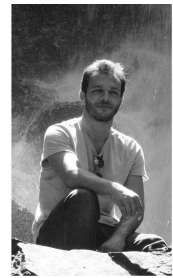


# Christos Katsavrias, Ph.D.

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in Christos Katsavrias

🌐 <https://scholar.google.com/citations?user=7kIwflsAAAAJ&hl=en/>



## Summary

**Brief Bio**    📖 Dr. Christos Katsavrias is a space physicist and research associate at the University of Athens. He received his PhD from the University of Athens in February 2019, working, under the supervision of Professor Ioannis A. Daglis, on the variability of the electron population in the outer radiation belt. He has worked as a research associate for several research projects, including the ESA HERMES and ECIRENE projects, the Hellenic National Space Weather Research Network, the FP7-Space MAARBLE project and Horizon-2020 SafeSpace. He has uninterrupted participation in scientific conferences since 2011 and more than 30 publications in peer-reviewed journals (more than 400 citations and h-index = 12 according to Google Scholar). Since February 2019, he serves as the Early Career Officer of the Southeast Europe Hub of Europlanet Society, while since 2021, he is a member of the editorial board of the peer-review journal "Annales Geophysicae".

**Research Interests**    📖 Research interests include (but not limited to):

- **Magnetospheric physics:** energetic particle variability in planetary magnetospheres, wave-particle interactions, radial diffusion, wavelet analysis.
- **Space Weather:** modelling of the trapped particle populations in the Earth's radiation belts, data analysis, machine learning.
- **Heliospheric physics and solar wind:** Large scale structures in the solar wind (ICMEs/SIRs) and their geoeffectiveness, Periodic density structures (PDS).

## Education

- 2019    📖 **Ph.D. in Space Physics**, National and Kapodistrian University of Athens.  
Dissertation title: *On the Variability of Seed, Relativistic and Ultra-relativistic Electron Population in the Outer Van Allen Belt.*
- 2013    📖 **M.Sc. in Astrophysics**, National and Kapodistrian University of Athens.  
Thesis title: *Energetic Particles in the Jovian Magnetosphere.*
- 2011    📖 **B.Sc. in Physics**, National and Kapodistrian University of Athens.

## Employment History

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### NASA GSFC

- Jan 2023 – Apr 2023 ■ Short-term scholar at the Heliophysics Division .  
*Exploring synergistic studies of radiation belt dynamics (modeling and observations) and ULF waves in the magnetosphere/magnetosheath.*

### Institute of Accelerating Systems and Applications (IASA)

- Apr 2023 – Dec 2024 ■ Research associate in *S2P S1-SW-14.2 - SPACE ENVIRONMENT NOWCAST AND FORECAST DEVELOPMENT - PART 2-RBFAN2*, an ESA funded project. In this project I served as WP Leader of: WP430 (*D<sub>LL</sub>* Model Detailed Design), WP440 (*D<sub>LL</sub>* Model Implementation), WP740 (Performances Campaign Definition) and WP770 (Performances Campaign).
- May 2019 – May 2020 ■ Research associate in *SSA P3-SWE-XXIII - Space Weather User Needs for the Mediterranean Region-SWUNMed*, an ESA funded project. In this project I served as WP Leader of: WP210 (Analysis of current SWE System and Product Requirements), WP230 (Definition of new SWE System and Product Requirements) and WP340 (SWE Service Network Improvements Plan).
- Mar 2017 – Mar 2018 ■ Research associate in *Radiation Belt Model Development and Validation: AP9/AE9/SPM models-VALIRENE*, an ESA funded project.
- Feb 2015 – Oct 2018 ■ Research associate in *Hellenic Evolution of Radiation data processing and Modelling of the Environment in Space-HERMES*, an ESA funded project. In this project I served as WP Leader of WP1200 (Data Cleaning and Evaluation).

### Space Applications and Research Consultancy (SPARC)


- Dec 2023 – Jul 2026 ■ Research associate in *Event-based Electron Belt Radiation Storm Environments Modelling-VERSE*, an ESA funded project. In this project I served as WP Leader of WP210 (Model Baseline Investigation).
- Jul 2019 – Jul 2020 ■ Research associate in *European Contribution to IRENE model-ecIRENE*, an ESA funded project. In this project I served as WP Leader of WP2400 (Epoch Analysis of Variability of the RB Environment).

### National and Kapodistrian University of Athens


- Nov 2023 – Dec 2024 ■ Research associate in *Particle Radiation Modelling for Interplanetary Missions Extending to Low Energies-FIRESPELL*, an ESA funded project. In this project I served as Task Leader of Task 210 (Data assessment and pre-processing).
- Jul 2023 – Dec 2024 ■ Research associate in *Forecast of Actionable Radiation Belt Scenarios-FARBES*, an EU funded project.
- Jan 2020 – Dec 2022 ■ Research associate in *Radiation Belt Environmental Indicators for the Safety of Space Assets-SafeSpace*, an EU funded project. In this project I served as Task Leader of Task 3.2 (Impact of plasma density and waves on diffusion coefficients) and Task 6.3 (Scientific Dissemination of Results).


## Employment History (continued)


### Aristotle University of Thessaloniki

Jan 2015 – Sep 2015     Research associate in the *Hellenic National Space Weather Research–THALES Network*, a National Strategic Reference Framework funded project.


### National Observatory of Athens

Sep 2019 – Sep 2020     Research associate in *arTificial intelligenCe To link publiCations wIth observAtioNs–TACTICIAN*, an ESA funded project.

Sep 2017 – Sep 2018     Research associate in *Linking data and publications in ESA's Science Archives Publications System–LPUB SAPS*, an ESA funded project.

Nov 2013 – Dec 2014     Research associate in *Monitoring, Analysing and Assessing Radiation Belt Energization and Loss–MAARBLE*, an EU funded project.






## Academic Experience

2015 – present     Teaching Assistant in National and Kapodistrian University of Athens

- Astrophysics Lab (Contribution to the design and implementation of laboratory exercises).
- Space Physics lectures (Contribution to course theory comprehension exercises and notes for undergraduate students).
- Co-supervision of undergraduate and postgraduate theses.
- Co-author of the academic book: "Space Physics" (in greek).

## Research Publications

### Journal Articles

- 1 S. Aminalragia-Giamini, **C. Katsavriasis**, C. Papadimitriou, *et al.*, "The emerald model for the estimation of the radial diffusion coefficients in the outer belt," *Space Weather*, vol. 21, no. 1, Jan. 2023, ISSN: 1542-7390.  DOI: 10.1029/2022sw003283.
- 2 A. Brunet, N. Dahmen, **C. Katsavriasis**, *et al.*, "Improving the electron radiation belt nowcast and forecast using the safespace data assimilation modeling pipeline," *Space Weather*, vol. 21, no. 8, Aug. 2023, ISSN: 1542-7390.  DOI: 10.1029/2022sw003377.
- 3 N. Dahmen, A. Brunet, S. Bourdarie, *et al.*, "Electron radiation belt safety indices based on the safespace modelling pipeline and dedicated to the internal charging risk," *Annales Geophysicae*, vol. 41, no. 2, pp. 301–312, Aug. 2023, ISSN: 1432-0576.  DOI: 10.5194/angeo-41-301-2023.
- 4 K. Thanasoula, **C. Katsavriasis**, A. Nasi, I. Daglis, G. Balasis, and T. Sarris, "The dependence of radial diffusion coefficients on solar/interplanetary drivers," *Advances in Space Research*, vol. 71, no. 12, pp. 5171–5184, Jun. 2023, ISSN: 0273-1177.  DOI: 10.1016/j.asr.2023.02.015.
- 5 N. Dahmen, A. Sicard, A. Brunet, *et al.*, "Farwest: Efficient computation of wave-particle interactions for a dynamic description of the electron radiation belt diffusion," *Journal of Geophysical Research: Space Physics*, vol. 127, no. 10, Oct. 2022, ISSN: 2169-9402.  DOI: 10.1029/2022ja030518.

- 6 **C. Katsavriasis**, S. Aminalragia-Giamini, C. Papadimitriou, I. A. Daglis, I. Sandberg, and P. Jiggins, "Radiation belt model including semi-annual variation and solar driving (sentinel)," *Space Weather*, vol. 20, no. 1, Jan. 2022, ISSN: 1542-7390. [DOI: 10.1029/2021sw002936](#).
- 7 **C. Katsavriasis**, A. Nasi, I. A. Daglis, *et al.*, "The "safespace" database of ulf power spectral density and radial diffusion coefficients: Dependencies and application to simulations," *Annales Geophysicae*, vol. 40, no. 3, pp. 379–393, Jun. 2022, ISSN: 1432-0576. [DOI: 10.5194/angeo-40-379-2022](#).
- 8 **C. Katsavriasis**, C. Papadimitriou, A. Hillaris, and G. Balasis, "Application of wavelet methods in the investigation of geospace disturbances: A review and an evaluation of the approach for quantifying wavelet power," *Atmosphere*, vol. 13, no. 3, p. 499, Mar. 2022, ISSN: 2073-4433. [DOI: 10.3390/atmos13030499](#).
- 9 A. Nasi, **C. Katsavriasis**, I. A. Daglis, *et al.*, "An event of extreme relativistic and ultra-relativistic electron enhancements following the arrival of consecutive corotating interaction regions: Coordinated observations by van allen probes, arase, themis and galileo satellites," *Frontiers in Astronomy and Space Sciences*, vol. 9, Aug. 2022, ISSN: 2296-987X. [DOI: 10.3389/fspas.2022.949788](#).
- 10 **C. Katsavriasis**, S. Aminalragia-Giamini, C. Papadimitriou, *et al.*, "On the interplanetary parameter schemes which drive the variability of the source/seed electron population at geo," *Journal of Geophysical Research: Space Physics*, vol. 126, no. 6, May 2021, ISSN: 2169-9402. [DOI: 10.1029/2020ja028939](#).
- 11 **C. Katsavriasis**, C. Papadimitriou, S. Aminalragia-Giamini, I. A. Daglis, I. Sandberg, and P. Jiggins, "On the semi-annual variation of relativistic electrons in the outer radiation belt," *Annales Geophysicae*, vol. 39, no. 3, pp. 413–425, May 2021, ISSN: 1432-0576. [DOI: 10.5194/angeo-39-413-2021](#).
- 12 **C. Katsavriasis**, S. Raptis, I. A. Daglis, T. Karlsson, M. Georgiou, and G. Balasis, "On the generation of piz pulsations due to plasma flow patterns around magnetosheath jets," *Geophysical Research Letters*, vol. 48, no. 15, Aug. 2021, ISSN: 1944-8007. [DOI: 10.1029/2021gl093611](#).
- 13 I. Sandberg, P. Jiggins, H. Evans, *et al.*, "Harmonization of rbsp and arase energetic electron measurements utilizing esa radiation monitor data," *Space Weather*, vol. 19, no. 6, Jun. 2021, ISSN: 1542-7390. [DOI: 10.1029/2020sw002692](#).
- 14 A. Nasi, I. Daglis, **C. Katsavriasis**, and W. Li, "Interplay of source/seed electrons and wave-particle interactions in producing relativistic electron psd enhancements in the outer van allen belt," *Journal of Atmospheric and Solar-Terrestrial Physics*, vol. 210, p. 105 405, Nov. 2020, ISSN: 1364-6826. [DOI: 10.1016/j.jastp.2020.105405](#).
- 15 I. A. Daglis, **C. Katsavriasis**, and M. Georgiou, "From solar sneezing to killer electrons: Outer radiation belt response to solar eruptions," *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences*, vol. 377, no. 2148, p. 20 180 097, May 2019, ISSN: 1471-2962. [DOI: 10.1098/rsta.2018.0097](#).
- 16 **C. Katsavriasis**, I. A. Daglis, and W. Li, "On the statistics of acceleration and loss of relativistic electrons in the outer radiation belt: A superposed epoch analysis," *Journal of Geophysical Research: Space Physics*, vol. 124, no. 4, pp. 2755–2768, Apr. 2019, ISSN: 2169-9402. [DOI: 10.1029/2019ja026569](#).
- 17 **C. Katsavriasis**, I. Sandberg, W. Li, *et al.*, "Highly relativistic electron flux enhancement during the weak geomagnetic storm of april–may 2017," *Journal of Geophysical Research: Space Physics*, vol. 124, no. 6, pp. 4402–4413, Jun. 2019, ISSN: 2169-9402. [DOI: 10.1029/2019ja026743](#).
- 18 **C. Katsavriasis**, A. Hillaris, and P. Preka-Papadema, "A wavelet based approach to solar–terrestrial coupling," *Advances in Space Research*, vol. 57, no. 10, pp. 2234–2244, May 2016, ISSN: 0273-1177. [DOI: 10.1016/j.asr.2016.03.001](#).
- 19 P. Ppathanasopoulos, P. Preka-Papadema, A. Gkotsinas, *et al.*, "The possible effects of the solar and geomagnetic activity on multiple sclerosis," *Clinical Neurology and Neurosurgery*, vol. 146, pp. 82–89, Jul. 2016, ISSN: 0303-8467. [DOI: 10.1016/j.clineuro.2016.04.023](#).

- 20 S. Patsourakos, M. K. Georgoulis, A. Vourlidas, *et al.*, “The major geoeffective solar eruptions of 2012 march 7: Comprehensive sun-to-earth analysis,” *The Astrophysical Journal*, vol. 817, no. 1, p. 14, Jan. 2016, ISSN: 1538-4357. [DOI: 10.3847/0004-637x/817/1/14](#).
- 21 C. Tsironis, A. Anastasiadis, **C. Katsavrias**, and I. A. Daglis, “Modeling of ion dynamics in the inner geospace during enhanced magnetospheric activity,” *Annales Geophysicae*, vol. 34, no. 2, pp. 171–185, Feb. 2016, ISSN: 1432-0576. [DOI: 10.5194/angeo-34-171-2016](#).
- 22 M. Georgiou, I. A. Daglis, E. Zesta, *et al.*, “Association of radiation belt electron enhancements with earthward penetration of pc5 ulf waves: A case study of intense 2001 magnetic storms,” *Annales Geophysicae*, vol. 33, no. 11, pp. 1431–1442, Nov. 2015, ISSN: 1432-0576. [DOI: 10.5194/angeo-33-1431-2015](#).
- 23 **C. Katsavrias**, I. A. Daglis, W. Li, *et al.*, “Combined effects of concurrent pc5 and chorus waves on relativistic electron dynamics,” *Annales Geophysicae*, vol. 33, no. 9, pp. 1173–1181, Sep. 2015, ISSN: 1432-0576. [DOI: 10.5194/angeo-33-1173-2015](#).
- 24 **C. Katsavrias**, I. A. Daglis, D. L. Turner, *et al.*, “Nonstorm loss of relativistic electrons in the outer radiation belt,” *Geophysical Research Letters*, vol. 42, no. 24, Dec. 2015, ISSN: 1944-8007. [DOI: 10.1002/2015gl066773](#).
- 25 **C. Katsavrias**, P. Preka-Papadema, X. Moussas, T. Apostolou, A. Theodoropoulou, and T. Papadima, “Helio-geomagnetic influence in cardiological cases,” *Advances in Space Research*, vol. 51, no. 1, pp. 96–106, Jan. 2013, ISSN: 0273-1177. [DOI: 10.1016/j.asr.2012.07.030](#).
- 26 **C. Katsavrias**, P. Preka-Papadema, and X. Moussas, “Wavelet analysis on solar wind parameters and geomagnetic indices,” *Solar Physics*, vol. 280, no. 2, pp. 623–640, Aug. 2012, ISSN: 1573-093X. [DOI: 10.1007/s11207-012-0078-6](#).

## Books and Chapters












- 1 I. Daglis, **C. Katsavrias**, N. Sergis, and M. Georgiou, *Space Physics*, el. Kallipos, Open Academic Editions, 2023. [DOI: 10.57713/KALLIPOS-384](#).

## Conferences/Workshops/Invited Talks

### Selected Conference Presentations

- Nov 2023 **Katsavrias, C.**, S. Aminalragia-Giamini, K. Thanasoula, C., Papadimitriou, A. Nasi, and I.A. Daglis; On the relationship between the magnetic and electric component of the radial diffusion coefficients in the outer Van Allen belt, (Contributed Poster), European Space Weather Week, Toulouse, France.
- May 2022 **Katsavrias, C.**, Raptis, S., Daglis, I.A., Karlsson, T., Georgiou, M., and Balasis, G.; On the Generation of Piz Pulsations due to Plasma Flow Patterns Around Magnetosheath Jets, (Contributed Talk), EGU General Assembly, Vienna, Austria.
- Dec 2021 **Katsavrias, C.**, Daglis, I.A., Nasi, A., Dahmen, N., Brunet, A., Bourdarie, S. and Papadimitriou, C.; Radial diffusion coefficients: a database and a machine learning model for use in radiation belt simulations, (Contributed Talk), AGU fall meeting, New Orleans, USA.
- Oct 2021 **Katsavrias, C.**, S. Aminalragia-Giamini, C. Papadimitriou, I.A. Daglis, I. Sandberg, and P. Jiggins; Radiation belt model including semi-annual variation and Solar driving (Sentinel), (Contributed Talk), European Space Weather Week, Glasgow, Scotland.

## Conferences/Workshops/Invited Talks (continued)

- Apr 2021  **Katsavrias, C.**, I.A. Daglis, A. Nasi, C. Papadimitriou, and M. Georgiou; Radial diffusion coefficients database in the frame of SafeSpace project., (Virtual Pico), EGU General Assembly, Online.
- Oct 2020  **Katsavrias, C.**, I.A. Daglis, G. Balasis, A. Belehaki, A. Papaioannou, A. Anastasiadis, M. Ieronymaki and S. Bollanos; Space Weather User Needs for the Mediterranean Region – Current Customer Requirements., (Contributed Talk), ESA SWE Service Network Workshop 2020, Online.
- May 2020  **Katsavrias, C.**, A. Nasi, C. Papadimitriou, S. Aminimalragia–Giamini, I. Sandberg, P. Jiggins and I.A. Daglis; Identification of interplanetary parameter schemes which drive the variability of the magnetospheric radiation environment., (Contributed Talk), EGU General Assembly, Vienna, Austria.
- Nov 2019  **Katsavrias, C.**, I.A. Daglis, W. Li, I. Sandberg, O. Podladchikova, C. Papadimitriou and S.Aminimalragia-Giamini; On the cause of relativistic electron acceleration and loss in the outer Van Allen belt., (Contributed Poster), European Space Weather Week, Liege, Belgium.
- Apr 2019  **Katsavrias, C.**, I.A. Daglis and W. Li; On the cause of electron acceleration and loss in the outer Van Allen belt., (Contributed Poster), EGU General Assembly, Vienna, Austria.
- Mar 2018  **Katsavrias, C.**, I.A. Daglis, W. Li, S. Dimitrakoudis, and C. Papadimitriou; Geospace driver effects on electron acceleration and loss in the outer Van Allen belt., (Contributed Talk), Chapman Conference on Radiation Belt Dynamics, Cascais, Portugal.
- May 2017  **Katsavrias, C.**, I.A. Daglis, W. Li, S. Dimitrakoudis, M. Georgiou, and C. Papadimitriou; Investigation of internal magnetospheric effects on electron acceleration and loss in the outer Van Allen belt, (Contributed Poster), Space Weather Workshop, Broomfield, Colorado, US.
- Apr 2016  **Katsavrias, C.**, I.A. Daglis, W. Li, S. Dimitrakoudis, M. Georgiou and C. Papadimitriou; Acceleration and loss of relativistic and ultra-relativistic electrons in the outer Van Allen belt during intense storms: a statistical study., (Contributed Talk), EGU General Assembly, Vienna, Austria.
- Aug 2015  **Katsavrias, C.**, I.A. Daglis, W. Li, S. Dimitrakoudis, M. Georgiou, C. Papadimitriou and D.L. Turner; Combined Effects of Concurrent Pc<sub>5</sub> and Chorus Waves on Radiation Belt Dynamics, (Contributed Poster), IPELS Conference, Pitlochry, UK.
- Apr 2015  **Katsavrias, C.**, I.A. Daglis, D.L. Turner, M. Georgiou, C. Papadimitriou, I. Sandberg and G. Balasis; The role of Pc<sub>5</sub> waves in relativistic electron losses through the magnetopause, (Contributed Talk), EGU General Assembly, Vienna, Austria.
- Dec 2014  **Katsavrias, C.**, I.A. Daglis, M. Georgiou, D.L. Turner, I. Sandberg, C. Papadimitriou and G. Balasis; Investigation of Solar Wind and Magnetospheric Forcing Effects on the Outer Van Allen Belt through Multi-point Measurements in the Inner Magnetosphere, (Contributed Talk), AGU Fall Meeting, San Francisco, USA.







## Conferences/Workshops/Invited Talks (continued)

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- May 2014     **Katsavrias, C.**, I.A. Daglis, M. Georgiou, D.L. Turner, I. Sandberg and G. Balasis; Radiation Belt Response to the March 7, 2012 Eruptive Solar Event, (Contributed Poster), EGU General Assembly, Vienna, Austria.
- Oct 2013     **Katsavrias, C.**, P. Preka-Papadema, X. Moussas and A Hillaris; Solar-Terrestrial Coupling: An Approach Based on Wavelet Analysis, (Contributed Talk), STEREO /WAVES and WIND / WAVES workshop on Solar Radio Emissions, Santorini, Greece.
- Jun 2012     **Katsavrias, C.**; Preka-Papadema, P.; Moussas, X.; Apostolou, Th.; Theodoropoulou, A. and Papadima, Th.; Helio-Geomagnetic activity Influence on Cardiological Cases (Contributed Talk), Space Weather Effects on Humans: in Space and on Earth, International Conference, Space Research Institute (IKI), Moscow, Russia.
- Jul 2010     **Katsavrias, C.**; Preka-Papadema, P. and Moussas, X.; 23rd Solar Cycle Solar wind parameters correlation and wavelet analysis (Contributed Talk), 38th COSPAR Scientific Assembly, Bremen, Germany.

### Invited Talks

- Jul 2024     Periodic density structures (PDS) in the solar wind and their geoeffectiveness, 45th COSPAR general assembly, South Korea.
- Jan 2023     Acceleration and Loss of Relativistic Electrons in the Outer Radiation Belt: Recent Scientific Insights and Modelling Efforts, HSD Seminar, NASA GSFC.
- Feb 2022     Acceleration and loss of relativistic electrons in the outer radiation belt: a delicate interplay between various mechanisms, KTH seminars, Virtual seminar.
- Aug 2021     Acceleration and loss of relativistic electrons in the outer radiation belt: recent scientific insights and prediction efforts, IAGA-IASPEI, India, Virtual Conference.

### Skills








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- Languages     Greek (native) and fluent English (Cambridge Proficiency Certificate)
- Coding         Fortran (low level), Python (medium level), and Matlab (high level),  $\text{\LaTeX}$ (high level).
- Applications     Origin, common Windows database, and presentation software.
- Algorithms      Experience programming Wavelet algorithms and multiple regression.
- Operating Systems     Unix/Linux, Windows.


## Miscellaneous Experience

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### Awards and Achievements

- 2021  Open Academic Textbooks (Kallipos+) grant for the academic book: *Space Physics*.
- 2020  National Strategic Reference Framework grant for the project: *Looking for the source of Ultra Low Frequency waves in periodic oscillations of solar wind dynamic pressure (ULFpulse)*.
  -  EGU grant for young researcher participation at the EGU General Assembly, Vienna, Austria.
- 2019  ESWW grant for young researcher participation at the European Space Weather Week meeting, Liege, Belgium.
- 2018  AGU grant for young researcher participation at the Chapman Conference on Particle Dynamics in the Earth's Radiation Belts, Cascais, Portugal.
- 2017  NSF grant for young researcher participation at the Space Weather Workshop, Broomfield, Colorado, USA.
- 2015  EGU grant for young researcher participation at the EGU General Assembly, Vienna, Austria.

### Scientific Outreach

- 2021  Participation in the Greek Public Television documentary series "The great tomorrow". Episode title: Just above the sky, <https://www.ertflix.gr/en/vod/vod.126832-es-ayrion-ta-spydaialigo-pano-ap-ton-oyrano>.

## References

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Available on Request