

# Savvas Raptis

Curriculum Vitae



## PERSONAL DETAILS

---


	8/7/1991
	Stockholm, Sweden
	(+30)697872889, (+46)727306937
	<a href="mailto:savvra@kth.se">savvra@kth.se</a> , <a href="mailto:savvasraptis@gmail.com">savvasraptis@gmail.com</a>
	<a href="https://github.com/savvasraptis">savvasraptis.github.io</a>
	<a href="https://www.linkedin.com/in/savvas-raptis">savvas-raptis</a>
	<a href="https://www.researchgate.net/profile/Savvas-Raptis">Savvas_Raptis</a>
	0000-0002-4381-3197
	<a href="https://scopus.com/authid/detail.uri?authorid=57202168000">SavvasRaptis</a>
	<a href="https://publons.com/author/1111111/Savvas-Raptis/">Savvas Raptis</a>
	AAZ-9063-2020






## EDUCATION

---

- 2022 **PhD. Space and Plasma Physics (240 ECTS)**  
*KTH Royal Institute of Technology, School of Electrical Engineering, Division of Space and Plasma Physics (SPP) - Alfvénlaboratoriet*  
Topic: "Investigation of high-speed jets and related phenomena in Earth's magnetoseath"
- 2018 **MSc. Astronomy and Astrophysics (120 ECTS)**  
*KU Leuven, Department of Physics and Astronomy, The Institute of Astronomy (IVS), Department of Mathematics, Centre for mathematical Plasma Astrophysics (CmPA)*  
Thesis: "Processing Solar Images to Forecast Coronal Mass Ejections using Artificial Intelligence"  
Download (English): 
- 2016 **BSc. (Hons.) Physics (240 ECTS)**  
*National and Kapodistrian University of Athens, Faculty of Physics*  
Thesis: "Solar Energetic Particles: A study of their properties through measurements from ESA's SREM instrument."  
Download (Greek): 

## TEACHING EXPERIENCE

Full Description & Examples: 

- 2019 – Now **Teaching Assistant & Lecturer**  
*KTH, Royal Institute of Technology*  
2021 - Now: Guest Lecturer & TA | Space Physics I Master course (EF2240)   
2020 - Now: TA | Electrical Circuit Analysis, Extended course (EI1110)   
2020 - 2021: TA | Space Physics I Master course (EF2240)   
2019 - Now: Lecturer |  $\text{\LaTeX}$ workshop   
2019 - 2020: TA | Electrodynamics 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 preparing them for the Panhellenic National examinations to proceed to higher education.

## SCIENTIFIC REVIEWING, EDITING & SERVICE

---

2021 – Now

### MMS Scientist In The Loop (SITL)

*KTH, Royal Institute of Technology*

SITL service work for the NASA MMS team for orbits: 1181 - 1183, 1204 - 1206, 1248 - 1250, 1284-1285

2021 – Now





### Journal Reviewer



*Journal of Geophysical Research : Space Physics*











More information: Publons Profile [🔗](#)

## PUBLICATIONS

 = Abstract |  = PDF |  = Powerpoint |  = Video























- 2022 [13] Lindberg, M., Vaivads, A., **Raptis, S.**, Lindqvist, P.-A., Giles, B. L., & Gershman, D. J. (2022). Electron kinetic entropy across quasi-perpendicular shocks. *Journal of Geophysical Research: Space Physics*, (**Under Review**)
- [11] Karlsson, T., Trollvik, H., **Raptis, S.**, Nilsson, H., & Hadi Madanian (2022). Solar wind magnetic holes can cross the bow shock and enter the magnetosheath. *J. Geophys. Res - Space Physics*, (**Under Review**)
- [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> | [🔗](#) 
- **Highlighted:** Focus - Astronomy and planetary science: [🔗](#)  
- **News:** KTH [🔗](#), [phys.org](#) [🔗](#)  
- **Behind The Paper:** Nature Portfolio [🔗](#)
- 2021 [9] Sigiava, A-G., **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 Vlasov 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.**, AminiAlragia-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 |  

## SELECTED PRESENTATIONS





---



- 2022 “Magnetosheath jet generation due to shock reformation” *MMS SWT Tag-up Tuesday Meetings* Online, Virtual. (*talk*) |  
- 2021 “Super-magnetosonic Downstream Jet Formation as a Direct Consequence of Shock Reformation” *AGU 2020 Fall meeting (AGU2020)* New Orleans, 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. ( **Virtual invited talk**) |  



“Investigation of Different Types of Magnetosheath jets and Their Origin using MMS” *mini-GEM - Dayside Kinetic Group* Online January 19, 2021. ( **Virtual invited 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) |   

## INVITED SEMINARS

---

”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 Vlasiator 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. | [📄](#) [📺](#) [📖](#)

## SUMMER SCHOOLS & WORKSHOPS

---

- 2021 **Polar Magnetospheric Substorms**  
*UNIS, Svalbard, Norway*  
Course - Winter School | 26 November – 07 December 2021. [🔗](#)
- 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

---

- 2020 – 2022 **Early Career Scientist – ISSI International Team 465**  
*International Space Science Institute, Bern, Switzerland*  
Early-career scientist of ISSI team "Foreshocks Across the Heliosphere: System Specific or Universal Physical Processes?" (2019-2020). [🔗](#)
- 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

---

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

*Programming* Python, MATLAB, R, C++, Wolfram/Mathematica, IDL, JavaScript, SQL

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

*ML tools*        Tensorflow, Keras, Theano, Pytorch, SciANN

*Miscellaneous* OpenMP, MPI

*Hobbies*         Classical Guitar, Fitness, Psychology, Investing

## REFERENCES

---

**PhD supervisor** | Tomas Karlsson | Royal Institute of Technology, [✉ : tomask@kth.se](mailto:tomask@kth.se)  
**PhD co-supervisor** | Andris Vaivads | Royal Institute of Technology, [✉ : vaivads@kth.se](mailto:vaivads@kth.se)  
**Collaborator** | Minna Palmroth | University of Helsinki, [✉ : minna.palmroth@helsinki.fi](mailto:minna.palmroth@helsinki.fi)  
**MSc. supervisor** | Giovanni Lapenta | KU Leuven, [✉ : giovanni.lapenta@kuleuven.be](mailto:giovanni.lapenta@kuleuven.be)  
**BSc. supervisor** | Ioannis Daglis | University of Athens, [✉ : iadaglis@phys.uoa.gr](mailto:iadaglis@phys.uoa.gr)

Last updated: 01/03/2022