

Professrr CHAN, KWING LAM
Department of Engineering Science, Faculty of Innovation Engineering
Macau University of Science and Technology
Office: A314
Tel.: +852-8897 2255
E-mail: klchan@must.edu.mo

Academic Qualification

Ph.D. in Physics, Princeton University, USA
B.A. in Physics, University of California, Berkeley, USA

Teaching Area

Mathematics
Astronomy
Scientific Computation

Research Area

Planet Jupiter
Computational Fluid Dynamics
Astrophysics

Professional Services

Advisory Board, The Innovation Journal, since 2020
Academic Editor, Advance in Astronomy, since 2020
Scientific Adviser, Hong Kong Space Museum, since 2000

Working Experience

2022 - present Professor and Deputy Head, Department of Engineering Science,
Faculty of Innovation Engineering, MUST
2021 - 2022 Professor, School of Information Technology, MUST
2018 - 2021 Professor, State Key Laboratory of Lunar and Planetary Sciences (MUST)
2016 - 2018 Professor and Director, Institute for Space Science Research, MUST
2015 - 2018 Director, Lunar and Planetary Science Laboratory, MUST
1998 - 2015 Professor of Mathematics, Hong Kong University of Science and
Technology (HKUST)
2014 Spring Visiting Scholar, Earth and Space Sciences Dept, UCLA, USA
2007 - 2015 Director, Center for Space Science Research, HKUST
1999 - 2015 Professor, Department of Mathematics, HKUST
1998 - 1999 Senior Research Fellow, Noel Croucher Foundation, Hong Kong
1994 - 1998 Senior Lecturer, HKUST
1990 - 1991 Visiting Adjunct Professor, Yale University, USA
1986 - 1994 Senior Scientist (contracting at CSFC/NASA), Applied Research Corporation, USA
1980 - 1986 Assoc. Scientist (contracting at GSFC/NASA), Applied Research Corporation, USA
1977 - 1980 Lecturer/Research Associate, Physics Department, Queen's University, Canada
1976 - 1977 Postdoctoral Fellow, Physics Dept, Calgary University, Canada
1974 - 1976 Postdoctoral Fellow, Thomas J. Watson Research Center, USA

Academic Publications (selected)

1. Chan, K. L., & Jones, B. J. T. 1975, Distortions of the 3K background radiation spectrum: observational constraints on the early thermal history of the universe, *Astrophys. J.*, **195**, 1-11.
2. Chan, K. L., & Chau, W. Y. 1979, Mathematical theory of reduction of physical parameters and similarity analysis, *International J. Theor. Phys.*, **18**, 835-844.
3. Chan, K. L., & Henriksen, R. N. 1980, On the supersonic dynamics of magnetized jets of thermal gas in radio galaxies, *Astrophys. J.*, **241**, 534-551.
4. Chan, K. L., & Wolff, C. L. 1982, ADI on staggered mesh - a method for the calculation of compressible convection, *J. Comput. Phys.*, **47**, 109-129.
5. Chiu, H.-Y., Chan, K. L., & Kondo, Y. 1988, Correlation mass method for analysis of neutrinos from supernova 1987A, *Astrophys. J.*, **329**, 326- 34.
6. Chan, K. L., & Sofia, S. 1989, Turbulent compressible convection in a deep atmosphere: IV. Results of three-dimensional computations, *Astrophys. J.*, **336**, 1022-1040.
7. Chan, K. L., Mayr, H. G., Mengel, J. G., & Harris, I. 1994, A spectral approach for studying middle and upper atmospheric phenomena, *J. Atmos. Terr. Phys.*, **56**, 1399-1419.
8. Chan, K. L., Mayr, H. G., Mengel, J. G., & Harris, I. 1994, A 'stratified' spectral model for convective and stable atmospheres, *J. Comput. Phys.*, **113**, 165-176.
9. Singh, H. P., Roxburgh, I. W., & Chan, K. L. 1995, Three-dimensional simulation of penetrative convection - penetration below a convection zone, *Astron. Astrophys.*, **295**, 703-709.
10. Mengel, J. G., Mayr, H. G., Chan, K. L., Hines, C. O., Reddy, C. A., Arnold, N. F., & Porter, H. S. 1996, Equatorial oscillations in the middle atmosphere generated by small-scale gravity waves, *Geophys. Res. Lett.*, **22**, 3027-3030.
11. Mayr, H., Mengel, J., & Chan, K. L. 1998, Equatorial oscillations maintained by gravity waves as described with the Doppler spread parameterization: I. numerical experiments, *J. Atm. Solar-Terr. Phys.*, **60**, 181-199.
12. Kim, Y. C., & Chan, K. L. 1998, A hydrodynamical simulation of the highly superadiabatic layer of the sun, *Astrophys. J.*, **496**, L121-L124.
12. Robinson, F. J., & Chan, K. L. 2001, A large-eddy simulation of turbulent compressible convection: differential rotation in the solar convection zone, *Mon. Not. R. Astron. Soc.*, **321**, 723-732.
13. Chan, K. L. 2001, Rotating convection in f-planes – mean flow and Reynolds stress, *Astrophys. J.*, **548**, 1102-1117.
14. Chow, K. C., Chan, K. L., & Lau, K. H. 2002, Generation of moving spiral bands in tropical cyclones, *J. Atmos. Sci.*, **59**, 2930-2950.
15. Chan, K. L. 2007, Rotating convection in f-boxes: Faster rotation, *Astron. Nach.*, **328**, 1059-1061.
16. Chan, K. L., Tsang, K. T., Kong, B., & Zheng, Y.-C. 2010, Lunar regolith thermal behavior revealed by ChangE-1 microwave brightness temperature data, *Earth and Planetary Sci. Lett.*, **295**, 287-291.
17. Chan, K. L., & Mayr, H. G. 2013, Numerical simulation of convectively generated vortices: Application to the Jovian planets, *Earth and Planetary Sci. Lett.*, **371-372**, 212-219.

18. Cai, T., Chan, K. L., Mayr, H. G., Deep 2021, closely packed long-lived cyclones on Jupiter's poles, *The Planetary Science J.*, **2**, 81.
19. Cai, T., Chan, K. L., Chow, K.-C. 2022, Spontaneous generated convective anticyclones at low latitude - A model for the Great Red Spot, *The Astrophysical J.*, **925**, 94.

Research Grants (as PI)

2019 - 2021	Dynamics and Forecast of Multiscale Severe Weather Processes over the Pearl River Estuary Region, FDCT(Macau)/NSFC(China)
2016 - 2019	Dust climate associated with mesoscale dynamics in the atmosphere of Mars, FDCT, Macau
2013 - 2016	Numerical study of overshooting stellar convective cores, Research Grants Council (RGC), Hong Kong
2010 - 2011	Lunar thermal behavior based on microwave characteristics, 863 Project, China
2010 - 2013	A lunar Geographic Information System, Research Project Competition, HKUST, Hong Kong
2009 - 2011	Numerical study of Jovian winds - deep versus shallow convection, RGC, Hong Kong
2008 - 2010	Modeling of lunar helium-3 distribution with remote sensing data from Chang'E-1, Research Project Competition, HKUST, Hong Kong
2007 - 2008	Supportive research for China's moon project, School-Based Initiative, HKUST, Hong Kong
2006 - 2009	Numerical study of stellar core overshooting and mixing, RGC/Hong Kong
2005 - 2006	Supersonic convection in supergiant envelopes, Direct Allocation Grant, HKUST, Hong Kong
2002 - 2005	Numerical study of solar/stellar differential rotation, RGC, Hong Kong
2000 - 2002	Numerical study of solar differential rotation by a global spectral method, RGC, Hong Kong
1998 - 2000	Numerical solar convection and differential rotation, RGC, Hong Kong
1998 - 1999	Numerical study of astrophysical dynamos, British Council, Hong Kong
1995 - 1998	Numerical study of fundamental problems in solar physics: convection and differential rotation, RGC, Hong Kong
1994 - 1995	Numerical study of gravity waves/atmospheric dynamics, Direct Allocation Grant, HKUST, Hong Kong
1991 - 1993	Solar differential rotation and its connection to solar variation, National Science Foundation (NSF), USA
1989 - 1991	Numerical study of stellar convection: the upper solar convection zone, NSF, USA
1985 - 1988	Numerical study of turbulent compressible convection, NSF, USA
1985 - 1994	NSF(USA) supercomputer time awards

Professional Society Membership

Since 1974	American Physical Society
Since 1974	American Astronomical Society
Since 1981	International Astronomical Union
1982 - 1984	American Institute of Aeronautics and Astronautics
1988 - 2020	American Geophysical Union