Stergios Misios

CURRICULUM VITAE

National Academy of Athens, Greece

Personal

Born:	31 January 1980, Ptolemaida, Greece
Family:	Married, two children
Working Address:	Institute for Astronomy, Astrophysics, Space Applications and Remote Sensing, National Observatory of Athens, Greece

References

Prof. Joanna D. Haigh, Imperial College London, j.haigh@imperial.ac.uk
Prof. Lesley J. Gray, University of Oxford, Lesley.Gray@physics.ox.ac.uk
Dr. Hauke Schmidt, Max-Planck-Institut für Meteorologie, hauke.schmidt@mpimet.mpg.de

Professional Positions

I have been employed as a post-doctoral research associate in research organizations in Europe (University of Oxford, Aarhus University, Aristotle University of Thessaloniki, Max Planck Institute for Meteorology) and as a Marie Skłodowska-Curie fellow in the National Observatory of Athens. In 2023, I was elected as an Associate researcher in the Academy of Athens, Greece.

2024-now *Associate researcher, Academy of Athens*

2021-2023: *National Observatory of Athens*

- **Marie Skłodowska-Curie fellow** in the action "Climatic impacts of volcanic ash electrification — ElectricVolcano".
- **Co-Principal investigator** in the HFRI project "Fire smoke in the stratosphere: a new climate forcer-StratoFire".

2020-2021*: Democritus University of Thrace, Greece*

- **Co-Principal Investigator** in a young-researchers group (with one PhD student and Prof. K. Kourtidis) funded by the Greek Ministry of Education on "Cosmic and electric impacts on aerosols and clouds".

2019-2022*: Department of Geoscience, Aarhus University, Denmark*

- **Principal Investigator** funded by a **personal research grant** from the Vellux Foundation, Denmark, Villum Experiment "Environmental consequences of solar cosmic rays".

2016-2019*: Atmospheric, Oceanic and Planetary Physics, University of Oxford, UK*

- **Post-doctoral research associate** funded by the NERC, UK project "Decadal influence of Solar cycle".

2016-2017*: Department of Geoscience, Aarhus University, Denmark*

- **Post-doctoral assistant** (part-time) funded by the Villum Young Investigator Grant, Denmark, "Solar variability and North Atlantic climate during the last 1500 years".
- Teaching a block course "Practical Climate Modelling".

***2015**: GEOMAR Helmholtz-Z. Ozeanforschung Kiel, Germany*

- **Visiting researcher** funded by a **personal research grant** by Deutsche Akademische AustauschDienst.

2013: *Atmospheric, Oceanic and Planetary Physics, University of Oxford, United Kingdom*

- **Visiting researcher** funded by a visiting grant by the COST Action ES1005-Towards a more complete assessment of the impact of solar variability on the Earth's climate.

***2012-2016**: Laboratory of Atmospheric Physics, Aristotle University of Thessaloniki, Greece*

- **Post-doctoral research associate** funded by the FP7 project "First European Comprehensive Solar Irradiance Data Exploitation".
- **Post-doctoral research associate** funded by EUMETSAT **"**Validation and continuous quality assurance for total ozone column".

2012: *Max Planck Institute for Meteorology, Germany*

- **Post-doctoral research associate**

***2008-2012**: International Max Planck Research School on Earth System Modelling, Max Planck Institute for Meteorology, Germany*

- **Research assistant** funded by the CAWSES-ARTOS (The Atmospheric Response to Solar Variability)

***2005-2007**: Cram and public schools, Greece*

- Teaching physics and telecommunications

Education

2012: Doctor of Philosophy in Natural Sciences, Max-Planck Institute for Meteorology/University of Hamburg, Germany. *Advisers*: Dr. H. Schmidt, Dr. M. Giorgetta, and Prof. B. Stevens

Dissertation: *Influences of the 11-yr solar cycle on the tropical atmosphere and oceans*

2007: Master of Science, Laboratory of Atmospheric Physics/Aristotle University of Thessaloniki, Greece. Adviser: Prof. K. Tourpali

Thesis: *Influence of the solar activity on the stratospheric climate and circulation*.

2004: Diploma in Physics, Aristotle University of Thessaloniki, School of Physics, Greece. Adviser: Prof. A. Bais

Thesis: *Error estimation of narrow-band UV instruments for monochromatic radiation measurements*.

Synopsis of research interests

I am a climate modeler involved in the development and evaluation of the MPI-ESM, EMAC/MESSy and HadGEM3-GC3.1 global climate models. My research blends modelling and observations to help articulate the role of external forcings in the climate system. I have conceived and co-led (with Dr. D.M. Mitchell) the SPARC SolarMIP (Solar Model Intercomparison Project) an international programme for

the first ever intercomparison of the CMIP5 climate model simulations in regards to the solar cycle availability and effects in the atmosphere and surface. Likewise, I have employed global climate models under the VolMIP (Volcanic Forcings Model Intercomparison) to disentangle effects of volcanic eruptions in the climate system on global and regional scales, such as the Mediterranean climate. With the chemistry climate model EMAC/MESSy, I am responsible for the quantification of the radiative forcing of stratospheric aerosols of volcanic and wild-fires origin. I have also deployed instrumentation for measuring Atmospheric Electricity in the Chelmos high-altitude observatory and the Villum Research Station, Greenland. Lately, I am interested in developing methodologies for climate-related financial disclosures for the benefit of business activities.

- Expertise in global- and chemistry-climate models: MPI-ESM, HadGEM and EMAC/MESSy
- Effects of the 11-yr solar variability and volcanoes in the Earth's climate
- Decadal climate variability in the past and future
- Atmospheric electrification measurements
- Stratosphere-troposphere interactions and stratospheric ozone
- Stratospheric aerosols from volcanoes and fires
- Climate-related financial disclosures and business reformation

Research projects and personal funding

I have been awarded **five personal research grants** (Marie Skłodowska-Curie Fellowship, Vellux Foundation, Greek Ministry of Education, SCOSTEP grant and DAAD fellowship) and I am participating as a **co-principal investigator** in 2 funded projects (Erasmus+, HFRI Greece).

- Erasmus+ Denmark, ReEngineering BUsIness under cLimaTe crisis (ReBUILD), Co-principal investigator, 2022-2024 (~285.000 EUR)
- SCOSTEP campaign grant, Atmospheric electricity measurements at the Villum Research Station, 2022 (5.000 USD)
- HFRI Greece, Fire smoke in the stratosphere: a new climate forcer (StratoFIRE), Co-principal investigator, 2022-2025 (~200.000 EUR)
- Marie Skłodowska-Curie fellowship EC, Climatic impacts of volcanic ash electrification ElectricVolcano, Principal investigator, 2021-2023 (~167.000 EUR)
- Vellux Foundation Denmark, "Environmental consequences of solar cosmic rays", Principal investigator, 2019-2022 (~1.900.000 DKK)
- Ministry of Education Greece, Cosmic and electric impacts on aerosols and clouds, Principal investigator, 2020-2021 (41.500 EUR)
- COST Action ELECTRONET, Short term mission grant for research visit to PMOD-WRC, Davos (2800 EUR)
- Deutsche Akademische AustauschDienst (DAAD) Germany, Research Visit at the GEOMAR Helmholtz-Z. Ozeanforschung Kiel, 2015 (7.200 EUR)
- NERC UK, Decadal influence of Solar Cycle (DISC), Post-doctoral research associate, 2016-2019
- FP7, SOLID: First European SOLar Irradiance Data Exploitation, Post-doctoral research associate, 2013-2016

- DFG Germany, CAWSES-ARTOS: The Atmospheric Response to Solar Variability, Doctoral student, 2008-2012
- EUMETSAT, Validation and continuous quality assurance for total ozone column, Post-doctoral research associate, 2012
- EU, SCOUT-O3, Stratospheric-Climate links with emphasis on the upper troposphere and lower stratosphere, Field campaign assistant, 2007

Professional Activities

- Science discipline representative of the SCOSTEP (Scientific Committee on Solar-Terrestrial Physics), since 2020
- Co-leader of the Pillar 3 of SCOSTEP-PRESTO (Variability and Predictability of the Solar-Terrestrial Coupling), since 2020
- Working group co-leader of the SPARC SOLARIS-HEPPA, since 2016
- Member of the VolMIP (Model Intercomparison Project on the climatic response to Volcanic forcing) consortium. 2017-present
- Co-author of the SPARC project LOTUS (Long-term Ozone Trends and Uncertainties in the Stratosphere), in support of the WMO/UNEP 2018 Ozone Assessment. 2016-2018
- Member of the COST action "Atmospheric Electricity Network-ELECTRONET", 2020-2021
- Principal investigator of WCRP Solar Model Intercomparison Project (SolarMIP), 2014-2015
- Member of the COST action "TOwards a more complete assessment of. the impact of Solar variability on the Earth's Climate-TOSCA", 2013-2016

Field Studies

- Villum Research Station, Greenland, Measuring Atmospheric Electricity with a JCI 131, July 2022
- CALISHTO-HELMOS Campaign, Measuring Atmospheric Electricity with a JCI 131, 2021
- UV Radiation and Aerosol Campaign, SCOUT-O3, Thessaloniki, Greece, 2006

Publications

I have contributed to 18 refereed publications (6 as a first author) to the scientific literature. These have resulted in an (ISI) h-index of 11 and more than 663 citations according to the Scopus metrics (04/06/23). **A research highlight is a publication in the Proceedings of the National Academy of Sciences of the United States of America**. I have also contributed to 4 book chapters and 2 assessment reports. I have given more than 60 talks (3 invited) in international conferences and projects meetings, while he has communicated physics- and climate-related topics to secondary and high schools in national science events.

<u>In review</u>

- P.L.M. Gonzalez, L.J. Gray, **S. Misios**, H. Ma, Retrospective reanalyses support the presence of solar cycle impacts on North Atlantic climate, submitted to Quarterly Journal of Royal Meteorological Society

Peer-reviewed

18) V. Amiridis, A. Kampouri, A. Gkikas, **S. Misios**, …, A.G. Straume: Aeolus winds impact on volcanic ash early warning systems for aviation, Scientific Reports, 2023, **cited:1**

17) S.G. Kaiser Kudsk, M.F. Knudsen, C. Karoff, C. Baittinger, **S. Misios**, J. Olsen: Solar minima and changes in the 11- and 22-year solar cycles between AD 650 and 1950: - novel insights from a global compilation of new and existing high- resolution 14C records, Quaternary Science Reviews, 2022, **cited:1**

16) **S. Misios**, I. Logothetis, M. F. Knudsen, C. Karoff, V. Amiridis, K. Tourpali: Decline of Etesian winds after large volcanic eruptions in the last millennium, Weather and Climate Dynamics, 2022, https://doi.org/10.5194/wcd-2022-16 **cited:-**

15) **S. Misios**, M. Kasoar, E. Kasoar, L. Gray, J. Haigh, S. Stathopoulos, K. Kourtidis, G. Myhre, D. Olivié, D. Shindell and T. Tang: Similar patterns of tropical precipitation and circulation changes under solar and greenhouse gas forcing, Environmental Research Letters, 2021, https://doi.org/10.1088/1748-9326/ac28b1, **cited:-**

14) I. Logothetis, S. Dafka, K. Tourpali, **S. Misios**, P. Zanis, E. Xoplaki, J. Luterbacher, E. Papagianoulis: The Southeast Asian monsoon and El Niño–Southern Oscillation impact on the summer atmospheric circulation of East Mediterranean during 20th century based on ERA-20C and CMIP5 simulations, International Journal of Climatology, 2021, https://doi.org/10.1002/joc.7510, **cited:1**

13) M.B. Andrews, J.K. Ridley, R.A. Wood, …, **S. Misios**,… R.T. Sutton: Historical Simulations with HadGEM3-GC3.1 for CMIP6, Journal of Advances in Modeling Earth Systems, 2020, https://doi.org/10.1029/2019MS001995, **cited:62**

12) Logothetis I., Tourpali K., **Misios S.**, Zanis P., Etesians and the Summer Circulation over East Mediterranean in CMIP5 Simulations: Connections to the West Indian Summer Monsoon, International Journal of Climatology, 2019, https://doi.org/10.1002/joc.6259, **cited:6**

11) **S. Misios,** L.J. Gray, M.F. Knudsen, C. Karoff, H. Schmidt and J.D. Haigh: Slowdown of the Walker circulation at Solar Cycle Maximum, Proceedings of the National Academy of Sciences of the United States of America, 2019, https://doi.org/10.1073/pnas.1815060116, **cited:31**

10) Gray, L.J., Ball, W., **Misios, S.,** Solar influences on climate over the Atlantic / European sector, AIP Conference Proceedings, 2017, https://doi.org/10.1063/1.4975498, **cited:13**

9) K. Matthes, B. Funke, …, **S. Misios**,…, S. Versick: Solar Forcing for CMIP6 (v3.2), Geoscientific Model Development, 2017, https://doi.org/10.5194/gmd-10-2247-2017, **cited: 242**

8) M. Haberreiter, M. Schoell, T. Dudok de Wit, M. Kretzschmar, **S. Misios**, K. Tourpali, and W. Schmutz: A new observational solar irradiance composite, Journal of Geophysical Research-Space Physics, 2017, https://doi.org/10.1002/2016JA023492, **cited:42**

7) **S. Misios**, D.M. Mitchell, L.J. Gray, K. Tourpali, K. Matthes, L. Hood, H. Schmidt, G. Chiodo, R. Thieblemont, E. Rozanov, D. Shindell, A. Krivolutsky: Solar Signals in CMIP-5 Simulations: Effects of Atmosphere-Ocean Coupling, Quarterly Journal of Royal Meteorological Society, 2016, https://doi.org/10.1002/qj.2695, **cited:43**

6) L. Hood, **S. Misios**, D.M. Mitchell, L.J. Gray, K. Tourpali, K. Matthes, H. Schmidt, G. Chiodo, R. Thieblemont, E. Rozanov, D. Shindell, A. Krivolutsky: Solar Signals in CMIP-5 Simulations: The Ozone Response, Quarterly Journal of Royal Meteorological Society, 2015, https://doi.org/10.1002/qj.2553, **cited:44**

5) D.M. Mitchell, **S. Misios**, L.J. Gray, K. Tourpali, K. Matthes, L. Hood, H. Schmidt, G. Chiodo, R. Thieblemont, E. Rozanov, D. Shindell, A. Krivolutsky: Solar Signals in CMIP-5 Simulations: The Stratospheric Pathway, Quarterly Journal of Royal Meteorological Society, 2015, https://doi.org/10.1002/qj.2530, **cited:62**

4) D.M. Mitchell, L.J. Gray, M. Fujiwara, T. Hibino, J. A. Anstey, W. Ebisuzaki, Y. Harada, C. Long, **S. Misios**, P. A. Stott, D. Tan: Signatures of Natural Variability in the Atmosphere using Multiple Reanalysis Datasets, Quarterly Journal of Royal Meteorological Society, 2014, https://doi.org/10.1002/qj.2492, **cited:61**

3) Fountoulakis I., Bais A., Tourpali K., Fragkos K., **Misios S.**: Projected changes in solar UV radiation over the Arctic and subarctic Ocean: Effects from changes in reflectivity, clouds and ozone, Journal of Geophysical Research, 2014, https://doi.org/10.1002/2014JD021918, **cited:17**

2) **Misios, S.** and Schmidt, H.: The role of the oceans in shaping the tropospheric response to the 11-yr solar cycle, Geophysical Research Letters, 2013, https://doi.org/10.1002/2013GL058439, **cited:11**

1) **Misios, S.**, and Schmidt, H.: Mechanisms involved in the amplification of the 11-yr solar cycle signal in the tropical Pacific Ocean, Journal of Climate, 2012, https://doi.org/10.1175/JCLI-D-11-00261.1, **cited:27**

Research monographs, book chapters and reports

1) **Misios, S.** Understanding climate system and why it's under pressure, Rebuilt MOOC, learning.rebuilt-project.eu/
2) Braesicke P., et al, Update on Global ozone: past, present, and future, in Scientific Assessment of Ozone Depletion: 2018, Global Ozone Research and Monitoring Project — Report No. 58, World Meteorological Organization, Geneva, Switzerland, 2018
3) Petropavlovskikh I. et al., Report on Long-term Ozone Trends and Uncertainties in the Stratosphere, SPARC Report No. 9, WCRP-17/2018, GAW Report No. 241, doi:10.17874/f899e57a20b
4) Logothetis, I.; Tourpali, K.; **Misios, S.,** The Evolution of Etesians: Trends in 20th Century and Future Projections, in Perspectives on Atmospheric Sciences, Springer, 2017
5) Maycock, A. C., and **S. Misios**, Bottom-up versus top-down mechanisms for solar-climate coupling, in: Earth's climate response to a changing Sun, edited by: Jean Lilensten, EDP sciences, 2015
6) **Misios, S.** and Schmidt, H.: Stratospheric responses to the 11-year solar cycle in MAECHAM5 with and without ocean coupling, in: Advances in Meteorology, Climatology and Atmospheric Physics, Helmis, C.; Nastos, P. (Eds.), Springer, 2013
7) Schmidt, H., Kieser, J., **Misios, S.,** and Gruzdev, A. M.,: The Atmospheric Response to Solar Variability: Simulations with a General Circulation and Chemistry Model for the Entire Atmosphere, in: Climate and Weather of the Sun Earth System, edited by: Lübken, F.-J., Springer, 2013
8) Weil, M. et al.: Pathways, Impacts, and Policies on Severe Aerosol Injections into the Atmosphere, Bulletin of American Meteorological Society, 2012

Selection of recent conferences/meetings (full list in the detailed publication list)

1. **S. Misios**, Decline in the Mediterranean Etesian winds after large volcanic eruptions in the last millennium, EGU 2023
2. (invited) **S. Misios**, Solar influences on hydroclimate, 44th COSPAR Scientific Assembly, July 2022
3. K. Kourtidis, **S. Misios**, A. Karagioras, and I. Kosmadakis: Measurements of PG during rain, hail, snow and lightning, EGU 2022

4. A.Kampouri, V.Amiridis,…, **S.Misios**, … et al.: First numerical experiments assessing the impact of Aeolus wind data assimilation on volcanic ash dispersion, Aeolus 3rd Anniversary Conference, 2022
5. **S. Misios**, Similar patterns of tropical precipitation and circulation changes under solar and greenhouse gas forcing, 15TH QUADRENNIAL SOLAR-TERRESTRIAL PHYSICS SYMPOSIUM (STP-15), 2022
6. S. Misios, P. Fetfatzis, K. Elefteriadis, V. Daskalopoulou, V. Amiridis, M. F. Knudsen, C. Karoff Electric field measurements at a high-altitude station, Mt. Chelmos, Greece, ICAEA 2022
7. (invited) **S. Misios**, Similar patterns of tropical precipitation and circulation changes under solar and greenhouse gas forcing, Joint Scientific Assembly IAGA-IASPEI 2021
8. **S. Misios**, M.F. Knudsen, and C. Karoff: Simulating effects of the 774 AD solar proton event on atmospheric electricity, EGU 2021
9. **S. Misios**: Volcanoes and Climate: with some history, public talk, Kryoneri, 2021
10. S. Stathopoulos, **S. Misios**, and K. Kourtidis: Cause-and-effect relations between cosmic rays, electric field, aerosols and clouds, EGU 2021
11. S. Misios, M.F. Knudsen, C. Karoff: Simulating effects of the 774 AD solar proton event on atmospheric electricity, MESSY Symposium, 2021
12. (invited) **S.Misios**: Solar influences on climate: how to turn sloppy statistics to interdisciplinary science, 2nd Eddy Cross Disciplinary Symposium, 2021

Supervision

3 PhDs and 3 master students.

2021, Sigmund Guttu, Forcing from the 11-year Solar Cycle and relevance for inter-annual to decadal climate variability, University of Oslo, Evaluation committee (with Dr. Lon Hood).

2016-2021, Sabrina Nielsen, PhD candidate: Solar variability during grand solar minima/maxima and associated influences on Earth's environment, Aarhus University (Jointly with Prof. M.F. Knudsen)

2015-2020, Ioannis Logothetis, PhD, Effects of large-scale dynamic phenomena of the summer atmospheric circulation over the Aegean basin, Aristotle University of Thessaloniki, Adviser: Prof. K. Tourpali, https://www.openarchives.gr/aggregator-openarchives/edm/phdtheses/000040-10442_47406

2015, Andreas Chrysanthou, Master Thesis: The effect of 11-year solar cycle spectral variability as calculated with libRadtran radiative transfer model and EMAC (ECHAM/MESSy) Chemistry Climate model, Aristotle University of Thessaloniki, 2015, https://ikee.lib.auth.gr/record/280641 (joint with Prof. K. Tourpali)

2015, Morfi Vaskos, Master Thesis: Solar radiation in Europe (via "CMIP5" climate models), Aristotle University of Thessaloniki, https://ikee.lib.auth.gr/record/269783 (joint with Prof. K. Tourpali)

2014, Ioannis Logothetis, Master Thesis: The Etesian winds over Aegean Sea in the 21st century from Earth System Model (ESM) simulations available from the 5th phase of CMIP, https://ikee.lib.auth.gr/record/135159 (joint with Prof. K. Tourpali)

Teaching

2023	Block Course "Solar influences on climate with some statistics", ICTP
2017-2018	Block course on "Practical climate modeling", Aarhus University, Denmark

2013-2015 Block courses on post-graduate course: "Introduction to LINUX and Climate Data Operators", Aristotle University of Thessaloniki, Greece

2013-2015 Assistant tutor on pre-graduate course "Atmospheric Technology", 8th semester, Aristotle University of Thessaloniki, Greece

2014 Tutor in the 2nd COST-TOSCA training school on Solar variability and climate response, Trieste, Italy

2009 Teaching assistant of "Working with ECHAM6" course, MPI for Meteorology, Hamburg, Germany

2005-2007 "Telecommunication Systems" course, Institute of Occupational Training, Health Ministry, Greece

2005-2007 Elementary Physics course, Technical High School of Sidirokastro, Serres, Greece

Workshop and Meeting Organization

- ICTP-SCOSTEP-ISWI School and Workshop on the Predictability of the Solar-Terrestrial Coupling – PRESTO, 2023 (Co-organiser)
- Organiser of a Special session for Young Scientists, 14th International Conference on Meteorology, Climatology and Atmospheric Physics, 2018
- 3rd Solar Connections Symposium, Oxford, UK, 2017 (Local organiser)
- EGU Session on Solar Variability and its impact on the Earth's atmosphere, 2016 (Co-convener)
- 3rd SOLID Annual Meeting, Thessaloniki, Greece, 2015 (Co-organiser)
- TOSCA workshop on future solar scenario, Corfu, Greece, 2014 (Co-organiser)
- COST-TOSCA summer school on the impact of solar variability on the Earth's climate, Thessaloniki, Greece, 2013 (Co-organiser)
- SolarMIP workshop on model Intercomparison, Thessaloniki, Greece, 2013 (Co-organiser)

Memberships and service to community

- "Climate and Climatic Variability", online round table, Municipality of Nea Smirni, Greece, 2021
- "Past, present and Future of the Earth's climate", TV show, Anixneuseis, 2021
- "Volcanoes and Climate: with some history" public talk at the Kryoneri observatory, 2021
- Communication of the of the PNAS paper to public in the Phys.org "Solar variability weakens the Walker cell", 2019
- "The stratosphere" public talk to High School students in Kiel, 2015
- Talks about meteorology for primary school children organized by Hellenic Physics Society, 2014.
- Member of the American Meteorological Society and American Geophysical Union, Hellenic Meteorological Society
- Reviewer for Journal of Geophysical Research, Theoretical and Applied Climatology, Climate of the Past, Scientific Online Letters on the Atmosphere, Journal of Solar and Terrestrial Physics, Quarterly Journal of Royal Meteorological Society
- Member of working Group SPARC/WRCP SOLARIS (SOLAR Influence for SPARC)