

## Pierre Friedlingstein

Professor, fellow of the Royal Society, former Royal Society Wolfson Research Merit recipient. I hold a Chair in Mathematical Modelling of the Climate System at the University of Exeter, I am also Research Director at CNRS, France. I have near 30 years research experience in the field of global carbon cycle and climate modelling, published 180+ peer-reviewed articles including 57 in high profile journals (Nature publishing, Science, PNAS), H-index of 85, more than 35,000 citations (WoS, Feb. 2021). I received several awards for my scientific research, including the Vladimir Ivanovich Vernadsky Medal of the European Geosciences Union in 2020 and the Alexander von Humboldt Research award in 2019. I have been a Thompson Reuters highly cited researcher every year since 2014. I am an international leader in the understanding of the feedbacks between the carbon cycle and the climate system. I was the first to quantify with a mechanistic model the land carbon content at the Last Glacial Maximum (GRL, 1992); and the first to quantify the limited role of atmospheric CO<sub>2</sub> increase in the historical land carbon sink (GBC, 1995). I pioneered research on the climate-carbon cycle coupled system, conceptualising the climate-carbon feedback framework (GRL, 2001) and coordinating the international climate-carbon cycle modelling effort. My C<sup>4</sup>MIP paper (J. Climate, 2006) is the amongst the most cited paper in the field (>1800 citations). I believe my work played a critical role reshaping climate science, moving from physical climate system to Earth system science, putting the carbon cycle at the centre of the climate and policy agenda. Over the last decade, I also took a leading role on several international activities, in particular the leadership of the Global Carbon Budget (ESSD, 2019), an effort that provides reliable carbon cycle information to assist international climate policy such as the UNFCCC. More recently, I have been appointed in 2018 as member of the Joint Science Committee of the World Climate Research Programme. I have been actively involved in climate assessment through participation in the Intergovernmental Panel on Climate Change (IPCC) AR4 WG1 and AR5 WG1 and Synthesis Report.

### PERSONAL INFORMATION

Pierre Friedlingstein; ORCID ID 0000-0003-3309-4739; Research ID H-2700-2014

<https://publons.com/researcher/2517563/pierre-friedlingstein/>

Date of Birth: 21/08/1966, Uccle, Belgium

Married, 2 children.

University of Exeter, College of Engineering Mathematics and Physical Sciences (CEMPS), Exeter, EX4 4QE

+44 1392 725279, p.friedlingstein@exeter.ac.uk <http://emps.exeter.ac.uk/mathematics/staff/pf229>

Laboratoire de Météorologie Dynamique, Ecole Normale Supérieure, Paris, France, pierre.friedlingstein@lmd.ipsl.fr

### EDUCATION

2006 Habilitation à Diriger des Recherches (HDR), Université Pierre et Marie Curie, Paris VI, France

1995 PhD, Sciences, Faculty of Sciences, Université Libre de Bruxelles (ULB), Belgium.

1989 Civil Engineer, Ecole Polytechnique, ULB, Belgium.

### CURRENT POSITIONS

2019– Directeur de Recherche CNRS, Laboratoire de Météorologie Dynamique, ENS, Paris

2009– Chair in Mathematical Modelling of the Climate System, CEMPS, University of Exeter

2008– Director of Research, Centre National de la Recherche Scientifique, France

2012– Professeur Extérieur, Faculté des Sciences, Université Libre de Bruxelles, Belgium.

### PREVIOUS POSITIONS

2017–21 Head (Academic lead) of the Climate Dynamics Group, CEMPS, University of Exeter

2010–18 Visiting Professor, School of Geography, University of Bristol, UK

2008–10 NERC/QUEST visiting fellow, Department of Earth Sciences, University of Bristol, UK

1998–08 Research Associate, Centre National de la Recherche Scientifique, France.

1995–97 Post-Doctoral fellow, Columbia University NASA/GISS, New York

1994–95 Research fellow, Belgian Institute for Space Aeronomy, Brussels, Belgium.

1990–94 PhD student, Université Libre de Bruxelles, Belgium.

1990 Junior Researcher, National Center for Atmospheric Research, Boulder, Colorado

### AWARDS

2020 Fellow of the Royal Society

2021 Ranked 3rd in the Reuters list of the world's top climate scientists

2020 Vladimir Ivanovich Vernadsky Medal of the European Geosciences Union.

2019 Alexander von Humboldt Research Award

2017– Fellow of the Royal Meteorological Society

2014–19 Royal Society Wolfson Research Merit Award.

2014–20 Highly cited researcher in Geosciences, Thompson Reuters (awarded every year since 2014).

2017 Google Scholar Classic paper award.

- 2015 Top 10 most cited author, Carbon Brief
- 2007 Lead author of the IPCC when IPCC was awarded the Nobel Peace Prize
- 1990 PhD research fellowship, IRSIA, Belgium

#### **INSTITUTIONAL RESPONSABILITIES/MEMBERSHIPS**

##### *Uni Exeter*

- 2018–21 Director of Global Development, Dept. of Mathematics, CEMPS, University of Exeter
- 2017– 21 Head of the Climate Dynamics Group, CEMPS, University of Exeter
- 2010– International Officer for Mathematics, University of Exeter

#### **MAJOR NATIONAL RESPONSABILITIES/MEMBERSHIPS**

- 2018– UKRI Future Leaders Fellowships Panel
- 2018– Royal Society Global Environment Research Committee (GERC)
- 2017–19 National Centre for Earth Observation (NCEO) Science Advisory Group
- 2017– Royal Meteorological Society Climate Communication Group
- 2016– Royal Society International Collaboration Awards committee
- 2014–15 NERC Strategic Programme Advisory Group (SPAG)

#### **MAJOR INTERNATIONAL RESPONSABILITIES/ MEMBERSHIPS**

- 2019– Executive team Leader, Global Carbon Budget
- 2018– Member, Joint Scientific Committee (JSC) of the World Climate Programme (WCRP)
- 2016– Co-chair, WCRP Grand Challenge “Carbon feedbacks in the climate system”
- 2016–20 SSC member, WCRP Modelling Advisory Council (WMAC)
- 2014–20 SSC member, WCRP Working Group on Climate Modelling (WGCM)
- 2010– Co-chair TRENDY, terrestrial carbon cycle modelling activity
- 2005– Co-chair, Coupled Climate Carbon Cycle Model Intercomparison Project (C4MIP)
- 2012–19 Editor, Journal of Climate
- 2006–12 SSC member, Global Carbon Project (GCP)
- 2005–11 SSC member, IGBP Analysis, Integration and Modelling of the Earth System (AIMES)
- 2001–04 SSC member, IGBP Global Analysis, Integration and Modelling (GAIM)

#### **CONTRIBUTION TO THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (IPCC)**

- 2012–14 IPCC AR5, Synthesis Report, Coordinating Author
- 2008–13 IPCC AR5, WG1, Lead Author Chapter 12, Technical Summary and Summary for Policymakers
- 2002–07 IPCC AR4, WG1, Lead Author Chapter 10 and Summary for Policymakers
- 2001 IPCC TAR, Contributing Author WG1, Chapter 3
- 1994 IPCC Climate change 1994, Contributing Author, Chapter 1

#### **CLIMATE SCIENCE AND POLICY ADVICE**

- 2019 Committee on Climate Change, The global mitigation effort towards achieving the Paris Agreement
- 2020 UNFCCC SBSTA Earth Information Day, Closing the global carbon cycle and closing the emissions gap
- 2020 UNFCCC SBSTA Chair’s Information meeting, Overview of impacts of COVID-19 on GHG emissions and concentrations
- 2017 Scoping Meeting of the IPCC AR6
- 2014 House of Parliament, Parliamentary Office of Science and Technology, Briefing note on Feedbacks in the Climate System.
- 2013 COP19 Warsaw, Organisation of Side Event on the Global Carbon Budget 2013
- 2013 Committee on Climate Change, Presentation of the science of IPCC AR5 WG1
- 2009 Scoping Meeting of the IPCC AR5

#### **MEMBERSHIPS OF SCIENTIFIC SOCIETIES**

- 2017– Fellow of the Royal Meteorological Society

#### **RESEARCH GRANTS AWARDED (MOST RECENT)**

##### *International*

- 2019–2022 EU/H2020 : 4C (Project Coordinator), £1,200,000
- 2018–17 ESA RECCAP-2, 2018–2019, £108,000
- 2015–19 EU/H2020: CRESCENDO, £541,891
- 2015–18 EU/ITN: C-CASCADES, £423,321
- 2013–17 EU/FP7: LUC4C, £477,213
- 2013–17 EU/FP7: HELIX, £943,705

##### *UK*

- 2017–21: NERC FabGGR, £300,000
- 2016–17: NERC TCRE1.5°C, £100,000
- 2015–16: AVOID-2, £25,000

## **SUPERVISION OF GRADUATE STUDENTS AND POSTDOCTORAL FELLOWS**

UK (2009–) Supervision of 13 postdocs, 7 PhD, 3 MSc. Examiner of 10 PhD.  
France (1998–2008) Supervision of 7 postdocs, 4 PhD, 8 MSc

## **PUBLICATIONS**

230+ peer reviewed publications, including 61 in Nature Publishing journals, Science and PNAS, 10 chapters in books. Lead author of IPCC AR5 synthesis report, IPCC AR5 WG1 summary for policymakers, technical summary and chapter 12, IPCC AR4 WG1 summary for policymakers and chapter 10.

H-index =94 , 44,000+ citations (*Web of Science*, May 2022).

<https://publons.com/researcher/2517563/pierre-friedlingstein/>

## **TOP 10 PUBLICATIONS (Full listed available at**

**<http://emps.exeter.ac.uk/mathematics/staff/pf229/publications>)**

1. Friedlingstein P, Jones MW, O'Sullivan M, Andrew RM, Hauck J, Olsen A, Peters GP, Peters W, Pongratz J, Sitch S., Le Quéré C., Canadell, J, Ciais P., Jackson R, et al. (2020) Global Carbon Budget 2021, *Earth System Science Data*, volume 14, no. 4, pages 1917-2005, DOI 10.5194/essd-14-1917-2022
2. Wang S, Zhang Y, Ju W, Chen JM, Ciais P, Cescatti A, Sardans J, Janssens IA, Wu M, Berry JA, E. Campbell, M. Fernández-Martínez, R. Alkama, S. Sitch, P. Friedlingstein, W. K. Smith, W. Yuan, W. He, D. Lombardozzi, M. Kautz, D. Zhu, S. Lienert, E. Kato, B. Poulter, T. G. M. Sanders, I. Krüger, R. Wang, N. Zeng, H. Tian, N. Vuichard, A. K. Jain, A. Wiltshire, V. Haverd, D. S. Goll, J. Peñuelas, (2020) Recent global decline of CO2 fertilization effects on vegetation photosynthesis, *Science*, volume 370, no. 6522, pages 1295-1300,, DOI:10.1126/science.abb7772
3. Matthews HD, Tokarska KB, Nicholls ZRJ, Rogelj J, Canadell JG, Friedlingstein P, Frölicher TL, Forster PM, Gillett NP, Ilyina T. (2020) Opportunities and challenges in using remaining carbon budgets to guide climate policy, *Nature Geoscience*, volume 13, no. 12, pages 769-779, DOI:10.1038/s41561-020-00663-3
4. Jones, C.D., Friedlingstein, P., Quantifying process-level uncertainty contributions to TCRE and carbon budgets for meeting Paris Agreement climate targets, *Env. Res. Lett.*, 15, 10.1088/1748-9326/ab858
5. Le Quere, C; Jackson, RB; Jones, MW; Smith, AJP; Abernethy, S; Andrew, RM; De-Gol, AJ; Willis, DR; Shan, YL; Canadell, OS; Friedlingstein, PER; Creutzig, EL; Peters, GP, Temporary reduction in daily global CO2 emissions during the COVID-19 forced confinement, *Nature Clim. Change*, 10, 10.1038/s41558-020-0797-x
6. Buermann, W; Forkel, M; O'Sullivan, M; Sitch, S; Friedlingstein, P; Haverd, V; Jain, AK; Kato, E; Kautz, M; Lienert, S; Lombardozzi, DA; Nabel, JEMS; Tian, HQ; Wiltshire, AJ; Zhu, D; Smith, WK; Richardson, AD (2018) Widespread seasonal compensation effects of spring warming on northern plant productivity, *Nature*, 562, 10.1038/s41586-018-0555-7, 2018.
7. Millar, RJ, Fuglestvedt, JS, Friedlingstein, P, Rogelj, J, Grubb, MJ, Matthews, HD, Skeie, RB, Forster, PM, Frame, DJ, Allen, MR (2018), Reply to 'Interpretations of the Paris climate target', *Nature Geoscience*, doi 10.1038/s41561-018-0087-7
8. Friedlingstein, P., Andrew, R.M., Rogelj, J., Peters, G.P., Canadell, J.G., Knutti, R., Luderer, G., Raupach, M.R., Schaeffer, M., Van Vuuren, D.P., Le Quéré, C. Persistent growth of CO2 emissions and implications for reaching climate targets (2014) *Nature Geoscience*, 7 (10), pp. 709-715. DOI: 10.1038/NCEO2248
9. Solomon S, Plattner G, Knutti R & Friedlingstein, P (2009) Irreversible climate change due to carbon dioxide emissions. *Proceedings of the National Academy of Sciences of the United States of America*, 106 1704-1709, doi:10.1073/pnas.0812721106.
10. Friedlingstein, P., Cox, P., Betts, R., Bopp, L., von Bloh, W., Brovkin, V., Cadule, P., Doney, S., Eby, M., Fung, I., Bala, G., John, J., Jones, C., Joos, F., Kato, T., Kawamiya, M., Knorr, W., Lindsay, K., Matthews, H.D., Raddatz, T., Rayner, P., Reick, C., Roeckner, E., Schnitzler, K.-G., Schnur, R., Strassmann, K., Weaver, A.J., Yoshikawa, C., Zeng, N. Climate-carbon cycle feedback analysis: Results from the C4MIP model intercomparison (2006) *Journal of Climate*, 19 (14), pp. 3337-3353. DOI: 10.1175/JCLI3800.1