Ting-Wei Chen 陳挺煒

Associate Professor, Semiconductor Materials Science in Master Program of College of Science

886-8-7663800 Ext. 35513

twchen@mail.nptu.edu.tw

Room 209, Liou Ai Building, Pingshih Campus

Computational Photonics Laboratory

Research Field

Computational optoelectronics

Exciton-polariton physics

Education

Ph. D., Department of Photonics, National Cheng Kung University, R.O.C.(Taiwan)

Publications

1.1 Journal Papers

1.1.1 Minh-Loi Le and Ting-Wei Chen* (2025, Sep). Thickness-dependent bandgap engineering of multi-layer 2D molybdenum disulfide. *Results in Physics*, 76, 108372.

1.1.2 Szu-Cheng Cheng, Shih-Da Jheng and Ting-Wei Chen* (2025, Jul). Periodically driven Floquet time crystal of homogeneous exciton-polariton condensate. *Optics Continuum*, Volume 4, Number 7, 1325.

1.1.3 Szu-Cheng Cheng, Shih-Da Jheng and Ting-Wei Chen* (2025, Jun). Discrete photonic time crystals in a parametrically driven exciton-polariton system with a periodic potential. *Physica Scripta*, Volume 100, Number 7, 075504.

1.1.4 Szu-Cheng Cheng, Shih-Da Jheng and Ting-Wei Chen* (2024, Jul). Topological excitation of exciton-polariton half-vortices and skyrmions in a magnetic field with TE-TM splitting. *Physics Letters A*, 512, 129600.

1.1.5 Szu-Cheng Cheng, Shih-Da Jheng, and Ting-Wei Chen* (2024, Jun). Realization of photonic time crystals via spin bifurcations of exciton-polariton condensates. *Optics Express*, Vol. 32, Issue 13, pp. 23524-23535..

1.1.6 Yu-Yen Tsai and Ting-Wei Chen* (2024, Mar). Optical design of reflective Bragg mirrors for EUV photolithography. *Journal of Optics*, 26(4), 045803.

1.1.7 Szu-Cheng Cheng and Ting-Wei Chen* (2024, Feb). Compact gap solitons and compact edge states of exciton–polariton condensates with spin–orbit coupling in a one-dimensional flatband lattice. *Journal of Physics B: Atomic, Molecular and Optical Physics*, 57, 025401.

1.1.8 Ting-Wei Chen and Szu-Cheng Cheng (2024, Feb). Nonequilibrium spinor exciton-polariton condensates in a magnetic field. *Physica Scripta*, 99(3), 035534.

1.1.9 Szu-Cheng Cheng and Ting-Wei Chen* (2024, Feb). Compact gap solitons and compact edge states of exciton-polariton condensates with spin-orbit coupling in a one-dimensional flatband lattice. *Journal of Physics B: Atomic, Molecular and Optical Physics*, 57, 025401.

1.1.10 Shih-Da Jheng, Ting-Wei Chen and Szu-Cheng Cheng* (2022, Sep). Spontaneous giant vortices and circular supercurrents in a trapped exciton–polariton condensate. *Optics Express*, Vol. 30, Issue 20, pp. 35325-35337.

1.1.11 Shih-Da Jheng, Ting-Wei Chen and Szu-Cheng Cheng* (2022, Jun). Rotating vortex lattices mimicking a time crystal in a trapped exciton-polariton condensate. *Chinese Journal of Physics*, 77, 2576-2581.

1.1.12 Szu-Cheng Cheng, Shih-Da Jheng, and Ting-Wei Chen* (2021, Nov). Half skyrmions with higher topological quantum numbers in homogeneous exciton polariton condensates. *Physical Review E*, 104, 054216.

1.1.13 Szu-Cheng Cheng, Shih-Da Jheng, and Ting-Wei Chen* (2021, Jan). Synchronized full vortices as topological spin-Meissner states in spinor exciton polariton condensates. *Journal of the Optical Society of America B*, Vol. 38, Issue 2, pp. 544-549.

1.1.14 Szu-Cheng Cheng and Ting-Wei Chen* (2020, Mar). Topological spin-Meissner states in nonequilibrium polariton condensates. *Physical Review B*, 101, 125304.

1.1.15 Szu-Cheng Cheng, Shih-Da Jheng and Ting-Wei Chen* (2020, Jan). Ring-vortex solitons and their stabilities in microcavity polariton condensates. *Journal of Physics B: Atomic, Molecular and Optical Physics*, 53, 045401.

1.1.16 Szu-Cheng Cheng, Shih-Da Jheng and Ting-Wei Chen* (2020, Jan). Nonequilibrium localized states at an interface between two mismatched potentials of exciton-polariton condensates. *Physica E: Low-dimensional Systems and Nanostructures*, Volume 115, 113651.

1.1.17 Shih-Da Jheng, Szu-Cheng Cheng and Ting-Wei Chen* (2019, Oct). Ring dark solitons in microcavity polariton condensates. *Solid State Communications*, Volume 300, 113695.

1.1.18 Ting-Wei Chen and Szu-Cheng Cheng (2018, Sep). Surface gap solitons in exciton polariton condensates. *Physical Review E*, 98, 032212.

1.1.19 Szu-Cheng Cheng and Ting-Wei Chen* (2018, Mar). Dark gap solitons in exciton polariton condensates in a periodic potential. *Physical Review E*, 97, 032212.

1.1.20 Ting-Wei Chen, Szu-Cheng Cheng (2018, Jan). Polariton solitons and nonlinear localized states in a one-dimensional semiconductor microcavity. *Physical Review E*, 97, 012218.

1.1.21 Ting-Wei Chen, Shih-Da Jheng, T F Jiang and Szu-Cheng Cheng (2017, Jan). Quantum fluctuations and stability of vortex lattices in a nonresonantly pumped exciton polariton condensate. *Journal of Physics: Condensed Matter*, 29, 1-8.

1.2 Conference Papers

1.2.1 Ting-Wei Chen, Shih-Da Jheng and Szu-Cheng Cheng (2023, Jul). Theoretical realization of half-vortices and skyrmions of exciton-polariton in a magnetic field. PIERS 2023, Prague, Czech Republic.

1.2.2 Ting-Wei Chen, Shih-Da Jheng and Szu-Cheng Cheng (2019, Jul). Realization of ring-type time crystals in a trapped exciton-polariton condensate. PLMCN20, Moscow, Russia.

1.2.3 Ting-Wei Chen and Szu-Cheng Cheng (2018, Aug). Optical Properties of Spinor Exciton-polariton Condensates in a Magnetic Field. Photonics & Electromagnetics Research Symposium (PIERS 2018), Toyama, Japan.

1.2.4 Ting-Wei Chen* and Szu-Cheng Cheng (2017, Jul). Instability of two-dimensional ring dark solitons in microcavity polariton condensates (PLMCN18). 18th International Conference on Physics of Light-Matter Coupling in Nanostructures, Wurzburg, Germany.

Academic Projects

2.1 MOST Projects (In recent years)

2.1.1 Project Principal Investigator

General research project:

2.1.1.1 New material optical exploration on photomasks for EUV photolithography. (NSTC 114-2112-M-153-001- ; Execution duration：2025/8/01 ~ 2026/07/31).

2.1.1.2 Study on physical phenomena arising from spinor polariton condensates with periodicity and flat energy bands. (NSTC 113-2112-M-034-001- ; Execution duration：2024/08/01 ~ 2026/04/30) [Co-Principal Investigator].

2.1.1.3 Pumped and dissipative nonlinear phenomena in exciton-polariton condensates. (MOST 105-2112-M-415-009-MY3 ; Execution duration：2016/10/01 ~ 2019/07/31).

2.1.1.4 Optical manipulation of skyrmions and spatial polarization patterns in spinor polariton microcavities. (MOST 108-2112-M-415-003- ; Execution duration：2019/08/01 ~ 2020/07/31).

2.1.1.5 Optical manipulated polarization textures of polariton condensates in semiconductor microcavities (1/2). (MOST 109-2112-M-415-004- ; Execution duration：2020/08/01 ~ 2021/07/31).

2.1.1.6 Optical manipulated polarization textures of polariton condensates in semiconductor microcavities (2/2). (MOST 110-2112-M-415-004- ; Execution duration：2021/08/01 ~ 2023/07/31).

2.1.1.7 Realization of time crystals in nonequilibrium exciton-polariton condensates. (MOST 111-2112-M-415-002- ; Execution duration：2022/08/01 ~ 2024/07/31).

Relevant Experience

3.1 Industrial Experience

3.1.1 Taiwan Semiconductor Manufacturing Company, Principal Engineer; Job duration：1999/06 ~ 2009/02.

3.2 Academic Experience

3.2.1 Department of Photonics, National Cheng Kung University, PhD program; Academic duration：2009/09 ~ 2014/06.

3.2.2 Department of Optoelectric Physics, Chinese Culture University, Postdoctoral Research Fellow; Job duration：2014/08 ~ 2016/07.

3.3 Teaching Experience

3.3.1 Department of Electrophysics, National Chiayi University, Non-tenure-track Assistant Professor; Job duration：2016/08 ~ 2022/07.

3.3.2 Semiconductor Materials Science in Master Program of College of Science, National Pingtung University, Assistant Professor; Job duration：2022/08 ~2023/07.

3.3.3 Semiconductor Materials Science in Master Program of College of Science, National Pingtung University, Associate Professor; Job duration：2023/08 ~.

Updated:2025/9/18