Ekaterina Dineva

Curriculum Vitae

Personal Information

Date of Birth	August 1, 1988
Place of Birth	Sofia, Bulgaria
Citizenship	Bulgarian
Gender	Female

Professional Experience

2023 Apr – current	Post-doctoral Researcher at the Centre for mathematical Plasma-Astrophysics (CmPA), KU Leuven
winter semester 2023/24, 2024/25	Teaching Assistant for lectures *Mathematics of the 21st Century* at KU Leuven
2021 Oct – 2023 Mar	Post-doctoral Researcher at the Leibniz-Institut für Astrophysik Potsdam (AIP), Solar Physics Section
2020 Apr – 2021 Sep	Institute-funded position as a Doctoral Student at Leibniz-Institut für Astrophysik Potsdam (AIP)
winter semester 2017/18	Teaching Assistant for lecture and recitation *Stars and Stellar Evolution* for M.Sc.-level students at the Universität Potsdam
2016 Oct – 2021 Sep	Doctoral Student at Leibniz-Institut für Astrophysik Potsdam (AIP) in the Solar Physics Section

Education

2016 Oct – 2021 Sep	**Doctoral Studies in Physics**, *Universität Potsdam*, Institut für Physik und Astronomie and *Leibniz-Institut für Astrophysik Potsdam (AIP), Cosmic Magnetic Fields*, Physics of the Sun
2014 Oct – 2015 Dec	**Master of Science in Astrophysics**, *Glasgow University*, School of Physics and Astronomy
2009 Oct – 2013 Jun	**Bachelor of Science (Astrophysics, Meteorology, and Geophysics)**, *Sofia University "St. Kliment Ohridski"*, Faculty of Physics
2009 Oct – 2012 Sept	**Professional Qualification (Micro- and Macroeconomics, Commerce Law, and Business Management)**, *University of National and World Economy*, Business Management, Sofia, Bulgaria

Doctoral Dissertation (2021)

Thesis Topic	*Sun-as-a-star Spectroscopy with PEPSI*
Supervisors	apl. Prof. Dr. Carsten Denker & Prof. Dr. Klaus G. Strassmeier
Mentor	Prof. Dr. Maria-Rosa Cioni
Area of Research	Solar Physics

Master Thesis (2015)

Thesis Topic	*Classification of Radio Emissions from Solar Flares*
Supervisor	Prof. Dr. Eduard P. Kontar
Area of Research	Solar Physics

Bachelor Thesis (2014)

Thesis Topic	*Cepheid-variable Stars and their Use as a Standard Candles for Measuring Distance in Space*
Supervisor	Assoc. Prof. Petko Nedqlkov, Ph.D.
Area of Research	Stellar Physics

Research Interest

- Space weather
- Machine Learning applications in solar physics
- Evolution and variation of solar magnetism

Projects

Primary

2023 Apr – current	**AIDefSpace**: Using Artificial Intelligence to defend telecommunications and satellite positioning systems from the interference of space weather events https://research.kuleuven.be/portal/en/project/3E230105, funded by Belspo and Defence-Related Research Action (DEFRA) under grant agreement 22DEFRA006 AIDEFSPAC

Partial

2023 Apr – 2024 Apr	**DEEP** - Software for Exascale Architectures (DEEP-SEA) https://deep-projects.eu/, funded by the European High-Performance Computing Joint Undertaking (JU) under grant agreements No 955606, 95811, and 955776
2023 Oct – current	**ASAP** Automatics in Space Exploration https://asap-space.eu/, funded by the European Union's HORIZON Research and Inovation Action under grant agreement No 101082633
2023 Apr – current	Deep Learning Prediction and Hindsight of Flare Initiation - **DELPHI** https://research.kuleuven.be/portal/en/project/3E210423, funded by Belspo and BRAIN-be under grant agreement B2/202/P1/DELPHI

Schools and Qualifications

2024 May 20 – 24	Laboratory for Atmospheric and Space Physics (LASP) *Python in Heliophysics Summer School 2024*, hybrid, PyHC Summer School, Boulder, CO, US
2023 Sep 27 – 28	Forschungszentrum Jülich *Getting Started with AI on Supercomputers (3rd run)*, online, Jülich Supercomputing Centre (JSC)
2024	KU Leuven Team Learning & Development *Leadership for Postdoctoral Researchers*, HR department, KU Leuven, Leuven, Belgium
2022 Sep 7	Potsdam Graduate School *How to become a Data Scientist*, online, Präsenz-Workshop: How to become a Data Scientist
2022 Feb 22 – 24	Second ESCAPE School *Virtual Observatories*, online, ESCAPE VO School
2021 Jun 7 – 18	ESCAPE Summer School *Data Science for Astronomy, Astroparticle and Particle Physics*, online, ESCAPE Summer School 2021
2020 Nov 17 – 18	DESY Workshop *Practical Applications of Machine Learning in Modern Astronomy*, online, AIP
2017 Aug 1 – 8	Heliophysics Summer School on *Long-term Solar Activity and the Climates of Space and Earth*, Boulder, Colorado, USA

Fellowships

2016 Oct – 2020 Mar	Doctoral Scholarship, German Academic Exchange Service (DAAD)

Computer skills

Basic	FORTRAN
Intermediate	C++
Advanced	SLURM, Matlab, IDL, Python
HPC	DEEP system Jülich Supercomputing Centre (JSC), VSC system Flemish Supercomputer Center (Vlaams Supercomputer Centrum - VSC)

Languages

Based on the Common European Framework (CEF)

Bulgarian	Native speaker
Russian	Native speaker
English	Proficient user (C1)
German	Basic user (A3)

Grants

2019 May – Aug	DAAD Research Internship in Science and Engineering (RISE) Program: Internship provider for Jeniveve Pearson, an undergraduate student from Ohio State University, Columbus, Ohio, who worked in the project *"Characterization of Solar-Stellar Activity Cycles by Employing Chromospheric Activity S-Index"*

2019 Aug 26 – Sept 7	DAAD Project-related Exchange Program with Slovakia: Travel grant to participate in an observing campaign at the Astronomical Institute, Slovak Academy of Sciences, Tatranská Lomnica, Slovak Republic
2019 May 6 – 10	CESPM 2019: Travel grant to attend an d participate in the Chinese-European Solar Physics Meeting, Hvar, Croatia
2018 Aug 20 – 31	IAU 30 GA: Volunteer grant to attend and participate in the IAU XXX General Assembly, Vienna, Austria
2017 Sep 2 – 8	ESPM-15: Travel grant to attend and participate in the European Solar Physics Meeting, Budapest, Hungary
2017 Aug 1 – 8	Heliophysics Summer School: Travel grant to attend the summer school in Boulder, Colorado

Scientific Talks

2025 Oct 27 – 31	*Combining Physics-Derived and Machine-Learned Features for Probabilistic Solar Flare Forecasting*. ESWW 2025, Umeå, Sweden
2025 Sep 22 – 26	*Combining Physics-Derived and Machine-Learned Features for Probabilistic Solar Flare Forecasting*. 3rd ML-Helio, Madrid, Spain
2025 Aug 31 – Sep 5	*Semantic segmentation of SHARP vector magnetic field maps using Kohonen Self-Organizing Maps*. IAGA / IASPEI 2025, Lisbon, Portugal
2025 Apr 27 – May 2	*Parametrization of SHARP Vector Magnetic Field Using Disentangled Representation Learning* . EGU General Assembly 2025, Vienna, Austria
2024 Nov 4 – 8	*Flare Forecasting Framework Based on SHARP Features Extracted with Disentangled Representation Learning*. 20th European Space-Weather Week (ESWW2024), Coimbra, Portugal
2024 Sep 9 – 13	*Parametrization of SHARP Vector Magnetic Field Using Disentangled Representation Learning*. 17th European Solar Physics Meeting (ESPM-17), Turin, Italy
2024 Jul 8 – 12	*Machine Learning Based Parametrization of Solar Active Regions Using Disentangled Variational Autoencoders*. Machine Learning for Astrophysics 2nd Edition (ML4ASTRO2), Catania, Italy
2023 Nov 20 – 24	*Investigation of the VAE and Their Potential for Active Region Classification and Flare Prediction*. 19th European Space-Weather Week (ESWW2023), Toulouse, France
2023 May 8 – 12	*Classification Based on Machine Learning of Fe I 7090 Å Spectra Derived from CO5BOLD Simulations*. SOLARNET II Conference: The Many Scales of the Magnetic Sun, Potsdam, Germany
2023 Mar 13 – 17	*Characterization of Chromospheric Activity Based on PEPSI Sun-as-a-Star Spectra and Multiwavelength Disk-resolved Observations*. Sun-as-a-Star Workshop: Exploring Solar Variability with Disk-Integrated Spectra, Flatiron Institute, New York City, US
2022 Jul 4 – 9	*Classification of* Fe I *7090 Å Spectra Derived from CO^{5}BOLD Simulations Using Machine Learning Algorithms*. Cool Stars 21: Machine Learning for Cool Stars, Toulouse, France

2022 Jun 6 – 10	*Classification based on machine learning of* Fe I *7090 Å spectra derived from* CO^5BOLD *simulations*. 14th Workshop on "Solar Influences on the Magnetosphere, Ionosphere and Atmosphere", Primorsko, Bulgaria
2021 Sep 13 – 17	*Solar Activity Variations Characterised by Spectroscopic Proxies and Excess Brightness Indices* . 13th Workshop on "Solar Influences on the Magnetosphere, Ionosphere and Atmosphere", online, ws-sozopol.stil.bas.bg
2021 Sep 6 – 10	*Global Solar Magnetic Variations Characterised by Excess Brightness Indices and Spectroscopic Proxies*. 16th European Solar Physics Meeting (ESPM-16), online, ESPM-16
2019 Jun 30 – July 6	*Sun-as-a-Star Velocity Observations of the 2017 August 21 Solar Eclipse*. IAU Symposium 345 "Solar and Stellar Magnetic Fields: Origins and Manifestations", Copiapo, Chile
2019 Jun 3 – 7	*PCA as a Tool for High-Resolution Echelle Spectroscopy Analysis*. 11th Workshop on "Solar Influences on the Magnetosphere, Ionosphere and Atmosphere", Primorsko, Bulgaria
2018 Sep 10 – 13	*Sun-as-a-Star Velocity Observations of the 2017 August 21 Solar Eclipse with PEPSI/SDI*. Sun-as-a-Star Workshop "Would we Find the Solar System if we Saw it?", Göttingen, Germany
2018 Jun 4 – 8	*PEPSI/SDI Sun-as-a-Star Observations of the 2017 August 21 Solar Eclipse*. 10th Workshop on "Solar Influences on the Magnetosphere, Ionosphere and Atmosphere", Primorsko, Bulgaria
2017 May 30 – June 4	*High-resolution Spectroscopy with PEPSI/SDI*: 9th Workshop "Solar Influences on the Magnetosphere, Ionosphere and Atmosphere", Sunny Beach, Bulgaria
2012 Mar 11 – 14	*The Technical Analysis of the Stock Exchange and Physics: Japanese Candlesticks for Solar Activity*: The XXXVIII National Youth Conference on Astronomy, Varna, Bulgaria

Poster Presentations

2021 Mar 2 – 4	**E. Dineva**, J. Pearson, I. Ilyin, M. Verma, K.G. Strassmeier, and C. Denker: *Global Solar Magnetic Variations Using Spectroscopic Proxies and Excess Brightness Indices*. Cool Stars 20.5 – Virtually Cool
2019 May 6 – 10	**E. Dineva**, C. Denker, K.G. Strassmeier, I. Ilyin, and A. Pevtsov: *Monitoring Solar Activity Variations Using High-resolution Sun-as-a-Star Spectroscopic Observations with PEPSI*. 2nd Chinese-European Solar Physics Meeting, Hvar, Croatia
2019 May 6 – 10	M. Verma, C. Denker, A. Diercke, C. Kuckein, H. Balthasar, **E. Dineva**, I. Kontogiannis, P.S. Pal, and M. Sobotka: *High-resolution Spectroscopy of a Surge in an Emerging Flux Region*. 2nd Chinese-European Solar Physics Meeting, Hvar, Croatia
2018 Oct 29 – Nov 2	C. Kuckein, C. Denker, M. Verma, H. Balthasar, A. Diercke, S.J. González Manrique, **E. Dineva**, I. Kontogiannis, and Z. Shen: *sTools – a Software Package for Data Reduction of GREGOR Instruments and General Data Analysis*. SDO Science Workshop, Ghent, Belgium

2018 Aug 20 – 31	**E. Dineva**, C. Denker, K.G. Strassmeier, I. Ilyin, and I. Milic: *Sun-as-a-Star Observations of the 2017 August 21 Solar Eclipse*. IAU 30th General Assembly: Division E: Sun and Heliosphere, Vienna, Austria
2018 Aug 20 – 31	**E. Dineva**, C. Denker, K.G. Strassmeier, I. Ilyin, and A. Pevtsov: *Monitoring Solar Activity Variations with High-resolution Sun-as-a-Star Spectra Observed with PEPSI/SDI*. IAU 30th General Assembly: Focus Meeting 9: Solar Irradiance: Physics-based Advances, Topic: Proxies of Long-term Solar Magnetic Activity, Vienna, Austria
2017 Jun 20 – 23	K.G. Strassmeier, I. Ilyin, M. Steffen, **E. Dineva**, and C. Denker: *The Sun as a Star: Solar Spectra with PEPSI, and Why this is News for the LBT Community*. LBTO Users Meeting, Florence, Italy
2017 Sep 2 – 8	**E. Dineva**, C. Denker, K.G. Strassmeier, I. Ilyin, and A. Pevtsov: *Monitoring Solar Activity Variations with High-resolution Sun-as-a-Star Spectroscopy*. 15th European Solar Physics Meeting, Budapest, Hungary

Committees

2025 Oct 27 – 31	Convener of *Scientific outlooks for analysis of space weather data in the age of AI* TDM at ESWW 2025, Umeå, Sweden
2025 Oct 7	2nd ASAP Workshop *Smart Orbits: Advancing AI for Space Exploration and Space Plasmas*, Leuven, Belgium
2025 Oct 6	2nd ASAP: Automatics in Space Exploration General Assembly, Leuven, Belgium
2025 May 28	Member of LOC and SOC of *Workshop in Memory of Prof. Giovanni Lapenta*, KU Leuven, Leuven, Belgium
2023 April – present	Member of the organizing committee of KU Leuven *CmPA Plasma Physics Seminar*
2022 Jun – 2023 Mar	Member of the Internal Scientific Committee of the the Leibniz-Institut für Astrophysik Potsdam (AIP)
2019 Jul 8 – 12	Associate member of LOC for the *CESRA2019: The Sun and the Inner Heliosphere*, Potsdam, Germany
2016 Jun 6 – 11	Associate member of LOC for the *First VarSITI General Symposium*, Albena, Bulgaria

References

○ Prof. Dr. Stefaan Poedts
E-Mail: stefaan.poedts@kuleuven.be
KU Leuven, Centre for mathematical Plasma-Astrophysics (CmPA)
Celestijnenlaan 200b, 3001 Leuven, Belgium

○ Prof. Dr. Jasmina Magdalenić Zhukov
E-Mail: jasmina.magdalenic@kuleuven.be
KU Leuven, Centre for mathematical Plasma-Astrophysics (CmPA)
Celestijnenlaan 200b, 3001 Leuven, Belgium

- apl. Prof. Dr. Carsten Denker
  E-Mail: cdenker@aip.de
  Leibniz-Institut für Astrophysik Potsdam (AIP)
  An der Sternwarte 16, 14482 Potsdam, Germany