











# Savvas Raptis

Space & Plasma Physics | Data Science | Machine Learning

## PERSONAL DETAILS

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	<a href="https://www.researchgate.net/profile/Savvas-Raptis">Savvas_Raptis</a>
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	AAZ-9063-2020

## RESEARCH EXPERIENCE

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Jun 2023 – Now	<b>Associate Professional Staff II</b> <i>Johns Hopkins University Applied Physics Laboratory, Laurel, Maryland, USA</i>
Jan 2023 – Apr 2023	<b>Visiting Researcher</b> <i>European Space Agency (ESA) - ESTEC, Leiden, Netherlands</i>
Nov 2022 – May 2023	<b>Postdoctoral Researcher</b> <i>KTH Royal Institute of Technology, Stockholm, Sweden</i>
Oct 2018 – Nov 2022	<b>PhD. Researcher</b> <i>KTH Royal Institute of Technology, Stockholm, Sweden</i>

## EDUCATION

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2022	<b>PhD. Space and Plasma Physics</b> <i>KTH Royal Institute of Technology, Stockholm, Sweden</i> <u>Thesis</u> : "High-speed jets and related phenomena at Earth's bow shock and magnetosheath" <u>Download (English)</u> : <a href="#">📄</a>
2018	<b>MSc. Astronomy and Astrophysics</b> <i>KU Leuven, Leuven, Belgium</i> <u>Thesis</u> : "Processing Solar Images to Forecast Coronal Mass Ejections using Artificial Intelligence" <u>Download (English)</u> : <a href="#">📄</a>
2016	<b>BSc. (Hons.) Physics</b> <i>National and Kapodistrian University of Athens, Athens, Greece</i> <u>Thesis</u> : "Solar Energetic Particles: A study of their properties through measurements from ESA's SREM instrument." <u>Download (Greek)</u> : <a href="#">📄</a>







## TEACHING EXPERIENCE

Full Description & Examples: 

2019 – 2023

### Teaching Assistant (TA) & Lecturer

*KTH, Royal Institute of Technology*

- 2022: Guest Lecturer | Collisionless Shocks | PhD course
- 2022: Guest Lecturer | Space Physics I | Master course (EF2240) 
- 2021 - 2022: Guest Lecturer & TA | Space Physics I | Master course (EF2240) 
- 2020 - 2022: TA | Electrical Circuit Analysis | Bachelor course (EI1110) 
- 2020 - 2021: TA | Space Physics I | Master course (EF2240) 
- 2019 - 2022: TA | L<sup>A</sup>T<sub>E</sub>Xworkshop | Bachelor course 
- 2019: TA | Electrodynamics | Bachelor course (EI2405) 

2013 – 2015

### Teacher - Mechanics/Oscillations/Waves (High School)



*City of Athens, Social Tuition Center of City of Athens*

Assisting High school students with their studies in school and preparation for the Panhellenic National examinations to proceed to higher education.

## SUPERVISION & MANAGEMENT EXPERIENCE





2025 – 2029

### GEM Focus Group Leader

- Main organizer and leader of NSF Geospace Environment Modeling (GEM) focus group 
- The topic is Multiscale Dayside Transients and their Effect on Earth's Magnetosphere and our team is planning to organize for 4 years, a series of meetings, sessions, and activities to integrate dayside phenomena into our magnetospheric modelling efforts. More information can be found online on the Wiki page 




2023 – Now

### Convener & Chair

- Primary convener, and chair of the session "Collisionless Shocks in Heliospheric and Astrophysical Plasmas and their Effects on Planetary Magnetospheres" at American Geophysical Union (AGU) general assembly 2024 
- Co-convener, of the session "Collisionless shocks and associated transient phenomena at Earth and beyond" at European Geophysical Union (EGU) general assembly 2024 
- Co-convener, of the session "Dayside mesoscale transients and their impact on the magnetosphere and ionosphere" at American Geophysical Union (AGU) general assembly 2023 
- Primary convener, and chair of the session "Dayside transient phenomena and their effects on planetary magnetospheres" at European Geophysical Union (EGU) general assembly 2023 

2023 – Now



### Mentoring & Supervision

- Mentor for the European Geophysical Union (EGU) general assembly 2023 
- Mentor of the summer internship program CIRCUIT of Johns Hopkins University 
- Co-supervisor of Graduate student Anusree Padinjarethadathil Devanandan from University of New Hampshire 

2022 – Now

### Early Career Leadership Advisory Committee

*American Geophysical Union (AGU)*

- 2024 - Now: Co-Chair of the Early Career Leadership Advisory Committee (EC-LAC) of the Physics and Aeronomy (SPA) section 
- 2022 - 2024: Member of the Early Career Leadership Advisory Committee (EC-LAC) of the Physics and Aeronomy (SPA) section 

## SCIENTIFIC REVIEWING, EDITING & COMMUNITY SERVICE

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2021 – Now

### Science Working Teams

- SMILE Mission (ESA/CAS) - Member of Science Working Team & The Modeling Working Group (2023 – Now)
- MMS Mission (NASA) - Member of Science Working Team & the Energetic Particle Detector (EPD) instrument team (2023 – Now)
- MMS Mission (NASA) - Member of the Electric Double Probe (EDP) instrument team (2023)

2022 – Now

### Grant Proposal Reviewer

- NASA Heliophysics Heliophysics Supporting Research (HSR) program
- NASA Heliophysics Guest Investigator Open (HGIO) program
- NASA Heliophysics Living with a Star Science (LWS) program

2021 – Now

### Journal Reviewer

- Science Advances - *AAAS*
- Journal of Geophysical Research (JGR): Space Physics - *AGU/Wiley*
- AGU Advances - *AGU/Wiley*
- Journal of Geophysical Research (JGR): Machine Learning and Computation - *AGU/Wiley*
- Geophysical Research Letters (GRL) - *AGU/Wiley*
- Radio Science - *AGU/Wiley*
- Annales Geophysicae - *EGU/Copernicus Publications*
- The Astrophysical Journal (ApJ) - *Institute of Physics (IOP)*
- Astronomy and Astrophysics - *EDP Sciences*
- Frontiers in Astronomy and Space Sciences - *Frontiers*
- Journal of Plasma Physics - *Cambridge Press*
- Astrophysics and Space Science - *Springer*
- Advances in Space Research - *Elsevier*
- Remote Sensing - *MDPI*
- Universe - *MDPI*
- Journal of Experimental & Theoretical Artificial Intelligence - *Taylor & Francis*

More information: Web of Science Profile 

2024 – Now

### Poster Judge

- American Geophysical Union (AGU) meeting, held 9-13 December 2024 in Washington, DC, US - Outstanding Student Presentation Awards (OSPA) Judge
- The Triennial Earth-Sun Summit (TESS), held 7-12 April 2024 in Dallas, TX, US - Student Poster Judge
- Geospace Environment Modeling (GEM) workshop, held 23-28 July 2024 in Fort Collins, CO, US - Student Poster Judge

2021 – Now

### MMS Scientist In The Loop (SITL)

SITL service work for the NASA MMS team for orbits: 1181 - 1183, 1204 - 1206, 1248 - 1250, 1284 - 1285, 1314 - 1315, 1364 - 1365, 1404 - 1407, 1600 - 1601



## PUBLICATIONS

 = Abstract |  = PDF |  = PowerPoint |  = Video

- 2025 [28] **Raptis, S.**, Lindberg, M., Liu, T.Z., Turner, D.L., Lalti, A., Zhou, Y., Kajdič, P., Kouloumvakos, A., Sibeck, D.G., Vuorinen, L., Michael, A., Shumko, M., Osmane, A., Krämer, E., Turc, L., Karlsson, T., Katsavrias, C., Wilson III, L.B., Madanian, H., Blanco-Cano, X., Cohen, I.J., & Escoubet C.P., (2025). Multimission Observations of Relativistic Electrons and High-speed Jets Linked to Shock-generated Transients. *The Astrophysical Journal Letters* 981(1) L10, <https://dx.doi.org/10.3847/2041-8213/adb154>

|  



- NASA MMS highlight 1-page summary: 



- [27] **Raptis, S.**, Ahmad, L., Lindberg, M., Turner, D. L., Caprioli, D., & Burch, L. J. (2025). Revealing an unexpectedly low electron injection threshold via reinforced shock acceleration. *Nature Communications* 16(1), 488 <https://doi.org/10.1038/s41467-024-55641-9> |  



- NASA MMS highlight 1-page summary: 

- Press Coverage: Northumbria University , [phys.org](https://phys.org) , [sciencedaily.com](https://sciencedaily.com) 



- Behind The Paper: Nature Portfolio 



- [26] Krämer, E., Koller, F., Suni, J., LaMoury T. A., Pöppelwerth, A., Glebe, G., Mohammed-Amin, T., **Raptis, S.**, Vuorinen, L., Weiss, S., Xirogiannopoulou, N., Archer, M., Bianco-Cano, X., Gunell, H., Hietala, H., Karlsson, T., Plaschke, F., Preisser, L., Roberts, O., Wedlund, S. C., Temmer, M., & Vörös, Z. (2025). Jets Downstream of Collisionless Shocks: Recent Discoveries and Challenges. *Space Science Reviews*, 221(1), 1-59 |  



- 2024 [25] Osmane, A. & **Raptis, S.** (2024). On the Formation of Super-Alfvénic Flows Downstream of Collisionless Shocks. *The Astrophysical Journal*, 976(1), 104. |  



- [24] **Raptis, S.**, Merkin, V., Ohtani, S., Gkioulidou, M., & Regoli, L. H. (2024). Plasma sheet magnetic flux transport during geomagnetic storms. *Geophysical Research Letters*, 51, e2024GL110839. <https://doi.org/10.1029/2024GL110839> |  



- NASA MMS highlight 1-page summary: 



- [23] Kajdic P., Blanco-Cano X., Turc L., Archer M., **Raptis S.**, Liu T. Z., Pfau-Kempf Y., LaMoury A., Hao Yufei., Escoubet C-P., Omid N., Sibeck D. G., Wang B., Zhang H., & Lin Y. (2024). Transient Upstream Mesoscale Structures: Drivers of Solar-Quiet Space Weather. *Front. Astron. Space Sci. - Space Physics*, 10.3389/fspas.2024.1436916 |  

- [22] Toy-Edens, V., Mo, W., **Raptis, S.**, & Turner, D. L. (2024). Classifying 8 years of MMS dayside plasma regions via unsupervised machine learning. *Journal of Geophysical Research: Space Physics*, 129, e2024JA032431. <https://doi.org/10.1029/2024JA032431> |  













- [21] Regoli, L. H., Gkioulidou, M., Ohtani, S., **Raptis, S.**, Mouikis, C. G., Kistler, L. M., et al. (2024). Temporal evolution of O+ population in the near-Earth plasma sheet during geomagnetic storms as observed by the magnetospheric multiscale mission. *Journal of Geophysical Research: Space Physics*, 129, e2023JA032203. <https://doi.org/10.1029/2023JA032203> |  

- [20] Koller, F., **Raptis, S.**, Temmer, M., & Karlsson, T. (2024). The Effect of Fast Solar Wind on Ion Distribution Downstream of Earth's Bow Shock. *The Astrophysical Journal Letters*, 964(1), L5. <https://doi.org/10.3847/2041-8213/ad2ddf> |  





- [19] Lindberg, M., Vaivads, A., Amano, T., **Raptis, S.**, & Joshi, S. (2024). Electron Acceleration at Earth's Bow Shock Due to Stochastic Shock Drift Acceleration. *Geophysical Research Letters*, 51, e2023GL106612. <https://doi.org/10.1029/2023GL106612> |  

- [18] Zhou, Y., **Raptis, S.**, Wang, S., Shen, C., Ren, N., & Ma, L. (2024). Magnetosheath jets at Jupiter and across the solar system. *Nature Communications*, 15, 4, <https://doi.org/10.1038/s41467-023-43942-4> |  

- **Press Coverage:** [phys.org](https://phys.org) , *Astronomy Magazine* 




- 2023 [17] Collinson, G., Hietala, H., Plaschke, F., Karlsson, T., Wilson, B. L., Archer, M., Battarbee, M., Bianco-Cano, X., Bertucci, C., Long, D., Opher, M., Sergis, N., Gasque, C., Liu, T., **Raptis, S.**, Burne, S., Frahm, R., Zhang, T., & Futaana, Y. (2023). Shocklets and Short Large Amplitude Magnetic Structures (SLAMS) in the high Mach foreshock of Venus. *Geophysical Research Letters*, 50, e2023GL104610, <https://doi.org/10.1029/2023GL104610> |  
- [16] Trollvik, H., Karlsson, T., & **Raptis, S.** (2023). Velocity of magnetic holes in the solar wind from Cluster multipoint measurements. *Ann. Geophys.*, 41, 327–337, <https://doi.org/10.5194/angeo-41-327-2023> |  
- [15] Lindberg, M., Vaivads, A., **Raptis, S.**, & Karlsson, T. (2023). MMS observation of two-step electron acceleration at Earth's bow shock. *Geophysical Research Letters*, 50, e2023GL104714. <https://doi.org/10.1029/2023GL104714> |  
- 2022 [14] Karlsson, T., Trollvik, H., **Raptis, S.**, Nilsson, H., & Hadi Madanian (2022). Solar wind magnetic holes can cross the bow shock and enter the magnetosheath. *Ann. Geophys.*, 40, 687–699, doi:10.5194/angeo-40-687-2022 |  
- [13] Pollock, C., Chen, L.-J., Schwartz, S., Wang, S., Avanov, L. A., Burch, J. L., Gershman, D. J., Giles, B. L., **Raptis, S.**, & Russell, C. T. (2022). Dynamics of Earth's bow shock under near-radial interplanetary magnetic field conditions. *Physics of Plasmas* 29, 112902 (2022) <https://doi.org/10.1063/5.0089937> |  
- [12] **Raptis, S.**, Karlsson, T., Vaivads, A., Lindberg, M., Johlander, A., & Trollvik, H. (2022). On magnetosheath jet kinetic structure and plasma properties. *Geophysical Research Letters*, 49, e2022GL100678. <https://doi.org/10.1029/2022GL100678> |  


- **NASA MMS highlight 1-page summary:** 



















- [11] Lindberg, M., Vaivads, A., **Raptis, S.**, Lindqvist, P.-A., Giles, B. L., & Gershman, D. J. (2022). Electron kinetic entropy across quasi-perpendicular shocks. *Entropy* 24, 745. <https://doi.org/10.3390/e24060745> |  
- [10] **Raptis, S.**, Karlsson, T., Vaivads, A., Pollock, C., Plaschke, F., Johlander, A., Trollvik, H., & Lindqvist, P.-A. (2022). Downstream high-speed plasma jet generation as a direct consequence of shock reformation. *Nature Communications*. 13, 598 <https://doi.org/10.1038/s41467-022-28110-4> |  

- **Springer 2022 Highlight:** Breakthrough Research Highlights: Astronomy: 

- **Editor Highlighted:** Focus - Astronomy and planetary science: 





- **Press Coverage:** KTH , [phys.org](https://phys.org) , [spacedaily.com](https://spacedaily.com) 




- **Behind The Paper:** *Nature Portfolio* 

- 2021 [9] AminaIragia-Giamini, S., **Raptis, S.**, Anastasiadis, A. A., Tsigkanos, A., Sandberg, I., Papaioannou, A., Papadimitriou, C., Jiggins, P., Aran, A., & Daglis, I.A. (2021). Solar Energetic Particle Event occurrence prediction using Solar Flare Soft X-ray measurements with Machine Learning. *Journal of Space Weather and Space Climate (JSWSC)*, 11, 59 <https://doi.org/10.1051/swsc/2021043> |  
- [8] Karlsson, T., **Raptis, S.**, Trollvik, H., & Nilsson, H. (2021). Classifying the magnetosheath behind the quasi-parallel and quasi-perpendicular bow shock by local measurements. *Journal of Geophysical Research: Space Physics*, 126, e2021JA029269. doi:10.1029/2021JA029269 |  
- [7] Katsavrias, C., **Raptis, S.**, Daglis, I. A., Karlsson, T., Georgiou, M., & Balasis, G. (2021). On the generation of Pi2 pulsations due to plasma flow patterns around magnetosheath jets. *Geophysical Research Letters*, 48, e2021GL093611. doi:10.1029/2021GL093611 |  
- [6] Kajdič, P., **Raptis, S.**, Blanco-Cano, X., & Karlsson, T. (2021). Causes of jets in the quasi-perpendicular magnetosheath. *Geophysical Research Letters*, 48, e2021GL093173. doi:10.1029/2021GL093173 |  
- [5] Palmroth, M., **Raptis, S.**, Suni, J., Karlsson, T., Turc, L., et al., (2020). Magnetosheath jet evolution as a function of lifetime: global hybrid-Vlasov simulations compared to MMS observations. *Ann. Geophys.*, doi: 10.5194/angeo-2020-49 |  
- 2020 [4] Battarbee, M., Blanco-Cano, X., Turc, L., Kajdič, P., Johlander, A., Tarvus, V., Fuselier, S., Trattner, K., Alho, M., Brito, T., Ganse, U., Pfau-Kempf, Y., Akhavan-Tafti, M., Karlsson, T., **Raptis, S.**, Dubart, M., Grandin, M., Suni, J., and Palmroth, M. (2020), Helium in the Earth's foreshock: a global Vlasiator survey. *Ann. Geophys.*, 38, 1081–1099, doi: 10.5194/angeo-38-1081-2020 |  
- [3] **Raptis, S.**, Karlsson, T., Plaschke, F., Kullen, A., & Lindqvist, P.-A. (2020). Classifying magnetosheath jets using MMS: Statistical properties. *Journal of Geophysical Research: Space Physics*, 125, e2019JA027754. doi:10.1029/2019JA027754 |  
- [2] **Raptis, S.**, AminaIragia-Giamini, S., Karlsson, T., & Lindberg, M. (2020). Classification of Magnetosheath Jets using Neural Networks and High Resolution OMNI (HRO) data. *Machine Learning in Heliophysics* *Front. Astron. Space Sci. - Space Physics*, doi: 10.3389/fspas.2020.00024 |  
- [1] Yordanova, E., Vörös, Z., **Raptis, S.**, & Karlsson T. (2020). Current Sheet Statistics in the Magnetosheath. *Front. Astron. Space Sci. - Space Physics*, doi: 10.3389/fspas.2020.00002 |  

## SEMINARS

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Collisionless Shocks and Shock Generated Transients: Recent Advancements and Implications, LASP Magnetosphere Seminars - The Friends of the Magnetosphere (FOM) , 10 Sep 2024.   

Reinforced Shock Acceleration of Relativistic Electrons, SoLO WG IR/RS meeting, Online, 20 June 2024.   

High-speed jets and related phenomena at Earth's bow shock, 40th SMILE MWG meeting, Online, 12 September 2023. [📄](#) [📄](#)

High-speed jets and related phenomena in Earth's bow shock and magnetosheath, Johns Hopkins University Applied Physics Laboratory (JHU/APL), Online, 19 August 2022. [📄](#) [📄](#)

Downstream high-speed plasma jet generation as a direct consequence of shock reformation, *IRF Uppsala Seminars* [🔗](#) Uppsala University, Uppsala, Sweden, 16 March 2022. [📄](#) [📄](#)

Magnetosheath Jets: Simulations, Data Analysis & Machine Learning, *SpaceCoffee Meetings* [🔗](#) National and Kapodistrian University of Athens, Athens, Greece, 29 January 2020. [📄](#) [📄](#) [📄](#)

Classifying Magnetosheath Jets Using MMS: Quasi parallel & Quasi perpendicular Jets, *Third International Vlasov Science Hackathon* [🔗](#) University of Helsinki, Helsinki, Finland, 21 August 2019. [📄](#) [📄](#)

Forecasting CMEs using Image Processing & Neural Networks, *SpaceCoffee Meetings* [🔗](#) National and Kapodistrian University of Athens, Athens, Greece, 19 December 2018. [📄](#) [📄](#)

## SCIENTIFIC PRESENTATIONS

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2025

“Advancements on AI for Heliophysics and Space Weather” AI for Space Applications, ASAP project meeting Stockholm, Sweden, January 28, 2025. (**Invited talk**) | [📄](#)

2024

“Advances in Understanding Stormtime Magnetotail Dynamics ” *GU 2024 Fall meeting* Washington DC. US December 8 - 13 2024 (**Invited talk**) | [📄](#) [📄](#) [📄](#)

“Stormtime Observations of Plasma Sheet Convection” *COSPAR 24* Busan, South Korea, July 14 - 19, 2024. (*talk*) | [📄](#) [📄](#) [📄](#)

“Relativistic Electrons Energized by Reinforced Shock Acceleration” *COSPAR 24* Busan, South Korea, July 14 - 19, 2024. (*talk*) | [📄](#) [📄](#) [📄](#)

“Plasma Sheet Magnetic Flux Transport During Geomagnetic Storms” *GEM 24* Fort Collins, CO, US, June 23 - 28, 2024. (*talk*) | [📄](#) [📄](#)




“Modeling Earth's Plasma Sheet Using Machine Learning” *GEM 24* Fort Collins, CO, US, June 23 - 28, 2024. (*talk*) | [📄](#) [📄](#)

“Reinforced Shock Acceleration of Relativistic Electrons” *GEM 24* Fort Collins, CO, US, June 23 - 28, 2024. (*talk*) | [📄](#) [📄](#)



“Evaluating the magnetic flux transport in the plasma sheet during geomagnetic storms using MMS and Geotail” *EGU2024* Vienna, Austria, April 14 - 19, 2024. (*talk*) | [📄](#) [📄](#) [📄](#)







“Heliophysics Education and Research using Cloud Computing” *EGU2024* Vienna, Austria, April 14 - 19, 2024. (*talk*) |   




“Magnetic flux transport in the plasma sheet during geomagnetic storms using MMS” *TESS2024* Dallas, TX, US, April 07 - 12, 2024. (*talk*) |   




2023



“Transient phenomena in foreshock, shock, and magnetosheath – Expectations from large separation campaign” *MMS SWT 23* Washington DC, US October 22 - 26, 2023. (*talk*) |  

“Discovering patterns, imbalanced classification & boundary surfaces in Heliophysics with artificial neural networks” *DASH23* Johns Hopkins University Applied Physics Laboratory (JHU/APL), MD, US October 9 - 11, 2023. (*talk*) |  



“Characterizing Earth’s Magnetosheath and High-Speed Downstream Jets using Machine Learning” *LMAG23* Johns Hopkins University Applied Physics Laboratory (JHU/APL), MD, US August 21 - 24, 2023. (*talk*) |  



“High-speed downstream jets: relevance to bow shock dynamics & evolution” *IGA23* Messe Berlin – City Cube, Berlin, Germany, July 11 - 20, 2023. (**invited** *talk*) |   

“Multi-mission observations of a high speed jet associated to a solar wind discontinuity” *EGU2023* Vienna, Austria, April 23 - 28, 2023. (*poster*) |   



“High-speed jets at Earth’s magnetosheath & more” *CGS weekly meetings* Laurel, US, January 18, 2023. (*talk*) |  

2022




“Investigation of magnetosheath jet kinetic structure and plasma moment derivation” *AGU 2022 Fall meeting (AGU2022)* Chicago, US, December 11 - 15, 2022. (*poster*) |  

“On the discrepancies of magnetosheath jet identification and statistical properties due to different temporal resolution and plasma moment derivation” *44th COSPAR Scientific Assembly (COSPAR2022)* Athens, Greece, July 16 - 24, 2022. (*talk*) |  




“Magnetosheath Jets using MMS” *Swedish Space Plasma Meeting 2019* Umeå, Sweden, June 8 - 9, 2022. (*talk*) |  

“High-speed plasma jets generated by the cyclic behavior of the Earth’s bow shock” *Solar Orbiter School 2022* Sete, France, May 30 - June 3, 2022. (*poster*) |  




“Shock Reformation Generating High-speed Magnetosheath Jets” *EGU2022* Vienna, Austria, May 23 - 27, 2022. (*talk*) |   





“High-speed Downstream Plasma Jet Generated due to Shock Reformation” *8th MMS Community Workshop* Daytona Beach, FL, US, May 9-13, 2022. (*talk*) |   





2021



“Super-magnetosonic Downstream Jet Formation as a Direct Consequence of Shock Reformation” *AGU 2020 Fall meeting (AGU2020)* New Orleans, US, December 13 - 17, 2021. (*poster*) |   









“Characterization of the Earth’s Magnetosheath and its Fast Plasma Flows Using Upstream Measurements and Machine Learning” *Asia Oceania Geosciences Society (AOGS) 18th Annual Meeting* Online, August 1-8, 2021. (*virtual talk*) |   

“Magnetosheath Jets Close to the Bow Shock: Generation Mechanisms Using MMS” *The 15th Hellenic Astronomical Conference* Patras, Greece, July 5 - 8 , 2021. (talk) |    





“Fast Plasma Flows Downstream of the Bow Shock Using MMS: Correlations and Generation Mechanisms” *EGU2021* Vienna, Austria, April 19 - 30, 2021. (*Virtual PICO*) |    



“Differentiating Between Convective and Nested Structures With a Single Spacecraft” *Swedish Space Plasma Meeting 2021* Kiruna, Sweden, February 1 - 2, 2021. (talk) |  

“Magnetosheath jets using MMS: classification and generation mechanisms” *43rd COSPAR Scientific Assembly (COSPAR2021)* Sydney, Australia, January 28 - February 04, 2021. (talk) |    



“Magnetosheath Jets Close to the Bow Shock | Generation Scenarios using MMS” *mini-GEM - Collisionless Shock Group* Online January 19, 2021. (**invited** *virtual talk*) |  



2020




“Investigation of Different Types of Magnetosheath Jets and their Origin using MMS” *AGU 2020 Fall meeting (AGU2020)* San Francisco, US, December 01-12, 2020. (*Virtual talk*) |    


“Jets Downstream of Quasi-parallel and Quasi-perpendicular Bow Shock” *MMS FALL SWT 2020* Online October 08, 2020. (*Virtual talk*) |  




2019

“Classification of Magnetosheath Jets using Neural Networks, Solar Wind Observations and High-resolution IMF Measurements” *Sixteenth European Space Weather Week (ESWW16)* Liege, Belgium, November 18-22, 2019. (poster) |  


“Creation & Classification of Magnetosheath Jet Database using Magnetospheric Multiscale (MMS) mission” *Sixteenth European Space Weather Week (ESWW16)* Liege, Belgium, November 18-22, 2019. (poster) |  

“Classification of Magnetosheath Jets using Neural Networks and High Resolution OMNI (HRO) data” *Machine Learning in Heliophysics* Amsterdam, Netherlands, September 16-20, 2019. (talk) |   

“Deep Learning Applications in Space & Solar Physics” *Solar Physics Summer School at Raman Science Center* Leh, India, June 10-16, 2019. (poster) | 




“Investigation of Quasi-parallel & Quasi-perpendicular Magnetosheath Jets Using Magnetospheric Multiscale (MMS)” *EGU General Assembly 2019* Vienna, Austria, April 7-12, 2019. (talk) |   

“Difference between Quasi-parallel & Quasi-perpendicular Magnetosheath Jets Using MMS” *SRS (Svenska Rymdforskarens Samarbetsgrupp) 2019* Gothenburg, Sweden, March

14-15, 2019. (poster) | 

“Quasi-parallel & Quasi-perpendicular Magnetosheath Jets Using MMS” *Swedish Space Plasma Meeting 2019* Uppsala, Sweden, February 7-8, 2019. (talk) |  

2018

“Processing Solar Images to forecast Coronal Mass Ejections using Artificial Intelligence” *Fifteenth European Space Weather Week (ESWW15)* Leuven, Belgium, November 5-9, 2018. (poster) |   


## SUMMER SCHOOLS & WORKSHOPS

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2022

### Solar Orbiter School

*CCSD, Sète, France*

Course - Summer School | 30 May – 03 June 2022. 

Presentation topic: *High-speed plasma jets generated by the cyclic behavior of the Earth's bow shock*

2021

### Polar Magnetospheric Substorms


*UNIS, Svalbard, Norway*

Course - Winter School | 26 November – 07 December 2021. 

Presentation topic: *Magnetosheath Jets Formation & Basic Properties using MMS*

### 14s Iberian Space Science Summer School


*University of Coimbra, Coimbra, Portugal*

Summer school | 26 – 30 July 2021. 

2020

### Solar-Stellar Connection STFC Summer School


*University of Warwick, Warwick, UK*

Summer school | 14 – 18 September 2020. 

Presentation topic: *Magnetosheath Jets*


### STFC Introductory Solar System Plasmas Summer School

*University of Birmingham, Birmingham, UK*

Summer school | 24 – 27 August 2020. 

### NASA Heliophysics Summer School

*UCAR, Boulder, CO, USA*


Summer school | 6 - 17 July 2020. 

Presentation topic: *Magnetosheath Jets using Magnetospheric Multiscale (MMS) Mission*

2019

### Solar Physics Summer School

*Raman Science Center, Indian Institute of Astrophysics, Leh, India*

Summer school | 10 - 16 June 2019. 

Presentation topic: *Deep Learning Applications in Space & Solar Physics*

2018

### CESRA Summer School

*Royal Observatory of Belgium, Brussels, Belgium*


Summer school | 10 - 14 September 2018.

Presentation topic: *Forecasting Coronal Mass Ejections using Artificial Intelligence*

2017

### Intensive Week on Numerical Modeling in Astrophysics

*University of Cologne, Cologne, Germany*

Summer school | 11 - 16 September 2017. 

2016

### BCGS Summer School in Physics and Astronomy

*BCGS, Bad Honnef, Germany*

Summer school | 22 - 26 August 2016. [🔗](#)

Presentation topic: *Is there a quantum computer? The D-Wave controversy*

2015 **Petnica Summer Institute: Astrophysics and Astroparticles**

*Petnica Science Center, Valjevo, Serbia*

Summer school | 24 July - 2 August 2015. [🔗](#)

Presentation topic: *Limb Darkening*

## DISTINCTIONS, AWARDS & MERITS

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2023 **Springer Nature 2022 Astronomy Highlight**

*Springer Nature, Berlin, Germany*

Our work "Downstream high-speed plasma jet generation as a direct consequence of shock reformation" has been featured as one of the nine articles of 2022's highlighted research in Astronomy. [🔗](#)

2022 – 2024 **ISSI International Team 555**

*International Space Science Institute, Bern, Switzerland*

Early-career researcher of ISSI team "Impact of Upstream Mesoscale Transients on the Near-Earth Environment". [🔗](#)

2023 **Outstanding contribution - ESA Cluster mission**

*European Space Agency (ESA) - ESTEC, Leiden, Netherlands*

Recognition of outstanding contribution to the Cluster mission

2019 – 2022 **ISSI International Team 465**

*International Space Science Institute, Bern, Switzerland*

Early-career researcher of ISSI team "Foreshocks Across the Heliosphere: System Specific or Universal Physical Processes?". [🔗](#)

2016 – 2018 **Student Representative – Committee of Msc. Astronomy and Astrophysics**

*KU Leuven, Leuven, Belgium*

Student representative in the faculty committee of the Master of Astronomy and Astrophysics  
- Permanente Onderwijscommissie (POC).

## SKILLS

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*Languages* Greek (Native), English (Excellent), French (Good)

*Programming* Python, MATLAB, R, C++, IDL, JavaScript, SQL

*Software* L<sup>A</sup>T<sub>E</sub>X, git, Inkscape, ParaView, VisIt

*ML tools* Tensorflow, Keras, Scikit-learn, Pytorch, SciANN

*Hobbies* Classical guitar, fitness, video games

## GRANTS, FUNDINGS & SCHOLARSHIPS

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- MMS Early CAREER grant 2025: Kinetic Processes and Particle Energization of Downstream Highspeed Jets using Magnetospheric Multiscale mission (**Pi-I**). Funding Acquisition: \$125,000
- GEM - NSF 2022: Explorative Global-To Kinetic-Scale Modeling of Collisionless Shocks Using Physics-Informed Data Mining and Machine Learning (**Contributor/Collaborator**)

## REFERENCES

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Drew Turner | Applied Physics Laboratory, Johns Hopkins University, ✉ : [Drew.Turner@jhuapl.edu](mailto:Drew.Turner@jhuapl.edu)

Tomas Karlsson | KTH Royal Institute of Technology, ✉ : [tomask@kth.se](mailto:tomask@kth.se)

Slava Merkin | Applied Physics Laboratory, Johns Hopkins University, ✉ : [Slava.Merkin@jhuapl.edu](mailto:Slava.Merkin@jhuapl.edu)

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