Degrees Awarded

- Teaching Certificate “Good Teaching Practice” 2018, University of Hamburg
- Habilitation 2016, University of Hamburg, Germany (In Germany the Habilitation is a certification of excellence in research and teaching)
- PhD (Dr. Rer. Nat.) 2001 in Natural Sciences; University of Hamburg, Germany
- Diplom 1998 in Meteorology, University of Hamburg, Germany
- Vordiplom 1995 in Meteorology, University of Karlsruhe, Germany

Scientific Path

- Privatdozent (PD), Meteorological Institute, University of Hamburg, Germany, 2017 – present (In Germany, the title Privatdozent indicates that the holder has permission to teach and examine independently without being a professor.)
- Senior Research Scientist, Meteorological Institute and Center for Earth System Research and Sustainability, University of Hamburg, Germany, 08/2013 – present
- Senior Research Scientist, British Antarctic Survey, Cambridge, UK, 07/2007 – 07/2013
- Postgraduate Scientist, Institute for Mathematics Applied to Geosciences, National Center for Atmospheric Research, Boulder, CO, USA, 07/2006 – 06/2007
- Postdoctoral Fellow, Courant Institute of Mathematical Sciences and Center for Atmosphere-Ocean Science, New York University, New York, USA 01/2003 – 06/2006
- Research Associate, Environment Institute, The Pennsylvania State University, State College, USA, 09/2001 – 12/2002

Management and Editorial Activities:

- EGU NP division officer (2019-)
- EGU NP Outreach team member (2019-)
- Co-Founder and Science committee member of PAGES working group: Climate Variability Across Scales (http://pastglobalchanges.org/ini/wg/cvas/intro) (2016-)
- Management Committee member for COST-Action Sci-Generation TN1301 (2014-2017)
- Guest Editor: “Geophysical & Astrophysical Fluid Dynamics” for special issue “Mathematical Developments in Geophysical Fluid Dynamics: Structure, Vortices, and Waves” (2017-2019) https://www.tandfonline.com/toc/ggaf20/113/5-6?nav=tocList&
- Guest Editor: “Past Global Changes” special issue on “Centennial to Millennial Climate Variability” (2017) http://pastglobalchanges.org/products/pages-magazine/11504
- Editor: Nonlinear Processes in Geophysics (2017-)
- Editor: Earth System Dynamics (2015-)
- Associate Editor: Mathematics for Climate and Weather Forecasting (2016-)
- Associate Editor: Monthly Weather Review (2012-2016)

Book:

1. **C. Franzke** and T. O'Kane, 2017: Nonlinear and Stochastic Climate Dynamics, Cambridge University Press, 466 pages.

Peer Review Publications (* denotes supervised students)

1. Huang, Y., **C. Franzke**, N. Yuan and Z. Fu, 2019: Systematic identification of causal relations in high-dimensional chaotic systems: Application to Stratopshere-Troposphere coupling. Clim. Dyn., submitted.
2. Nian, D., N. Yuan, K. Ying, G. Liu, Z. Fu, Y. Qi and **C. Franzke**, 2019: Identifying the sources of seasonal predictability based on climate memory analysis and variance decomposition. Clim. Dyn., submitted.
3. Önskog, T., **C. Franzke** and A. Hannachi, 2019: Nonlinear time series models for the North Atlantic Oscillation. Adv. Stat. Clim. Meteorol. Oceanogr., submitted.
4. **Franzke, C.**, S. Barbosa, R. Blender, H.-B. Fredriksen, T. Laepple, F. Lambert, T. Nilsen, K. Rypdal, M. Rypdal, M. Scotto, S. Vannitsem, N. Watkins, L. Yang, and N. Yuan, 2019: The Structure of Climate Variability Across Scales. Rev. Geophys., submitted.
5. Haug, O., T. L. Thorarinsdottir, S. H. Sørbye and **C. Franzke**, 2019: Spatial trend analysis of gridded temperature data at varying spatial scales. Adv. Stat. Clim. Meteorol. Oceanogr., submitted.
6. Hu, G*. and **C. Franzke**, 2019: Evaluating the Reliability of Extremes in Analysis Fields in a Conceptual Model of the Atmosphere. Proc. Roy. Soc., submitted.
7. Yang, L.*, **C. Franzke**, Z. Fu, 2019: Power-Law Behavior of Hourly Precipitation Intensity and Dry Spell Duration over the US. Int. J. Climatol., in press.
8. **Franzke, C.** and M. Czupryna, 2019: Probabilistic Assessment and Projections of US Weather and Climate Risks and Economic Damages. Climatic Change, in press.
9. Dwivedi, S., **C. Franzke** and F. Lunkeit, 2019: Energetically Consistent Stochastic and Deterministic Kinetic Energy Backscatter Schemes for Atmospheric Models. Q. J. Roy. Meteorol. Soc., in press.
10. De Luca P., C. Harpham, R. L. Wilby, **C. Franzke**, G. C. Leckebusch, J. K. Hillier, 2019: Implications of future weather pattern persistence and frequency for multi-hazards in the British Isles. Atmosphere, 10, 577.
11. Gugole, F.* and **C. Franzke**, 2019: Numerical Development and Evaluation of an Energy Conserving Conceptual Stochastic Climate Model. Math. Clim. Weather Forecast., 5, 45-64.
12. **Franzke, C.**, D. Jelic, S. Lee and S. Feldstein, 2019: Systematic Decomposition of the MJO and its Northern Hemispheric Extra-Tropical Response into Rossby and Inertio-Gravity Components. Q. J. Roy. Meteorol. Soc., 145, 1147-1164.
13. **Franzke, C.**, M. Oliver, J. Rademacher and G. Badin, 2019: Systematic multi-scale methods for geophysical flows. In Energy transfers in Atmosphere and Ocean. Eds. C. Eden and A. Iske. Springer book, 1-51.
14. Risbey, J., T. O'Kane, D. Monselesan, **C. Franzke** and I. Horenko, 2018: On the dynamics of Austral heat waves. J. Geophys. Res., 122. DOI: 10.1002/2017JD027222.
15. Önskog, T., **C. Franzke**, and A. Hannachi, 2018, Predictability and non-Gaussian Characteristics of the North Atlantic Oscillation. J. Climate, 31, 537-554, doi: 10.1175/JCLI-D-17-0101.1.
16. Hu*****, G. and **C. Franzke,** 2017: Data assimilation in a multi-scale model. Math. Clim. Weather Forecast., 3, 118–139.
17. Gao, M. and **C. Franzke**, 2017: Quantile regression-based spatio-temporal analysis

of extreme temperature change in China. J. Climate, 30, 9897–9914.
18. Bodai, T. and **C. Franzke**, 2017: Predictability of fat-tailed extremes. Phys. Rev. E, 96, 032120. DOI: https://doi.org/10.1103/PhysRevE.96.032120
19. Graves*****, T., R. B. Gramacy, N. W. Watkins and **C. Franzke**, 2017: A brief history of long memory. Entropy, 19, 437; doi:10.3390/e19090437.
20. **Franzke, C.**, 2017: Impacts of a Changing Climate on Economic Damages and Insurance. Economics of Disasters and Climate Change, 1, 95-110. doi:10.1007/s41885-017-0004-3.
21. Hannachi, A., D. Straus, **C. Franzke**, S. Corti and T. Woollings, 2017: Low Frequency Nonlinearity and Regime Behavior in the Northern Hemisphere Extra-Tropical Atmosphere. Rev. Geophys., 55, 199-234.
22. Berner, J., U. Achatz, L. Batte, A. De Li Camara, H. Christensen, M. Colangeli, D. Coleman, D. Crommelin, S. Dolaptchiev, **C. Franzke**, P. Friederichs, P. Imkeller, H. Järvinen, S. Juricke, V. Kitsios, F. Lott, V. Lucarini, S. Mahajan, T. Palmer, C. Penland, M. Sakradzija, J.-S. von Storch, A. Weisheimer, M. Weniger, P. Williams and J.-I. Yano, 2017: Stochastic Parameterization: Towards a new view of Weather and Climate Models. Bull. Amer. Meteorol. Soc., 98, 565-587.
23. Blender, R., C. Raible and **C. Franzke**, 2017: Vorticity and geopotential height extremes in ERA interim data in boreal winters. Q. J. Roy. Meteorol. Soc., 143, 634-640.
24. O'Kane, T. J., D. P. Monselesan, J S. Risbey, I. Horenko and **C. Franzke**, 2017: On memory, dimension, and atmospheric teleconnection patterns. Math. Clim. Weather Forecast, 3, 1-27.
25. **Franzke, C.**, 2017: Extremes in dynamic-stochastic systems. Chaos, 012101. DOI: 10.1063/1.4973541 (Invited review).
26. Graves*****, T., **C. Franzke**, N. Watkins, R. Gramacy and E. Tindale, 2017: Systematic Bayesian inference of the Long-Range Dependence and Heavy-Tail distribution parameters. Physica A, 473, 60-71. DOI: http://dx.doi.org/10.1016/j.physa.2017.01.028.
27. **Franzke, C.**, S. Lee and S. B. Feldstein, 2017: Evaluating Arctic warming mechanism in CMIP5 models. Clim. Dyn., 48, 3247-3260. doi: 10.1007/s00382-016-3262-9
28. Gottwald, G., D. Crommelin and **C. Franzke**, 2017: Stochastic Climate Theory. p. 209-240. Nonlinear and Stochastic Climate Dynamics, Edited by C. Franzke and T. O'Kane. Cambridge University Press.
29. Feldstein, S. and **C. Franzke**, 2017: Atmospheric Teleconnection Patterns. p. 54-104. Nonlinear and Stochastic Climate Dynamics, Edited by C. Franzke and T. O'Kane. Cambridge University Press.
30. O'Kane T., J. Risbey, D. Monselesan, I. Horenko and **C. Franzke**, 2015: On the dynamics of persistent states and their secular trends in the waveguides of the Southern Hemisphere troposphere. Clim. Dyn., 46, 3567-3597.
31. Luo, D., Y. Xiao, Y. Yao, A. Dai, I. Simmonds and **C. Franzke**, 2016: Impact of Ural Blocking on Winter Warm Arctic-Cold Eurasian Anomalies. Part I: Roles of Blocking and Warming Trend. J. Climate, 29, 3925-3947.
32. Luo, D., Y. Xiao, Y. Diao, A. Dai, **C. Franzke** and I. Simmonds, 2016: Impact of Ural Blocking on Winter Warm Arctic-Cold Eurasian Anomalies. Part II: The link to the North Atlantic Oscillation, J. Climate, 29, 3948-3971.

33. Ludescher, J., A. Bunde, **C. Franzke** and H. J. Schellnhuber, 2015: Long-term persistence enhances uncertainty about anthropogenic warming of West Antarctica. Clim. Dyn.,46, 263-271.
34. Graves*****, T., R. B. Gramacy, **C. Franzke** and N. W. Watkins, 2015: Efficient Bayesian inference for long memory processes, Nonlin. Proc. Geophys., 22, 679-700, 2015.
35. Zagar, N. and **C. Franzke**, 2015: Systematic Decomposition of the Madden-Julian Oscillation into Balanced and Inertio-Gravity Components. Geophys. Res. Lett., 42, 6829-6835.
36. Luo, D., L. Zhong and **C. Franzke**, 2015: Inverse energy cascades in an eddy-induced NAO-Type flow: Scale interaction mechanism. J. Atmos. Sci., 72, 3417-3448.
37. **Franzke, C.**, T. O'Kane, D. Monselesan, J. Risbey and I. Horenko, 2015: Systematic Attribution of Secular Southern Hemispheric Circulation Trends with Observational Forcing Data, Nonlin. Proc. Geophys., 22, 513-525. doi:10.5194/npg-22-513-2015.
38. **Franzke, C.**, 2015: Local Trend Disparities Of European Minimum And Maximum Temperature Extremes. Geophys. Res. Lett., 42, 6479-6484.
39. Lin, Y. and **C. Franzke**, 2015: Scale-dependency of the global mean temperature trend and its implication for the hiatus of recent global warming. Scientific Reports, 5, 12971.
40. Woollings, T., **C. Franzke**, D. Hodson, B. Dong, E. Barnes, C. Raible and J. Pinto, 2015: Contrasting interannual and multidecadal NAO variability. Climate Dynamics, 45 539-556.
41. **Franzke, C.**, S. Osprey, P. Davini and N. Watkins, 2015: A Dynamical Systems Explanation of the Hurst Phenomenom and Atmospheric Low-Frequency Variability, Scientific Reports, 5, 9068: doi: 10.1038/srep09068.
42. Risbey, J., T. O'Kane, D. Monselesan, **C. Franzke** and I. Horenko, 2015: Metastability of Northern Hemisphere teleconnection modes, J. Atmos. Sci., 72, 35-54.
43. Peavoy*****, D., **C. Franzke** and G. O. Roberts, 2015: Physics constrained parameter estimation of stochastic differential equations. Comp. Stat. Data Ana., 83, 182-199.
44. **Franzke, C.**, T. O'Kane, J. Berner, P. Williams and V. Lucarini, 2015: Stochastic Climate Theory and Modelling. WIREs Climate Change (*Invited review*), 6, 63-78.
45. Cnossen, I. and **C. Franzke**, 2014: The role of the Sun in long-term change in the F2 peak ionosphere: new insights from Ensemble Empirical Mode Decomposition (EEMD) and numerical modelling. J. Geophys. Res., 119, 8610-8623.
46. Kim, S.-W., K. Song, S.-Y. Kim, S.-W. Son, **C. Franzke**, 2014: Linear and nonlinear trends of extreme temperatures in Korea. Atmosphere (in Korean), 24, 379-390.
47. **Franzke, C.**, 2014: Nonlinear Climate Change. Nature Climate Change, 4, 423–424.
48. Bunde, A., J. Ludescher, **C. Franzke**, and U. Büntgen, 2014: How significant is West Antarctic warming? Nature Geoscience, 7, 246-247.
49. Varotsos, C., **C. Franzke**, M. Efstathiou and A. Degermendzhi, 2014: Evidence for two abrupt warming events of SST in the last century. Theor. Appl. Climatol., 116, 51-60, DOI: 10.1007/s00704-013-0935-8
50. Woollings, T., C. Czuchniki and **C. Franzke**, 2014: Twentieth century jet stream

variability. Quart. J. R. Meterol. Soc., 140, 783-791. DOI: 10.1002/qj.2197
51. Capparelli*****, V., **C. Franzke**, A. Vecchio, M. P. Freeman, N. W. Watkins and V. Carbone, 2013: A spatio-temporal analysis of US station temperature trends over the last century. J. Geophys. Res., 118, 7427-7434. DOI: 10.1002/jgrd.50551
52. Lu, H., **C. Franzke**, O. Martius, M. J. Jarvis and T. Philips, 2013: Solar Wind Dynamic Pressure Effect on Planetary Wave Propagation and Rossby Wave Breaking. J. Geophys. Res., 118, 4476-4493. DOI: 10.1002/jgrd.50374
53. T. J. O'Kane, J. S. Risbey, **C. Franzke**, I. Horenko and D. P. Monselesan, 2013: The metastability of the mid-latitude Southern Hemisphere circulation. ANZIAM J., 54, C233-C249.
54. **C. Franzke**, 2013: A novel method to test for significant trends in extreme values in serially dependent time series. Geophys. Res. Lett., 40, 1391-1395. DOI: 10.1002/grl.50301 *(This paper was chosen as an AGU Research Spotlight)*.
55. **Franzke, C**., 2013: Significant reduction of cold temperature extremes in the Antarctic Peninsula at Faraday/Vernadsky Station, Int. J. Clim., 33, 1070-1078. DOI: 10.1002/joc.3490.
56. **Franzke, C.**, 2013: Circulation Regimes and Extreme Events in the North Atlantic. Phil. Trans. R. Soc. A, 371, 20110471. *(This study has attracted wide public interest. See Press Release and here)*.
57. T. J. O'Kane, J. S. Risbey, **C. Franzke**, I. Horenko and D. P. Monselesan, 2013: Changes in the meta-stability of the mid-latitude Southern Hemisphere circulation and the utility of non-stationary cluster analysis and split flow indices as diagnostic tools. J. Atmos. Sci., 70, 824-842. doi: 10.1175/JAS-D-12-028.1.
58. **Franzke, C.**, 2012: On the statistical significance of surface air temperature trends in the Eurasian Arctic region. Geophys. Res. Lett., L23705, doi: 10.1029/2012GL054244.
59. **Franzke, C.**, 2012: Predictability of Extreme Events in a Nonlinear Stochastic-Dynamical Model. Phys. Rev. E, 85, DOI: 10.1103/PhysRevE.85.031134.
60. **Franzke, C.,** 2012: Nonlinear Trends, Long-Range Dependence and Climate Noise Properties of Surface Air Temperature. J. Climate, 25, 4172-4183. DOI: 10.1175/JCLI-D-11-00293.1
61. **Franzke, C.,** T. Graves*****, N. W. Watkins, R. B. Gramacy and C. Hughes*****, 2012: Robustness of Estimators of Long-Range Dependence and Self-Similarity under non-Gaussianity. Phil. Trans. R. Soc. A, 370, 1250-1267, *doi:10.1098/rsta.2011.0349* (**Invited paper**).
62. **Franzke, C.,** T. Woollings and O. Martius, 2011: Persistent Circulation Regimes and Preferred Regime Transitions in the North Atlantic. J. Atmos. Sci., 68, 2809-2825. doi: 10.1175/JAS-D-11-046.1
63. **Franzke, C.**, S. B. Feldstein and S. Lee, 2011: Synoptic Analysis of the Pacific-North American Teleconnection Pattern. Quart. J. R. Meterol. Soc., 137, 329-346.
64. **Franzke, C.** and T. Woollings, 2011: On the Persistence and Predictability Properties of North Atlantic Climate Variability. J. Climate, 24, 466-472. doi: 10.1175/2010JCLI3739.1
65. Peavoy*****, D. J. and **C. Franzke,** 2010**:** Bayesian analysis of rapid climate change during the last glacial using Greenland $d^{18}O$ data. Climate of the Past,

doi:10.5194/cpd-6-1209-2010.

66. **Franzke, C.**, 2010: Long-range Dependence and Climate Noise Characteristics of Antarctic Temperature Data. J. Climate, 23, 6074-6081. doi: 10.1175/2010JCLI3654.1
67. Thomas, E. R., P. Dennis, T. Bracegirdle and **C. Franzke**, 2009: Ice core evidence for significant 100-year regional warming on the Antarctic Peninsula. Geophys. Res. Lett., doi:10.1029/2009GL04104. (*This paper was chosen as Editors highlight and was the 3rd most downloaded GRL paper in the first week after publication.*)
68. Majda, A. J., **C. Franzke** and D. Crommelin, 2009: Normal forms for reduced stochastic climate models. Proc. Natl. Acad. Sci. USA, doi:10.1073/pnas.0900173106.
69. **Franzke, C.**, 2009: Multi-Scale Analysis of Teleconnection Indices: Climate Noise and Nonlinear Trend Analysis. Nonlin. Proc. Geophys., 16, 65-76.
70. **Franzke, C.**, I. Horenko, A. J. Majda and R. Klein, 2009: Systematic Metastable Atmospheric Regime Identification in a AGCM. J. Atmos. Sci., 66, 1997-2012. Doi:10.1175/2009JAS2939.1
71. **Franzke, C.**, R. Blender, K. Fraedrich and F. Lunkeit, 2008: Dynamische Antriebsmechanismen der NAO. Promet, 34, 107-111.
72. Majda, A. J., **C. Franzke** and B. Khouider, 2008: An Applied Mathematics Perspective on Stochastic Modelling for Climate. Phil. Trans. R. Soc. A, 366, 2429-2455.
73. **Franzke, C.**, D. T. Crommelin, A. Fischer and A. J. Majda, 2008: A Hidden Markov Model Perspective on Regimes and Metastability in Atmospheric Flows. J. Climate, 21, 1740-1757.
74. **Franzke, C.**, A. J. Majda, and G. Branstator, 2007: The Origin of Nonlinear Signatures of Planetary Wave Dynamics: Mean Phase Space Tendencies and Contributions from Non-Gaussianity. J. Atmos. Sci., 64, 3987-4003.
75. Feldstein, S. B., and **C. Franzke**, 2006: Are the North Atlantic Oscillation and the Northern Annular Mode Distinguishable? J. Atmos. Sci., 63, 2915-2930.
76. Majda, A. J., **C. Franzke**, A. Fischer, and D. T. Crommelin, 2006: Distinct Atmospheric Regimes despite nearly Gaussian Statistics - A Paradigm Model. Proc. Natl. Acad. Sci. USA, 103, 8309-8314.
77. **Franzke, C.**, and A. J. Majda 2006: Low-Order Stochastic Mode Reduction for a Prototype Atmospheric GCM. J. Atmos. Sci. 63, 457-479.
78. **Franzke, C.**, and S. B. Feldstein, 2005: The Continuum and Dynamics of Northern Hemisphere Teleconnection Patterns. J. Atmos. Sci., 62, 3250-3267.
79. **Franzke, C.**, A. J. Majda and E. Vanden-Eijnden, 2005: Low-order stochastic mode reduction for a realistic barotropic model climate. J. Atmos. Sci., 62, 1722-1745.
80. **Franzke, C**., S. Lee, and S. B. Feldstein, 2004: Is the North Atlantic Oscillation a breaking wave? J. Atmos. Sci., 61, 145-160. (*The corresponding press release has been widely picked up by various news media; see press release at* http://www.psu.edu/ur/ 2002/northatlanticoscillation.html)
81. **Franzke, C.**, 2002: Dynamics of low-frequency variability: Barotropic mode. J. Atmos. Sci., 59, 2909-2897.
82. **Franzke, C.,** K. Fraedrich and F. Lunkeit, 2001: Teleconnection and low-frequency variability in idealized experiments with two storm tracks. Q. J. R. Meteorol. Soc., 127, 1321-1340.

83. **Franzke, C.**, K. Fraedrich and F. Lunkeit, 2000: Low-frequency variability in a simplified atmospheric global circulation model: Storm-track induced 'spatial resonance'. Q. J. R. Meteorol. Soc., 126, 2691-2708.