Institution name:	National Pingtung University		
Contact person:	Chun-Rong, Lin	**TEL**	+886 8 7663800 # 33462
Contact information	crlinspin@gmail.com	**Personal website**	https://www.researchgate.net/profile/Chun-Rong-Lin

Brief Introduction to Prof. Lin's Lab.:

Prof. Lin's group study on the magnetic properties of magnetic materials. Including to make nano-magnetic particles in different ways (special chemical synthesis method), and further analyze their physical properties.

Competence in ■R&D □Manufacturing □ Software □ Services □ Testing domain

Capabilities:

Magnetic Materials
Core-shell Nanoparticles
Polymer nanocomposites
Magnetic Properties
Chemical Synthesis

Research projects: (2020~2021)

1. Electronic transport, magneto-optical and Mössbauer spectroscopy of monodisperse self-assembled cobalt-doped iron-manganite spinel nanoparticle arrays (2/3). MOST 110-2112-M-153-005-, 2021/08/01 ~ 2022/07/31
2. Electronic transport, magneto-optical and Mössbauer spectroscopy of monodisperse self-assembled cobalt-doped iron-manganite spinel nanoparticle arrays (1/3). MOST 109-2112-M-153-003-, 2020/08/01 ~ 2021/07/31
3. Magneto-plasmonic effect in spinel nanoparticles capsulated in carbon and noble metal shells. MOST 106-2112-M-153-001-MY3, 2017/08/01 ~ 2020/12/31
4. Multifunctional materials based on core-shell magnetic nanoparticles and magnetic nanoparticles/polymer nanocomposites. MOST 108-2923-M-153-001-MY3, 2019/01/01 ~ 2021/12/31

Publication: (2020~2021)

1. Chun-Rong Lin*, Oxana S. Ivanova*, Dmitry A. Petrov, Alexey E. Sokolov, Ying-Zhen Chen, Marina A. Gerasimova, Sergey M. Zharkov, Yaw-Teng Tseng, Nicolay P. Shestakov, Irina S. Edelman, (2021, Sep). Amino-functionalized Fe_3O_4@SiO_2 core-shell magnetic nanoparticles for dye adsorption, Nanomaterials, 11(9), 2371.
2. A.S.Fedorov, E.A.Kovaleva, A.E.Sokolov, M.A.Visotin, C.R.Lin, S.G.Ovchinnikov, (2021, Oct). Trimetallic magnetite-Ti-Au nanoparticle formation: A theoretical approach, Materials Chemistry and Physics, 271, 124847
3. Aleksandr Spivakov, Chun-Rong Lin*, Yu-Chuan Chang, Ying-Zhen Chen, (2021, May). Synthesis of $Fe_{1-x}S$ nanoparticles with various superstructures by a simple thermal decomposition route and their magnetic properties. Nanomaterials, 11(6), 1447
4. Ruslan D. Ivantsov*, Chun-Rong Lin*, Oxana S. Ivanova, Roman R. Altunin, Yuriy V. Knyazev, Maxim S. Molokeev, Sergey M. Zharkov, Ying-Zhen Chen, En-Szu Lin, Bing-Yi Chen, Nikolai P. Shestakov, Irina S. Edelman, (2021, May). Mössbauer and MCD spectroscopy of the Fe_3S_4 nanoparticles synthesized by the thermal decomposition method with two different surfactants, Current Applied Physics, 25, 55-61
5. Jiann-Shing Lee, Wen-Bin Wu, Jiunn Chen, Chi-Liang Chen, Hung-Wei Kuo, Chun-Rong Lin, Hong-Ji Lin, and Chien-Te Chen, (2021, Feb). Carbon encapsulation of magnetite nanoparticles enhances magnetism at room-temperature due to spin-polarized charge transfer. Applied Physics Letters, 118, 072403

6. Aleksandr Spivakov, Chun-Rong Lin*, Yu-Chuan Chang, Cheng-Chien Wang and Dmitriy Sarychev (2020, Sep). Magnetic and Magneto-Optical Oroperties of Iron Oxides Nanoparticles Synthesized under Atmospheric Pressure. Nanomaterials, 10(9), 1888-1~1888-14.
7. D.A. Petrov*, C.-R. Lin*, R.D. Ivantsov, S.G. Ovchinnikov, S.M. Zharkov, G.Y. Yurkin, D.A. Velikanov, Y.V. Knyazev, M.S. Molokeev, Y.-T. Tseng, E.-S. Lin, I.S. Edelman, A.O. Baskakov, S.S. Starchikov, I.S. Lyubutin (2020, Jul). Characterization of the iron oxide phases formed during the synthesis of core-shell Fe_xO_y@C nanoparticles modified with Ag. Nanotechnology, 31, 395703.

Institution name:	**Magneto-Opto-Electronics Laboratory, National Pingtung University**		
Contact person:	Hua Shu, Hsu	**Website:**	https://sites.google.com/view/nptu-thinfilmlab-huashuhsu
Contact information	hshsu@mail.nptu.edu.tw		

Short description of the institution:
The Magneto-Opto-Electronics group (Principal Investigator: Prof. Hua-Shu Hsu) is a research group in the Department of Applied Physics at the National Pingtung University, Taiwan. Our research focuses on the development and physical characterization of new functional materials with novel spin-polarized band structures that induce desirable photophysical properties for magneto-optoelectronics and Spin-polarized catalysts applications.

Competence in ✓R&D

Capabilities:

1. **Magneto-optical technique**
2. **Spintronics related measurements**
3. **Thin film deposition**
4. **Nanomaterial fabrication**

Relevant projects: (in recent 3 years)

Project Name: Controlling the Mechanism of Carrier polarization and Related Magneto-Optical Phenomena in Hybrid Semiconductor Nanostructure Studied by MCD Spectroscopy
In this proposal, how to control the mechanism of carrier polarization in hybrid nanostructure integrated by magnetoplasmonic materials and semiconductors will be investigated by magnetic circular dichroism spectroscopy. The related magneto-optical phenomena, such as magnetoabsorption, will also be studied for further magnetic field controlled optoelectronic applications
(Prof. Hsu, 2019-2022)

Project Name: The charge transfer and microbiological interactions of hybrid metal oxide nanostructures (Czech-Taiwan joint research project supported by CSF&MOST)
To clarify the relation between physical and chemical properties of hybrid metal oxide nanostructures and microbiological interactions processes responsible for biosensor performance (biomolecule adsorption, surface properties, surface functionalization, electronic states, defects role, etc.) (dr. Remes, prof. Rezek, prof. Hsu, 2019-21)

I am interested in:
1. **Energy and Environment issue: Spin-polarized catalysts**

Jun-Xiao Lin†, Jutathip Thaomonpun†, Voranuch Thongpool, Wei-Jhong Chen, Chien-Hua Huang, Shih-Jye Sun, Zdenek Remes, Yaw-Teng Tseng, Yen-Fa Liao*, and **Hua-Shu Hsu***," Enhanced Photodegradation in Metal Oxide Nanowires with Co-Doped Surfaces under a Low Magnetic Field." ***ACS Appl. Mater. Interfaces***, 13, 19, 23173 (2021).

2. Emerging Materials: 2D perovskite

Tzu-Pei Chen†, Jun-Xiao Lin†, Cheng-Chieh Lin, Chi-Ying Lin, We-Chen Ke, Di-Yan Wang, **Hua-Shu Hsu***, Chia-Chun Chen, and Chun-Wei Chen*, "Strong Excitonic Magneto-Optic Effects in Two-Dimensional Organic–Inorganic Hybrid Perovskites." ***ACS Appl. Mater. Interfaces***, 13, 8, 10279 (2021).

3. Spintronics: Electrical control magnetism

Wan-Hsiu Chang Chien, Jing-Ya Huang, Jun-Xiao Lin,Yen-Fa Liao*, Hung-Wen Su, Hsia-Ling Liang, Ssu-Yen Huang,Yeong-Der Yao, **Hua-Shu Hsu***, "Low Current Densities Toggle Optical Polarization Switching in Pt/Yttrium Iron Garnet Magnetic Heterostructures Using Energy Resolution." ***Phys. Status Solidi Rapid Res. Lett.***, 14, 2000223 (2020).

Institution name:	National Pingtung University		
Contact person:	Wen-Jen Lee	**Website:**	https://www.researchgate.net/profile/Wen_Jen_Lee
Contact information	wenjenlee@mail.nptu.edu.tw		Department of Applied Physics, NPTU, TAIWAN.

Brief Introduction to Prof. LEE's Lab.:

Prof. Lee's group is mainly engaged in the development and application of functional thin film materials and nanomaterials. Including the use of atomic layer deposition (ALD), electrochemical deposition, and hydrothermal process to fabricate functional materials and apply them to optoelectronic devices and electrochemical energy storage devices. Recently, Prof. Lee's group mainly engaged in surface modification of graphite felts and applied to vanadium redox flow batteries (VRFBs), supercapacitors and metal-ion batteries.

Competence in ■R&D ☐Manufacturing ☐ Software ☐ Services ☐ Testing domain

Capabilities:

Thin Films Engineering and Technology
Atomic Layer Deposition
Material Characterization
Nanomaterials
Electrochemical Energy Storage Materials & Devices
Semiconductors
Optoelectronic Materials & Devices

Relevant projects:

1. Graphite felts modified by atomic layer deposited nitrogen-doped titanium dioxide nanocoatings for high performance electrodes of vanadium redox flow batteries, Project number: MOST 110-2221-E-153-004, 2021/08/01 ~ 2022/07/31. (PI)
2. Research on Surface Modification and Application of Graphite Felts, Project number: MOST 109-2622-E-153-001, 2020/11/01 ~ 2021/10/31. (PI)
3. Development of high surface area vanadium oxide coatings by atomic layer deposition for energy storage electrode, Project number: MOST 108-2622-E-153-001-CC3, 2019/06/01 ~ 2020/05/31. (PI)
4. Process development of two-stage atomic layer deposition for porous vanadium oxide films and its application of fabricating energy-storage-electrodes with high-surface-area, Project number: MOST 106-2622-E-153-002-CC3, 2017/11/01 ~ 2018/10/31. (PI)
5. The growth characteristics and properties of vanadium oxide films by atomic layer deposition (II), Project number: MOST 106-2221-E-153-004, 2017/08/01 ~ 2018/07/31. (PI)
6. The growth characteristics and properties of vanadium oxide films by atomic layer deposition, Project number: MOST 105-2221-E-153-001, 2016/08/01 ~ 2017/07/31. (PI)
7. Low-temperature growth of TiO_2 film on polycabonate substrate by atomic layer deposition, Project number: MOST 105-2622-E-153-003-CC3, 2016/06/01 ~ 2017/05/31. (PI)
8. Research and Development of high-performance ultraviolet photodetector based on solid-liquid heterojunction, Project number: MOST 104-2221-E-153-003, 2015/08/01 ~ 2016/07/31. (PI)

9. The studies of TiO_2 films grown on FTO-glass substrates by atomic layer deposition and their application for UV-light photodetectors (II), Project number: MOST 104-2221-E-153-003, 2014/08/01 ~ 2015/07/31. (PI)
10. The studies of TiO_2 films grown on FTO-glass substrates by atomic layer deposition and their application for UV-light photodetectors, Project number: NSC 102-2218-E-153-001, 2013/10/01 ~ 2014/09/30. (PI)

I am interested in:

Vanadium Redox Flow Batteries (VRFBs), Fuel Cells, Supercapacitors, Metal-ion Batteries, Solar Cells, Photodetectors, Photoelectrochemical hydrogen production, Electrochemical Energy Materials, Optoelectronic Materials, Oxide-based Semiconductors, Atomic Layer Deposition (ALD), Thin Films Technology.

Institution name:	Department of Applied Chemistry, National Pingtung University	
Contact person:	Jong-Chin Huang	**Website:** https://ac.nptu.edu.tw/p/412-1137-63.php?Lang=zh-tw
Contact information	hjc@mail.nptu.edu.tw	

Short description of the institution:

In my lab, we have two main research topics. First one is using biochemical analysis, molecular biology techniques and multiple endpoints to evaluate environmental ecotoxicity of chemicals or novel materials. We use aquatic animals (Zebrafish and Daphnia) as assessment platform to conduct different experiments. Second topic is deciphering the genes' functions which are correlated with pollen's development and germination. We cloned some novel genes from the specific cDNA library by performing lab-made microarray chip experiment. Many genes seem having unique function during pollen germination.

Competence in ✓R&D ☐Manufacturing ☐ Software ☐ Services ☐ Testing domain

Capabilities:
Molecular biology,
Cell biology,
Toxicity assessment with multiple endpoints using aquatic animals as model organisms

Relevant projects:

1. Kumail Abbas, Ferry Saputra, Michael Edbert Suryanto, Yu-Heng Lai, Jong-Chin Huang, Wen-Hao Yu, Kelvin H.-C. Chen*, Ying-Ting Lin* and Chung-Der Hsiao* (2021, Sep). Evaluation of Effects of Ractopamine on Cardiovascular, Respiratory, and Locomotory Physiology in Animal Model Zebrafish Larvae. *Cells*, 10(9), 2449. (SCI, Q2: Cell Biology).
2. Nemi Malhotra†, Kelvin H.-C. Chen†, Jong-Chin Huang, Hong-Thih Lai, Boontida Uapipatanakul, Marri Jmelou M. Roldan, Allan Patrick G. Macabeo*, Tzong-Rong Ger* and Chung-Der Hsiao* (2021, Sep). Physiological Effects of Neonicotinoid Insecticides on Non-Target Aquatic Animals—An Updated Review. *International Journal of Molecular Sciences*, 22(17), 9591. (SCI, Q1: Biochemistry & Molecular Biology).
3. Gilbert Audira, Yu-Heng Lai, Jong-Chin Huang, Kelvin H.-C. Chen and Chung- Der Hsiao* (2021, Aug). Phenomics Approach to Investigate Behavioral Toxicity of Environmental or Occupational Toxicants in Adult Zebrafish (Danio rerio). *Current Protocols*, 1(8):e223.
4. Kevin Adi Kurnia, Fiorency Santoso, Bonifasius Putera Sampurna, Gilbert Audira, Jong-Chin Huang, Kelvin H.-C. Chen* and Chung-Der Hsiao* (2021, Aug). TCMacro: A Simple and Robust ImageJ-Based Method for Automated Measurement of Tail Coiling Activity in Zebrafish. *Biomolecules*, 11(8), 1133. (SCI, Q2: Biochemistry & Molecular Biology).
5. Ferry Saputra†, Boontida Uapipatanakul†, Jiann-Shing Lee†, Shih-Min Hung, Jong-Chin Huang, Yun-Chieh Pang, John Emmanuel R. Muñoz, Allan Patrick G. Macabeo*, Kelvin

H.-C. Chen* and Chung-Der Hsiao* (2021, Jul). Co- Treatment of Copper Oxide Nanoparticle and Carbofuran Enhances Cardiotoxicity in Zebrafish Embryos. *International Journal of Molecular Sciences*, 22(15), 8259. (SCI, Q1: Biochemistry & Molecular Biology).

6. Ferry Saputra†, Yu-Heng Lai†, Rey Arturo T. Fernandez, Allan Patrick G. Macabeo, Hong-Thih Lai*, Jong-Chin Huang*, and Chung-Der Hsiao* (2021, Jun). Acute and Sub-Chronic Exposure to Artificial Sweeteners at the Highest Environmentally Relevant Concentration Induce Less Cardiovascular Physiology Alterations in Zebrafish Larvae. *Biology*, 10, 548. (SCI, 19/93 (Q1), Biology). MOST 107-2633-B-153-001. 本人為通訊作者.

7. Gilbert Audira, Petrus Siregar, Kelvin H.-C. Chen, Marri Jmelou M. Roldan, Jong-Chin Huang*, Hong-Thih Lai* and Chung-Der Hsiao* (2021, May). Interspecies Behavioral Variability of Medaka Fish Assessed by Comparative Phenomics. *International Journal of Molecular Sciences*, 22, 5686. (SCI, 74/297 (Q1), Biochemistry & Molecular Biology). MOST 107-2633-B-153-001. 本人為通訊作者.
8. Gilbert Audira†, Jiann-Shing Lee†, Petrus Siregar†, Nemi Malhotra, Marri Jmelou M Rolden, Jong-Chin Huang, Kelvin H-C Chen, Hua-Shu Hsu, Yuchun Hsu, Tzong-Rong Ger, and Chung-Der Hsiao* (2021, Mar). Comparison of the chronic toxicities of graphene and graphene oxide toward adult zebrafish by using biochemical and phenomic approaches. *Environmental Pollution*, 278,116907. (SCI, 21/265(Q1), ENVIRONMENTAL SCIENCES).
9. Kelvin H.-C. Chen, Jong-Chin Huang* and Yu-Hsien Liao (2021, Mar). Sustainable Combination Mechanism for Catalysts: A Game-Theoretical Approach. *Catalysts*. (SCI, 65/159 (Q2), Chemistry, Physical). 本人為通訊作者.
10. Petrus Siregar, Michael Edbert Suryanto, Kelvin H.-C. Chen, Jong-Chin Huang, Hong-Ming Chen, Kevin Adi Kurnia, Fiorency Santoso, Akhlaq Hussain, Bui Thi Ngoc Hieu, Ferry Saputra, Gilbert Audira, Marri Jmelou M. Roldan, Rey Arturo Fernandez, Allan Patrick G. Macabeo*, Hong-Thih Lai*, and Chung-Der Hsiao* (2021, Mar). Exploiting the Freshwater Shrimp Neocaridina denticulata as Aquatic Invertebrate Model to Evaluate Nontargeted Pesticide Induced Toxicity by Investigating Physiologic and Biochemical Parameters. *Antioxidants*, 10(3), 391. (SCI, 7/61 (Q1), Medicinal Chemistry; 10/139 (Q1), Food Science & Technology; 56/297 (Q1), Biochemistry & Molecular Biology).
11. Kevin Adi Kurnia†, Ferry Saputra†, Marri Jmelou M. Roldan, Agnes L. Castillo, Jong-Chin Huang, Kelvin H.-C. Chen*, Hong-Thih Lai*, and Chung-Der Hsiao* (2021, Jan). Measurement of Multiple Cardiac Performance Endpoints in Daphnia and Zebrafish by Kymograph. *Inventions*, 6(1), 8.
12. Fiorency Santoso†, Ali Farhan†, Agnes L. Castillo, Nemi Malhotra, Ferry Saputra, Kevin Adi Kurnia, Kelvin H.-C. Chen, Jong-Chin Huang* , Jung-Ren Chen* and Chung-Der Hsiao* (2020, Sep). An Overview of Methods for Cardiac Rhythm Detection in Zebrafish. *Biomedicines*, 8(9), 329. (SCI, 30/138 (Q1), Medicine, Research & Experimental; 36/270 (Q1), Pharmacology & Pharmacy). MOST 106-2633-B-153-001. 本人為通訊作者.
13. Gilbert Audira†, Nguyen Thi Ngoc Anh†, Bui Thi Ngoc Hieu, Nemi Malhotra, Petrus Siregar, Omar Villalobos, Oliver B. Villaflores, Tzong-Rong Ger, Jong- Chin Huang, Kelvin H.-C. Chen* and Chung-Der Hsiao* (2020, Sep). Evaluation of the Adverse Effects of Chronic Exposure to Donepezil (An Acetylcholinesterase Inhibitor) in Adult

Zebrafish by Behavioral and Biochemical Assessments. *Biomolecules*, 10(9), 1340. (SCI, 98/297 (Q2) in Biochemistry & Molecular Biology).

14. Akhlaq Hussain†, Gilbert Audira†, Nemi Malhotra, Boontida Uapipatanakul , Jung-Ren Chen, Yu-Heng Lai, Jong-Chin Huang, Kelvin H.-C. Chen*, Hong- Thih Lai* and Chung-Der Hsiao* (2020, Aug). Multiple Screening of Pesticides Toxicity in Zebrafish and Daphnia Based on Locomotor Activity Alterations. *Biomolecules*, 10(9), 1224. (SCI, 98/297 (Q2), Biochemistry & Molecular Biology).
15. Gilbert Audira, Petrus Siregar, Stefan-Adrian Strungaru, Jong-Chin Huang* and Chung-Der Hsiao* (2020, Aug). Which Zebrafish Strains Are More Suitable to Perform Behavioral Studies? A Comprehensive Comparison by Phenomic Approach. *Biology*, 9(8), 200. (SCI, 19/93 (Q1), Biology). MOST 106-2633-B- 153-001. 本人為通訊作者.
16. Petrus Siregar†, Stevhen Juniardi†, Gilbert Audira, Yu-Heng Lai, Jong-Chin Huang, Kelvin H.-C. Chen*, Jung-Ren Chen* and Chung-Der Hsiao* (2020, Aug). Method Standardization for Conducting Innate Color Preference Studies in Different Zebrafish Strains. *Biomedicines*, 8(8), 271. (SCI, 30/138 (Q1), Medicine, Research & Experimental; 36/270 (Q1), Pharmacology & Pharmacy).
17. Gilbert Audira, Petrus Siregar, Jung-Ren Chen, Yu-Heng Lai, Jong-Chin Huang, Chung-Der Hsiao* (2020, Jul). Systematical exploration of the common solvent toxicity at whole organism level by behavioral phenomics in adult zebrafish. *Environmental Pollution*, 266(Pt 1), 115239. (SCI, 21/265(Q1), ENVIRONMENTAL SCIENCES).
18. Nemi Malhotra†, Tzong-Rong Ger†, Boontida Uapipatanakul, Jong-Chin Huang, Kelvin H.-C. Chen* and Chung-Der Hsiao* (2020, Jun). Review of Copper and Copper Nanoparticle Toxicity in Fish. *Nanomaterials*, 10(6), 1126. (SCI, 147/460 (Q1), General Materials Science; 73/281 (Q1), General Chemical Engineering).
19. Ngoc Hieu Bui Thi, Ngoc Anh Nguyen Thi, Gilbert Audira, Petrus Siregar, Sung- Tzu Liang, Jong-Chin Huang* and Chung-Der Hsiao* (2020, Mar). Chronic Exposure to Low Concentration Lead Chloride-Induced Anxiety and Loss of Aggression and Memory in Zebrafish. *International Journal of Molecular Sciences*, 21(5), 1844. (SCI, 74/297 (Q1), Biochemistry & Molecular Biology). MOST 106-2633-B-153-001. 本人為通訊作者.
20. Ngoc Hieu Bui Thi, Ngoc Anh Nguyen Thi, Gilbert Audira, Stevhen Juniardi, Rhenz Alfred D. Liman, Oliver B. Villaflores, Yu-Heng Lai, Jung-Ren Chen, Sung-Tzu Liang, Jong-Chin Huang* and Chung-Der Hsiao* (2020, Feb). Development of a Modified Three-Day T-maze Protocol for Evaluating Learning and Memory Capacity of Adult Zebrafish. *International Journal of Molecular Sciences*, 21(4), 1464. (SCI, 74/297 (Q1), Biochemistry & Molecular Biology). MOST 107-2633-B-153-001. 本人為通訊作者.
21. Kenneth Y T Lim, Kelvin H.-C. Chen, Sheau-Wen Lin, Jong-Chin Huang, Kristal S-E Ng, Joel J L Ng, Yifei Wang and Nicholas Woong (2018, Dec). Representations of Novice Conceptions with Learner-Generated Augmentation: A Framework for Curriculum Design with Augmented Reality. *Journal of Virtual World Research*, Vol. 11, No. 3.

I am interested in:

We used neurobehavioral and biochemical methodology to perform ecotoxicity assessment of emerging pollutants in zebrafish and Daphnia. By multiple behavioral endpoints obtained from novel tank exploration, mirror biting, predator avoidance, social interaction, shoaling, color preference, circadian rhythm, short-term memory tests, and combined with biochemical analysis, we can evaluate emerging pollutant's ecotoxicity.