Te-Sheng Lin (林得勝)

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National Yang Ming Chiao Tung University
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Appointments

Associate Professor, Department of Applied Mathematics, Feb. 2021 - present
National Yang Ming Chiao Tung University, Taiwan.

Joint Appointment Associate Professor, Feb. 2022 - present
Institute of Data Science and Engineering,
National Yang Ming Chiao Tung University, Taiwan.

Associate Professor, Department of Applied Mathematics, Aug. 2020 - Jan. 2021
National Chiao Tung University, Taiwan.

Assistant Professor, Department of Applied Mathematics, Aug. 2014 - Jul. 2020
National Chiao Tung University, Taiwan.

Research Associate, Department of Mathematical Sciences, Dec. 2012 - Jul. 2014
Loughborough University, UK.

Marie Curie Experienced Researcher, Department of Mathematical Sciences, Jun. 2012 - Dec. 2012
Loughborough University, UK.

Education

New Jersey Institute of Technology, USA
Ph.D. in Applied Mathematics Sep. 2007 - May. 2012
Dissertation: "Instabilities in Newtonian films and nematic liquid crystal droplets."
Advisors: Dr. Lou Kondic and Dr. Linda J. Cummings

National Chung-Cheng University, Taiwan
M.S. in Applied Mathematics Sep. 2002 - Jun. 2004
Thesis: "Numerical methods for the nonlinear Schrödinger equation."
Advisor: Dr. Ming-Chih Lai

B.S. in Mathematics Sep. 1998 - Jun. 2002

Research Interests

Scientific computation; Mathematical modeling; Scientific machine learning.

Prizes and Awards:

3. 國立陽明交通大學 109 學年度優良教學獎 2021
2. 國立交通大學 108 學年度優良教學獎 2020
1. 國立交通大學理學院年輕學者研究獎 2019

Grants

10. MOST 111-2628-M-A49-008-MY4, (PI) Aug. 2022 - Jul. 2026
    Data-driven mathematical modeling

9. MOST 109-2115-M-075-001, (Co-PI) Aug. 2020 - Jul. 2021
    Integrating Time-Frequency Information with Pulse Waveform Manifold Learning via Optimal Transportation for Cardiovascular Signal Analysis

8. MOST 109-2115-M-009-006-MY2, (PI) Aug. 2020 - Jul. 2022
    Liquid films on curved substrates

7. MOST 108-2115-M-075-001, (Co-PI) Aug. 2019 - Jul. 2020
    Building knowledge base for manifold learning in medical diagnosis in clinical anesthesiology

6. MOST 107-2115-M-075-001, (Co-PI) Aug. 2018 - Jul. 2019
    Manifold learning for human circulation system modeling in clinical anesthesiology and critical care

5. MOST 107-2115-M-009-008-MY2, (PI) Aug. 2018 - Jul. 2020
    Bifurcation analysis of electrified falling liquid films

4. MOST 106-2115-M-075-001, (Co-PI) Aug. 2017 - Jul. 2018
    Momentary pulse waveform analysis and human cardiovascular system modeling for clinical anesthesiology

3. MOST 105-2115-M-009-008-MY2, (PI) Aug. 2016 - Jul. 2018
    Modeling thin nematic films: Weak anchoring model

2. MOST 105-2115-M-341-001-MY2, (Co-PI) Feb. 2016 - Jul. 2017
    Human cardiovascular system modeling for beat-to-beat pulse waveform analysis in clinical anesthesia

1. MOST 103-2115-M-009-015-MY2, (PI) Oct. 2014 - Jul. 2016
    Interaction theory for solitary pulses arising in falling film flows

Refereed Publications

29. A. Round, T.-S. Lin, M. Pradas, D. Tseluiko and S. Kalliadasis, Coherent structure interactions driven by excited hidden modes, submitted (2023).

28. Y.-H. Tseng, T.-S. Lin, W.-F. Hu and M.-C. Lai, A cusp-capturing PINN for elliptic interface problems, submitted (2022).

27. W.-F. Hu, Y.-J. Shih, T.-S. Lin and M.-C. Lai, A shallow physics-informed neural network for solving partial differential equations on surfaces, submitted (2022).

26. J.-J. Tsai, C.-C. Chang, D.-Y. Huang, T.-S. Lin and Y.-C. Chen, Analysis and classification of coffee beans using single coffee bean mass spectrometry with machine learning strategy, *Food Chemistry*, **426**, 136610 (2023).

25. W.-F. Hu, T.-S. Lin, Y.-H. Tseng and M.-C. Lai, An efficient neural-network and finite-difference hybrid method for elliptic interface problems with applications, *Commun. Comput. Phys.*, **33**, 1090-1105 (2023).

24. M. G. Blyth, T.-S. Lin and D. Tseluiko, On the transition to dripping of an inverted liquid film, *J. Fluid Mech.*, **958**, A46 (2023).

23. A. Farutin, S. M. Rizvi, W.-F. Hu, T.-S. Lin, S. Rafai and C. Misbah, A reduced model for a phoretic swimmer, *J. Fluid Mech.*, **952**, A6 (2022).

22. W.-F. Hu, T.-S. Lin, and M.-C. Lai, A discontinuity capturing shallow neural network for elliptic interface problems, *J. Comput. Phys.*, **469**, 111576 (2022).

21. M.-C. Lai, C.-C. Chang, W.-S. Lin, W.-F. Hu and T.-S. Lin, A shallow Ritz method for elliptic problems with singular sources, *J. Comput. Phys.*, **469**, 111547 (2022).

20. W.-F. Hu, T.-S. Lin, S. Rafai and C. Misbah, Spontaneous locomotion of phoretic particles in three dimensions, *Phys. Rev. Fluids*, **7**, 034003 (2022).

19. T.-S. Lin, J.A. Dijksman and L. Kondic, Thin liquid films in a funnel, *J. Fluid Mech.*, **924**, A26 (2021).

18. D. Tseluiko, M. Alesemi, T.-S. Lin, and U. Thiele, Effect of driving on coarsening dynamics in phase-separating systems, *Non.*, **33**, 4449-4483 (2020).

17. T.-S. Lin, W.-F. Hu, and C. Misbah, A direct Poisson solver in spherical geometry with an application to diffusiophoretic problems, *J. Comput. Phys.*, **409**, 109362 (2020).

16. T.-S. Lin, C.-Y. He and W.-F. Hu, Fast spectral solver for Poisson equation on an annular domain, *Ann. Math. Sci. App.*, **5(1)**, 65-74 (2020).

15. W.-F. Hu, T.-S. Lin, S. Rafai and C. Misbah, Chaotic swimming of phoretic particles, *Phys. Rev. Lett.*, **123**, 238004 (2019).

14. M. G. Blyth, D. Tseluiko, T.-S. Lin and S. Kalliadasis, Two-dimensional pulse dynamics and the formation of bound states on electrified falling films, *J. Fluid Mech.*, **855**, 210-235 (2018).

13. T.-S. Lin, D. Tseluiko, M. G. Blyth and S. Kalliadasis, Continuation methods for time-periodic travelling-wave solutions to evolution equations, *Appl. Math. Lett.*, **86**, 291-297 (2018).

12. T.-S. Lin, S. Rogers, D. Tseluiko and U. Thiele, Bifurcation analysis of the behavior of partially wetting liquids on a rotating cylinder, *Phys. Fluids*, **28**, 082102 (2016).

11. C. Honisch, T.-S. Lin, A. Heuer, U. Thiele and S. Gurevich, Instabilities of layers of deposited molecules on chemically stripe patterned substrates: Ridges vs. drops, *Langmuir*, **31**, 10618-10631 (2015).

10. M. A. Lam, L. J. Cummings, T.-S. Lin and L. Kondic, Three-dimensional coating flow of nematic liquid crystal on an inclined substrate, *Euro. J. Appl. Math.*, **26**, 647-669 (2015).

9. T.-S. Lin, M. Pradas, S. Kalliadasis, D. T. Papageorgiou and D. Tseluiko, Coherent structures in non-local dispersive active-dissipative systems, *SIAM J. Appl. Math.*, **75**, 538-563 (2015).

8. M. A. Lam, L. J. Cummings, T.-S. Lin and L. Kondic, Modeling flow of nematic liquid crystal down an incline, *J. Eng. Math.*, **94**, 97-113 (2015).

7. T.-S. Lin, L. J. Cummings, A. J. Archer, L. Kondic and U. Thiele, Note on the hydrodynamic description of thin nematic films: strong anchoring model, *Phys. Fluids*, **25**, 082102 (2013).

6. T.-S. Lin, L. Kondic, U. Thiele and L. J. Cummings, Modelling spreading dynamics of nematic liquid crystals in three spatial dimensions, *J. Fluid Mech.*, **729**, 214-230 (2013).

5. T.-S. Lin, L. Kondic and A. Filippov, Thin films flowing down inverted substrates: three dimensional flow, *Phys. Fluids*, **24**, 022105 (2012).

4. T.-S. Lin, L. Kondic and L. J. Cummings, Defect modelling in spreading nematic droplets, *Phys. Rev. E*, **85**, 012702 (2012).

3. L. J. Cummings, T.-S. Lin and L. Kondic, Modelling and simulations of the spreading and destabilization of nematic droplets, *Phys. Fluids*, **23**, 043102 (2011).

2. T.-S. Lin and L. Kondic, Thin films flowing down inverted substrates: two dimensional flow, *Phys. Fluids*, **22**, 052105 (2010).

1. M.-C. Lai, C.-Y. Huang and T.-S. Lin, A simple Dufort-Frankel type scheme for the Gross-Pitaevskii equation of Bose-Einstein condensates on different geometries, *Numer. Methods for Partial Diff. Eqs.*, **20**, 624-638 (2004).

Conference papers

1. T.-S. Lin, D. Tseluiko and S. Kalliadasis, Numerical study of a non-local weakly nonlinear model for a liquid film sheared by a turbulent gas, *Procedia IUTAM*, **11**, 98 (2014).

Presentations (Selected)

Solutions of differential equation on periodic domains using neural networks, Feb 2023
The 31st annual meeting on differential equations and related topics
National Chung Cheng University, Chiayi, Taiwan.

Machine Learning to solve elliptic interface problem, Jan. 2022
2021 TMS annual meeting
Institute of Mathematics, Academia Sinica, Taipei, Taiwan.

Autophoretic motion of an isotropic particle, Dec. 2019
2019 28th Annual Workshop on Differential Equations
Institute of Mathematics, Academia Sinica, Taiwan.

Two dimensional pulse dynamics and on electrified falling films, Apr. 2019
Modelling of Thin Liquid Films-Asymptotic Approach vs. Gradient Dynamics
BIRS, Canada.

Autophoretic motion of an isotropic particle, Mar. 2019
2019 Spring Progress in Mathematical and Computational Studies on Science and Engineering Problems
Taiwan-India Joint Conference - Recent Progress on Flow Simulation and Stability Analysis
CASTS, National Taiwan University, Taiwan.

Continuation methods and numerical bifurcation analysis, Dec. 2018
2018 TMS annual meeting,
National Taiwan Normal University, Taiwan.

Continuation method for time-periodic traveling-wave solutions to evolution equations, May 2018
6th TWSIAM Annual Meeting,
National Taiwan University of Science and Technology, Taipei, Taiwan.

Services

International and Domestic Committees:

Taiwan Society for Industrial and Applied Mathematics (TWSIAM)
Executive member of the council Aug. 2022 - present

National Center for Theoretical Sciences (NCTS) - Mathematics Division
Scientific member - Interdisciplinary Studies Jan. 2021 - present

Taiwan Society for Industrial and Applied Mathematics (TWSIAM)
Deputy secretary general June 2018 - May. 2020

Referee: Applied Mathematics and Computation; AIP Advances; European Journal of Applied Mathematics; European Journal of Mechanics B/Fluids; IMA Journal of Applied Mathematics; Journal of Colloid and Interface Science; Journal of Computational Physics; Journal of Engineering Mathematics; Journal of Fluid Mechanics; Physics of Fluids; Proceedings A; Taiwanese Journal of Mathematics; Zeitschrift für Angewandte Mathematik und Mechanik.