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學歷：

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材料科學與工程系 教授兼任副校長

經歷：

國立虎尾科技大學 秘書室 主任秘書 2023/8-2024/7

國立虎尾科技大學材料科學與工程系 系主任 2021/2-2023/7

以色列 特拉維夫大學 電子物理系 訪問學者 2016/7-2016/10

國立虎尾科技大學教務處 教務長 2012/8-2013/7

國立虎尾科技大學研究發展處 研發長 2012/2-2012/7

國立虎尾科技大學研究總中心 中心主任 2010/10-2012/1

英國劍橋大學 材料系 訪問學者 2009/8/-2010/7

國立虎尾科技大學材料科學與工程系 系主任 2004/2-2009/1

聯華電子股份有限公司技術開發部 1997/9-2000/7

專長：

薄膜製造技術/半導體製程/微電子材料/平面顯示器製程/ 薄膜太陽能電池元件/光電元件/奈米磁性材料/磁阻薄膜材料

一、曾執行之計畫：

補助或 委託機 構	起迄年月	計畫名稱(計畫編號)
國科會	113/8/01~114/7/31	新式中段互連導線之新創製作工藝－建構電化學原子層沉積細微鈷薄膜導線之高導電性與微量合金強化工程(1/2)(113-2221-E-150-006-)
國科會	111/8/01~113/7/31	後銅時代之中段(MOL)導線新式整合方案－實現電化學原子層析鍍雙重阻障鈷基&鈦基薄膜介面整合暨超填充柱塞/導線合金強化工程(111-2221-E-150-031-MY2)
國科會	109/8/01~111/7/31	革命性中段(MOL)全鈷導線材料與新式雙鑲嵌製程之整合研究－電化學原子層沉積全鈷導線之均向性填充與合金強化工程(109-2221-E-150-026-MY2)
科技部	107/8/1~109/7/31	全面自阻障銅合金導線與孔隙介電層之材料與製程整合(II)－全面自阻障電化學原子層沉積銅合金導線與孔隙介電層整合(II)(MOST107-2221-E150-002-MY2)
科技部	106/8/1~107/7/31	全面自阻障銅導線與高孔隙介電層之材料與製程整合－全面自阻障電化學原子層沉積銅導線與高孔隙介電層整合(MOST106-2221-E150-010)
科技部	105/8/1~106/7/31	孔隙介電層與超微銅導線新興鑲嵌製程之全程整合研究(II)－孔隙介電層之電化學原子層沉積雙重強化超微銅導線工程(II)(MOST104-2221-E150-005-MY2)
國科會	104/8/1~105/7/31	孔隙介電層與超微銅導線新興鑲嵌製程之全程整合研究(II)－孔隙介電層之電化學原子層沉積雙重強化超微銅導線工程(II)(MOST104-2221-E150-005-MY2)
國科會	103/8/1~104/7/31	孔隙介電層與超微銅導線新興鑲嵌製程之全程整合研究－孔隙介電層之電化學原子層沉積雙重強化超微銅導線工程(MOST103-2221-E150-006)

國科會	103/1/1~103/12/31	圖案化矽晶片上製作高效率 GaN-based LED(MOST103-2623-E150-002-ET)
國科會	100/8/1~103/7/31	創新型自阻障型電化學析鍍銅/銀合金連導線製程開發 (NSC100-2221-E-150-033-MY3)
國科會	97/8/1~100/7/31	超薄 TaSi ₂ C _x 擴散阻礙層與銅金屬化製程 (NSC97-2221-E-150-001-MY3)
國科會	96/8/1~97/7/31	CIGS 化合物薄膜光伏元件之研製-創新型 CIGS 光伏元件背面電極研製與整合特性 (NSC96-2221-E-150-034)
國科會	96/5/1~97/4/30	高透光率/高導電度透明導電氧化物薄膜研製 (NSC96-2622-E-150-003-CC3)
國科會	95/8/1~96/7/31	離子束沉積/電漿改質光伏元件透明導電薄膜製程特性(重點研究計畫) (NSC 95-2221-E-150-006)
國科會	94/11/1~95/10/31	離子束濺鍍製備薄膜電晶體同合金薄膜閘極、源/汲極製程 (NSC 94-2622-E-150-029-CC3)
國科會	94/8/1~95/7/31	離子束濺鍍/緻密新穎鈹基非晶質薄膜擴散阻礙特性與銅製程整合 (NSC 94-2216-E-150-004)
國科會	93/11/1~94/10/31	可撓式顯示器技術的新式低溫多晶矽薄膜電晶體製程 (NSC93-2262-E-150-054-CC3)
國科會	93/8/1~94/7/31	高導電性非晶質鈹基擴散阻礙層製備與銅金屬化製程整合 (II) (NSC93-2215-E-150-004)
國科會	92/8/1~93/7/31	高導電性非晶質鈹基擴散阻礙層製備與銅金屬化製程整合 (I) (NSC92-2215-E-150-004)
國科會	91/8/1~92/7/31	無電鍍製備次微米自行對準矽化物與銅製程整合研究 (NSC-91-2215-E-150-001)
國科會	91/1/1~91/7/31	高溫濺鍍現場沈積自行對準矽化物(COSI ₂ 與 NISI)與銅金屬化製程之整合研究 (NSC90-2215-E-150-001)

二、期刊論文：

國外期刊

1. Giin-Shan Chen, Meng-Jie Lin, Chun-Wei Huang, Yi-Lung Cheng, **Jau-Shiung Fang**, Chih-I. Lin (2024, Oct). The impact of titanium alloying on altering nanomechanical properties and grain structures of sputter-deposited cobalt for electromigration reliability enhancement. *Journal of Alloys and Compounds* 1003 (2024) 175564
2. Chien-Nan Hsiao, Yen-Chang Pan, Wei-Chun Chen, Yi-Lung Cheng, **Jau-Shiung Fang**, Ting-Hsun Su, Meng-Jie Lin, Giin-Shan Chen (2024, Aug). The feasibility of an ultrathin dual-barrier scheme to inhibit interfacial diffusion and reactions in contact stacks of Co/NiSi/Si. *Surfaces and Interfaces* 51 (2024) 104703.
3. **Jau-Shiung Fang**, Ting-Hsun Su, Yi-Lung Cheng, Giin-Shan Chen (2024, Jul). Synergistic enhancement of adhesion and electromigration reliability of cobalt via super-diluted (0.06 at.%) tungsten alloying as next-generation interconnect materials. *Microelectronics Reliability* 158 (2024) 115427.
4. In-Chi Gau, Yao-Wen Chang, Giin-Shan Chen, Yi-Lung Cheng, **Jau-Shiung Fang** (2024, May). Process optimization of titanium self-aligned silicide formation through evaluation of sheet resistance by design of experiment methodology. *Solid State Electronics* 215 (2024) 108879.
5. T.K. Tsai, Y.K. Lu, **J.S. Fang**, G.S. Chen (2024, Feb). Ultrasound assistance in the sensitization and activation of porous Al₂O₃ supports for improving the hydrogen separation of Pd/Al₂O₃ composite membranes. *International Journal of Hydrogen Energy* 55 (2024) 1007–1016.
6. **Jau-Shiung Fang**, Giin-Shan Chen, Chin-Chia Chang, Chien-Nan Hsiao, Wei-Chun Chen, Yi-Lung Cheng (2024, Jan). Understanding electromigration failure behaviors of narrow cobalt lines and the mechanism of reliability enhancement for extremely dilute alloying of manganese oxide. *Journal of Alloys and Compounds* 970 (2024) 172591.
7. Yi-Lung Cheng, Chih-Yen Lee, Giin-Shan Chen, **Jau-Shiung Fang** (2023, Dec). Comparison of Barrier Efficiency for Self-Assembled Monolayers on SiO₂ by Using Decyltrimethoxysilane or 3-Aminopropyltrimethoxysilane Vapor Treatment. *ECS J. Solid State Sci. Technol.* 12 123009.
8. Yi-Lung Cheng, Hong-Chang Huang, Wei-Fan Peng, Giin-Shan Chen, **Jau-Shiung Fang** (2023, Oct). Comparison of Cobalt Integration with Various Dielectric Materials under Thermal and Electrical Stress. *Coatings* 2023, 13(10), 1818.
9. Yi-Lung Cheng, Chih-Yen Lee, Giin-Shan Chen, **Jau-Shiung Fang** (2023, Jun). Comparison of Precursors for Self-Assembled Monolayers as Cu Barriers. *ECS J. Solid State Sci. Technol.* 12 063001.

10. **Jau-Shiung Fang**, Ching-En Lee, Yi-Lung Cheng, Giin-Shan Chen (2023, Apr). Reinforcement in electromigration reliability of Cu interconnects by alloying of extremely dilute MnO. *Journal of Alloys and Compounds* 951 (2023) 169974.
11. Yi-Lung Cheng, Kai-Hsieh Wang, Chih-Yen Lee, Giin-Shan Chen, **Jau-Shiung Fang** (2023, Feb). Comparison of CoW/SiO₂ and CoB/SiO₂ Interconnects from the Perspective of Electrical and Reliability Characteristics. *Materials* 2023, 16(4), 1452.
12. **Jau-Shiung Fang**, Kun-Huang Chen, Yi-Lung Cheng, Giin-Shan Chen (2023, Feb). Layer-by-layer deposition of breakdown-strengthened Co(Ni) films by modulating termination time over the redox replacement. *Materials Chemistry and Physics* 296 (2023) 127222.
13. Giin-Shan Chen, Yen-Chang Pan, Wei-Chun Chen, Chien-Nan Hsiao, Chin-Chia Chang, Yi-Lung Cheng, **Jau-Shiung Fang** (2023, Jan). Dual near-zero-thickness sealing for the strengthening of cobalt thin films and nano-lines for future interconnect applications. *Applied Surface Science* 609 (2023) 155387.
14. Yi-Lung Cheng, Wei-Fan Peng, Chi-Jia Huang, Giin-Shan Chen, **Jau-Shiung Fang** (2023, Jun). Reliability Characteristics of Metal-Insulator-Semiconductor Capacitors with Low-Dielectric-Constant Materials. *Molecules* 2023, 28(3), 1134.
15. Giin-Shan Chen, Chin-Chia Chang, Yen-Chang Pan, Yi-Lung Cheng, **Jau-Shiung Fang** (2022, Oct). Effect of Minor Alloying on Electromigration Reliability of Cobalt Nanowires for Advanced Interconnect Applications: Activation-Energy and Microstructure-Evolution Studies. *SSRN*.
16. Giin-Shan Chen, Ching-En Lee, Yi-Lung Cheng, **Jau-Shiung Fang**, Chien-Nan Hsiao, Wei-Chun Chen, Yiu-Hsiang Chang, Yen-Chang Pan, Wei Lee, Ting-Hsun Su (2022, Aug). Enhancement of Electromigration Reliability of Electroless-Plated Nanoscaled Copper Interconnects by Complete Encapsulation of a 1 nm-Thin Self-Assembled Monolayer. *J. Electrochem. Soc.* 169 082519.
17. Yi-Lung Cheng, Wei-Fan Peng, Chih-Yen Lee, Giin-Shan Chen, **Jau-Shiung Fang** (2022, Jun). Comparison of Self-Assembled Monolayers on SiO₂ and Porous SiOCH Dielectrics by Decyltrimethoxysilane Vapor Treatment. *Coatings* 2022, 12(7), 926.
18. Ting-Kan Tsai, I-Ting Shih, Yi-Lung Cheng, Giin-Shan Chen, **Jau-Shiung Fang** (2022, Apr). Enhancement of breakdown strength and electromigration reliability for cobalt lines lightly doped with boron. *Materials Chemistry and Physics* 285 (2022) 126136.

19. Giin-Shan Chen, Ching-En Lee, Tzu-Ming Yang, Yi-Lung Cheng, **Jau-Shiung Fang** (2021, Dec). All-wet encapsulation and electroless superfilling process for the fabrication of self-assembled-monolayer encapsulated copper interconnects with enhanced electromigration reliability. *Materials Letters* 304 (2021) 130718.
20. **Jau-Shiung Fang**, Ching-En Lee, Yi-Lung Cheng, Giin-Shan Chen (2021, Aug). Strengthening the Electromigration Resistance of Nanoscaled Copper Lines by (3-aminopropyl) trimethoxysilane Self-Assembled Monolayer. *ECS J. Solid State Sci. Technol.* 10 083007.
21. Giin-Shan Chen, Wen-Hong Chang, Chin-Chia Chang, Yi-Hsin Chien, **Jau-Shiung Fang**, Yi-Lung Cheng (2021, Aug). Structural models and barrier properties of amine-terminated trialkoxysilane monolayers incubated in nonpolar vs. polar protic solvents. *Materials Chemistry and Physics* 274 (2021) 125113.
22. Chih-Yen Lee, Giin-Shan Chen, **Jau-Shiung Fang**, Yi-Lung Cheng (2021, Jun). Effects of Cu Metal Barrier on Electrical Characteristics of Porous Carbon-Doped Oxide Film. *ECS J. Solid State Sci. Technol.* 10 063005.
23. Yi-Lung Cheng, Wei-Fan Peng, Chih-Yen Lee, Giin-Shan Chen, Ying-Ning Lin, **Jau-Shiung Fang** (2021, Jun). Electrical and Reliability Perspectives for Self-Forming Barrier CuSc Metallization. *ECS J. Solid State Sci. Technol.* 10 065014.
24. **Jau-Shiung Fang**, Yu-Lin Wu, Yi-Lung Cheng, Giin-Shan Chen (2021, Apr). Synthesis of Dilute Phosphorous-Embedded Co Alloy Films on a NiSi Substrate with a Superior Gap-Filling Capability for Nanoscale Interconnects. *J. Electrochem. Soc.* 168 042505.
25. Giin-Shan Chen, Wan-Ling Gao, Chin-Chia Chang, **Jau-Shiung Fang**, Yi-Lung Cheng (2021, Feb). Synergy of mercaptosilane monolayer embedding and extremely dilute cobalt alloying for metallization of copper without a conventional metallic barrier. *Materials Chemistry and Physics* 259 (2021) 124034.
26. **Jau-Shiung Fang**, Tzu-Ming Yang, Yi-Lung Cheng, Giin-Shan Chen (2021, Feb). (3-Aminopropyl) trimethoxysilane Self-Assembled Monolayer as Barrier of Porous SiOCH for Electroless Cu Metallization: Optimizations of SiOCH Hydroxylation and Monolayer Functionalization. *ECS J. Solid State Sci. Technol.* 10 023003.
27. **Jau-Shiung Fang**, Tzu-Ming Yang, Yen-Chang Pan, Guan-Yu Lai, Yi-Lung Cheng, and Giin-Shan Chen (2020, Dec). Chemical-Structure Evolution Model

- for the Self-Assembling of Amine-Terminated Monolayers on Nanoporous Carbon-Doped Organosilicate in Tightly Controlled Environments. *Langmuir*
28. G.S. Chen, W.L. Gao, **J.S. Fang**, Y.L. Cheng (2020, Nov). synergy of mercaptosilane monolayer embedding and extremely dilute cobalt alloy for metallization of copper without a conventional metallic barrier. *Materials Chemistry and Physics*
 29. Giin-Shan Chen, Ren-Jie Taaa, **Jau-Shiung Fang**, Yi-Lung Cheng, Yen-Chin Chen (2020, Oct). Mechanism of strengthening electroless plated copper films with extremely T dilute oxide dispersion alloying: The optimal MnO addition. *Appl. Surf. Sci.*, 527, 146818
 30. Li-Chung Yang, Der-Ru Jung, Fang-Ru Po, Chia-His Hsu and **Jau-Shiung Fang** (2020, Oct). Tailoring Bandgap and Electrical Properties of Magnesium-Doped Aluminum Zinc Oxide Films Deposited by Reactive Sputtering Using Metallic Mg and Al–Zn Targets. *Coatings*
 31. Cheng, Yi-Lung; Lin, Yu-Lu; Chen, Giin-Shan, **Fang Jau-Shiung** (2020, Aug). Reliability Improvement for Stacked Dielectric with Low-k SiOCH Dielectric and SiCN Barrier by UV-Assisted Thermal Curing. *ECS Journal of Solid State Science and Technology*
 32. Y.L. Cheng, **J.S. Fang**, G.S. Chen, C.Y. Lee (2020, May). Effect of Post-annealing on Reliability of Cu/Low-k Interconnects. *ECS J. Solid. State Sci. Techno*
 33. Yi-Lung Cheng, Hong-Chang Huang, Chih-Yen Lee, Giin-Shan Chen, **Jau-Shiung Fang** (2020, Apr). Comparison of Cu and Co Integration with Porous Low-k SiOCH Dielectrics. *Thin Solid Films*, 704, 138010
 34. **Jau-Shiung Fang**, Yu-Fei Sie, Yi-Lung Cheng and Giin-Shan Chen (2020, Feb). A New Alternative Electrochemical Process for a Pre-Deposited UPD-Mn Mediated the Growth of Cu(Mn) Film by Controlling the Time during the Cu-SLRR. *Coatings*, 164
 35. Yi-Lung Cheng, Chih-Yen Lee, Wei-Fan Peng, Giin-Shan Chen and **Jau-Shiung Fang** (2020, Feb). Electrical and Reliability Characteristics of Self-Forming Barrier for CuNd/SiOCH Films in Cu Interconnects. *coatings*, 10, 155
 36. **Jau-Shiung Fang**, Kuang-Yu Yu, Sung-Te Chen, Yi-Lung Cheng, Yi-Sheng Wang and Giin-Shan Chen (2019, Dec). Reliability enhancement of copper/porous SiOCH metallization systems using nitrogen stuffing and bias-

- filter sputter deposited Mn₂O₃ barrier. *ECS J. Solid State Sci. & Technol.*, 8, N208-N213
37. Yi-Lung Cheng, Yu-Lu Lin, Chih-Yen Lee, Giin-Shan Chen, **Jau-Shiung Fang** (2019, Oct). Electrical Characteristics and Reliability of Nitrogen-Stuffed Porous Low-k SiOCH/ Mn₂O₃-xN/Cu Integration. *Molecules*, 24, 3882
 38. Giin-Shan Chen, Ren-Jie Tau, Sung-Te Chen, Yen-Chin Chen, Yi-Lung Cheng, **Jau-Shiung Fang** (2019, Sep). Self-strengthening of electroless-plated copper via dual segregation of extremely dilute (0.1%) manganese oxide inclusions. *Materials Letter*, 257, 126711
 39. Jai-Ling Wu, **Jau-Shiung Fang** (2019, May). Role of ethylenediamine additive in Cu growth on a Co/SiO₂/Si substrate via electrochemical atomic layer deposition of Pb and its surface limited redox replacement. *Apply Surface Science*, 477, 280-284. MOST 104-2221-E-150-005-MY2
 40. **J.S. Fang**, H.M. Wang, C.H. Hsu, Y.L. Cheng, G.S. Chen (2019, Apr). Growth of a Cu(Co) film by underpotential deposition of Co and controlling the time of the surface-limited redox replacement of Cu. *Int. J. Electrochem. Sci.*, 14, 5143-5153
 41. Y.L. Chang, Chih-Yen Lee; Wei-Jie Hung; Giin-Shan Chen; **Jan-Shiung Fang** (2019, Apr). Barrier-Free Process for Fluorinated Silicon Glass Film in Cu Interconnects. *Thin Solid Films*, 678, 1-7
 42. Yi-Lung Cheng , Chiao-Wei Haung, Chih-Yen Lee, Giin-Shan Chen, **Jau-Shiung Fang** (2019, Apr). Self-Assembled Monolayers on Highly Porous Low-k Dielectrics by 3-Aminopropyltrimethoxysilane Treatment. *Coatings*, 9, 246
 43. **J.S. Fang**, K.Y. Yu, Y. S. Wang, G.S. Chen, Y.L. Chenu (2018, Nov). A 2-nm-thick Mn Oxide on a Nitrogen-Stuffed Porous Carbon-Doped Organosilica as a Barrier of Cu Films. *ECS J. Solid State Science and Technology*, 7, N137-N142
 44. **J.S. Fang**, M.Y. Hsu, Y.L. Cheng, G.S. Chen (2018, Oct). Electrochemical Growth of Cu(Ru) films via underpotential deposition of Pb, surface-limited redox replacement of Cu, and underpotential deposition of Ru. *J. Electro. Mater.*, 47, 5973-5980
 45. Y.L. Cheng, Chih-Yen Lee, Wei-Jie Hung, Giin-Shan Chen, **Jau-Shiung Fang** (2018, Sep). Electrical and Reliability Characteristics of Dielectric Stack with Low Dielectric Constant SiCOH and Capping SiCNH Films. *Surface Coatings and Technology*, 350, 57-63

46. Y.L. Cheng, B.H. Lin, C.Y. Lee, G.S. Chen, **J.S. Fang**(2018, Aug). Comparison of O₂ plasma treatment on porous low dielectric constant material at sidewall and bottom of trench structure.*Thin Solid Films*, 660, 808-813
47. Y.L. Cheng; Chih-Yen Lee; Wei-Jie Hung; Giin-Shan Chen; **Jan-Shiung Fang**(2018, Aug). Comparison of Various Low Dielectric Constant Materials.*Thin Solid Films*, 660, 871-878
48. **J.S. Fang**, J.L. Wu, S.M. Wang, C.H. Hsu, Y.L. Cheng, G.S. Chen (2018, Jun). Influence of trisodium citrate on the Cu electrodeposition by sequential underpotential deposition of Pb and surface-limited redox replacement of Cu.*Int. J. Electrochem. Sci.*, 13, 7466-7477
49. Giin-Shan Chena, Tzu-Ming Yang, Sung-Te Chen, Yi-Lung Cheng, **Jau-Shiung Fang**(2018, Feb). A new alternative self-assembled-monolayer activation process for electroless deposition of copper interconnects without a conventional barrier.*Electrochemistry Communications*, 87, 9-12
50. **J.S. FANG**, L.Y. LIN, C.L. WU, Y.L. CHENG, and G.S. CHEN (2017, Aug). Effects of Additives on Electrochemical Growth of Cu Film on Co/SiO₂/Si Substrate by Alternating Underpotential Deposition of Pb and Surface-Limited Redox Replacement by Cu.*Journal of Electronic Materials*, 46 (11) 6677-6684. MOST 104-2221-E-150-005-MY2
51. Sung-Te Chena, Yu-Cheng Chungb, **Jau-Shiung Fang**c, Yi-Lung Chengd, Giin-Shan Chen (2017, Feb). Enhancement of seeding for electroless Cu plating of metallic barrier layers by using alkyl self-assembled monolayers.*Applied Surface Science*, 405, 350-358
52. Y. L. Cheng, C. Y. Lee; Y. L. Huang, C. R. Sun, W. H. Lee, G. S. Chen; **J. S. Fang**, and B. T. Phan (2016, Dec). Cu-induced Dielectric Breakdown of Porous Low Dielectric Constant Film.*Journal of Electronic Materials*
53. Giin-Shan Chen, Ding-Ye Wu, Sung-Te Chen, Yi-Lung Cheng, **Jau-Shiung Fang**, and Tzu-Ming Yang (2016, Sep). Enhancement of Seeding and Electroless Cu Plating on TaN Barrier Layers: The Role of Plasma Functionalized Self-Assembled Monolayers.*Journal of The Electrochemical Society*, 163, D463-D468
54. Y.J. Cheng, G.S. Chen, **J.S. Fang**(2016, Aug). Effect of Annealing Temperature on Electrical and Reliability Characteristics of HfO₂/Porous Low-k Dielectric Stacks.*Microelectronic Engineering*, 34-39

55. Y. L. Cheng, Y. L. Huang, C. R. Sun, W. H. Lee, G. S. Chen, and **J. S. Fang**(2016, Jul). Effect of Cu Drift on Dielectric Breakdown for Porous Low Dielectric Constant Film under Static and Dynamic Stress.*Electrochemical Society Transactions*, 72(2), 241-252 (2016)
56. **J.S. Fang**, J.H. Chen, G.S. Chen, Y.L. Cheng, T.S. Chin (2016, Apr). Direct, sequential growth of copper film on TaN/Ta barrier substrates by alternation of Pb-UPD and Cu-SLRR.*Electrochimica Acta*, 206 (2016) 45–51. MOST 104-2221-E-150-005-MY2
57. Quang-Phu Tran; Tsung-Shune Chin;**Jau-Shiung Fang**; An-Ya Lo (2016, Mar). P-type highly conductive and transparent NdF3-doped tin oxide films prepared by dip coating.*Thin solid Films*, 618 (1) 159-164
58. **J.S. Fang**, S.L. Sun, Y.L. Cheng, G.S. Chen, T.S. Chin (2016, Feb). Cu and Cu(Mn) films deposited layer-by-layer via surface limited redox replacement and underpotential deposition.*Applied Surface Science*, 364, 258-364. MOST 104-2221-E-150-005-MY2
59. Yi-Lung Cheng Kai-Chieh. Kao Chi-Jia Huang Giin-Shan Chen **Jau-Shiung Fang** (2015, Nov). Atomic Layer Deposition HfO2 Capping Layer Effect on Porous Low Dielectric Constant Materials.*Applied Surface Sciences*, 354, 115-119
60. **J.S. Fang**, C.S. Lin, Y.Y. Huang, T.S. Chin (2015, Aug). Surface morphologies induced hydrophobicity of fluorocarbon films grown by a simultaneous etching and deposition process.*Journal of Electronic Materials*, 44, 2908-2914 (2015)
61. **J.S. Fang**, C.J. Cai, J.H. Lee, T.S. Chin (2015, May). Phase formation and stability of Cu-Ge films with low electrical resistivity.*Thin Solid Films*, 584, 228-231. MOST 100-2215-E-150-033-MY3
62. Q.P. Tran,**J.S. Fang**, T.S. Chin (2015, Apr). Properties of fluorine-doped SnO thin films by a green sol-gel method.*Materials Science in Semiconductor Processing*, 40, 664-669
63. **J.S. Fang**, Y.S. Liu, T.S. Chin (2015, Mar). Atomic layer deposition of copper and copper silver films using an electrochemical process.*Thin Solid Films*, 580, 1-5. MOST 100-2221-E-150-033-MY3
64. **Jau-Shiung Fang**, Li-Chung Yang, Yi-Chun Lee (2014, Feb). Low resistivity Fe–Co–B–Ti–Nb amorphous thin film as a copper barrier.*Journal of Alloys and Compounds*, 586, S348-S352. (SCI)

65. **J.S. Fang**, W.J. Su, M.S. Huang, C.F. Chiu, T.S. Chin (2014, Jan). Characteristics of plasma-treated amorphous Ta-Si-C film as a diffusion barrier for copper metallization. *J. Mater. Electron.*, 212-218. (SCI)
66. T. K. Tsai, S. J. Hsueh, **J. S. Fang** (2014, Jan). Optical Properties of Al_xO_y/Ni/Al_xO_y Multilayered Absorber Coatings Prepared by Reactive DC Magnetron Sputtering. *J. Electro. Mater.*, 43, 229-235
67. **J.S. Fang** and Y.T. Chen (2013, Sep). Passivation of copper-hafnium thin films using self-forming hafnium oxide. *Surf. Coating & Technol.*, 231, 166-170 (2013). (SCI)
68. T.K. Tsai, S.J. Hsueh, J.H. Lee and **J.S. Fang** (2012, Nov). Optical Properties and Durability of Al₂O₃-NiP/Al Solar Absorbers Prepared by Electroless Nickel Composite Plating. *J. Electro. Mater.*, 41, 53-59
69. T.K. Tsai, S.J. Hsueh, J.H. Lee and **J.S. Fang** (2011, Apr). Optical Properties and Durability of Al₂O₃-NiP/Al Solar Absorbers Prepared by Electroless Nickel Composite Plating. *J. Electro. Mater.*, Vol. 41 No. 1 53-59. (SCI)
70. **J. S. Fang**, J. H. Lin, B. Y. Chen and T. S. Chin (2011, Feb). Ultrathin Ru-Ta-C Barriers for Cu Metallization. *J. Electrochem. Soc.*, 158, H97-H102. (SCI)
71. **J.S. Fang**, W.H. Luo, C.H. Hsu, J.C. Yang, and T.K. Tsai, (2011) "The Transparent Conductive Properties of Manganese-doped Zinc Oxide Films Deposited by Chemical Bath Deposition", *J. Electro. Mater. J. Electro. Mater* Vol 41, No 1, 122-129, (SCI)
72. **J.S. Fang**, J.H. Lin, B.Y. Chen G.S. Chen and T.S. Chin, (2011) "Low-Resistivity Ru-Ta-C Barriers for Cu Interconnects", *J. Electro. Mater.* Vol. 41, No. 1, 138-141 (SCI)
73. T.K. Tsai, S.J. Hsueh, J.H. Lee and **J.S. Fang** (2011), "Optical Properties and Durability of Al₂O₃-NiP/Al Solar Absorbers Prepared by Electroless Nickel Composite Plating", Vol. 41 No. 1 53-59 (SCI)
74. T.K. Tsai, S.S. Wu, C.S. Hsu, **J.S. Fang**, (2011) "Effect of Phosphorous on the Copper Diffusion Barrier Properties of Electroless CoWP Films", *Thin Solid Films* 519 (2011) 4958–4962
75. **J. S. Fang**, J. H. Lin, B. Y. Chen and T. S. Chin, (2011) "Ultrathin Ru-Ta-C Barriers for Cu Metallization" *J. Electrochem. Soc.* 158, H97-H102 (SCI)

76. **J. S. Fang**, J. H. Lin, B. Y. Chen and T. S. Chin, (2010) “Ultrathin Ru-Ta-C Barriers for Cu Metallization” J. Electrochem. Soc. (Accepted)
77. T.K. Tsai, H.C. Chen, J.H. Lee, Y.Y. Huang, **J.S. Fang** (2010) “Highly conductive Indium Zinc Oxide Prepared by Reactive Magnetron Co-sputtering Technique using Indium and Zinc Metallic Targets”, J. Vac. Sci. Technol. A 28, 425-430 (SCI)
78. T.H. Lin, J.H. Lee, C.S. Hsu, and **J.S. Fang**(2009),” Fifteen-Nanometer Ru Diffusion Barrier on NiSi/Si for a sub-45 nm Cu Contact Plug”, J. Electro. Mater., 38 (11) 2251-2256. (SCI)
79. W.H. Luo, T.K. Tsai, J.C. Yang, W.M. Hsieh, C.H. Hsu, and **J.S. Fang**(2009),” Enhancement in Conductivity and Transmittance of Zinc Oxide Prepared by Chemical Bath Deposition”, J. Electro. Mater., 38 (11) 2264-2269. (SCI)
80. **Jau-Shiung Fang**, Chin-Fu Chiu, Jia-Huei Lin, Ting-Yi Lin, and Tsung-Shune Chin (2009) “Failure Mechanism of 5 nm Thick Ta-Si-C Barrier Layers Against Cu Penetration at 750-800°C” J. Electrochem. Soc. 156 (2) H147-H152. (SCI)
81. L.C. Yang, C.Y. Cheng, and **J.S. Fang**(2008),”Characterization of polycrystalline CuInSe₂ thin films deposited by sputtering and evaporation as a function of composition”, J. Phys. Chem. Solids 69, 435-440 (SCI)
82. C.S. Hsu, H.Y. Hsieh, and **J.S. Fang**(2008) “Enhancement of Oxidation Resistance and Electrical Properties of Indium-Doped Copper Thin Films” J. Electro. Mater. 37 (6) 852-859. (SCI)
83. Ting-Yi Lin, Huai-Yu Cheng, Tsung-Shune Chin, Chin-Fu Chiu and **Jau-Shiung Fang**(2008) “Highly Thermal-Stable Amorphous TaSi₂C_x Films as Diffusion Barrier” J. Electrochem. Soc. 155 (2) G29-G32. (SCI)
84. **J.S. Fang**, T.P. Hsu, M.L. Ker, H.C. Chen, J.H. Lee, C.S. Hsu, and L.C. Yang, (2008) “Evaluation of properties of Ta-Ni amorphous thin film for copper metallization in integrated circuits” J. Phys. Chem. Solids, 69, 430 – 434. (SCI)
85. T.Y. Lin, H.Y. Cheng, T.S. Chin, C.F. Chiu, and **J.S. Fang**(2007) “5-nm-thick TaSiC amorphous films stable up to 750°C as a diffusion-barrier for copper metallization” Appl. Phys. Lett. 91, 152908. (SCI)
86. **J.S. Fang**, M.L. Ker and H.C. Chen, (2007) ”Evaluation of dc-sputtered Glassy Ta-Co-N Thin Film for Copper Metallization” J. Electro. Mater., 36 (11) 1462-1468. (SCI)

87. **J.S. Fang**, T.P. Hsu, and H.C. Chen, (2007) "Barrier Properties of Amorphous Binary Ta-Ni Thin Films for Cu Interconnection" J. Electro. Mater. 36 (5) 614-622(SCI).
88. **J.S. Fang** and H.Y. Hsieh, (2007) "Structural and passivative behaviors of Cu(In) thin film" J. Electro. Mater. 36 (2) 129-135 (SCI).
89. J.K. Hsiao, M.F. Tai, Y.C. Lee, C.Y. Yang, H.Y. Wang, H.M. Liu, **J.S. Fang**, and S.T. Chen, (2006) "Labelling of cultured macrophages with novel magnetic nanoparticles" J. Magn. Magn. Mater., 304, c4-c6.(SCI)
90. **J.S. Fang**, T.P. Hsu, and G.S. Chen, (2006) "Crystallization and failure behavior of Ta-TM (TM = Fe, Co) nanostructured/amorphous diffusion barriers for copper metallization" J. Electro. Mater., 35 (1) 15-21.(SCI)
91. W.K. Wang, D.S. Wu, W.C. Shih, **J.S. Fang**, C.E. Lee, W.Y. Lin, P. Han, R.H. Horng, T.C. Hsu, T.C. Huo, M.J. Jou, A. Lin and Y.H. Yu (2005) "Near-Ultraviolet InGaN/GaN Light-Emitting Diodes Grown on Patterned Sapphire Substrates" J. J. Appl. Phys., 44(4) 2512-2515.(SCI)
92. D.S. Wu, W.K. Wang, W.C. Shih, R.H. Horng, C.E. Lee, W.Y. Lin, and **J.S. Fang**(2005)"Enhanced output power of near-ultraviolet InGaN-GaN LEDs grown on patterned sapphire substrates", IEEE Photon. Technol. Lett., 17(2) 288-290.(SCI)
93. **J.S. Fang**, T.P. Hsu and G.S. Chen (2004), "Crystallization and failure behaviors of Ta-Ni nanostructured/amorphous diffusion barriers for copper metallization" J. Electro. Mater., 33(10) 1176-1181.(SCI)
94. **J.S. Fang**, G.S. Chen and Y.W. Lin (2004), "Phase transition behavior of reactive sputtering deposited Co-N thin films using transmission electron microscopy" J. Vac. Sci. Tech. A, 22(3) 698-704(SCI)
95. H.L.Chang, **J.S. Fang** and C.T. Kuo(2003), "Structures and properties of the crystalline Si-C-N using additional Si-source and Co-catalyst" Review on Advanced Materials Science vol 5, 432-439(SCI)
96. H.L.Chang, **J.S. Fang** and C.T. Kuo (2003), "Growth model of carbon nanotubes assisted with Co-based catalyst" Review on Advanced Materials Science, vol 5, 425-431(SCIE)
97. **J.S. Fang**, H.L. Chang, G.S. Chen, and P.Y. Lee (2003), "Crystallization and failure behaviors of Ta-Co nanostructured/amorphous diffusion barriers for

- copper metallization” Review on Advanced Materials Science, vol 5, 510-513.(SCIE)
98. **J. S. Fang**, F.W. Tsai, and T.S. Chin, (2003), “Enhancement of [001] Texture and Magnetoresistance of Sputtered La-Ca-Mn-O Thin Films on Silicon by Inserting Buffer Layers” Jpn. J. Appl. Phys., 42 1237-1241 (SCI)
 99. G.S. Chen, J.J. Gua, C.K. Lin, C.S. Hsu, L.C. Yang, and **J.S. Fang**, (2002), “Evaluation of radio-frequency sputter-deposited textured TiN thin films as diffusion barriers between copper and silicon” J.Vac. Surf. Tech., A 20(2) 479-485 (SCI)
 100. **J. S. Fang**, F.W. Tsai, and T.S. chin, (2002), “Highly Textured LaCaMnO Thin Films Grown on SiO/Si(100)”, Jpn. J. Appl. Phys., vol. 41, 600-605 (SCI)
 101. **J.S. Fang**, C.T. Chang, and T.S. Chin, (2001), “Electric properties of barium-strontium titanate thin films deposited by two-step radio-frequency sputtering”, J. Mater. Res., Vol. 16, No. 9 p.2680-2686. (SCI)
 102. **J.S. Fang**, M.R. Jian, T.S. Chin, H.W. Zhang, B.G. Shen, (2000) “Magnetic Viscosity of NdFe₁₁TiN_x Thin Films”, Jpn. J. Appl. Phys., vol. 39, p.496. (SCI)
 103. J.C. Shih, T.S. Chin, C.A. Chen, and **J.S. Fang**, (1999), “ The Effect of Beryllium Addition on Magnetostriction of the Tb_{0.3}Dy_{0.7}Fe₂ Alloy”, J Mag. and Mag. Mater., vol.191, p.101-106. (SCI)
 104. **J.S. Fang**, T.S. Chin, J.C. Shih, C.A. Chen and S.W. Yung, (1999), " The ac-initial susceptibility as a measure of exchange coupling in two-phase nano-structured NdFeCuNbB magnet alloys, J Mag. and Mag. Mater., vol.195, p.588-594. (SCI)
 105. **J.S. Fang** and T.S. Chin, (1999), " High Temperature c_{ac} Behaviors of Fe-Nd-B Nanocomposite Alloy, J. Journal of Material Science, (SCI)
 106. **J.S. Fang**, M.S. Leu and T.S. Chin, (1998), “AC susceptibility of a two-phase nanocomposite Fe₈₈Nd₆B₆ alloy at 77-990 K”, J. Appl. Phys. Vol.83, p.3731. (SCI)
 107. **J. S. Fang**, M.F. Hsieh, S.K. Chen and T.S. Chin, (1997), “Magnetic properties and structure of Nd-(Fe,B) nanocomposite alloys with fixed Fe/B ratio at 4~14”, J. J. Appl. Phys. vol.36, p.6324. (SCI)
 108. T.S. Chin, F.M. Chen and **J.S. Fang**, (1997), “Magnetostrictive properties of Tb_{0.3}Dy_{0.7}(Fe_{1-x}V_x)₂ alloys”, IEEE Trans. on Magn., vol.33, p.3946. (SCI)

109. **J.S. Fang**, and T.S. Chin, (1996), “ Rapid thermal annealing of two phases nanocrystalline magnet alloys”, Materials Trans., JIM., vol.37, p.883. (SCI)
110. **J.S. Fang**, S.K. Chen and T.S. Chin, (1996), “ Nanocrystalline $\text{Nd}_6\text{Fe}_{88-x}\text{M}_x\text{B}_6$ (M= Ti or V) Magnets by rapid thermal annealing”, IEEE Trans. on Magn., vol.32, p.4401. (SCI)
111. F.M. Chen, **J.S. Fang** and T.S. Chin, (1996), ” The effect of carbon on magnetostrictive properties of the $\text{Tb}_{0.3}\text{Dy}_{0.7}\text{Fe}_2$ alloy”, IEEE Trans. on Magn., vol.32, p.4776. (SCI)
112. J.M. Yao, T.S. Chin, **J.S. Fang** and S.K. Chen, (1995), “ Magnetic aftereffect and magnetization process of nanocrystalline $\alpha\text{-Fe/Nd}_2\text{Fe}_{14}\text{B}$ two-phases magnet alloy”, IEEE Trans. on Magn., vol.31, p.3611. (SCI)

三、研討會論文：

(一) 國外 conference

1. **J.S. Fang**(2023)\“ Strengthening corrosion behavior of cobalt and ruthenium alloy films in an acidic electrolyte for nanoscale interconnect\”, Thermec 2023 (AUT)
2. **J.S. Fang**(2023)\“ Process Optimization of titanium Self-Aligned Silicide Formation through Evaluation of Sheet Resistance by Design of Experiment Methodology\”, ICMCTF 2023 (USA)
3. **J.S. Fang**(2019)硫酸銨對電化學共沈積 Cu(Mn)合金薄膜之特性,第十一屆海峽兩岸超微顆粒學術研討會(CHN)
4. **J.S. Fang**(2019)\“2 nm-thick Mn_2O_3 on nitrogen-stuffed p-SiOCH against Cu diffusion\”,15th Coatings Science International 2019(NLD)
5. **J.S. Fang**(2018)\“Strengthening of porous low-k dielectric by nitrogen stuffing treatment and capping an ultrathin Mn barrier\”,ANM 2018(PRT)
6. **J.S. Fang**(2018)\“Cu film fabrication via pulse underpotential deposition of Pb and surface-limited redox replacement of Cu on trenched Ru/SiO₂/Si₂\”,ISE 2018(LTU)
7. **J.S. Fang**(2018)\“Enhancement of Seeding for Electroless Cu Plating of Ta Thin-Film Electrodes by Using Alkyl Self-Assembled Monolayers\”,ISE 2018(LTU)

8. **J.S. Fang**(2017)\\"Fabricating high gap-filling Cu films on trench Ru/p-SiOCH/Si Substrates using pulse Pb-UPDs\",ICASS 2017(CHN)
9. **J.S. Fang**(2017)\\"Comparison of O₂ Plasma Treatment on Porous Low Dielectric Constant Material in Sidewall and Bottom of Trench Structure\",ICASS 2017(CHN)
10. **J.S. Fang**(2017)\\"Enhancement of catalyst growth for electroless Cu plating of TaN barrier layer: the role of alkyl self-assembled monolayer\",21st, ISE 2017(HUN)
11. **J.S. Fang**(2017)\\"Sequentially layer-by-layer growth of Ag(Cu) thin film using underpotentially deposition and self-limited redox reaction\",21th Topical ISE Meeting(HUN)
12. **J.S. Fang**(2017)\\"Pore sealing of porous low-k dielectrics assisted by self-assembled monolayers by 3-Aminopropyltrimethoxysilane treatment\",21st ISE 2017(HUN)
13. **J.S. Fang**(2017)\\"Ethylenediamine improves layer-by-layer growth of Cu film prepared on cobalt-based substrate via electrochemical atomic layer deposition\",SurfCoat Korea 2017 conference(KOR)
14. **J.S. Fang**(2016)\\"Sequentially layer-by-layer growth of Cu film on patterned Ru/Si substrate\",Thermec 2016(AUT)
15. **J.S. Fang**(2015)\\"Atomic Layer deposition of Cu and Cu(Ru) layer by electrochemical process\",The Advanced Materials World Congress(SWE)
16. **J.S. Fang**(2014)\\"以電化學原子層沈積 Cu-Ru 薄膜\",兩岸薄膜科技研討會(CHN)
17. **J.S. Fang**(2014)\\"Layer by layer growth of copper silver film using underpotential deposition by an electrochemical process\",SATF 2014(TUR)
18. **J.S. Fang**(2014)\\"Phase formation and stability of Cu-Ge films with low electrical resistivity\",ThinFilm 2104(CHN)
19. **J.S. Fang**(2013)\\"Thermal stability of Cu₃Ge film prepared by magnetron co-sputtering using a copper target and a germanium target\",Thermec 2013(USA)
20. **J.S. Fang**(2013)\\"Properties of co-sputtered AgGe and TaGe thin films\",兩岸工程材料會議(CHN 西安)
21. **方昭訓**(2013)\\"Cu(CoN) 與 CoN 顆粒薄膜應用於銅製程之特性\",第八屆海峽兩岸超微顆粒學術研討會(CHN 吉首)

22. **J.S. Fang**(2013)"Characteristics of plasma-treated amorphous Ta-Si-C film as a diffusion barrier for copper metallization,TMS 2013(USA)
23. **J.S. Fang**, Y.C. Lee, (2011) "Fe-Co-B-Nb High Entropy Thin Film for Copper Metallization", EUROMAT in Montpellier (France)
24. 鍾德儒¹ 柏方茹¹ 徐嘉禧¹ **方昭訓**“高能隙低電阻 Mg 摻雜 AZO 透明導電薄膜之特性” 第六屆海峽兩岸工程材料研討會, 南京 (2011)
25. **Jau-Shiung Fang**, Wu-Jia Su, Meng-Shuo Huang, Ting-Yi Lin, Chung-Shiun Chin "Characteristics of amorphous Ta-Si-C film as a diffusion barrier for copper metallization" ICETI 2011, Taipei
26. **J.S. Fang** and Y.T. Chen "Passivation of copper-hafnium thin films using self-forming hafnium oxide" TACT 2011, Kenting, Taiwan
27. **J.S. Fang**, W.H. Luo, C.H. Hsu, J.C. Yang, and T.K. Tsai, (2011) "The Transparent Conductive Properties of Manganese-doped Zinc Oxide Films Deposited by Chemical Bath Deposition", J. Electro. Mater. (Revised)
28. **J.S. Fang**, J.H. Lin, B.Y. Chen G.S. Chen and T.S. Chin, (2011) "Low-resistivity RuTaC barriers for Cu interconnects", J. Electro. Mater. (Revised)
29. **Jau-Shiung Fang**, Chin-Fu Chiu, Ting-Yi Lin, Tsung-Shune Chin (2009)"Highly thermal-stable ultrathin Ta-Si-C amorphous film as a diffusion barrier for Cu interconnection", THERMEC 2009 in Berlin (Germany)
30. 謝維銘 楊仁傑 駱煒翔 徐嘉禧 **方昭訓**, (2008) "化學鍍浴沉積法製備 ZnO 薄膜之性質" 兩岸顆粒會議, 上海 (China).
31. **J.S. Fang**, Y.S. Lin, C.S. Cheng, Y.C. Lee and H.Y. Hsio (2007) "Enhancement of conductivity and transmittance of Al-doped ZnO thin films prepared by a metallic Zn:Al target" EUROMAT2007 in Nuremberg, (Germany).
32. **J.S. Fang** and H.C. Chen, (2007) "Preparation of the High-Quality Indium Zinc Oxide by Reactive Magnetron Co-sputtering Technique from Indium and Zinc Metallic Targets" TMS in Orlando (USA)
33. **J.S. Fang** and W.K. Cheng, (2006) "Evaluation of magnetoresistance characteristic of Co-Ti-O granular alloy thin films" Particology, Beijing (China).
34. **J.S. Fang**, T.P. Hsu and L.C. Yang, (2005) "Diffusion Barrier Properties of DC Sputtering Deposited Ta-Ni Films in Cu/SiO₂/Si Contact Schemes", EUROMAT2005 in Prague (CZ)

35. **J.S. Fang**, M.L. Ker, and T.P. Hsu, (2005) “Thermal stability enhancement of sputtered Ta-Co-N diffusion barrier layer for copper metallization”, EUROMAT2005 in Prague (CZ)
36. **Jau-Shiung Fang** and Chen-Siang Hsu, (2005) “Designing experimental determination of sheet resistance of a submicron titanium self-aligned silicide formation”, TMS 2005 in San Francisco (USA)
37. **方昭訓**, 李安倫, 戴明鳳, (2004) “低溫燃燒合成製備 $\text{Ni}_x\text{Zn}_{1-x}\text{Fe}_2\text{O}_4$ ($0.3 \leq x \leq 0.8$) 鐵氧體粉末與特”,
The Chinese journal of Process Engineering, vol. 4, 212-217.
38. 李安倫, **方昭訓**, 戴明鳳, (2004) “燃燒法合成鐵鎳合金奈米粉末及包覆金的製程與特性”, The
Chinese journal of Process Engineering, vol. 4, 218-223.
39. **J.S. Fang**, F.W. Tsai, and T.S. Chin, (2002) “ Highly [00l] Texture and CMR of Sputtered La-Ca-Mn-O
Thin Films on Silicon with Buffer Layers”, International Magnetism and Magnetic Materials
Conference. Amsterdam (The Netherlands)
40. M.S. Leu, **J.S. Fang** and T.S. Chin, (2001), “In-Situ Permeability Study of Nano-Crystalline Magnetic Alloys”, Chinese Physics Conference.
41. J.M. Yao, **J.S. Fang** and T.S. Chin, (1996), “magnetization Reversal of Ti-modified $\text{Nd}_2\text{Fe}_{14}\text{B}/\text{a-Fe}$
nanocomposite magnets”, International Conference on Rare Earth Permanent Magnets. p.409.
42. **J.S. Fang**, T.S. Chin and S.K. Chen, (1996), “Magnetic properties of nanocomposite $\text{Fe}_{88-x}\text{M}_x\text{Nd}_6\text{B}_6$ magnets (M= Zr or Nb) by rapid thermal annealing” International Conference on Rare Earth Permanent Magnets p.698.

(二) 國內 conference

1. **方昭訓**(2023) , "Characteristics of Al-Sc Intermetallic Compounds for next generation interconnects", 2023 材料年會,新竹市
2. **方昭訓**(2023) , "Properties of Ru-Al intermetallic compounds deposited by magnetron co-sputtering ", 2023 材料年會,新竹市

3. 方昭訓(2023) , " Corrosion behavior of Co-Ru Alloy Thin Films Prepared by Electrochemical Codeposition on TiSi_2 ", 2023 TACT,Taipei
4. 方昭訓(2023) , " Characteristics of Al-based intermetallic compounds as a next-generation interconnect material ", 2023 TACT,Taipei
5. 方昭訓(2024) , "共濺鍍製備 Al-Sc 介金屬化合物薄膜製程之特性研究", 2024 材料年會,苗栗縣
6. 方昭訓(2024) , "磁控共濺鍍沈積 Ru-Al 借金屬化合物之特性", 2024 材料年會,苗栗縣
7. 方昭訓(2022) , "電化學沉積微量摻雜 Co(P)合金薄膜之結構", 2022 TACT,南投縣
8. 方昭訓(2022) , "調控低電位沉積層狀製備下世代 Co(Ru)合金連導線薄膜", 2022 TACT,南投縣
9. 方昭訓(2021) , " Nucleation Mechanism of Lightly-doped Co(C) Alloy Films Electrochemically Deposited by Mixing Co Electrolyte and Graphene ", 2021 材料年會,台北市
10. 方昭訓(2021) , " Structural Change and Stress Variation of self-forming Cu(Sc) Films as an Interconnecting Material ", 2021 材料年會,台北市
11. 方昭訓(2021) , " Improvement of electromigration reliability using a Sc-doped copper interconnects", 2021 材料年會,台北市
12. 方昭訓(2021) , " Crystalline and electrical properties of phosphorous lightly-doped Co alloy films electrochemically deposited on Ni substrate for nanoscale interconnects", 2021 TACT,Taipei
13. 方昭訓(2020) , "表面侷限氧化還原 Ru 置換低電位沉積 Co 單層製備 CoRu 合金薄膜特性", 2020 中國機械學會年會,雲林縣
14. 方昭訓(2020)"共濺鍍製備 Cu(Sc)自形成擴散阻障層應用於銅製程之特性研究",2020 材料年會,新北市
15. 方昭訓(2020)"調控 Ru 開路電位時間置換低電位沈積 Co 單層製備 CoRu 合金薄膜特性",中國顆粒學會第十一屆學術年會暨海峽兩岸顆粒技術研討會,台北
16. 方昭訓(2020)"電化學共沈積微量摻雜鈷磷合金薄膜於金屬化製程之應用",TACT 2020,台中

17. 方昭訓(2019)\\"Cu(Ru) Alloy Thin Films Prepared by Electrochemical Co-deposition\",2019 TACT,Taipei
18. 方昭訓(2019)\\"Cu(Mn) alloy thin film prepared by using Cu to replace underpotential deposited Mn through surface-limited redox replacement\",2019 TACT,Taipei
19. 方昭訓(2019)\\"Cu(Nd)自形成阻障層應用於銅連導線之特性\",2019 材料年會,台南
20. 方昭訓(2019)\\"電化學共沉積製備 Cu(Ru)合金薄膜之特性\",2019 材料年會,台南
21. 方昭訓(2018)\\"銅離子置換低電位沉積鈷原子層製備銅鈷合金薄膜特性\",2018 材料年會,台中
22. 方昭訓(2018)\\"電化學共沉積 Cu(Mn)合金薄膜之特性\",2018 材料年會,台中
23. 方昭訓(2017)\\"Effect of Cleaning solution on Electrical Characteristics and Reliability of Dense and Porous Low Dielectric Constant\",TACT 2017,Hualian
24. 方昭訓(2017)\\"Use of pulse Pb-UPD to fabricate high gap-filling Cu film on trenched Ru/SiO₂/Si by EC-ALD\",TACT 2017,Hualian
25. 方昭訓(2017)\\"Effect of O₂ Plasma Treatment on Cu Diffusion Characteristics of Porous Low Dielectric Constant Material\",TACT 2017,Hualian
26. 方昭訓(2017)\\"pH value affecting the growth of copper layer by EC-ALD on Cobalt\",TACT 2017,Hualian
27. 方昭訓(2016)\\"電化學原子層沉積製備銀銅薄膜之特性探討\",2016 材料年會,HsinChu
28. 方昭訓(2016)\\"以電化學原子層沉積圖案化 Cu(Mn)薄膜\",2016 材料年會,Hsinchu
29. 方昭訓(2015)\\"以電化學原子層沉積 Cu 薄膜在圖案化基板上的研究\",2015 材料年會,高雄
30. 方昭訓(2015)\\"Electrical and optical properties of bandgap-enlarged Mg-AZO films\",TACT 2015,Tainan
31. 方昭訓(2015)\\"Properties of Cu Thin Film on Pattern Substrates by Electrochemical Atomic Layer Deposition\",兩岸薄膜科技會議,Tainan

32. 方昭訓(2014)"Structural, Electrical, and Resistance Force Characteristics of Ga-In-Sn Eutectic Alloys",2014 ICETT,NanTou
33. 方昭訓(2014)"以電化學原子層沈積銅薄膜",第九屆海峽兩岸工程材料研討會,Tainan
34. 方昭訓(2014)"Characteristics of Cu Thin Film prepared by Electrochemical Atomic Layer Deposition",TACT 2014,Miaoli
35. 方昭訓(2014)"Hydrophobic and oleophobic properties of fluorocarbon films grown with C3F8/C4F8 and C2H2 containing HMDSO/Ar",VASSCAA-7,Hsinchu
36. 方昭訓(2013)"High hydrophobic fluorocarbon films prepared using C3F8 and C2H2 precursors",TACT 2013,Taipei
37. 方昭訓(2012)"RuO₂ 擴散阻礙層與同連導線製程特性探討",材料年會,Huwei
38. 方昭訓(2012)"濺鍍法製備 Ag-Ge 及 Ta-Ge 之特性",TVS-2012,Taichung
39. 黃孟碩、王漢瑜、方昭訓 (211) “雙層超薄 Ru/Ta-Si-C 擴散阻障層與銅連導線製程特性探討” Annual Conference of Taiwan Vacuum Society. Hsinchu, Taiwan
40. 蘇武加, 黃孟碩, 邱敬富, 林庭宜, 方昭訓, 金重勳 (2010) “電漿改質 Ta-Si-C 薄膜特性與銅製程擴散阻礙層探討” Annual Conference of the Chinese Society for Material Science. 高雄
41. 徐嘉禧, 駱煒翔, 鐘德儒, 方昭訓 (2009) ”探討 DMAB 濃度對 ZnO 化學鍍製備薄膜性質” Annual Conference of the Chinese Society for Material Science.
42. 王梓育, 方昭訓 (2009) ”Cu(CoN) 合金薄膜之特性研究 ” Annual Conference of the Chinese Society for Material Science.
43. 鍾德儒, 柏方茹, 徐嘉禧, 方昭訓 (2009) ”高能隙低電阻 Mg 摻雜 AZO 透明導電薄膜製備與性質” Annual Conference of the Chinese Society for Material Science.
44. 許銀驛, 柏方茹, 張詩沅, 鄭力綱, 邱敬富, 林庭誼, 方昭訓, 金重勳 (2009) ”5 nm Ta-Si-C 薄膜特性與銅製程整合” Annual Conference of the Chinese Society for Material Science.

45. 陳蓁慧, 洪士育, 林家輝, 方昭訓 (2009) ”超薄 Ta-C-N 薄膜特性與銅製程整合探討” Annual Conference of the Chinese Society for Material Science.
46. 蘇武加, 林家輝, 許銀驛, 黃孟碩, 林庭誼, 方昭訓, 金重勳 (2009) ”電漿表面改質 Ta-Si-C 三元合金薄膜之特性探討” Annual Conference of the Chinese Society for Material Science.
47. 鄭博元, 許銀驛, 鄭力綱, 蘇武加, 邱敬富, 方昭訓, 金重勳 (2009) ”超薄 (Ru-Ta)Si-C 非晶質擴散阻障層與銅製程整合特性研究” 熱處理年會
48. 陳蓁慧, 洪士育, 邱敬富, 方昭訓 (2009) ”超薄 TaCN 薄膜阻障層與銅製程整合特性探討” 熱處理年會
49. 駱煒翔, 徐嘉禧, 楊仁傑, 方昭訓 (2009) ”Mn:ZnO 透明導電氧化物與稀磁半導體薄膜之製備” 熱處理年會
50. 王梓育, 方昭訓 (2009) ”Cu(CoN)合金薄膜特性探討” 真空年會
51. 陳蓁慧, 洪士育, 邱敬富, 簡竹模, 方昭訓 (2009) ”3 nm Ta-C-N 阻障層特性與銅製程整合” 真空年會
52. 陳佑慈, 周瑋祖, 蘇武加, 方昭訓 (2008) ”自我鈍化型銅鉛合金薄膜抗氧化性及電性研究” Annual Conference of the Chinese Society for Material Science.
53. 黃智祥, 李逸群, 許禎祥, 方昭訓 (2008) ”共濺鍍製備 $\text{Cu}_{1-x}\text{Hf}_x$ 薄膜擴散阻礙特性之研究” Annual Conference of the Chinese Society for Material Science.
54. 林家輝, 邱敬富, 周瑋祖, 方昭訓 (2008) ”Ru/NiSi/Si 應用於銅接觸栓塞擴散阻障層之特性探討” Annual Conference of the Chinese Society for Material Science.
55. 謝維銘, 楊仁傑, 駱煒翔, 徐嘉禧, 方昭訓 (2008) ”化學鍍浴沉積法製備 ZnO 薄膜之性質” Annual Conference of the Chinese Society for Material Science.
56. 王梓育, 鍾德儒, 邱敬富, 李景恆, 方昭訓 (2008) ”In:AZO 透明導電薄膜之製備與性質” Annual Conference of the Chinese Society for Material Science.
57. 周瑋祖, 簡竣毅, 許禎祥, 方昭訓 (2008) ”自我鈍化型銅鎂合金薄膜電性及結構特性” Annual Conference of the Chinese Society for Material Science.
58. 陳蓁慧, 鄭博元, 洪士育, 邱敬富, 林庭誼, 方昭訓, 楊立中, 金重勳 (2008) ”Ta-Si-C 阻障層特性探討” Annual Conference of the Chinese Society for Material Science.

59. 詹媛婷, 張凱嵐, 鄭易承, 王漢瑜, 方昭訓 (2008) "添加少量銅元素之銀薄膜特性之研究" Annual Conference of the Chinese Society for Material Science.
60. 駱煒翔, 楊仁傑, 謝維銘, 徐嘉禧, 方昭訓 (2008) "化學鍍浴沉積製備 ZnO 透明導電薄膜之研製" Annual Meeting of TACT.
61. 陳蓁慧, 洪士育, 鄭博元, 鄭力綱, 邱敬富, 林庭誼, 方昭訓, 金重勳 (2008) "10 nm 之 Ta-Si-C 阻障層特性與銅製程整合探討" Annual Meeting of TACT.
62. 廖士運, 劉家瑋, 邱敬富, 方昭訓, 陳伯宜, 楊立中, 蘇孝農, 段安華, 葉冠成(2008) "超薄 AZO 阻障層特性探討" Annual Meeting of TACT.
63. 鄭博元, 陳蓁慧, 洪士育, 蘇武加, 邱敬富, 林庭誼, 方昭訓, 金重勳 (2008) "超薄 Ta-Si-C 非晶質薄膜之熱穩定性" Journal of Taiwan Society for Metal Heart Treatment.
64. 邱敬富, 林家輝, 林庭誼, 方昭訓, 楊立中, 金重勳 (2007) "超薄鈦矽化物銅製程阻障層特性探討" Annual Conference of the Chinese Society for Material Science.
65. 陳佑慈, 李逸群, 詹媛婷, 方昭訓, 李景恆, 許禎祥(2007) "自我鈍化型銅鉛合金薄膜抗氧化性及電性研究" Annual Conference of the Chinese Society for Material Science.
66. 方昭訓, 陳慧津, 黃智祥, 李景恆, 許禎祥 (2007) "熱處理對金屬靶製備氧化銦鋅薄膜性質之影響" Annual Conference of the Chinese Society for Material Science.
67. 洪伯賢, 王梓育, 王珮茹, 賴麗娟, 邱敬富, 李景恆, 許禎祥, 方昭訓 (2007) "摻雜 In 之 AZO 透明導電薄膜性質" Annual Conference of the Chinese Society for Material Science.
68. 徐永曄, 謝育倫, 邱敬富, 林家輝, 李景恆, 許禎祥, 方昭訓 (2007) "微量摻雜鉛之鈦薄膜阻障層特性探討" Annual Conference of the Chinese Society for Material Science.
69. J.S. Fang, M.L. Ker, H.C. Chen (2006) "Electrical characteristic and microstructure of ternary alloy $Ta_xCo_yN_z$ thin films deposited by reactive sputtering", Annual Conference of Taiwan Vacuum Society.
70. J.S. Fang, H.Y. Hsieh (2006) "自我鈍化型銅銦合金薄膜之固溶特性及電性之研究" Annual Conference of Taiwan Vacuum Society.

71. L. -C. Yang, C. Y. Cheng, **J. S. Fang**, W. Z. Chang , G. S. Chen (2006)” Characterization of polycrystalline CuInSe₂ thin films deposited by sputtering and evaporation as a function of composition” Annual Conference of Taiwan Vacuum Society.
72. **方昭訓**, 賴思宇 (2006) “鈷/氧化鈦顆粒合金多層薄膜的磁阻特性研究” Annual Conference of Taiwan Vacuum Society.
73. **J.S. Fang**, H. C. Chen (2006)” 氧化銦鋅(IZO)非晶質薄膜擴散阻礙特性與銅製程整合” Annual Conference of Taiwan Vacuum Society.
74. 林雍舜, 鄭仲祥, 李逸群, 蕭欣儀, 陳慧津, 李景恆, **方昭訓** (2006)”以 Zn:Al 金屬靶濺鍍沉積製備 Al:ZnO 薄膜之透明導電膜性質” Annual Conference of the Chinese Society for Material Science.
75. **方昭訓**, 陳慧津, 黃智祥, 楊立中, 李景恆 (2006)”金屬靶製備氧化銦鋅薄膜性質之影響” Annual Conference of the Chinese Society for Material Science.
76. **方昭訓**, 柯銘禮, 陳慧津(2006)” 利用 Ta-Co-N 作為銅製程擴散阻礙層之研究” Annual Conference of the Chinese Society for Material Science.
77. 林家輝, 陳枝政, 黃文良, 戴穎蓁, 陳慧津, **方昭訓**, 李景恆 (2006)”鎳矽化物銅製程阻障層之特性探討” Annual Conference of the Chinese Society for Material Science.
78. 紀宗佑, 廖敬期, 陳慧津, 李景恆, **方昭訓** (2006)”離子束濺鍍與磁控濺鍍製備 Ta 擴散阻礙層與銅製程之特性” Annual Conference of the Chinese Society for Material Scienc.
79. 李岳修, **方昭訓**, 楊立中(2006)”射頻交流磁控濺鍍 ZnO:Al 透明導電薄膜之材料特性與研究” Annual Conference of the Chinese Society for Material Science.
80. **方昭訓**, 賴思宇, 陳佑慈, 李景恆(2006)”不連續 Co/TiO₂ 顆粒合金多層薄膜的磁阻特性” Annual Conference of the Chinese Society for Material Science.
81. 李彥佑, 陳苡諺, 賴思宇, 李景恆, **方昭訓**(2006)”氧化銦絕緣層之製備與穿隧磁阻特性: Annual Conference of the Chinese Society for Material Science.
82. **J.S. Fang**, M.L. Ker, and T.P. Hsu (2005),” Phase formation and microstructure of amorphous Ta-Co-N thin films on Si substrates”, Annual Conference of the Chinese Society for Material Science.
83. **J.S. Fang**, H.Y. Hsieh (2005),” Structural and passive behaviors of Cu(In) thin film” Annual Conference of the Chinese Society for Material Science.

84. **J.S. Fang**, T.P. Hsu, C.H. Hsu and G.S. Chen, (2004) "Crystallization and failure behaviors of Ta-Ni nanostructured/amorphous diffusion barriers for copper metallization" Annual Conference of the Chinese Society for Material Science.
85. C.M. Zheng, S.H. Zeng, J.Y. Zhang, J.L. Zhang, J.W. Lin, Y.R. Li, T.P. Hsu, C.S. Hsu and **J.S. Fang**, (2004) "Diffusion barrier characteristics of amorphous Ta₅₀Fe₅₀ thin film prepared by a DC sputtering method", Annual Conference of the Chinese Society for Material Science.
86. T.H. Hsu, S.C. Zhang, P.J. Chen, B.Y. Chen, T.P. Hsu, C.S. Hsu and **J.S. Fang**, (2004) "Diffusion barrier properties of amorphous Ta-Co thin film for copper metallization", Annual Conference of the Chinese Society for Material Science.
87. **方昭訓**, 曾王坡, 許藻鏐, (2003) "Crystallization and failure behaviors of Ta-Co nanostructured/amorphous diffusion barriers for copper metallization" 材料年會論文集.
88. **方昭訓** "Evaluation of Sheet Resistance for 0.30 mm Titanium Self-Aligned Silicide Process by Design of Experimental Method" 材料年會論文集 (2002)
89. **方昭訓**、嚴楚才、王俊彬、林俊樺、陳錦山, (2001), "高溫現場沉積製作矽化鎳之熱穩定性", 真空科技年會論文
90. **方昭訓**、嚴楚才、王俊彬、林俊樺、鍾松畛、徐麒欽、陳錦山, (2001), "高溫現場沉積生成矽化鎳之活化能" 材料年會論文集
91. **J.S. Fang**, M.F. Ch

四、專利、專書或專書論文：

1. **方昭訓**、謝于飛、王宣閔 控制表面侷限氧化還原反應時間製備合金薄膜的方法 中華民國專利
2. **方昭訓**、柳璐明 積體電路之自動對準金屬矽化物製程 中華民國專利 發明第 126310 號。
專利權期間：中華民國九十年一月二十一日至二零八年一月二十五日止。
3. 柳璐明、**方昭訓** 自行對準矽化物製程中增加閘極有效長度的方法 中華民國專利 發明第 131956 號。
專利權期間：中華民國九十年五月一日至二零八年一月四日止。

4. 蔡騰群、方昭訓、柳璐明 防止閘極與源\汲極橋接之自行對準矽化物製程中
中華民國專利 發明第 123062 號。
專利權期間：中華民國八十九年十月二十一日至二零八年七月二日止。
5. 方昭訓、謝文益、游萃蓉 形成阻擋層的方法及形成的結構 中華人民共和國
專利 ZL 00128530.0。
專利權期間：2006 年 3 月 29 日至 2020 年 11 月 22 日止。(參考著作附件四十二)

四、專利、專書或專書論文：

1. 方昭訓、謝于飛、王宣閔 控制表面侷限氧化還原反應時間製備合金薄膜的方法 中華民國專利
2. 方昭訓、柳璐明 積體電路之自動對準金屬矽化物製程 中華民國專利 發明第 126310 號。
專利權期間：中華民國九十年一月二十一日至二零八年一月二十五日止。
3. 柳璐明、方昭訓 自行對準矽化物製程中增加閘極有效長度的方法 中華民國專利 發明第 131956 號。
專利權期間：中華民國九十年五月一日至二零八年一月四日止。
4. 蔡騰群、方昭訓、柳璐明 防止閘極與源\汲極橋接之自行對準矽化物製程中
中華民國專利 發明第 123062 號。
專利權期間：中華民國八十九年十月二十一日至二零八年七月二日止。
5. 方昭訓、謝文益、游萃蓉 形成阻擋層的方法及形成的結構 中華人民共和國
專利 ZL 00128530.0。
專利權期間：2006 年 3 月 29 日至 2020 年 11 月 22 日止。(參考著作附件四十二)

(一)參加國際學術研討會

1. 2009, Thermec, Berlin, Germany
2. 2009, TMS in San Francisco, U.S.A.
3. 2008, EUROMAT in Nuremberg, Germany.
4. 2008, 兩岸顆粒會議，上海，大陸。
5. 2007, ANSTO in Sidney, Australlia.
6. 2007, TMS in Orlendo, U.S.A.

7. 2006, 兩岸顆粒會議，北京，大陸。
8. 2005, EUROMAT in Pargue, C.Z.
9. 2005, TMS in San Francisco, U.S.A.
10. 2004, 兩岸顆粒會議，煙台，大陸。
11. 2003, Nano in Crete, Greece.
12. 2002, Intermag in Amsterdam, The Neatherland.
13. 2000, IITC in San Francisco, U.S.A.

(二)學術榮譽

1. 台灣熱處理年會論文-佳作 (2009) ”超薄(Ru-Ta)Si-C 非晶質擴散阻障層與銅製程整合特性研究 ” Journal of Taiwan Society for Metal Heart Treatment.
2. 台灣熱處理年會論文-第二名 (2008) ”超薄 Ta-Si-C 非晶質薄膜之熱穩定性” Journal of Taiwan Society for Metal Heart Treatment
3. 台灣鍍膜年會論文-佳作 (2008) ” 化學鍍浴沉積製備 ZnO 透明導電薄膜之研製 ” Annual Meeting of TACT
4. 台灣鍍膜年會論文-佳作 (2007) ”超薄鈮矽化物銅製程阻障層特性探討” Annual Meeting of TACT