mechanics, Aerodynamics, and Combustion Technology. He has been a recipient of many awards and honors, for instance, *World's Top 2% Scientists—Lifetime Scientific Influence Ranking* (listed by Standford University, USA), *Merit MOST Research Fellow 2021* (awarded by Ministry of Science and Technology, ROC), *National Award for Distinguished Contribution to Industry-Academia Cooperation 2018* (awarded by Ministry of Education, ROC), *Research Fellow 2017* (awarded by Ministry of Science and Technology, ROC), *Outstanding Research Award for years 2014*, *2011*, and *1999* (awarded by Ministry of Science and Technology, ROC), *Gold Medal for Invention of National Invention and Innovation Award 2012* (awarded by Ministry of Economic Affairs, ROC), *Gold Medal Award for Taipei Int'l Invention Show 2011*, *The Best Papers for years 2009* and *2005* (awarded by J. of Mechanics), *Distinguished Engineering Professor 2003* (awarded by Chinese Engineers' Association), *The Best Engineering Paper for year 2002* (awarded by J. of American Industrial Hygiene Association, USA), *National Industrial Research Award 2001* (awarded by Ministry of Education, ROC). Except for the fundamental research, he has also been devoted to the advanced R&D for industries for more than 35 years. He has published more than 160 papers and completed 34 technology transfers to the industries.

Year of Birth: 1955

Citizenship: ROC

Educations:

* Ph.D. in Aerospace & Mechanical Engr., University of Oklahoma, U.S.A., 1983 ~ 1987.
* M.S. in Mechanical Engineering, National Tsing Hua University, 1978 ~ 1980.
* B.S. in Mechanical Engineering, National Tsing Hua University, 1974 ~ 1978.

Research Interests:

Topics relevant to fields of *Fluid Mechanics*, *Aerodynamics*, and *Combustion Technology*.
For instance, Internal combustion engine, Ventilation, Swirl-flow combustor, Fan design, test, and simulation, Cardiovascular fluid dynamics, Cooling of electronic device, Wing aerodynamics, Bluff-body wake, Combusting jet, Suction flow, Push-pull air curtain technology, Channel flow, Wake, Shear flow, Boundary layer, Vortex shedding, Flow control & conditioning technologies, Laser diagnostic techniques for flow velocity field, Wind tunnel design, Measurement and calibration technologies of pressure, flow rate, flow velocity, and temperature, Flow visualization technology, and Development of instruments and apparatus.

Professional Experiences:

* *Chair Professor*, Taiwan University of Science and Technology, 2008 – present.
* *Professor*, Taiwan University of Science & Technology, Taipei, ROC, February 1996 - present.
* *Steering Committee Member*, Small Business Innovation Research (SBIR) Program, Industrial Development Bureau, Ministry of Economic Affairs, ROC, January 2014 – December 2015.

* *Convener*, Small Business Innovation Research (SBIR) Program, Industrial Development Bureau, Ministry of Economic Affairs, ROC, January 2012 - December 2012.
* *Convener*, Mechanical Engineering Section of Small Business Innovation Research (SBIR) Program, Industrial Development Bureau, Ministry of Economic Affairs, ROC, April 2011 - December 2012.
* *Subject Editor of Journal of Chinese Institute of Engineers, Mechanical Engineering Section*, January 2008 - February 2010; January 2011 - December 2015.
* *Managing Editor*, Journal of Mechanics, October 2011- December 2012.
* *Convener*, Aerospace Research Program, National Science Council, ROC, December 2005 - December 2008.
* *Chairman*, Department of Mechanical Engineering, Taiwan University of Science and Technology, Taipei, ROC, March 2005 - July 2007.
* *Associate Professor*, Taiwan University of Science and Technology, Taipei, ROC, August 1991 - January 1996.
* *Manager of Thermal Fluid Research*, DC USA, Harrison, New Jersey, USA, 1989 - 1991.
* *Associate Professor*, Nat'l Central University, Chung-Li, ROC, Aug. 1988 - July 1989.
* *Associate Researcher*, Dept. of Mechanical Engr., ITRI, Hsing-Chu, ROC, 1982 - 1983.
* *Engineer*, Chao-Syi Battery Manufacturing Co., Chao-Syi, ROC, 1980 - 1982.

Honors and Distinctions:

* *World's Top 2% Scientists* 2025—Lifetime Scientific Influence Ranking 1960-2024, listed by Standford University, USA.
* *World's Top 2% Scientists* 2024—Lifetime Scientific Influence Ranking 1960-2023, listed by Standford University, USA.
* *World's Top 2% Scientists* 2023—Lifetime Scientific Influence Ranking 1960-2022, listed by Standford University, USA.
* *Merit MOST Research Fellow* 2021, awarded by Ministry of Science and Technology, ROC.
* *National Award for Distinguished Contribution to Industry-Academia Cooperation* 2018, Ministry of Education, ROC.
* *Research Fellow* 2017–2020, Ministry of Science and Technology, ROC.
* *Distinguished Paper Award*, ICETAS 2017, Kitakyushu, Japan.
* *Best Paper Award*, VENT 2015, Shanghai, China.
* *Outstanding Research Awards* 2014, 2011, and 1999, awarded by Ministry of Science and Technology, ROC.
* *Silver Medal for Innovation*, *National Industrial Exhibition Award 2013*, Shianghai, China.
* *Distinguished Industrial Research Award* for Year 2013, National Taiwan University of Science and Technology.
* *Gold Medal Award for Invention 2012*, *National Awards for Invention and Innovation*, awarded by Ministry of Economic Affairs, ROC.
* *Annual Engineering Paper Award 2012*, "Performance and inter-blade flow of axial flow fans with different blade angles of attack," awarded by Journal of Chinese Institute of Engineers.
* *Distinguished Achievement in Technology Transfer* 2011, "Inclined Quad-Vortex Technology," awarded by Ministry of Education, ROC.
* *Gold Medal Award* 2011, "An Extremely High Efficiency Range Hood - IQV Range Hood," Taipei Int'l Invention Show & Technomart 2011, Word Trade Center, Taipei, ROC.
* *The Best Paper* 2009, "Manipulating tumble and swirl flows in cylinder of a motored four-valve engine by inlet deflection valve," *Journal of Mechanics*.
* *Project for Outstanding Research Scholar* 2008-2011, National Science Council, Taiwan.
* *The Best Paper* for Year 2005, "Development and characterization of jet-injected vee-gutter," *Journal of Mechanics*.
* *Distinguished Professor in Engineering* 2003, awarded by Chinese Institute of Engineers, ROC.
* *The Best Engineering Paper* 2001, "Capture envelopes of rectangular hoods in cross drafts," *American Industrial Hygiene Association Journal*. Award presented at AICHE 2002 in San Diego, California USA on June 5, 2002.
* *National Industrial Research Award* 2001, awarded by Ministry of Education, ROC.

* *Distinguished Engineering Technology Award* 2001, awarded by Tai-Chin Foundation, ROC.
* *Jane's Best Engineering Paper Award* 2000, "Experimental design of tuning pipe of a two-stroke engine for motorcycles," awarded by Chinese Institute of Engineers, ROC.
* *Gold Medal of Super Fuel-Saving Car Contest* 1997, awarded by SAE Taiwan Chapter, ROC.
* *Distinguished Professor in Education* 1995, awarded by Ministry of Education, ROC.

Sponsored Research Projects:

* 103 from Industries.
* 60 from Ministry of Science & Technology (MOST) of ROC.

Technology Transfers:

* Patent Authorizations/Technology Transfers: 34.

Patents:

* Approved: 142.

Books:

* Printed: 2.

Journal Papers:

* Published 161.

中文簡歷

1955 年生於臺灣台南，早年負笈美國，1987 年獲 University of Oklahoma 航空與機械工程博士學位。專長：流體力學、氣體動力學、燃燒科技、通風等領域相關之題材。在大學裡任教於機械工程領域，除了授課之外，亦積極從事研究與創作。在將近 35 年的教學研究生涯中，秉持的基本理念是：「學問是為了經世濟用，大學的功能除了傳道、授業、解惑、創造知識與學生人格培養之外，還有社會責任。」基於此一理念，以流體力學與燃燒的基礎學術研究為根柢，延伸至產業應用科技的研發，發展出多項可以使污染物近乎零洩漏且省能源的通風設備以及增強機車引擎燃燒效率、降低油耗與污染物排放的技術，將這些設備技轉至國內、外廠商，並輔助其商品化，希冀對人的健康與安全有所幫助。一生的志業：科技研發、作育英才。服膺王陽明的「格物致知」，認為知識的獲得需經深刻的反複思考以及科學實驗與工程技術經驗的體認，閱讀與聽講僅是初步的訊息接收方式；研究不只限於「有趣」，還需延展到「有用」；科學不只「分析、發現」，還有「創造、發明」。

在大學求學期間，受到一位敬愛的老師教誨：「科學若要對人類有益，必須從『有趣』做到『有用』。」這個烙印在腦海中的觀念，啟發了日後除了基礎研究之外，也開展應用研究的路。原本鎖定流體力學與燃燒氣動力學領域進行基礎研究，但在一個偶然的契機下，因緣際會，開始了應用面的研發。十幾年前，出席學生的婚禮，同桌有幾位老太太，悲傷的討論到家中先生、兒子、親戚因肺部疾病過世，她們懷疑與家族從事的廚師工作有關。當時想的是：「我的學生在結婚，她們會如此表現，可見是多麼的傷痛」。當晚情緒頗為低落，轉念想到，通風就是「流體力學」的應用之一，於是決定將實驗室的一部分資源與空間，轉移做通風相關的研究，希望對人的健康有直接的益處；其它部分，繼續進行基礎科研，以保留長期發展的根柢與希望。

生涯早期曾在研究單位與工業界任職，之後長期在大學任教與研究。培育學生的方法，分為【大學部與研究所學生授課】以及【研究生】兩類：

(1) 大學部與研究所學生授課：使用自行編寫的講義，將個人的研發成果與產學經驗溶入教學中，配合指定的教科書，並以電影、動畫及圖表配合解說。無論大學部或研究所的理論課程，均製作實驗模型與儀器，於課程中安排 2~3 週的實驗課，讓學生瞭解與體驗理論上的物理現象呈現於實際應用時的樣貌與應用。

(2)研究生的培育方式：於每年六月下旬，所有新報到的研究生必須到實驗室接受為期約三個月的「暑訓」，構築基礎。上午由我授課，使用受親手編寫的講義，用以彌補大學工程教育之不足，架一條通往研究的橋。下午與夜間則進行「勞改」(此為比喻用詞)，設計了十餘種與熱流、光機電、機械加工等相關的題目，讓學生在熱流實驗室、電子實驗室、光電實驗室、機械工廠裡進行實作、製作、實驗、創作，已實施二十多年。深刻體驗到「額外付出」與「加強訓練」可以克服日漸鬆弛之教育所衍生的問題；「因材施教」與「喚起興趣」，能使教授與學生都有不斷進步的機會，走出不同的路。至今培育畢業的研究生：本國碩士 200 位、博士 20 位；外籍碩士 8 位、博士 15 位。畢業學生有在國內、外產業界與學術界服務者，亦有自行創業者。

2025 年 10 月屆 70 歲，於 2026 年 2 月 1 日退休。臨退之際，反思一個問題：【數十年前飄洋過海唸博士學位，最終選擇在大學當教授作為一生志業的初衷是：(1)探索未知、(2)發展有益人類的科技、(3)作育英才。做到了嗎？】捫心檢驗：慶幸沒有違背初衷，雖無赫赫績效，但沒有對不起良知。賦樂府【落霞】一首，作別學術與產業生涯：

少年任俠遊，劍氣破九霄；倥傯七十載，寸心天地知。
卸甲歸漁樵，海隅孤舟渺；山巔雲天樹，向晚落霞風。

南朝梁武帝蕭衍(464-549)詔問陶弘景(456-536，集醫者、文學家、書法家於一身而辭官隱居於茅山之道士)，為何不願應詔回朝作官？詔書曰：【山中何所有？卿何戀而不返？】陶弘景答詔謂：【山中何所有？嶺上多白雲；只可自怡悅，不堪持贈君。】好個「嶺上多白雲」啊！

A. 姓名：黃榮芳

B. 出生年份：1955

C. 教育背景：

*博士：美國奧克拉荷馬大學航空與機械工程研究所 (1983 - 1987)
*碩士：新竹清華大學動力機械研究所 (1978 - 1980)
*學士：新竹清華大學動力機械系 (1974 - 1978)

D. 工作經歷：

專職

*臺灣科技大學講座教授 (頭銜、獎助：2008 – 迄今)
*臺灣科技大學機械工程系教授 (1996 – 迄今)
*臺灣科技大學機械工程系副教授 (1992 – 1996)
*DC USA 經理 (1990 – 1991)
*中央大學機械工程系副教授 (1988 – 1989)
*工業技術研究院副研究員(1982 – 1983)
*礁溪電池廠機械工程官 (1980 – 1982)

兼職

*經濟部中小企業辦公室(SBIR)指導委員(2015 – 2015)
*經濟部中小企業辦公室(SBIR)總召集人(2013 – 2014)
*經濟部中小企業辦公室(SBIR)機械組召集人(2011 – 2012)
*科技部航太學門召集人(2005 – 2008)
*國立臺灣科技大學機械工程系所主任(2005 – 2007)

E. 專長：航空與機械工程

F. 研究領域：流體力學、氣體動力學、燃燒科技領域相關之題材。

G. 研究項目舉例：

1. 基礎研究：

[噴流]、[燃燒噴流]、[鈍體尾流]、[旋轉流]、[燃燒旋轉流]、[混合層]、[邊界層]、[管流]、[吸氣]、[流動引致結構物振動]...的**流體力學**與**燃燒氣動力學**。

2. 應用研究：

[機翼、飛行體、建築物氣動力設計]、[流動控制技術]、[燃燒器設計、燃燒增強技術、模擬與測試]、[管流診斷與整流技術]、[機車引擎]、[心臟血管流動與控制]、[雷射熱流場診斷技術]、[電子設備散熱]、[風機設計、模擬與測試]、[風洞設計]、[水洞設計]、[拖拉式水槽設計]、[壓力、流率、流速、溫度量測與校準技術]、[流速、流量、壓力量測設備與儀器發展]、[流場視覺化技術]、[近乎零洩漏/低耗電量之高效率通風科技(例如：整體通風；局部通風；吹氣與吸氣管道設計；暖通空調氣流分配技術；推挽式氣簾技術；創新型氣罩、化學排氣櫃、桌上型排氣櫃、生物安全櫃、家庭與餐廳廚房排油煙機、解剖檯、藥品儲藏櫃設計等等)] …。

H. 關鍵績效指標(KPI)：

(a) Output

專業書籍 (冊)	期刊論文 (篇)	專利 (件)
2 **(1) 工業通風--原理與實務** **第四版**，ISBN 978-986-98806-1-9，2025年1月。A4 size，930頁。 **(2)廠房與建築物整體(全面)通風技術。** **第二版**，ISBN 978-986-98806-2-6，2025年1月。A4 size，400頁。	**161**	**142** 發明：53 新型：87 設計： 2 已技轉/授權：110件 (佔專利數目比例 = 100/142 = 77%)

(b) Outcome

	產學計畫	科技部計畫	技術移轉/專利授權
總件數	**103**	**60**	**34**
總金額	**約 1億8仟7百16萬元**	**約 6仟9百15萬元**	**約 5仟9百萬元** **(未計入衍生利益金)**

註	(1)三項金額共約：3億1仟5百31萬元。 (2)學校使用約25%：7仟8百82萬元(校20%：6306 萬元、系5%：1576萬元)。 (3)國稅局約20%：6仟3百06萬元。 (4)實驗室使用約53%：1億6仟7百11萬元。

(c) Awards

<1>International

(1) **Stanford University** (2025)：World's Top 2% Scientists—Lifetime Scientific Influence Ranking 1960-2024 (**全球前2%頂尖科學家—終身科學影響力排行榜1960-2024**)。

(2) **Stanford University** (2024)：World's Top 2% Scientists—Lifetime Scientific Influence Ranking 1960-2023 (**全球前2%頂尖科學家—終身科學影響力排行榜1960-2023**)。

(3) **Stanford University** (2023)：World's Top 2% Scientists—Lifetime Scientific Influence Ranking 1960-2022 (**全球前2%頂尖科學家—終身科學影響力排行榜1960-2022**)。

<2>Domestic [國科會(科技部)、教育部、經濟部 之高階獎項]

	國科會(科技部)	教育部	經濟部
1	傑出特約研究員 【條件：獲 2 次特約研究員者，經遴選產生】	國家講座 【條件：獲學術獎者，可提申請，經審查產生】	國家發明創作獎 -- 發明獎金牌 此獎項分為兩階： (1)發明獎(需有發明專利與實品、實績)。 (2)創作獎(需有新型專利) 【條件：開放個人申請，經審查產生。】
2	特約研究員(2 次) 【條件：獲 3 次(舊制)或 2 次(新制)傑出研究獎者，可提申請，經審查產生】	國家產學大師 【條件：開放個人申請，經審查產生】	
3	傑出研究獎 (3 次) [條件：開放個人申請，經學門、組、處、大會審查產生]	學術獎 【條件：開放個人申請，經審查產生】	
註	紅色字體為獲得之獎項。		

I. 獲獎與榮譽：

(a)<u>個人獲獎/榮譽</u>

1. **Stanford University** (2025)：World's Top 2% Scientists—Lifetime Scientific Influence Ranking 1960-2024 (**全球前2%頂尖科學家—終身科學影響力排行榜1960-2024**)。
2. **Stanford University** (2024)：World's Top 2% Scientists—Lifetime Scientific Influence Ranking 1960-2023 (**全球前2%頂尖科學家—終身科學影響力排行榜1960-2023**)。
3. **Stanford University** (2023)：World's Top 2% Scientists—Lifetime Scientific Influence Ranking 1960-2022 (**全球前2%頂尖科學家—終身科學影響力排行榜1960-2022**)。

4. **科技部** (2021)：109年度**傑出特約研究員獎**Merit MOST Research Fellow
5. **教育部** (2019)：**第一屆國家產學大師獎**
6. **科技部** (2017 – 2020)：**特約研究員**
7. ICETAS國際研討會 (2017)：最佳論文獎
8. VENT國際研討會 (2015)：最佳論文獎
9. **科技部** (2014、2011、1999)：**傑出研究獎**(3次)
10. 國際工業博覽會 (2013)：創新獎銀牌
11. 國立台灣科技大學 (2013)：教師產學合作傑出獎
12. **經濟部**(2012)：**國家發明創作獎—發明獎金牌**
13. 中國工程師學會 (2012)：工程論文獎
14. **教育部**(2011)：**全國績優商品化成果獎**
15. 台北國際發明展 (2011)：金牌獎
16. Journal of Mechanics (2009)：最佳論文獎第一名
17. **國科會**(2008-2011)：**傑出學者研究計畫**(註：該年國科會取消「傑出研究獎」，改以「傑出學者研究計劃」取代。之後於「科技部補助特約研究人員從事特約研究計畫作業要點」第十一條規定：「曾執行一次三年期傑出學者研究計畫者，視同執行一次特約研究計畫」)
18. 國立台灣科技大學 (2006)：傑出研究獎
19. Journal of Mechanics (2005)：最佳論文獎第一名
20. **中國工程師學會** (2003)：**傑出工程教授獎**
21. **American Industrial Hygiene Association Journal** (美國工業通風衛生協會期刊) (2001)：**最佳工程論文獎**
22. **教育部**(2001)：**產學合作獎第一名**
23. 財團法人台慶文教基金會 (2001)：工程科技獎
24. **中國工程師學會** (2000)：**詹天佑論文獎章**
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A. Output

I. Books

1. 黃榮芳*、許清閔、沈芥，「**廠房與建築物整體(全面)通風技術**」。
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2. 黃榮芳*、許清閔，沈芥、林楷玲，「**工業通風—原理與實務**」。
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III. Conference/Workshop Papers

International

1. Huang R. F., "Local ventilation—Hood design and practices," OSHA 9-hour Remote Workshop for Examiners of Safety and Hygienne, Taipei, Taiwan, ROC, August 15, 2022. Keynote Lecturer.
2. Huang R. F., "Local ventilation—hood design," OSHA 6-hour Workshop for Examiners of Safety and Hygienne, Taipei, Taiwan, ROC, Auguet 3, 2022. Keynote Lecturer.
3. Huang R. F., "Local ventilation—Hood design," Shanhai 6-hour Remote Workshop for ASHRAE practioners, Taipei, Taiwan, ROC, June 22, 2022. Keynote Lecturer.
4. Huang R. F., "Ventilation—principles and practices," New Taipei City 6-hour Workshop for Examiners of Safety and Hygienne, New Taipei City, Taiwan, ROC, June 17, 2022. Invited Lecturer.
5. Huang R. F., "Local exhaust ventilation—principles and practices," OSHA 72-hours Workshop, Taipei, Taiwan, ROC, April, 2022. Invited Lecturer.
6. Huang R. F., "Local exhaust ventilation—principles and practices," OSHA 72-hours Workshop, Taipei, Taiwan, ROC, September, 2021. Invited Lecturer.
7. Kumar, S., Huang, R. F., and C. M. Hsu, C. M., "Flow behaviour of excited dual plane jets," IEEE Forum: International Conference on Mechanical Engineering and Electrical Systems (ICMEES), Taichung, Taiwan, Nov. 8, 2020.
8. Huang R. F. and Hsu, C. M., "Flow and mixing characteristics of excited elevated transverse jets," 14th International Symposium on Advanced Science and Technology in Experimental Mechanics (ISEM 2019), Tsukuba, Japan, Nov. 1-4, 2019.
9. Huang R. F., "Local Exhaust Ventilation—Principles and Practices," Patiya Workshop, Shanghai, China, October 25-27, 2019. Keynote Speaker.
10. Huang R. F., "Innovative high-efficiency hoods for local ventilation," China Refrigeration & Air-Conditioning Industry Association (CRAA 2019) Workshop, Guiyang, China, October 19-21, 2019. Invited Speaker.
11. Huang R. F., "High efficiency pollutant-capturing technologies," Environmental Science and Engineering, Tianjin University, Tianjin, China, October 17-19, 2019. Invited Speaker.
12. Huang R. F., "Development and characterization of an inclined quad-vortex (IQV) Range Hood," The 5th International Forum on Advanced Technologies (IFAT 2019), Taipei, Taiwan, ROC, March 8, 2019. Keynote Speaker.
13. Huang R. F. and Hsu, C. M., "Flow motions of a pulsed elevated jet in crossflow," 2018 Annual Conference on Engineering and Applied Science (ACEAT 2018), Osaka, Japan, Nov. 27-29, 2018.
14. Huang R. F. and Hsu, C. M., "Controlling horseshoe vortices of a juncture flow controlling," The 12th International Symposium on Advanced Science and Technology in Experimental Mechanics (ISEM-12), Kanazawa, Japan, Nov. 1-4, 2017.
15. Huang R. F. and Hsu, C. M., "Effects of upstream jet injection on flow of a square cylinder in crossflow," The 27th International Symposium on Transport Phenomena (ISTP-27), Honolulu, USA, Sep. 20-23, 2016. Session Chair.
16. Huang R. F., Chen, J.-K., and Hsu, C. M., "Comparison of conventional and IQV range hoods," The 11th International Conference on Industrial Ventilation (VENT 2015), Tongji University, Shanghai, China, October 26-28, 2015. Session Chair.
17. Huang R. F. and Hsu, C. M., "Flow characteristics of an acoustically excited elevated transverse jet," The 25th International Symposium on Transport Phenomina (ISTP-25), Krabi, Thailand, Nov. 5-7, 2014.
18. Huang R. F. and Jufar, S. R., "Flow characteristics of acoustically excited swirling jets," The Ninth Pacific Symposium on Flow Visualization and Image Processing (PSFVIP-9), Busan, Korea, Aug. 25-28, 2013. Session Chair.
19. Huang R. F., Chen, J.-K., and Hsu, C. M., "Flow and containment characteristics of an air-curtain fume hood," The 10th International Conference on Industrial Ventilation (VENT 2012), Maison De La Mutualité, Paris, France, September 17-19, 2012. Scientific Committee Member; Session Chair.
20. Huang, R. F., "Air-curtain biological safety cabinety and chemical fume hood," Interior Workshop, ESCO Inc., Singapore, April 1-4, 2012. Invited Speaker.
21. Huang, R. F. and Chang, K. T., "Flow characteristics of a self-sustained transversely oscillating jet," The Eigth Pacific Symposium on Flow Visualization and Image Processing (PSFVIP-8), Moscow, Russia, Aug. 20-23, 2011.
22. Huang, R. F. and Hsu, C. M., "In-cylinder tumble flows and performance of a motorcycle engine with circular and elliptic intake ports," The Fourth Mechanical Engineering International Research Conference (MEIRC-4), Cebu, Philippines, January 12-14, 2011. Invited Speaker.
23. Huang, R. F., "Aerodynamics and containment performances of conventional and air-curtain Fume Hoods," The Fourth Mechanical Engineering International Research Conference (MEIRC-4), Cebu, Philippines, January 12-14, 2011. Invited Speaker.
24. Huang, R. F. and Chen, J. K., "Enhancing engine performance by manipulating in-cylinder tumble and swirl flow," The 8th Asia-Pacific Conference on Combustion (ASPACC-10), Hyderabad, India, December 10-13, 2010.
25. Huang, R. F. and Chou, C. Y., "Improving performance of biological safety cabinet," The 9th International Conference on Industrial Ventilation (Vent 2009), ETH Zurich, Switzerland, October 18-21, 2009.
26. Huang, R. F., "Temperature distributions and combustion efficiency of non-premixed reacting swirling-wake," The Seventh Asia-Pacific Conference on Combustion (ASPACC-09), Taipei, Taiwan, May 24-27, 2009.
27. Huang, R. F. and Lin, K. H., "In-cylinder tumble flows of a motorcycle engine with circular and elliptic intake ports," The 3rd International Symposium on Advanced Fluid/Solid Science and Technology in Experimental Mechanics (ISEM 2008), Tainan, Taiwan, Dec. 8-10, 2008.
28. Huang, R. F. and Chen, H. D., "Aerodynamics and containment performance of the air-curtain fume hood," The 29th Advanced Building Ventilation and Environmental Technology Conference (AIVC 2008), Kyoto, Japan, Oct. 14-16, 2008.
29. Huang, R. F. and Yen, S. C., "Aerodynamics and thermal structure of non-premixed reacting swirling-wake," The 19th International Symposium on Transport Phenomena (ISTP-19), Reykjavik, Iceland, August 17-20, 2008.
30. Huang, R. F., Chen, C.-C., and Chen, C. W., "Aerodynamics and containment evaluation of air curtain fume cabinet," The 2008 International Occupation Health Association (IOHA 2008), Taipei, Taiwan, Feb. 18-22, 2008.
31. Huang, R. F., Yen, S. C., and Chang, K. T., "On some passive flow control methods with/without self-sustained oscillating mechanism," The 18th International Symposium on Transport Phenomena (ISTP-18), KAIST, Daejeon, Korea, August 26-30, 2007. Keynote speaker.
32. Huang, R. F. and Chang, K. T., "Cavity-driven transversely oscillating planar jets," The 17th International Symposium on Transport Phenomena (ISTP-17), Toyama International Conference Center, Toyama, Japan, September 4-8, 2006.
33. Huang, R. F., Chen, C. W., Chang C. P., and Shih, T. S., "Development of an air curtain-isolated chemical fume hood with considerations of aerodynamics," The 8th International Conference on Practical Applications of Ventilation for Emission and Exposure Control (VENT 2006), Chicago, U.S.A., May 13-18, 2006.
34. Huang, R. F. and Lan, J., "Shear layer vortices in a crossflow-deflected jet," The 6th World Conference on Experimental Heart Transfer, Fluid Mechanics, and Thermodynamics (ExHFT-6), Matsushima, Miyagi, Japan, April 17-21, 2005.
35. Huang, R. F. and Lin, S. Y., "Aerodynamics and design guidelines of push-pull ventilation systems," The USC Engineering Conference 2005, University of San Carlos, Cebu City, Philippines, March 4-6, 2005.
36. Huang, R. F. and Chang, K. T., "Manipulating a vee-shaped bluff-body wake with a fluidic oscillator," The 21st International Congress of Theoretical and Applied Mechanics (21 ICTAM 2004, established by IUTAM), Warsaw University of Technology, Warsaw, Poland, Oct. 15-21, 2004.
37. Huang, R. F., Huang, C. W, and Chang, S. B., "Toplogical flow evolutions in cylinder of a motored engine during intake and compression strokes," The 15th International Symposium on Transport Phenomena (ISTP-15), Bangkok, Thailand, May 9-13, 2004.
38. Huang, R. F. and Hsieh, R. H., "Flow visualization and LDV measurement on near-wake of elevated jets in a crossflow," The 4th Pacific Symposium on Flow Visualization and Image Processing (PSFVIP 4), Chamonix, France, June 3-5, 2003.
39. Huang, R. F., Wu, C. S., and Jeng, J. H., "Modulaing surface flows of a wing started from rest using a near-leading edge control rod," The 10th International Symposim on Flow Visualization (ISFV 10), Kyoto, Japan, Aug. 26-29, 2002.
40. Huang, R. F. and Chung, D. L., "Thermal design of a disk-array system," The 2002 International Conference on Thermal, Mechanics, Thermomechanical Phenomena in Electronics (Itherm 2002), San Diego, USA, May 29-June 1, 2002.
41. Huang, R. F. and Hsieh, R. H., "Near-wake flow structures of elevated jets in a crossflow," The First Taiwan-Japan Workshop on Mechanical and Aerospace Engineering, Tainan, Taiwan, Dec. 19, 2001.
42. Huang, R. F. and Tsai, F. C., "Flow structures of swirling wakes behind circular discs," The Fifth World Conference on Experimental Heat Transfer, Fluid Mechanics, and Thermodynamics (ExHFT-5), Thessaloniki, Greece, September 24-28, 2001.
43. Huang, R. F. and Mao, S. W., "Separation control on an cantilever wing with a self-excited vibrating rod," The Taiwan-Japan Joint Workshop on Aerospace Mechanics, Hokkaido University, Hokkaido, Japan, Sep. 10-11, 2001.
44. Huang, R. F. and Wu, J. P., "Fuel processing capability of a jet flame in crossflow at incidences," The Sixth International Conference on Technologies and Combustion for a Clean Environment (CleanAir 2001), Oporto, Portugal, July 9-12, 2001.
45. Huang, R. F. and Lin, C. L., "Velocity Measurements in Disc Stabilized Flames," Paper presented at Eight International Conference on Laser Anemometry-Advances and Applications (EALA'99), Rome, Italy, September 6-9, 1999.
46. Huang, R. F., Yen, S. C., Huang, C. Y., Wu, J. Y., and Chen, R.-C., "Vortex evolution on an impulsively started wing," The Second Pacific Symposium on Flow Visualization and Image Processing (PSFVIP-2), Honolulu, Hawaii, U.S.A., May 16-19, 1999.
47. Huang, R. F., Lin, C. L., and Lee, W.-B., "Flowfields of circular disc stabilized flame," The Second Asia-Pacific Conference on Combustion (ASPACC-99), Tainan, Taiwan, May 9-12, 1999.
48. Huang, R. F. and Lee, H. W., "Characteristics of frequency selection in wake of a NACA 0012 wing model," The Second Ankara International Aerospace Conference (AIA'98), Ankara, Turkey, September 9-11, 1998.
49. Lai, C. Y., Chih, C. C., and Huang, R. F., "Size characteristics of particulate matter by a two-stroke engine," The Sixteenth Annual Conference of the American Association for Aerosol Research, Denver, Colorado, U.S.A., October 13-17, 1997.
50. Huang, R. F. and Lin, C. L., "Shear-layer vortex shedding of recirculation wake flushed by a central jet," The Seventh International Conference on Laser Anemometry-Advances and Applications, Karlsruhe, Germany, September 8-11, 1997.
51. Huang, R. F. and Lin, C. L., "Flow structure and vortex shedding of a cantilever wing," The International Aerospace Congress 1995 (IAC'95), Melbourne, Australia, March 20-23, 1995.
52. Huang, R. F. and Lin, C. L., "Vortex shedding and shear-layer instability of a cantilever wing at low Reynolds numbers," AIAA Paper 95-0589, The 33rd Aerospace Sciences Meeting and Exhibit, Reno, U.S.A., January 1995.
53. Huang, R. F., Savaş, Ö, and Gollahalli, S. R., "Turbulence characteristics in the flow field of a nonpremixed gas jet flame in cross-flow," The Energy and Environmental Expo '95 - The Energy-Sources Technology Conference and Exhibition, Houston, Texas, U. S. A., January 1995, Sponsored by The Petroleum Division, ASME. Also in *Emerging Energy Technology*, ASME PD-Vol. 66, ASME, 1995, pp. 11-19.
54. Huang, R. F. and Chang, J. M., "The coherent structure in the combusting jet flushed by cross-flow," AIAA Paper 94-2314, 25th AIAA Fluid Dynamics Conference, Colorado Springs, Colorado, U. S. A., June 1994.
55. Huang, R. F. and Lin, C. L., "Flow patterns of near-wake region behind a circular disc with central flushing jet," Proceeding of The Third Asian Symposium on Visualization, Chiba, Japan, May 1994.
56. Huang, R. F. and Chang, J. M., "The stability and visualized flame and flow structures of a combusting jet in cross flow," Proceedings of the Sixth International Conference on Flow Measurement (FLOMEKO '93), pp. 604-611, Korea Research Institute of Standards and Science, 1993. Conference held at Seoul, Korea on October 1993.
57. Huang, R. F., Savaş, Ö, and Gollahalli, S. R., "Flow field in the near burner region of a partially lifted turbulent gas jet flame in cross flow," ASME Winter Annual Meeting, Anaheim, CA, U.S.A., November 1992. Also in *Heat and Mass Transfer in Fire and Combustion Systems*, ASME HDT-223, ASME, 1992, pp. 105-113.

58. Huang, R. F., Savaş, Ö, and Gollahalli, S. R., "Lift-off characteristics of diffusion flames," The Seventh Annual Symposium of AIAA/ASME joint meeting, Norman, Oklahoma, 1985.

Domestic

1. Huang, R. F., "Principles & Practices of High-Efficiency Industrial Venti," Workshop for Safety and Hygiene, OSHA, Ministry of Labors (ROC), Taipei, November 20-21, 2019. Invited Speak
2. Huang, R. F., "Industrial Ventilation – Principles and Practices," Workshop for Safety and Hygiene, OSHA, Ministry of Labors (ROC), Taipei, July 16-18, July 23-25, July 30-31, August 1-2, 2019. Invited Speaker.
3. Huang, R. F., "Technologies of Ventilation," Workshop for Safety and Hygiene, OSHA, Ministry of Labors (ROC), Taipei, May 30-31, 2019. Invited Speaker.
4. Huang, R. F., "Introduction to Industrial Ventilation," Workshop for Safety and Hygiene, OSHA, Ministry of Labors (ROC), Taipei, April 9, 2019. Invited Speaker.
5. Huang, R. F., "Industrial Ventilation – Principles and Practices," Workshop for Safety and Hygiene, OSHA, Ministry of Labors (ROC), Taipei, October 24 -25, 2018. Invited Speaker.
6. Huang, R. F., "Aerodynamic Problems and Testing of Ventilation Systems," Workshop for Taiwan Province Industrial and Mine Safety & Health Engineers Association (台灣省工礦安全衛生技師公會), Taipei, September 29, 2018. Invited Speaker.
7. Huang, R. F., "Aerodynamic Problems and Testing of Ventilation Systems," Workshop for Industrial Safety and Health of ROC, (中華民國工業安全衛生協會), Taipei, August 24, 2018. Invited Speaker.
8. Huang, R. F., "Industrial Ventilation – Principles and Practices," Workshop for Safety and Hygiene, OSHA, Ministry of Labors (ROC), Taipei, September 3 - 6, 2018. Invited Speaker.
9. Huang, R. F., "Industrial Ventilation – Principles and Practices," Workshop for Safety and Hygiene, OSHA, Ministry of Labors (ROC), Taipei, July 16 - 19, 2018. Invited Speaker.
10. Huang, R. F., "Industrial Ventilation – Principles and Practices," Workshop for Safety and Hygiene, OSHA, Ministry of Labors (ROC), TaiChung, July 9 - 12, 2018. Invited Speaker.
11. Huang, R. F., "Industrial Ventilation – Principles and Practices," Workshop for Safety and Hygiene, OSHA, Ministry of Labors (ROC), KaoShung, July 2 - 5, 2018. Invited Speaker.
12. Huang, R. F., "Industrial Ventilation – Principles and Practices," Workshop for Safety and Hygiene, OSHA, Ministry of Labors (ROC), Yilan, June 25 - 28, 2018. Invited Speaker.
13. Huang, R. F., "Industrial Ventilation – Principles and Practices," Workshop for Safety and Hygiene, OSHA, Ministry of Labors (ROC), Taipei, November 15 - 16, 2017. Invited Speaker.
14. Huang, R. F., "Industrial Ventilation – Principles and Practices," Workshop for Safety and Hygiene, OSHA, Ministry of Labors (ROC), Taipei, August 29-September 1, 2017. Invited Speaker.
15. Huang, R. F., "Industrial Ventilation – Principles and Practices," Training Workshop for Pou Chen Industrial (寶成工業), ChungHua, August 23-24, 2017. Invited Speaker.
16. Huang, R. F., "Industrial Ventilation – Principles and Practices," Workshop for Safety and Hygiene, OSHA, Ministry of Labors (ROC), TaiChung, July 3-6, 2017. Invited Speaker.
17. Huang, R. F., "Industrial Ventilation – Principles and Practices," Workshop for Safety and Hygiene, OSHA, Ministry of Labors (ROC), KaoShung, June 27-30, 2017. Invited Speaker.
18. Huang, R. F., "Technologies of Ventilation Devices and Performance Improvement," Workshop for NUSHA, ROC (中華民國工礦安全衛生技師公會全國聯合會), Taipei, September 1-4, 2016. Invited Speaker.
19. Huang, R. F., "Design and Methods for Ventilation Systems," Workshop for ITRI (ROC), HsingChu, August 9, 2016. Invited Speaker.
20. Huang, R. F., "Technologies of Ventilation Devices and Performance Improvement," Workshop for Safety and Hygiene, OSHA, Ministry of Labors (ROC), Taipei, August 2-5, 2016. Invited Speaker.
21. Huang, R. F., "Technologies of Ventilation Devices and Performance Improvement," Workshop for Safety and Hygiene, OSHA, Ministry of Labors (ROC), TaiChung, July 26-29, 2016. Invited Speaker.
22. Huang, R. F., "Technologies of Ventilation Devices and Performance Improvement," Workshop for Safety and Hygiene, OSHA, Ministry of Labors (ROC), KaoShung, July 19-22, 2016. Invited Speaker.
23. Huang, R. F., "Aerodynamic Problems in Ventilation," Workshop for Safety and Hygiene, OSHA, Ministry of Labors (ROC), Taipei, July 8, 2016. Invited Speaker.
24. Huang, R. F., "Technologies of Ventilation Devices and Performance Improvement," Workshop for Safety and Hygiene, OSHA, Ministry of Labors (ROC), TaiChung, July 19-22, 2015. Invited Speaker.
25. Huang, R. F., "Innoveltive Ventilation Technologies," Invited Speaker, Interior Workshop, Euro-Asia Electrostatic Precipitator Technology, Taipei, Taiwan, August 21, 2015. Invited Speaker.
26. Huang, R. F., "Conventional and Innoveltive Ventilation Technologies," Workshop for Safety and Hygiene, OSHA, Ministry of Labors (ROC), KaoShung, August 12-14, 2015. Invited Speaker.
27. Huang, R. F., "Conventional and Innoveltive Ventilation Technologies," Workshop for Safety and Hygiene, OSHA, Ministry of Labors (ROC), Taipei, July 15-17, 2015. Invited Speaker.
28. Huang, R. F., "Conventional and Innoveltive Ventilation Technologies," Workshop for Safety and Hygiene, OSHA, Ministry of Labors (ROC), Taipei, June 17, 2015. Invited Speaker.
29. Huang, R. F., "Conventional and Innoveltive Ventilation Technologies," Workshop for Safety and Hygiene, OSHA, Ministry of Labors (ROC), TaiChung, June 10-12, 2015. Invited Speaker.
30. Huang, R. F., "Conventional and Innoveltive Ventilation Technologies," ITRI, HsinChu, Taiwan, June 5, 2015. Invited Speaker.
31. Huang, R. F., "Technologies of ventilation devices and performance improvement," Workshop for Ventilation, Industrial Technology Research Institute (ITRI, ROC), Hsing Chu, Taiwan, June 24, 2014. Invited Speaker.
32. Huang, R. F., "Improvent of ventilation devices," Workshop for Safety and Hygiene, Ministry of Labor Affairs (ROC), Taipei, Taiwan, May 7, 2014. Invited Speaker.
33. Huang, R. F., "Improvent of ventilation devices," Workshop for Safety and Hygiene, Ministry of Labor Affairs (ROC), Kaoshung, Taiwan, May 14, 2014. Invited Speaker.
34. Huang, R. F., "Improvent of ventilation devices," Workshop for Safety and Hygiene, Ministry of Labor Affairs (ROC), Taichung, Taiwan, May 16, 2014. Invited Speaker.
35. Huang, R. F., "Performance and improvement of industrial ventilation devices," Workshop for Safety and Hygiene, Ministry of Labor Affairs (ROC), Kaoshung, Taiwan, Nov. 8, 2013. Invited Speaker.
36. Huang, R. F., "Performance and improvement of industrial ventilation devices," Workshop for Safety and Hygiene, Ministry of Labor Affairs (ROC), Hualian, Taiwan, Nov. 1, 2013. Invited Speaker.
37. Huang, R. F., "Performance and improvement of industrial ventilation devices," Workshop for Safety and Hygiene, Ministry of Labor Affairs (ROC), Lugan, Taiwan, Oct. 25, 2013. Invited Speaker.
38. Huang, R. F., "Performance and improvement of industrial ventilation devices," Workshop for Safety and Hygiene, Ministry of Labor Affairs (ROC), Taipei, Taiwan, Oct. 18. Invited Speaker.
39. Huang, R. F., "Flow and containment characteristics of conventional and modern chemical fume hoods/biological safety cabinet," Workshop for Ventilation Technologies, Ministry of Labor Affairs (ROC), Taipei, Taiwan, Oct. 28 - Nov. 3, 2011. Invited speaker.
40. Huang, R. F., "Flow and containment characteristics of conventional and modern chemical fume hoods/biological safety cabinet," Workshop for Environmental Protection Techniques, Ministry of Labor Affairs (ROC), Taipei, Taiwan, Oct. 25, 2011. Invited speaker.
41. Huang, R. F., "Local Ventilation -- Principle and Practice," Workshop for Ventilation Technologies, Ministry of Labor Affairs(ROC), Taipei, Taiwan, July 5, 2011. Invited speaker.
42. Huang, R. F., "Local ventilation – principle and practice," Workshap on Testing and Verification of Biological Safety Cabinet and Chemical Fume, Ministry of Labor Affairs(ROC), Taipei, Taiwan, Dec. 30, 2011. Invited speaker.
43. Huang, R. F. and Hsu, C. M., "Flow and mixing characteristics of an elevated pulsating transverse jet," paper presented at AASRC/CSCA Joint Conference, Dec. 4, 2010.
44. Huang, R. F., Chang, J. C., and Chen, J. K., "Flow and mixing characteristics of an elevated pulsating transverse jet," paper presented at AASRC/CSCA Joint Conference, Dec. 4, 2010.
45. Huang, R. F., Cheng, J. C., and Chen, J. K., "Manipulating flow characteristics around a square cylinderat incidence by using a galloping rod," paper presented at AASRC/CSCA Joint Conference, Dec. 12, 2010.
46. Huang, R. F., "Local ventilation – principle and practice," Invited speaker, Workshop for Environmental Protection Techniques, Tainan, Taiwan, July 9, 2010.
47. Huang, R. F., "A new technology for chemical fume hood," Invited Speaker, Testing and Verification of Biological Safety Cabinet and Chemical Fume Hood Conference, Taipei, Taiwan, Nov. 10, 2009.
48. Huang, R. F. and Kuo, K. T., "Bluff-body wake subject to modification of cavity-driven oscillation plannar jet," Workshop for ThermoFluid Division, NSC, November 22, 2008. Invited speaker.
49. Liou, S. S. and Huang, R. F., "Design of an axial fan," paper presented at CFD Conference, Nan Tou, Taiwan, Aug. 23-24, 2007. (in Chinese)
50. Huang, R. F., Yen, S. C., and Huang, L. C., "Flow and aerodynamic performance of a back-swept wing," paper presented at Aeronautical and Aerospace Conference 2006, National Central University, Chung Li, Taiwan, December 9-10, 2006. (in Chinese)
51. Hunag, R. F. and Chang, K.T., "Cavity-driven transversely oscillating plannar jets," paper presented at 23th CSME Conference, Kun-Shang Technical University, Taiwan, Taiwan, November 24-25, 2006.
52. Chang, K. T. and Huang, R. F., "Vortex shedding and shear-layer instability oscillation frequence of vee-gutter," paper presented at the 29th National Conference on Theoretical and Applied Mechanics, National Tsing Hua University, Hsinchu, Taiwan, December 16-17, 2005.
53. Huang, C. W. and Huang, R. F., "PIV measurements on in-cylinder flows of a four-stroke cycle motorcycle engine," paper presented at the 11th Combustion Conference of ROC, National Central University, Chung-Li, Taiwan, March 27, 2004.
54. Huang, J. W. and Huang, R. F., "Engine flows at intake and compression strokes," paper presented at the 10th Combustion Conference of ROC, National Taiwan University od Science & Technology, Taipei, Taiwan, Taiwan, March 29, 2003.
55. Hsieh, R. H. and Huang, R. F., "Sectional flow structures of a rounf jet in crossflow," paper presented at Aeronautical and Aerospace Conference 2002, National Kaohsiung Hospitality College, Kaohsiung, Taiwan, March 23, 2002.
56. Mao, S. W., and Huang, R. F., "Control of surface flows on a wing," paper presented at Aeronautical and Aerospace Conference 2002, National Kaohsiung Hospitality College, Kaohsiung, Taiwan, March 23, 2002.
57. Wu, J. Y., Huang, R. F., and R.-C. Chen, "Surface and vortex shedding of animpulsively-started wing," paper presented at 16th CSME Conference, National Tsing Hua University, Hsin Chu, Taiwan, Dec. 3-4, 1999.
58. Chen, J. L., Huang, R. F., and Chen, Y. K., "Effect of the cross draft on capture zone of an flanged circular hood," paper presented at 16th CSME Conference, National Tsing Hua University, Hsin Chu, Taiwan, Dec. 3-4, 1999.
59. Hseih, M. K., Huang, R. F., Lee, K. J., and Hsu, J. M., "Flow and fly ash diagnostics in ducts entering EP of a power plant," paper presented at 16th CSME Conference, National Tsing Hua University, Hsin Chu, Taiwan, Dec. 3-4, 1999.
60. Lee, H. W., Sheih, M. K., and Huang, R. F., "Effects of free-stream turbulence on the aerodynamic performance of a cantilever wing," paper presented at 40th AASRC Conference, Fong-Chah University, Taichung, Taiwan, December 12, 1998.
61. Lee, H. W. and Huang, R. F., "Frequency selection of instabilities in the wake of a wing," paper presented at the 22th National Conference on Theoretical and Applied Mechanics, Taipei, Taiwan, December 19-20, 1998.
62. Yen, S. C., Huang, C. Y., Huang, R. F., and Chen, R. C., "Evolution of surface vortices on a impulsively started wing," paper presented at 15th CSME Conference, National Cheng Kung University, Tainan, Tiawan, November 27-28, 1998. (in Chinese)
63. Liang, W. Y., Shu, L. H., and Huang, R. F., "Effect of exit diameter on performance of an air-assisted swirling atomizer," paper presented at 15th CSME Conference, National Cheng Kung University, Tainan, Tiawan, November 27-28, 1998. (in Chinese)
64. Huang, R. F. and Lin, C. L., "Vortices shed in shear layer evolving from edge of a circular disk," paper presented at the 20th National Conference on Theoretical and Applied Mechanics, Taipei, Taiwan, December 1996.
65. Huang, R. F. and Lin, C. L., "Shear-layer vortex shedding of double concentric jets," paper presented at the 13th CSME Conference, Taipei, Taiwan, November 1996.
66. Huang, R. F., Bear, G. M., and Lin, C. L., "Flow visualization of double concentric jets," paper presented at the 11th CSME Conference, Taichung, Taiwan, November 1994.
67. Huang, R. F. and Shy, W. W., "Flow patterns and separation characteristics of a cantilever airfoil," paper presented at the 11th CSME Conference, Taichung, Taiwan, November 1994.
68. Huang, R. F. and Lin, C. L., "Interaction of vortex shedding and a cantilever wing," paper presented at the 11th CSME Conference, Taichung, Taiwan, November 1994.
69. Huang, R. F., Chen, C. F., Lin, C. L., and Bear, G. M., "Low speed flow patterns behind a circular disc," paper presented at the 10th CSME Conference, Hsing Chu, Taiwan, December 1993.
70. Huang, R. F. and Chang, J. M., "The flame behavior of a combusting jet in cross-flow," paper presented at the 10th CSME Conference, Hsing Chu, Taiwan, December 1993.
71. Sheen, H. J., Lin, C. M., and Huang, R. F., "A feasibility study of diode laser LDA," paper presented at 33rd Chinese Aerospace and Aeronautics Society Conference, Taipei, Taiwan, Dec. 1991. (in Chinese).
72. Huang, R. F. and Lin, S. C., "The characteristics and interaction of turbulent and thermal fields in a 3-D reacting flow," paper presented at 6th CSME Conference, Tainan, Taiwan, Dec. 1989.
73. Huang, R. F. and Chen, L. T., "A simulative investigation of the R-22/DMF absorptive refrigeration systems," paper presented at 8th Annual Meeting of Chinese Solar Energy Society, Kaohsiung, Taiwan, November 1988.

IV. Patents

	Title 專利名稱	Country/ Region 專利核發國家/地區	Type 專利型態	Number 專利號碼	Inventor 發明人	Patent Owner 專利權人	Effective Period 專利權期間
1	廠房之通風散熱結構	China	發明		黃榮芳 沈芥	台灣科技大學	
2	廠房之通風散熱結構	ROC	發明	I 873071	黃榮芳 沈芥	台灣科技大學	02/01/2025 ~ 08/22/2044
3	廠房散熱結構	China	發明	ZL202210259882.8 P228593CN	黃榮芳	台灣科技大學	10/13/2025 ~ 03/16/2042
4	廠房空間散熱結構	越南	發明	PN: 43124 P228585VN	黃榮芳	台灣科技大學	01/06/2025 ~ 04/08/2042
5	廠房空間散熱結構	新加坡	發明	P228585SG	黃榮芳	台灣科技大學	03/29/2022 ~
6	廠房空間散熱結構	馬來西亞	發明	P228585MA	黃榮芳	台灣科技大學	03/25/2022 ~
7	無頂氣簾式解剖檯	ROC	發明	I 851389	黃榮芳	台灣科技大學	08/01/2024 ~ 08/29/2043
8	氣罩之使用配置方法	ROC	發明	I 827024 P228634	黃榮芳	台灣科技大學	12/21/2023 ~ 04/26/2042
9	廠房空間散熱结構	China	發明	CN115247852B	黃榮芳	台灣科技大學	03/28/2023 ~
10	廠房散熱結構	China	發明	CN116772340A P208304	黃榮芳	台灣科技大學	09/19/2023 ~

11	廠房通風導流結構	ROC	發明	I 814603B	黃榮芳	台灣科技大學	09/01/2023 ~
12	出風管道之出風均勻度調整方法	China	發明	CN115854533A	黃榮芳	台灣科技大學	03/28/2023 ~
13	出風管道及其出風均勻度調整方法	ROC	發明	TW202311678	黃榮芳	台灣科技大學	03/16/2023 ~
14	廠房通風散熱方法	ROC	發明	CN115854457A	黃榮芳	台灣科技大學	03/28/2023 ~
15	廠房通風散熱方法	ROC	發明	TW202312001A	黃榮芳	台灣科技大學	03/16/2023 ~
16	隧道式發酵槽結構	ROC	新型		黃榮芳	台灣科技大學	
17	遮罩及使用該遮罩之解剖裝置(二)	Taiwan	新型	M 627738	黃榮芳	台灣科技大學	06/01/2022 ~ 01/02/2032
18	遮罩及使用該遮罩之解剖裝置(一)	Taiwan	新型	M 624242	黃榮芳	台灣科技大學	12/09/2021 ~ 12/08/2031
19	廠房散熱結構	Taiwan	發明	TWI798014B P228587	黃榮芳	台灣科技大學	04/01/2023 ~
20	廠房散熱結構	China	實用新型	CN 217715298 U ZL 2022 2 0577734.6	黃榮芳	台灣科技大學	03/16/2022 03/16/2032
21	廠房散熱結構(三)	Taiwan	發明	I 773240	黃榮芳	台灣科技大學	04/09/2022 ~ 04/08/2041
22	廠房散熱結構(二)	Taiwan	發明	I 778572	黃榮芳	台灣科技大學	09/22/2022 04/08/2041
23	廠房之散熱結構	China	新型	CN 214370742U P208305CN 10/21/2020	黃榮芳	黃榮芳	10/19/2020 ~ 10/18/2030
24	室內通風結構	Taiwan	新型	M 607638 P208303 10/19/2020	黃榮芳	台灣科技大學	10/16/2020 ~ 10/15/2030
25	室內通風結構	China	新型	CN 213955344U P208303 10/21/2020	黃榮芳	黃榮芳	10/19/2020 ~ 10/18/2030
26	廠房之散熱結構	Taiwan	發明	I 764844 P208304 10/19/2020	黃榮芳	台灣科技大學	05/11/2022 ~ 10/17/2041
27	斜向抽氣式化學排氣櫃	Taiwan	新型	M 606216 P208291	黃榮芳	台灣科技大學	01/01/2021 ~ 09/22/2030
28	油煙導引結構	Taiwan	新型	M 605556	黃榮芳	台灣科技大學	12/21/2020 ~ 07/09/2030
29	工作枱型吸氣罩	China	新型	ZL 201920589811.8	黃榮芳	台灣科技大學	01/17/2020 ~ 04/25/2029
30	廠房散熱結構(寶成越南廠)	Taiwan	發明	I 659145	黃榮芳	台灣科技大學	05/11/2019 ~ 04/11/2037
31	雙背吸式排油煙機 (DBS)	China	發明	ZL 201710094604.0	黃榮芳	台灣科技大學	11/05/2019 ~ 02/20/2037
32	工作枱型吸氣罩	Taiwan	新型	M 581945	黃榮芳	台灣科技大學	08/11/2019 ~ 04/23/2029
33	排油煙機之避震結構	China	新型	ZL 201821831836.6	黃榮芳	台灣科技大學	08/02/2019 ~
34	排油煙機之靜音結構	China	新型	ZL 201821833309.9	黃榮芳	台灣科技大學	11/08/2019 ~
35	排油煙機之吸氣罩結構	China	新型	ZL 201821910782.2	黃榮芳	台灣科技大學	11/20/2019 ~
36	排油煙機之避震結構	Taiwan	新型	M 577926 P187839	黃榮芳	台灣科技大學	05/11/2019 ~
37	排油煙機之靜音結構	Taiwan	新型	M 577925 P187840	黃榮芳	台灣科技大學	05/11/2019 ~

38	排油煙機之吸氣罩結構	Taiwan	新型	M 575087	黃榮芳	台灣科技大學	03/01/2019 ~
39	抽油煙機結構改良	Taiwan	新型	M 575510	黃榮芳	台灣科技大學	03/01/2019 ~
40	油煙排除裝置 (IQV-bsc2 Range Hood)	China	發明	ZL 201410053081.1	黃榮芳 陳佳塋 許清閔	台灣科技大學	06/19/2018 ~ 02/16/2034
41	雙背吸式排油煙機 (DBS)	Taiwan	發明	I 618894	黃榮芳	台灣科技大學	03/21/2018 ~ 02/16/2037
42	油煙排除裝置 (IQV-bsc2 Range Hood)	USA	發明	US 9541296B2	黃榮芳	台灣科技大學	12/14/2017 ~ 02/17/2035
43	雙背吸式排油煙機 (DBS) (DBS Range Hood)	China	新型	ZL 201720155583.4	黃榮芳	台灣科技大學	09/26/2017 ~ 02/20/2027
44	廢油導引結構 (上凸弧形板)	China	新型	ZL 201720043550.0	黃榮芳	台灣科技大學	09/15/2017 ~ 01/12/2027
45	排油煙機 (IQV-bsc2 Range Hood)	China	發明	ZL 201310644120.0 P136750CN	黃榮芳 陳佳塋 許清閔	台灣科技大學	06/03/2017 ~ 12/02/2033
46	廢油導引結構 (上凸弧形板)	Taiwan	新型	M 540864	黃榮芳	台灣科技大學	05/01/2017 ~ 01/12/2027
47	具阻隔板之排氣裝置 (任何油煙機的側板)	China	新型	ZL 201621062421.8	黃榮芳	台灣科技大學	06/06/2017 ~ 09/18/2026
48	排油煙機 (IQV-bsc2 Range Hood)	Taiwan	發明	I 591295	黃榮芳 陳佳塋 許清閔	台灣科技大學	07/11/2017 ~ 11/26/2033
49	具阻隔板之排氣裝置 (任何油煙機的側板)	Taiwan	新型	M 535298	黃榮芳	台灣科技大學	01/11/2017 ~ 09/18/2026
50	具有導流風道之排油煙機 (風機殼下部有外擴或弧形)	China	新型	ZL 201620570657.6	黃榮芳	台灣科技大學	11/28/2016 ~ 06/14/2026
51	具導流風道之排油煙機 (風機殼下部有外擴或弧形)	Taiwan	新型	M 535297	黃榮芳	台灣科技大學	01/11/2017 ~ 06/07/2026
52	排油煙機 (DBS的前身，後吸槽＋短小側板)	China	新型	ZL 201620626481.1	黃榮芳	台灣科技大學	11/28/2016 ~ 06/21/2026
53	渦流消除結構 (horseshoe vortex)	Taiwan	發明	I 550161	黃榮芳 許清閔 陳佳塋 廖洪鈞	台灣科技大學	09/21/2016 ~ 07/13/2034
54	油煙排除裝置 (IQV-bsc2 Range Hood)	Taiwan	發明	I 550236	黃榮芳 陳佳塋 許清閔	台灣科技大學	09/21/2016 ~ 02/13/2034
55	排油煙機 (SBS) (DBS的前身，後吸槽＋短小側板)	Taiwan	新型	M 529122	黃榮芳	台灣科技大學	09/21/2016 ~ 6/21/2026
56	含吹氣風道的抽油煙機	China	新型	ZL 201620274106.5	黃榮芳	台灣科技大學	09/07/2016 ~ 04/04/2026
57	含吹氣風道的抽油煙機	Taiwan	新型	M 527938	黃榮芳	台灣科技大學	09/01/2016 ~ 03/31/2026
58	集油結構	China	新型	ZL 201520833296.5	黃榮芳	台灣科技大學	05/11/2016 ~ 10/25/2025
59	集油結構	Taiwan	新型	M 515627	黃榮芳	台灣科技大學	01/11/2016 ~ 10/18/2025
60	出風口風雨罩 (龍嘴鳳嘴)	Taiwan	新型	M 515633	黃榮芳	台灣科技大學	01/11/2016 ~ 07/21/2025
61	出風口風雨罩 (龍嘴鳳嘴)	China	實用新型	ZL 201520542078.6	黃榮芳	台灣科技大學	12/30/2015 ~ 07/23/2025
62	排油煙機 (吸氣槽口哨音消除裝置)	Taiwan	新型	M 503535	黃榮芳	台灣科技大學	06/21/2015 ~ 11/30/2024

63	排氣裝置 (弧形導流兩側板前緣＋左右上角小三角板)	China	實用新型	ZL 201420590306.2	黃榮芳	台灣科技大學	04/08/2015 ~ 10/12/2024
64	排氣裝置 (弧形導流兩側板前緣＋左右上角小三角板)	Taiwan	新型	M 498292	黃榮芳	台灣科技大學	04/01/2015 ~ 10/07/2024
65	油煙阻隔板組 (bsc1之保護側板給任何Range Hood用)	Taiwan	新型	M 483393	黃榮芳	台灣科技大學	08/01/2014 ~ 01/23/2024
66	Range Hood Capable of Resisting Draft (IQV Range Hood, guard plates + blowdown jet)	Canada	發明	CA 2743409	黃榮芳	台灣科技大學	07/22/2014 ~ 06/15/2031
67	具有偏折板的排氣裝置 (IAC Fume Hood & Commercial Kitchen Hood)	China	發明	ZL 201110089455.1	黃榮芳	台灣科技大學	11/26/2014 ~ 04/10/2031
68	排氣櫃 (排油煙櫃：槽吸、槽吹、隔板) (IQV-com2)	Taiwan	新型	M 484679	黃榮芳	台灣科技大學	08/21/2014 ~ 02/20/2024
69	排氣櫃 (排油煙櫃：槽吸、槽吹、隔板) (IQV-com2)	China	實用新型	ZL 201420080039.4	黃榮芳	台灣科技大學	09/10/2014 ~ 02/23/2024
70	油煙阻隔板組 (bsc1保護側板給任何Range Hood用)	China	實用新型	ZL 201420054710.8	黃榮芳	台灣科技大學	08/20/2014 ~ 01/26/2014
71	具有抗擾動氣流能力的排油煙機 (IQV Range Hood, guard plates)	China	發明	ZL 201110033572.6	黃榮芳	台灣科技大學	08/06/2014 ~ 01/31/2031
72	排氣櫃 (IAC Fume Hood 櫃門下緣延伸板)	China	新型	ZL 201320749287.9	黃榮芳	台灣科技大學	07/02/2014 ~ 11/25/2023
73	排油煙機殼之部分	Taiwan	設計	D 161310	黃榮芳	台灣科技大學	06/21/2014 ~ 01/31/2025
74	排氣櫃 (IAC Fume Hood 櫃門下緣延伸板)	Taiwan	新型	M 476827	黃榮芳	台灣科技大學	04/21/2014 ~ 11/19/2023
75	側吸式排氣裝置 (air box with lateral suction slot)	Taiwan	新型	M 476897	黃榮芳 陳佳堃 許清閔	台灣科技大學	04/21/2014 ~ 10/06/2023
76	排油煙櫃 (Commercial Kitchen Hood, 加下吹IQV-com1)	China	新型	ZL 201320511622.1	黃榮芳	台灣科技大學	03/05/2014 ~ 08/21/2023
77	具有偏折板的排氣裝置 (Commercial Kitchen Hood & IAC Fume Hood)	Taiwan	發明	I 426220	黃榮芳	台灣 科技大學	02/11/2014 ~ 03/21/2031
78	排油煙機 (IQV Range Hood, crossflow fans結構)	Taiwan	新型	M 472167	黃榮芳	台灣科技大學	02/11/2014 ~ 10/03/2023
79	排油煙櫃 (Commercial Kitchen Hood, 加下吹IQV-com1)	Taiwan	新型	M 472166	黃榮芳	台灣科技大學	02/11/2014 ~ 08/15/2023
80	Range Hood Capable of Resisting Draft (IQV Range Hood, guard plates + blowdown jet)	Japan	實用新案	JP 3188116	黃榮芳	台灣科技大學	12/11/2013 ~ 06/14/2021
81	Reverse Oblique Air Curtain Exhaust Cabinet (sIAC Fume hood; No deflection plate)	USA	發明	US 8,469,780	黃榮芳	台灣科技大學	06/25/2013 ~ 04/25/2032
82	排油煙機殼之部分	Taiwan	設計	D 156958	黃榮芳	台灣科技大學	11/01/2013 ~ 12/04/2025
83	Exhaust device having deflection plates (Commercial Kitchen Hood & IAC Fume Hood)	Japan	發明	特許第5362783號	黃榮芳	台灣科技大學	09/13/2013 ~ 07/20/2031
84	Range Hood Capable of Resisting Draft (IQV Range Hood, guard plates + blowdown jet)	Korea	發明	10-1306756	黃榮芳	台灣科技大學	09/04/2013 ~ 06/14/2031
85	分離式排油煙機	China	新型	ZL 201320061620.7	黃榮芳	台灣科技大學	09/11/2013 ~ 02/04/2023
86	具有抗擾動氣流能力的排油煙機 (IQV Range Hood, guard plates)	Taiwan	發明	I 408317	黃榮芳	台灣科技大學	09/11/2013 ~ 12/14/2030
87	分離式排油煙機	Taiwan	新型	M 461764	黃榮芳	台灣科技大學	09/11/2013 ~ 01/29/2023
88	置換式通風系統	Taiwan	發明	I 397659	林怡均 黃榮芳 唐永新	台灣科技大學	06/01/2013 ~ 11/12/2029
89	具有可活動側板之排油煙機	Taiwan	新型	M 449922	黃榮芳	台灣科技大學	04/01/2013

	(IQV Range Hood, re-movable guard plates)						~ 09/09/2022
90	排油煙機 (有後牆板)	China	新型	ZL 201220177244.3	黃榮芳	台灣科技大學	12/19/2012 ~ 04/24/2022
91	排油煙機 (IQV 有後牆板)	Taiwan	新型	M 440418	黃榮芳	台灣科技大學	11/01/2012 ~ 04/19/2022
92	逆向傾斜氣簾式排氣櫃 (IAC Fume hood; Up-down motion, No deflection plate)	Taiwan	發明	I 365768	黃榮芳	台灣科技大學	06/11/2012 ~ 10/13/2029
93	污染物排放裝置及使用該裝置之雙氣簾式排油煙機 (IAC Range Hood)	China	發明	ZL 200810067646.6	黃榮芳	台灣科技大學	04/11/2012 ~ 06/06/2028
94	汙染物排放裝置及使用該裝置之斜向單氣簾式排油煙機 (IAC Range Hood)	Taiwan	發明	I 361263	黃榮芳	台灣科技大學	04/01/2012 ~ 09/16/2028
95	Reverse Oblique Air Curtain Exhaust Cabinet (sIAC Fume hood; No deflection plate)	EU	發明	EP 2327484	黃榮芳	台灣科技大學	02/08/2012 ~ 11/26/2029
96	具有兩側立板的排油煙機 (任何排油煙機皆可加立板)	Taiwan	新型	M 423213	黃榮芳	台灣科技大學	02/21/2012 ~ 06/14/2021
97	氣簾式生物櫃	China	新型	ZL 201020694397.6	黃榮芳	台灣科技大學	02/08/2012 ~ 12/24/2021
98	具有抵抗氣流擾動能力的排油煙機 (IQV Range Hood, guard plates + blowdown jet)	China	新型	ZL 201120051239.3	黃榮芳	台灣科技大學	12/14/2011 ~ 03/01/2021
99	Air Curtain-Isolated Biosafety Cabinet (AC BSC)	Japan	發明	特許4775595	黃榮芳 石東生 張振平 陳春萬	勞委會勞工安全衛生研究所	07/08/2011 ~ 12/21/2027
100	具有傾斜氣簾的排氣裝置 (IAC Fume hood; deflection plate)	Taiwan	新型	M 407362	黃榮芳	台灣科技大學	07/11/2011 ~ 09/16/2020
101	具有斜向噴流之框架 (IAC Range Hood)	China	新型	ZL 201020240770.0	黃榮芳	台灣科技大學	06/15/2011 ~ 06/21/2021
102	汙染物排放裝置及使用該裝置之斜向單氣簾式排油煙機 (IAC Range Hood)	China	發明	ZL 200810169506.X	黃榮芳	台灣科技大學	09/14/2011 ~ 10/06/2028
103	可導引氣流之排油煙機 (IQV Range Hood, 突緣前端有弧度)	Taiwan	新型	M 413825	黃榮芳	台灣科技大學	10/11/2011 ~ 03/09/2021
104	具有抗擾動氣流能力的吸氣罩 (IQV Range Hood, Work Station, guard plates)	Taiwan	新型	M 415759	黃榮芳	台灣科技大學	11/11/2011 ~ 01/11/2021
105	引擎冷卻水道結構	Taiwan	發明	I 331644	黃榮芳 黃文彥 葉啟南 黃志偉 林冠旭	三陽工業股份有限公司	10/11/2011 ~ 11/22/2027
106	全面包圍式排油煙機 (IQV Range Hood, 三面下吹,無檔板)	Taiwan	新型	M 413826	黃榮芳	台灣科技大學	10/11/2011 ~ 03/29/2021
107	具有抵抗氣流擾動能力的排油煙機 (IQV Range Hood, guard plates, blowdown jet)	Taiwan	新型	M 413824	黃榮芳	台灣科技大學	10/11/2011 ~ 02/24/2021
108	Air-Isolator Fume Hood (AC Fume Hood)	Japan	發明	特許第4704284號	黃榮芳 陳友剛 石東生	勞委會勞工安全衛生研究所	03/18/2011 ~ 07/05/2026
109	具有氣流穩定裝置的排氣櫃 (AC Fume Hood, 上面強制給氣)	Taiwan	新型	M 399959	黃榮芳	台灣科技大學	03/11/2011 ~ 09/16/2020
110	具有傾斜氣簾的排氣裝置 (IAC Fume Hood, deflection plates)	Taiwan	新型	M 407362	黃榮芳	台灣科技大學	07/11/2011 ~ 09/16/2020
111	污染物排放裝置及使用該裝置之雙氣簾式排油煙機 (IAC Range Hood)	Taiwan	發明	I 341916	黃榮芳	台灣科技大學	05/11/2011 ~ 05/27/2028
112	具有排氣系統之解剖檯	Taiwan	新型	M 404006	黃榮芳	台灣科技大學	05/21/2011 ~ 10/18/2020
113	具有長形吸氣槽的排油煙機 (Slot Range Hood; 雙吸式風機)	Taiwan	新型	M 397496	黃榮芳	台灣科技大學	02/01/2011 ~ 07/08/2020

114	Pollutant Removing Device and Dual-Air Curtain Range Hood Using The Device	EU	發明	EP 2138771	黃榮芳	台灣科技大學	07/28/2010 ~ 06/26/2028
115	具有斜向噴流之框架 (IAC Range Hood)	Taiwan	新型	M 392930	黃榮芳	台灣科技大學	06/22/2010 ~ 06/26/2020
116	水冷式引擎改良結構	Taiwan	發明	I 319792	黃榮芳 蔡期琮 黃志偉 楊賀順 葉啟南	三陽工業股份有限公司	11/21/2010 ~ 06/21/2020
117	相對傾斜雙氣簾式排氣櫃	Taiwan	新型	M 375855	黃榮芳	台灣科技大學	03/11/2010 ~ 11/08/2019
118	防止有害氣體洩漏的裝置 (AC Fume Hood)	China	新型	ZL 200920170176.6	黃榮芳	台灣科技大學	06/16/2010 ~ 08/25/2019
119	污染物排放裝置及使用該裝置之排油煙機 (IAC Range Hood)	Taiwan	新型	M 358949	黃榮芳	台灣科技大學	06/11/2009 ~ 02/24/2019
120	防洩漏之污染物排放裝置及使用該裝置之排油煙機 (IAC Range Hood, vortex stablizer)	Taiwan	新型	M 358273	黃榮芳	台灣科技大學	06/01/2009 ~ 01/11/2019
121	汙染物排放裝置及使用該裝置之斜向單氣簾式排油煙機 (IAC Range Hood, inclined angle)	Taiwan	新型	M 356084	黃榮芳	台灣科技大學	05/01/2009 ~ 12/21/2018
122	半遮蔽型推挽式排油煙櫃 (IAC Range Hood, Cabinet)	Taiwan	新型	M 348209	黃榮芳	台灣科技大學	01/01/2009 ~ 06/03/2018
123	雙氣簾式排氣櫃 (AC Fume Hood)	Taiwan	新型	M 353258	黃榮芳	台灣科技大學	03/21/2009 ~ 11/11/2018
124	氣簾式生物安全櫃	Taiwan	新型	M 326441	黃榮芳 石東生 張振平 陳春萬	勞委會勞工安全衛生研究所	04/26/2008 ~ 05/31/2017
125	Air-Isolator Fume Hood (AC Fume Hood)	USA	發明	US 73118771 B2	黃榮芳 石東生 張振平 陳春萬	勞工委員會勞工安全衛生研究所	01/05/2007 ~ 07/18/2025
126	Air Curtain-Isolated Biosafety Cabinet (AC BSC)	EU	發明	EP 2014365	黃榮芳 石東生 張振平 陳春萬	勞工委員會勞工安全衛生研究所	12/19/2007 ~ 12/19/2027
127	環境汙染物移除方法及裝置 (Push-Pull Technique)	Taiwan	發明	I 281533	石東生 黃榮芳 張振平 湯大同 周瑞淑 方澤沛 黃亦孝	勞委會勞工安全衛生研究所	05/21/2007 ~ 11/28/2016
128	Air-Isolator Fume Hood (AC Fume Hood)	EU	發明	EP 1745866 A1	黃榮芳 陳友剛 石東生 張振平 陳春萬	勞委會勞工安全衛生研究所	07/07/2006 ~ 07/06/2026
129	氣冷引擎之風扇外罩結構	Taiwan	新型	M 298645	吳啟隆 許文瑋 黃榮芳	光陽工業股份有限公司	10/01/2006 ~ 03/30/2016
130	Push-Pull Type Ventilation Hood (Push-Pull)	USA	發明	US 7,819,727 B2	黃榮芳 石東生 張振平 陳春萬	勞委會勞工安全衛生研究所	01/16/2006 ~ 01/08/2024
131	前下吸式氣櫃 (AC Fume Hood, no blow)	Taiwan	新型	M 281062	黃榮芳 陳友剛 石東生 張振平 陳春萬 吳奕達 陳宏達	勞委會勞工安全衛生研究所	11/21/2005 ~ 07/07/2015
132	氣簾式氣櫃 (AC Fume Hood)	Taiwan	新型	M 279718	黃榮芳 陳友剛 石東生 張振平	勞委會勞工安全衛生研究所	11/01/2005 ~ 07/07/2015

					陳春萬 吳奕達 陳宏達		
133	吹吸式氣罩結構改良 (Push-Pull)	Taiwan	新型	M 262204	黃榮芳 陳有剛 石東生 張振平 葉文裕 陳春萬 林欣毅 詹順淵	勞委會勞工安全衛生研究所	04/21/2005 ~ 06/17/2014
134	Airflow Capture Booth with Single-Plate Windbreak	USA	發明	US 6,705,937 B2	黃榮芳 陳友剛 石東生 張振平 陳春萬	勞委會勞工安全衛生研究所	03/16/2004 ~ 03/08/2022
135	局部非遮蔽式氣流亭	Taiwan	新型	201565	黃榮芳 陳有剛 葉文裕 陳春萬 劉錦勳	勞委會勞工安全衛生研究所	03/21/2003 ~ 06/13/2014
136	機車二行程引擎的進氣系統之改良結構	Taiwan	新型	190859	黃榮芳	光陽工業股份有限公司	06/01/2002 ~ 08/02/2012
137	一種具有中央鈍體效應的旋風式液體霧化器	Taiwan	發明	134255	黃榮芳	台灣科技大學	05/16/2001 ~ 08/12/2018
138	一種安裝小型省油引擎與六連桿無段變速器的動力輔助腳踏車	Taiwan	新型	173899	黃榮芳 李　鍇 王勵群 徐茂濱 林清安	台灣科技大學	05/01/2001 ~ 08/12/2010
139	一種可以使管道彎角下游流速均勻的高效率薄板型導葉片	Taiwan	新型	168623	黃榮芳	台灣科技大學	12/21/2000 ~ 04/07/2011
140	汽機車排氣管結構改良裝置	Taiwan	新型	160087	黃榮芳	光陽工業股份有限公司	06/01/2000 ~ 01/18/2011
141	能分層掃氣的摩托車二行程引擎	China	新型	ZL 98 2 41040.9	黃榮芳	光陽工業股份有限公司	09/04/1999 ~ 9/3/2009
142	具有分層掃氣設計的機車二行程引擎	Taiwan	新型	150578	黃榮芳	光陽工業股份有限公司	08/11/1999 ~ 09/01/2010

B. Outcome

V. Patent Authorizations/Technology Transfers

（下表僅包含『產業界與學校簽訂正式技轉合約』之案件，而不包括『研究計畫的一部份經費登錄為先期技轉金或技轉金』之案件）

	Title 專利授權/ 技術移轉名稱	**Country/ Region 專利核發 國家**	**Type 專利 型態**	**Number 專利 號碼**	**Inventor 發明人**	**Owner 專利 權人**	**Contractor 對象**	**Effective Period 合約有 效期間**	**Attri- bution 屬性**	**簽約 金額 (NT$)**	**衍生 利益金 (NT$)**
1					黃榮芳	台灣科技大學				100萬	3%
2					黃榮芳	台灣科技大學				136萬	3%
3	台塑仁武廠通風改善專案技術諮詢			技術移轉	黃榮芳	台灣科技大學	金合田科技	02/14/2025 ~	Exclusive	30萬	0
4	家用廚房排油煙機	China	Canada, Korea, USA		黃榮芳	台灣科技大學	澄淨智能家居有限公司	10/30/2024 ~	Exclusive	75萬	0
5	家用及商用傾斜四渦流排油煙機	China	China		黃榮芳	台灣科技大學	澄淨智能家居有限公司	05/01/2024 ~	Exclusive	1500萬	0
6	台塑仁武廠通風改善專案技術諮詢	Taiwan	發明 新型		黃榮芳	台灣科技大學	金合田科技股份有限公司	08/01/2022 ~ 06/30/2024	Non- exclusive	10萬	0
7	家用及商用傾斜四渦流排油煙機	China Taiwan	發明 新型		黃榮芳	台灣科技大學	Metro Investments 明都投資	10/29/2021	Non- exclusive	520萬	3% / 件

8	家用傾斜四渦流排油煙機	Taiwan	發明 新型		黃榮芳	台灣科技大學	歐亞科技環保工程股份有限公司	12/11/2020 ~	Non-exclusive	75萬	3% / 件
9	商用廚房排油煙櫃	Taiwan	發明 新型		黃榮芳	台灣科技大學	北昕企業	10/11/2019 ~ 10/10/2020	Non-exclusive	25萬	3% / 件
10	工作站型吸氣罩	Taiwan	發明 新型		黃榮芳	台灣科技大學	竑毅企業	04/30/2019 ~	Non-exclusive	55萬	3% / 件
11	傾斜四渦流排油煙機	Taiwan	發明 新型		黃榮芳	台灣科技大學	巧婦企業	06/15/2018 ~	Non-exclusive	45萬	3% / 件
12	傾斜四渦流排油煙機	Taiwan	發明 新型		黃榮芳	台灣科技大學	神廚實業	02/07/2018 ~	Non-exclusive	45萬	3% / 件
13	家用廚房排油煙機	Taiwan	發明 新型		黃榮芳	台灣科技大學	錦茂企業	06/12/2017 ~	Non-exclusive	135萬	3% / 件
14	斜氣簾式排氣櫃及桌上型吸氣罩	China	發明 新型		黃榮芳	台灣科技大學	盈強不銹鋼有限公司	10/31/2015 ~	Non-exclusive	40萬	0.3萬/件
15	家用與商用廚房排油煙機	China Taiwan Korea Canada USA Japan EU	發明 新型		黃榮芳	台灣科技大學	楷鑫國際有限公司	08/27/2015 ~	Non-exclusive	500萬	3% / 件
16	家用廚房排油煙機	Taiwan	發明 新型		黃榮芳	台灣科技大學	神廚企業社	06/12/2015 ~ 06/11/2017	Non-exclusive	45萬	3% / 件
17	家用及商用廚房排油煙機	China Taiwan	發明 新型		黃榮芳	台灣科技大學	久常興有限公司	01/20/2015 ~ 01/19/2016	Non-exclusive	100萬	3% / 件
18	家用排油煙機及工作站型排氣櫃	China Taiwan	發明 新型		黃榮芳	台灣科技大學	中榮科技有限公司	01/23/2014 ~ 03/22/2015	Non-exclusive	100萬	3% / 件
19	家用及商用廚房排油煙機	China	發明 新型		黃榮芳	台灣科技大學	沙建國(湖北巨源永磁科技有限公司--湖北宜昌)	01/01/2014 ~ 04/30/2016	Non-exclusive	100萬	3% / 件
20	家用排油煙機及工作站型排氣櫃	China Taiwan	發明 新型		黃榮芳	台灣科技大學	簡金敏(瑞司比有限公司)	02/15/2013 ~ 03/05/2014	Non-exclusive	100萬	3% / 件
21	逆向傾斜氣簾式排氣櫃及工作站型排氣櫃	Taiwan	發明 新型		黃榮芳	台灣科技大學	盈強不銹鋼有限公司	07/15/2011 ~	Non-exclusive	160萬	0.35萬/件
22	家用排油煙機及工作站型排氣櫃	Taiwan	發明 新型		黃榮芳	台灣科技大學	森活有限公司	03/29/2011 ~ 03/28/2013	Non-exclusive	60萬	3% / 件
23	家用排油煙機及工作站型排氣櫃	Taiwan	發明 新型		黃榮芳	台灣科技大學	榮造科技有限公司	04/02/2011 ~ 04/01/2017	Non-exclusive	240萬	3% / 件
24	家用排油煙機及工作站型排氣櫃	Taiwan	發明 新型		黃榮芳	台灣科技大學	禮運開發有限公司	12/23/2010 ~ 01/15/2013	Non-exclusive	30萬	3% / 件
25	一種可以使管道彎角下游流速均勻的高效率薄板型導葉片	Taiwan	新型		黃榮芳	台灣科技大學	盈強不銹鋼有限公司	09/15/2010 ~	Non-exclusive	30萬	
26	推挽式氣簾設計與參數規劃			技術移轉	黃榮芳	台灣科技大學	盈強不銹鋼有限公司	10/01/2009 ~	Non-exclusive	40萬	
27	氣簾式氣櫃、前下吸式氣櫃	Taiwan	新型		黃榮芳 陳友剛 石東生 張振平 陳春萬	勞委會勞工安全衛生研究所	盈強不銹鋼有限公司	10/01/2009 ~	Non-exclusive	40萬	0.5 萬/件
28	建築物複合置換式通風技術			技術移轉	林怡均 黃榮芳	台灣科技大學	靜思精舍	08/01/2009 ~ 08/01/2012	Non-exclusive	無收費(因技轉對象為慈善機構)	

29	一種具有中央鈍體效應的旋風式液體霧化器	Taiwan	發明		黃榮芳	台灣科技大學	盈強不銹鋼有限公司	06/20/2009 ~	Non-exclusive	60萬	
30	Air-Isolator Fume Hood	Japan	發明	特許第4704284號	黃榮芳 陳友剛 石東生 張振平 陳春萬	勞委會勞工安全衛生研究所	Dalton Inc., Japan	05/01/2009 ~ 04/30/2014	Exclusive		日幣2萬/件
31	Physical and geometric design parameters for reducing mass exchange across opening of cabinet			技術移轉	黃榮芳	台灣科技大學	Dalton Inc., Japan	05/01/2009 ~ 04/30/2014	Non-exclusive	日幣500萬	
32	半隔離腔質傳操控技術			技術移轉	黃榮芳	台灣科技大學	盈強不銹鋼有限公司	09/01/2008 ~ 02/28/2017	Non-exclusive	140萬	
33	氣簾式生物安全櫃	Taiwan	新型		黃榮芳 石東生 張振平 陳春萬	勞委會勞工安全衛生研究所	盈強不銹鋼有限公司	08/01/2008 ~ 05/31/2017	Non-exclusive	40萬	
34	氣簾式氣櫃、前下吸式氣櫃	Taiwan	新型		黃榮芳 陳友剛 石東生 張振平 陳春萬	勞委會勞工安全衛生研究所	弘泰鋼鐵有限公司	06/26/2006 ~	Non-exclusive	150萬	
總計	**34件**									**5900萬**	

VI. Sponsored Research Projects

Source (計畫來源)	**Total number (總件數)**	**Total amount (總 金 額)**
Industries (產業界)	102	NT$ 246,153,000
Ministry of Science and Technology (科技部)	60	NT$ 69,157,000
Total (總計)	**162**	**NT$ 315,310,000**

產業界計畫

編號	計 畫 名 稱	擔任工作	起迄年月	金 額	計畫來源
001	FY113 引擎熱效率提升-空氣輔助噴射與雙點火系統研究	主持人	113.08~114.07	100.0萬	三陽工業
002	風速計校準風洞	主持人	112.01~112.12	90.0萬	日本慧慶堂商事株式會社
002	FY112_引擎熱效率提升-雙噴嘴噴射系統研究	主持人	112.08~113.07	100.0萬	三陽工業
003	112-113 年度「工業通風專業知能及設施效能提升」計畫(二年期)	主持人	112.04~114.12	374萬	勞動部職安署
004	FY111 引擎熱效率提升-EGR排氣再循環研究	主持人	111.08~112.07	100.0萬	三陽工業
005	110-111年度局部通風系統設計、測試與維護管理專業知能提升計畫(二年期)	主持人	111.01~111.12	380.0萬	勞動部職安署
006	FY110引擎熱效率提升--中央預燃燒室研究	主持人	110.08~111.07	100.0萬	三陽工業
007	FY109引擎熱效率提升-預燃燒室研究	主持人	109.08~110.07	100.0萬	三陽工業
008	109年度提升工業通風專業能量及設施效能改善工作計畫	主持人	109.04~109.12	199.0萬	勞動部職安署

09	FY108引擎熱效率提升-多點點火分析	主持人	108.09~109.08	100.0萬	三陽工業
010	108年度提升工業通風專業能量及設施效能改善工作計畫	主持人	108.04~108.12	196.0萬	勞動部職安署
011	噴油嘴噴霧觀測計畫	主持人	107.10~108.07	58.7萬	華擎機械工業
012	FY107噴油嘴定性可視化觀測量化與分析	主持人	107.09~108.08	100.0萬	三陽工業
013	107年度高危害事業單位設置工業通風設施效能改善工作計畫	主持人	107.03~107.12	230.0萬	勞動部職安署
014	流場可視化及質點影像速度儀教學設備開發研究	主持人	106.11~107.10	23.0萬	均億企業有限公司
015	IAC排氣櫃特性量測	主持人	106.07~108.08	8.0萬	金永德實驗室設備有限公司
016	單缸四閥四行程引擎燃燒室最適化研究	主持人	106.07~107.06	98.0萬	光陽工業
017	FY106節能方案之研究	主持人	106.07~107.06	100.0萬	三陽工業
018	106年度高危害事業單位設置工業通風設施效能改善工作計畫	主持人	106.03~106.12	283.6萬	勞動部職安署
019	4V引擎球型燃燒室最適化設計之研究	主持人	105.08~106.07	100.0萬	三陽工業
020	105年度高危害事業單位設置工業通風設施效能改善工作計畫	主持人	105.04~105.12	242.3萬	勞動部職安署
021	FY-104-2V引擎球型燃燒室最適化之研究	主持人	104.08~105.07	100.0萬	三陽工業
022	單缸二閥四行程低油耗引擎之發展	主持人	104.06~105.05	98.0萬	光陽工業
023	104年度高危害事業單位設置工業通風設施效能改善工作計畫	主持人	104.04~104.12	250.0萬	勞動部職安署
024	排放管道內空氣污染物流速量測技術評析與調查	主持人	104.03~104.12	194.0萬	環保署環檢所
025	增強2V引擎缸內氣流滾轉運動	主持人	103.07~104.06	100.0萬	三陽工業
026	103年度高危害事業單位設置工業通風設施效能改善工作計畫	主持人	103.01~103.12	235.0萬	勞委會安衛處
027	FY102分析軟體StarCD esice-PFI噴油模擬分析技術移轉	主持人	102.05~103.04	30.0萬	三陽工業
028	FY102四行程引擎缸內直噴技術研究	主持人	102.05~103.04	100.0萬	三陽工業
029	102年度高危害事業單位設置工業通風設施效能改善工作計畫	主持人	102.01~102.12	400.0萬	勞委會安衛處
030	FY101分析軟體StarCD esice引擎缸內動態模擬及噴油模擬分析技術轉移	主持人	101.01~101.12	30.0萬	三陽工業
031	雙火星塞引擎之發展：缸內流場調整與燃燒模擬(II)	主持人	101.10~102.09	105.0萬	光陽工業
032	101年度高危害事業單位設置工業通風設施效能改善工作計畫	主持人	101.01~101.12	370.0萬	勞委會安衛處
033	FY101四行程引擎缸內直噴技術研究(II)	主持人	101.01~101.12	100.0萬	三陽工業
034	風洞與風速校準技術	主持人	100.09~101.08	200.0萬	太一電子
035	中小企業局部排氣空污輔導改善(IV)	主持人	100.08~101.07	88.0萬	勞委會勞保局
036	100年度高危害業別工業通風設施效能測試及驗證計畫(II)	主持人	100.01~100.12	367.0萬	勞委會安衛處
037	雙火星塞引擎之發展：缸內流場調整與燃燒模擬(I)	主持人	100.01~100.12	110.0萬	光陽工業
038	FY100四行程缸內直噴技術研究(I)	主持人	100.01~100.12	80.0萬	三陽工業
039	中小企業局部排氣空污輔導改善(III)	主持人	99.03~100.02	89.0萬	勞委會勞保局
040	99 年度高危害業別工業通風設施效能測試及驗證計畫(I)	主持人	98.09~99.12	600.0萬	勞委會安衛處
041	氣簾式生物安全櫃氣膠噴霧洩漏檢測	主持人	98.05~99.04	40.0萬	盈強不銹鋼
042	四行程引擎研究(II)	主持人	98.06~99.05	60.0萬	三陽工業
043	氣簾式氣櫃內流場與外部氣流影響測試	主持人	98.04~98.12	74.5萬	勞委會勞研所

044	四行程引擎研究(I)	主持人	97.06~98.05	60.0萬	三陽工業
045	中小企業局部排氣空污輔導改善(II)	主持人	97.01~97.12	220.0萬	勞委會勞保局
046	生物安全櫃操作條件影響因素測試	主持人	96.04~96.11	92.0萬	勞委會勞研所
047	四行程引擎缸內直噴技術研究	主持人	95.12~97.11	230.0萬	光陽工業
048	中小企業局部排氣空污輔導改善(I)	主持人	95.09~96.08	200.0萬	勞委會勞保局
049	學校實驗室通風櫃測試規範、標準操作方法建立及教育推廣計畫(III)	主持人	95.07~96.06	178.0萬	環保小組
050	學校實驗室通風櫃測試規範、標準操作方法建立及教育推廣計畫(II)	主持人	94.07~95.06	177.5萬	環保小組
051	崗亭式氣櫃之最佳化設計	主持人	94.03~94.11	105.0萬	勞委會勞研所
052	引擎水冷系統之設計與改善	主持人	94.06~96.05	300.0萬	三陽工業
053	動態氣體穩流最佳化模擬分析	主持人	94.02~95.06	30.0萬	金屬中心
054	學校實驗室通風櫃測試規範、標準操作方法建立及教育推廣計畫(I)	主持人	93.07~94.06	270.0萬	環保小組
055	機車引擎散熱風扇與導氣罩的調整與設計改良	主持人	93.06~94.05	106.0萬	光陽工業
056	風扇流場於模擬水槽中的可視化與量化之PIV技術發展	主持人	93.03~93.11	45.0萬	工研院機械所
057	PIV技術應用於稀薄燃燒引擎缸內流場觀測研究	共同主持人	93.03~93.11	40.0萬	工研院機械所
058	崗亭式氣罩設計規範研究	主持人	93.02~93.11	117.0萬	勞委會勞研所
059	TF-1蒸發室與熱管的發展	主持人	92.08~93.07	60.0萬	洋鑫科技
060	散熱模組流場PIV量測方法研究	共同主持人	92.03~92.11	40.0萬	工研院機械所
061	V2-機車引擎缸內動態流場量測技術研究	共同主持人	92.03~92.11	50.0萬	工研院機械所
062	微細流場測試觀察及技術研究	主持人	92.03~92.11	58.0萬	工研院機械所
063	吹吸式氣罩設計與操作指引研究	主持人	92.02~92.11	110.0萬	勞委會勞研所
064	風扇流場觀測系統	主持人	91.10~92.09	100.0萬	Armadale Holding Limited
065	CPU冷卻器流場可視化系統研發	主持人	91.10~92.02	50.0萬	鴻海精密
066	使用PIV於引擎的氣流調整	主持人	91.11~92.10	50.0萬	三陽工業
067	機車引擎的進氣調整	主持人	91.09~92.08	75.0萬	光陽工業
068	筆記型電腦CPU扁平式高效率熱傳輸器的技術發展	主持人	91.06~92.05	70.0萬	洋鑫科技
069	微飛機自動飛行關鍵技術-微飛機氣動力資料拮取	共同主持人	91.05~91.12	25.0萬	工研院航太中心
070	逸散性洩漏流量控制閥模型控制	共同主持人	91.07~91.12	63.0萬	金屬中心
071	微細氣流場診測設備發展	主持人	91.03~91.11	60.0萬	工研院航太中心
072	發散式危害源氣罩設計模式研究	主持人	91.02~91.11	84.0萬	勞委會勞研所
073	微飛機翼形與流場控制機構風洞測試分析	主持人	90.06~90.12	78.0萬	工研院航太中心
074	雷射光頁照片拍攝	主持人	90.06~90.10	62.0萬	勞委會勞研所
075	質點影像測速發展	主持人	90.06~91.05	180.0萬	長洛國際
076	引擎相關雷射煙霧流場觀察	主持人	90.06~90.08	35.0萬	三陽工業
077	伺服系統煙霧流場可視化	主持人	90.04~90.06	20.0萬	研華電子
078	閥體內流場觀察與量測	共同主持人	90.01~90.12	60.0萬	金屬中心
079	磁碟陣列設計方法與流程之發展	主持人	90.03~91.02	100.0萬	台達電子
080	氣罩凸緣對捕集效果相關性探討	主持人	90.02~90.12	121.0萬	勞委會勞研所
081	PIV應用於機車引擎氣流旋轉與滾轉運動	主持人	90.01~90.12	75.0萬	光陽工業
082	引擎缸內流場雷射診測技術之發展與應用	主持人	89.10~91.03	120.0萬	三陽工業
083	電子構裝的散熱與冷卻 - 設計、量測與分析	主持人	89.04~90.03	150.0萬	天邁企業
084	CFD在電子構裝散熱與冷卻設計的應用	主持人	89.03~90.02	135.0萬	台達電子
085	微飛機空氣動力流場觀察	主持人	89.03~89.10	35.0萬	工研院航太中心
086	鈍體效應補強的旋流燃燒器之流場混合與設計參數研究(II)	主持人	88.08~89.07	154.8萬	台灣電力公司
087	外裝型氣罩控制風速與捕集能力之探討	主持人	88.10~89.09	96.0萬	勞委會勞研所

088	TOP BOY 50 引擎排氣系統之研發	主持人	88.06~89.05	70.0萬	光陽工業
089	興達電廠二號機組煙氣道流場量測	主持人	88.02~89.03	140.0萬	台灣電力公司
090	風洞與風速計校正	主持人	88.03~88.06	20.0萬	勞委會勞研所
091	鈍體效應補強的旋流燃燒器之流場混合與設計參數研究(I)	主持人	88.02~88.07	110.0萬	台灣電力公司
092	作業場所空氣有害物預估與控制研究：側風對外裝型氣罩捕集效果之探討	主持人	87.07~88.06	100.0萬	勞委會勞研所
093	二行程機車引擎排氣污染之改善：化油器分層掃氣裝置之研發	主持人	87.08~88.07	48.5萬	光陽工業
094	協和電廠靜電集塵器性能研究	主持人	87.04~88.03	170.0萬	台灣電力公司
095	風洞與風速計校正	主持人	87.03~87.06	20.0萬	勞委會勞研所
096	雙噴流鈍體燃燒器之燃燒性能與尺寸效應	主持人	86.07~87.06	80.0萬	台灣電力公司
097	風洞與風速計校正	主持人	86.03~86.06	20.0萬	行政院勞委會勞研所
098	二行程機車引擎進氣系統省油裝置之研發	主持人	86.02~87.01	95.5萬	光陽工業
099	風洞與風速計校正	主持人	85.03~85.06	20.0萬	勞委會勞研所
100	GAK引擎排氣系統之設計與改良	主持人	84.09~85.08	49.5萬	光陽工業
101	風洞與風速計校正	主持人	84.03~84.06	16.0萬	勞委會勞研所
102	GAK引擎之馬力提昇	主持人	83.04~84.03	46.6萬	光陽工業
103	風洞與風速計校正	主持人	82.03~82.06	15.5萬	勞委會勞研所
統計				**18716萬**	

科技部(國科會)計畫

No. 編號	Title 計 畫 名 稱	Duty 擔任工作	Period 起迄年月	Amount 金 額	Source 計畫來源
001	共流中合併震盪噴流的流場與混合特性	主持人	113.08~114.07		科技部
002	共流中合併震盪噴流的流場與混合特性	主持人	112.08~113.07		科技部
003	層流尾流衝擊平板形成蕈形馬蹄狀渦流的特性以及在減阻與混合的效應(3/3)	主持人	111.08~112.07		科技部
004	共流中合併震盪噴流的流場與混合特性	主持人	111.08~112.07		科技部
005	層流尾流衝擊平板形成蕈形馬蹄狀渦流的特性以及在減阻與混合的效應(2/3)	主持人	110.08~111.07		科技部
006	以聲波激擾改善具有雙圓盤流動控制器的雙共軸旋轉燃燒噴流之火燄與流場(3/3)	主持人	110.08~111.07		科技部
007	層流尾流衝擊平板形成蕈形馬蹄狀渦流的特性以及在減阻與混合的效應(1/3)	主持人	109.08~110.07		科技部
008	以聲波激擾改善具有雙圓盤流動控制器的雙共軸旋轉燃燒噴流之火燄與流場(2/3)	主持人	109.08~110.07		科技部
009	受側向氣流衝擊之燃燒噴流在聲波激擾時的火焰與流場特性(3/3) (特約計畫)	主持人	108.08~109.07		科技部
010	以聲波激擾改善具有雙圓盤流動控制器的雙共軸旋轉燃燒噴流之火燄與流場(1/3)	主持人	108.08~109.07		科技部
011	圓柱與平板交接區域上游馬蹄狀渦流與下游振盪尾流的流動與控制(3/3)	主持人	107.08~108.07		科技部
012	受側向氣流衝擊之燃燒噴流在聲波激擾時的火焰與流場特性(2/3) (特約計畫)	主持人	107.08~108.07		科技部
013	圓柱與平板交接區域上游馬蹄狀渦流與下游振盪尾流的流動與控制(2/3)	主持人	106.08~107.07		科技部
014	受側向氣流衝擊之燃燒噴流在聲波激擾時的火焰與流場特性(1/3) (特約計畫)	主持人	106.08~107.07		科技部

015	受平面噴流控制之方柱流場 (3/3)	主持人	105.08~106.07		科技部
016	圓柱與平板交接區域上游馬蹄狀渦流與下游振盪尾流的流動與控制(1/3)	主持人	105.08~106.07		科技部
017	受平面噴流控制之方柱流場 (2/3)	主持人	104.08~105.07		科技部
018	聲波激擾對旋轉雙重噴流之流場與混合特性的調制(3/3)	主持人	104.08~105.07		科技部
019	受平面噴流控制之方柱流場 (1/3)	主持人	103.08~104.07		科技部
020	聲波激擾對旋轉雙重噴流之流場與混合特性的調制(2/3)	主持人	103.08~104.07		科技部
021	自我激勵振動燃燒噴流之流場與火焰特性(3/3)	主持人	102.08~103.07		國科會
022	聲波激擾對旋轉雙重噴流之流場與混合特性的調制(1/3)	主持人	102.08~103.07		國科會
023	自我激勵振動燃燒噴流之流場與火焰特性(2/3)	主持人	101.08~102.07		國科會
024	聲波激擾對旋轉雙重燃燒噴流動態特性之效應與控制(3/3)	主持人	101.08~102.07		國科會
025	自我激勵振動燃燒噴流之流場與火焰特性(1/3)	主持人	100.08~101.07		國科會
026	聲波激擾對旋轉雙重燃燒噴流動態特性之效應與控制(2/3)	主持人	100.08~101.07		國科會
027	受聲波激擾之燃燒噴流在側風衝擊下的動態特性與控制(3/3)	主持人	99.08~100.07		國科會
028	聲波激擾對旋轉雙重燃燒噴流動態特性之效應與控制(1/3)	主持人	99.08~100.07		國科會
029	受聲波激擾之燃燒噴流在側風衝擊下的動態特性與控制(2/3)	主持人	98.08~99.07		國科會
030	發展自激振動桿技術以調制方柱之表面流場、渦漩逸放及氣動力性能(3/3)	主持人	98.08~99.07		國科會
031	受聲波激擾之燃燒噴流在側風衝擊下的動態特性與控制(1/3)	主持人	97.08~98.07		國科會
032	發展自激振動桿技術以調制方柱之表面流場、渦漩逸放及氣動力性能(2/3)	主持人	97.08~98.07		國科會
033	發展自激振動桿技術以調制方柱之表面流場、渦漩逸放及氣動力性能(1/3)	主持人	96.08~97.07		國科會
034	受強制孔穴激勵橫向震盪平面噴流調制之鈍體尾流(2/2)	主持人	96.08~97.07		國科會
035	受強制孔穴激勵橫向震盪平面噴流調制之鈍體尾流(1/2)	主持人	95.08~96.07		國科會
036	受側風衝擊之噴流的剪流層動態結構與控制(2/2)	主持人	95.08~96.07		國科會
037	受側風衝擊之噴流的剪流層動態結構與控制(1/2)	主持人	94.08~95.07		國科會
038	鈍體型流體自激振盪器的發展機制與尾流調制(2/2)	主持人	94.08~95.07		國科會
039	鈍體型流體自激振盪器的發展機制與尾流調制(1/2)	主持人	93.08~94.07		國科會
040	自激振動桿技術於圓柱流場的發展與調制(2/2)	主持人	93.08~94.07		國科會
041	自激振動桿技術於圓柱流場的發展與調制(1/2)	主持人	92.08~93.07		國科會
042	旋噴流受雙圓盤機構調制時的流場與混合效應	主持人	92.08~93.07		國科會
043	側風衝擊角度對噴流流場、混合與燃燒特性的影響(3/3)	主持人	91.08~92.07		國科會
044	小直徑圓棒對瞬間起動機翼表面流場及渦旋流逸之機制與控制	主持人	91.08~92.07		國科會

045	機翼表面流場及氣動力性能之自我激勵振動圓桿技術之發展	主持人	90.08~91.07		國科會
046	側風衝擊角度對噴流流場、混合與燃燒特性的影響(2/3)	主持人	90.08~91.07		國科會
047	瞬間起動機翼表面流場及渦旋流逸之機制與控制	主持人	89.08~90.07		國科會
048	側風衝擊角度對噴流流場、混合與燃燒特性的影響(1/3)	主持人	89.08~90.07		國科會
049	瞬間起動機翼之動態渦旋與尾流非穩定性	主持人	88.08~89.07		國科會
050	端渦旋與燃燒偏折噴流之交互作用	主持人	87.08~88.07		國科會
051	雙重噴流鈍體燃燒器之流場與燃燒特性研究	主持人	86.08~87.07		國科會
052	流體結構與機翼之交互作用(III)	主持人	85.08~86.07		國科會
053	剪流層動態結構對圓盤鈍體雙同心噴流特性之影響	主持人	85.08~86.07		國科會
054	流體結構與機翼之交互作用(II)	主持人	84.08~85.07		國科會
055	非預混迴流穩定火焰之特性模式與結構	主持人	83.08~84.07		國科會
056	流體結構與機翼之交互作用(I)	主持人	83.08~84.07		國科會
057	圓盤鈍體燃燒器之流場與火焰特性	主持人	83.02~83.07		國科會
058	燃燒噴流在橫風中之非穩態結構(II)	主持人	82.02~83.01		國科會
059	具一自由端之有限長度翼形物在氣流中之流體/固體交互作用	主持人	82.08~84.07		國科會
060	燃燒噴流在橫風中之非穩態結構(I)	主持人	81.02~82.01		國科會
統計				**6916萬**	

VII. Industrial Services

輔導多種高危害行業之中小企業進行通風改善，並開設課程訓練通風系統設計專業人才。

(1) 因應職安署修法後「通風設計專人」需求，近三年每年開設 72 小時課程，講授「工業通風設計與實務」，訓練技師專業人才。

(2) 前數年暑假在台北、台中、高雄為產業界義務講授 4 天工業通風課程(共 16 天，每天 6 小時)；因需求量大，另加開工業通風課程師資班 4 天(每天 6 小時)。

(3) 對大約 500 家會產生高危害氣態污染物之中小企業，義務進行通風工程改善輔導。步驟為：

<1> 至廠區現場訪視評估，瞭解高危害製程區作業環境與製程並取得瞭解在輔導前之勞工危害物質暴露量；

<2> 現場提供該廠各製程區初步局部排氣或整體通風工程改善對策；

<3> 回實驗室撰寫詳細報告，建議該廠各製程區詳細之改善方法。