

Academic Staff Resume

Name: CAI Tao

Title: Assistant Professor

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Academic Qualification:

Ph.D. in Mathematics, The Hong Kong University of Science and Technology, 2011

Master in Astrophysics, Chinese Academy of Sciences, 2006

Bachelor in Mathematics, Central South University, 2003

Teaching Area

Applied Mathematics

Pure Mathematics

Research Area

Stellar and planetary atmospheres

Computational fluid dynamics

Applied mathematics

Working Experience

Macau University of Science and Technology, State Key Laboratory of Lunar and Planetary Sciences, Assistant Professor, 2018.01-present

Sun Yat-sen University, School of Mathematics, Lecturer, 2013.07-2017.12

City University of Hong Kong, Visiting Fellow, 2013.01-2013.05

Research Projects

Science and Technology Development Fund, Macau, SAR, No.0156/2019/A3, 2020. (PI)

Guangdong Basic and Applied Basic Research Foundation, No.2019A1515011625, 2019. (PI)

Research Grant of Science and Technology Program of Guangzhou, No.201707010006, 2017. (PI)

Research Grant of National Natural Science Foundation of China, No.11503097, 2016. (PI)

Professional Certification and Awards

Professional Society Membership

Member of Chinese Mathematical Society

Academic Publication

Journal Articles:

T.Cai, Penetrative convection for rotating Boussinesq flow in tilted f-planes, *The Astrophysical Journal*, 898, 22, (2020)

T.Cai, Upward overshooting in turbulent compressible convection. III. Calibrate parameters for one-dimensional Reynolds stress model, *The Astrophysical Journal*, 891, 77, (2020)

T.Cai, Upward overshooting in turbulent compressible convection. II. Simulations at large relative stability parameters, *The Astrophysical Journal*, 891, 49, (2020)

T.Cai, Upward overshooting in turbulent compressible convection. I. Effects of the relative stability parameter, the Prandtl number, and the Peclet number, *The Astrophysical Journal*, 888, 46, (2020)

T.Cai, Numerical analysis of nonlocal convection --- comparison with three-dimensional numerical simulations of efficient turbulent convection, *The Astrophysical Journal*, 868, 12, (2018)

T.Cai, B. Hazari, J.T. Lai, and V. Mohan, Kaldorian disaggregation, temporary migration and welfare: theory and calibration. *Pacific Economic Review*, 23(2), 193, (2018)

T.Cai, A Semi-implicit spectral method for compressible convection of rotating and density stratified flows in Cartesian Geometry, *Journal of Computational Physics*, 310, 342, (2016).

T.Cai, V. Dang, and J.T. Lai, China's capital and 'hot' money flows: an empirical investigation. *Pacific Economic Review*, 21(2), 276, (2016)

T.Cai, Numerical analysis of nonlocal convection, *Monthly Notices of the Royal Astronomical Society*, 443, 3703, (2014)

T.Cai, K.L. Chan, 3D numerical simulation of convection in giant planets: effects of solid core size, *Planetary and Space Science*, 71(1), 125, (2012)

T.Cai, K.L. Chan, L.C. Deng, Numerical simulation of core convection by a multi-layer semi-implicit spherical spectral method, *Journal of Computational Physics*, 230(24), 8698, (2011)

T.Cai, Supersonic convection in stellar interiors, *Chinese Astronomy and Astrophysics*, 30, 284, (2006)

Books & Book Chapters:

Conference Papers:

K.L. Chan, T.Cai, H.P. Singh, Overshooting above a convection zone, *Proceedings of International Astronomical Union, IAU Symposium*, 271, 317, (2011)