PD Dr. Elena Kronberg

Curriculum Vitae

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Citizenship: Germany

Education

01/2019 **Habilitation**, *Ludwig Maximilian University of Munich (LMU)*, Germany
Research: *"Charged particles in the terrestrial magnetosphere"*

05/2006 **Dr. rer. nat.**, *Technical University of Braunschweig*, Germany
Thesis title: *"Dynamical processes in the Jovian magnetotail"*

06/2001 **Master in Physics**, *Altai State University (ASU)*, Barnaul, Russia
Thesis title: *"Stochastic dynamics of relativistic electrons in the vector-scalar wave field and in the static magnetic field"*

06/1999 **Bachelor in Physics**, *ASU*, Barnaul, Russia
Thesis title: *"Stochastic dynamics of relativistic electrons in the upper-hybrid wave field and transverse magnetic field"*

Professional positions

From 11/2023 **Heisenberg Research Group Leader**, *Geophysics, Department of Earth and Environmental sciences, LMU*, Munich
Responsibility: Principal Investigator of the project "Energetic Ions in Space' (EIS) to understand dynamics of energetic plasma in the geospace using machine learning, statistical modeling and high performance simulations; leading a group on space plasma physics

01/2020–11/2023 **Scientist**, *Geophysics, Department of Earth and Environmental sciences, LMU*, Munich
Responsibility: Principal Investigator of the project "Ions in near-Earth space" (IONS) to depelop a predictive empirical model of the plasma pressure in the geospace environment using observations by ESA/Cluster mission and to conduct high performance simulations of the geomagnetic storms using Space Weather Modeling Framework; leader of the international project on "Energy transformation, turbulence and acceleration in space plasmas"

09/2021–03/2022 Parental leave

04/2021–09/2021 **Guest Professor**, *Geophysics, Department of Earth and Environmental sciences, LMU*, Munich
Responsibility: conduct science and teaching on the subject "Earth's magnetic field"

Since 04/2019 **Privatdozent**, *Geophysics, Department of Earth and Environmental sciences, LMU*, Munich

08/2015–12/2019 **Guest lecturer and scientist**, *Geophysics, Department of Earth and Environmental sciences, LMU*, Munich
Responsibility: led courses on plasma physics with application to space weather; mentored Bachelor and Master students; developed and enhanced data analysis techniques based on the INTERMAGNET data base, by including relevant physics needed to accurately characterize the geospace environment and the connection to the solar conditions

11/2006–12/2019 **Scientist**, *Max Planck Institute for Solar System Research (MPS)*, Göttingen
Responsibility: conducted and developed new data analysis techniques including machine learning of energetic particle population observed by ESA/Cluster/RAPID instrument enhanced by observations from other Cluster spacecraft instruments and multiple spacecraft missions to investigate the distribution, origin and energization of magnetospheric plasmas; developed predictive models of the space environment; led the preparation of data, documentation and software tools for community use integrated in Cluster Science Archive

05/2006-10/2006 **Postdoctoral Researcher**, *MPS*, Katlenburg-Lindau
Responsibility: explored Galileo observations to establish dynamics of the Jovian magnetosphere

09/2001-12/2002 **Scientific assistant**,
Department of general physics, ASU, Barnaul, Russia
Responsibility: conducted seminars at undergraduate level: informatics, general physics, optics

Awards and Fellowships

2025 Co-I of the Soft X-ray Imager (SXI) on SMILE mission, ESA

2024 ESA grant on "Soft proton flux analysis for SMILE", 6 months, 25,774 Euros

2024 Proposals within Research Unit "Energy Deposition from the maGnetotail into the ionosphere and thermospherE" and "Electron Seed Population and its impac on Ring current, Ionosphere and Thermosphere dynamics" by DFG (2 PhD position and scientific assistant, 4 years, 674,000 Euros)

2024 Travel Grants for international collaborations: "A collaborative study on the establishment of basis for the hybrid simulation code development for understanding the dynamics of solar system radiation belts", with Korea, 12,000 Euros; "Exploring the dynamics of charged particles in the near-Earth space: collaborative insights from Japanese and European satellite missions", 7,000 Euros; "Cold ion outflow in the terrestrial magnetosphere", 3,500 Euros

2024 Work on "A possible mechanism for the formation of an eastward moving auroral spiral" was highlighted by ESA with a story "Cluster explains spiral dance seen over Norway".

2023 Heisenberg Program, project "Energetic Ions in Space" funded by German Research Foundation (DFG) (own position for 5 years, ca. 650,000 Euros)

2023 Proposal "Understanding the Properties of Chorus Waves in the Earth's Inner-magnetosphere and Their Effects on Van Allen Radiation Belt Electrons" by DFG (PostDoc position and scientific assistants, 2 years, 225,700 Euros)

2020–2023 Grant for the project "Energy transformation, turbulence and acceleration in space plasmas" in the frame of a trilateral partnership between the Ukraine, Russia and Germany, 294,000 Euros, Volkswagen Foundation, Germany, hired 1 PostDoc at the LMU

2020–2021 Travel grant from Bavaria California Technology Center, “Ionosphere-Magnetosphere coupling: combining spacecraft and ground based observations”, 8000 Euros

2020-2021 Equal opportunity in research and teaching at the LMU, 2 research assistants, 4340 Euros

2020-2022 Proposal “IONS” funded within the focused area (SPP) “Dynamic Earth” by DFG (own position and scientific assistants, 3 years, 292,000 Euros)

2016-2019 Grant for the project “Energy transformation, turbulence and acceleration in space plasmas” in the frame of a trilateral partnership between the Ukraine, Russia and Germany, 255,900 Euros, Volkswagen Foundation, Germany, press release, e.g., Space Daily, published 23 Web of Science papers, hired 1 PostDoc at the MPS

2015 Co-Investigator (Co-I) of the Turbulence Heating ObserveR (THOR)/Ion Mass Spectrometer (IMS) instrument

2012-2014 Leader of an International Space Science Institute (ISSI) Team on “Heavy ions: their dynamical impact on the magnetosphere", Switzerland, Result: highly cited review in Space Science Reviews

2010 Co-I of the Cluster/RAPID instrument, Science Working Team, Belgium

2010 Team Achievement Award, RAPID Team, Cluster Workshop, Greece

2008 Work on “Comparison of periodic substorms at Jupiter and Earth” was highlighted by ESA. This story was published in many public news portals, e.g., Space Daily.

Services to the scientific community (selection)

2024 Evaluation for the Austrian Academy of Sciences

since 2024 Deputy speaker of RU “Magnetopshere, Ionosphere, Plasmasphere and Thermosphere as coupled system (MIPT)”

since 2023 Topic Editor “Frontiers Space Physics”: “Energy Transfer And Exchange With Low-Energy Plasma Via Cross-Energy And Cross-Scale Interactions Throughout The Magnetosphere”

since 2022 Associate Editor “Frontiers Space Physics”

since 2022 Annales Geophysicae topical Editor for Magnetospheric Physics

2022–2024 Topic Editor “Frontiers Space Physics”: special issue on “Circulation of Heavy Ions and Their Role in Regulating the Near-Earth Plasma Dynamics”

2021–2022 Guest Editor in “Earth, Planets and Space”: special issue on “DynamicEarth: Earth’s interior, surface, ocean, atmosphere, and near space interactions”

2020–2022 Topic Editor “Frontiers Space Physics”: special issue on “Cold-Ion Populations and Cold-Electron Populations in the Earth’s Magnetosphere and Their Impact on the System”

2020-2023 Topic speaker of SPP “Dynamic Earth”

2018–2019 Reviewer of the Rosetta Standard Radiation Environment Monitor (SREM) datasets for the ESA based Planetary Science Archive, European Space Astronomy Centre (ESAC)

2013–2020 Proposal Reviewer: NASA review panel, Swedish National Space Board, Kazakhstan National Centre of Science and Technology, Hungarian National Research Development and Innovation Office, Czech Science Foundation, German Research Foundation (Deutsche Forschungsgemeinschaft), Alexander von Humboldt Foundation (Germany), General Research Fund (Hong Kong)

Since 2006 Referee for peer-review journals: J. of Geophysical Research, Geophysical Research Letters, Nature physics, Nature Communications, Planetary Space Science, Space Science Reviews, Ann. Geophysicae, Astrophysical Journal, Earth, Planets and Space, Advances in Space Research, Canadian Journal of Physics, Space Weather

Organisation of scientific meetings (selection)

2024 COSPAR, Scientific Organizing Committee, "Particle Transport Acceleration and Loss in the Earth and Planetary Magnetospheres", Korea

2023 AGU, session co-convener, "Circulation of Heavy Ions and Their Role in Regulating Plasma Dynamics", USA

2022 Cluster 22nd anniversary symposium, scientific committee, Germany

2022 AGU, session co-convener, "Circulation of Heavy Ions and their Role in Regulating the Near-Earth Plasma Dynamics", USA

2022 EGU, session co-convener, ST2.5, "Wave-particle interactions in the Earth's inner magnetosphere, radiation belt dynamics, and coupling", Austria

2021 AGU, sessions co-convener, "SM006 "Cold plasmas in the magnetosphere-ionosphere system: drivers, impacts, open questions, new measurements techniques and new space missions" and SM004 "Circulation of Heavy Ions and their Role in Regulating the Near-Earth Plasma Dynamics", USA

2021 EGU, sessions co-convener, ST2.4, "Wave-particle interactions in the Earth's inner magnetosphere, radiation belt dynamics, and coupling" and ST2.6 "The ionospheric source of plasma: effects on the plasmasphere and magnetosphere", Austria

2020 AGU, sessions co-convener, "Magnetosphere–Plasmasphere–Ionosphere Coupling: Transport of Ionospheric Ions to the Magnetosphere and Their Consequences" and "Understanding the Role of Heavy Ions and Plasma Convection in Regulating the Coupled Magnetosphere–Ionosphere Dynamics", USA

2020 DGG, sessions convener, "Nature catastrophes", "Extraterrestrial Physics", Munich

2019 AGU, session co-convener, "Magnetosphere - Plasmasphere - Ionosphere coupling: transport of ionospheric ions to the magnetosphere and their consequences", USA

2019 Cluster 29th workshop, scientific committee, 110 participants, Spain

2019 EGU, session co-convener, ST2.4, "Wave-particle interactions in the Earth's magnetosphere and radiation belt dynamics", ST2.5, "Magnetosphere - plasmasphere - ionosphere coupling: tracking of cold and heavy ionospheric ions and their impact on the magnetosphere", Austria

2018 EGU, session co-convener, ST2.9, "Wave-particle interactions in the Earth's magnetosphere and radiation belt dynamics", Austria

2016 EGU, session co-convener, ST3.3, "The dynamical ionosphere", Austria

2013 EGU, session convener, ST2.5, “Heavy ions and their dynamical impact on the magnetosphere”, Austria

2013 Cluster 23rd workshop, scientific committee, 120 participants, Norway

2012 AGU, session convener, SM016, “Planetary Ion Sources and Magnetospheric Impacts”, USA

2012 MPS Symposium, Germany

2010 11th CAA Cross-calibration meeting, Germany

Public outreach

2017 Video for Eclipse de Sol 2017, La Escuela Superior de Fisica y Matematicas in Mexico City, to encourage Mexican girls to combine family and science

2005–2019 Guiding public tours, participation at the open house days at MPS

Other scientific achievements

- Author of 114 peer-review publications, 25 of which I am the first author, h-index 25 and >2034 citations (Web of Science, on 09.07.2024)
- Acquired ∼2.4MEuros third party money
- 37 invited talks to international conferences e.g., Deutsche Physikalische Gesellschaft (DPG)-Frühjahrstagung der Extraterrestrischen Physik (Göttingen, Germany), Magnetism Atmospheres Life (USA), “Current understanding of the geospace environment variations based on multi-spacecraft observations during solar cycle 24” ISSI-BJ (China, online); Frontiers Symposium (online); Ionosphere-Magnetosphere Coupling IV (Germany), Mini-Symposium at IRF (Sweden), SMILE mission Science Working Team #23, #18 and consortium #12, online, ESA; 16th Plasma Physics in the Solar System Conference (Russia), Impact of the Cold Plasma Populations in the Earth’s Magnetosphere (USA), the annual Institute of Plasma, 47th Plasma Physics Conference (UK), International Conference on Substorms (Norway, Austria), Ion Composition in the Sun-Earth System (USA), Keynote speaker at Royal Astronomical Society Specialist Discussion Meeting (UK), Japanese Geoyphysical Union Meeting (Japan), Cluster Workshop (Germany, Slovenia, USA, Greece), 2 times European Geophysical Union (EGU) General Assembly (Austria), Committee on Space Research (COSPAR) Assembly (USA, Russia, 4 times), Geospace Environment Modeling Meeting (USA), Asia Oceania Geosciences Society Meeting (Singapore, Australia), Western Pacific Geophysics Meeting (Taiwan), European Planetary Science Congress (Germany)
- invited colloquiums e.g., virtual Astrophysics Colloquium at University of Athens, Greece; INAF-IASF, Milan, Italy; GSI Helmholtzzentrum für Schwerionenforschung (Darmstadt), University of California Los Angeles, USA, online Cold Plasma Seminar Series, USA; the University of Rostock, the Arctic University of Norwey, the University of Tokyo, Japan; the University of Illinois, USA; the University of West Virginia, USA; the University of Texas at Arlington, USA; Institute of Geology and Geophysics Chinese Academy of Sciences, China

- Member of 7 ISSI Teams (including giving invited presentations) led by D. Turner and G. Reeves on “Understanding energetic particle injections and their effect on Earth’s outer radiation belt electrons using multipoint observations”,
  by M. Balikhin on “Analysis of Cluster inner magnetosphere campaign Data, in application the dynamics of waves and wave-particle interaction within the outer radiation belt”,
  by M. Vogt on “How does the solar wind influence the giant planet magnetospheres?”,
  by F. Gastaldello on “Soft Protons in the Magnetosphere focused by X-ray Telescopes”;
  by R. Ilie and R. Oran on “How Heavy Elements Escape the Earth: Past, Present, and Implications to Habitability”;
  by E. Panov on “Magnetotail Dipolarizations: Archimedes Force or Ideal Collapse?”;
  by N. Ganushkina and M. Liehmon on “1-100 keV Electrons in the Earth’s Magnetosphere: Unique and Unpredictable?”.
- Member of GEM focus group led by R. Chappell, B. Schunk and D. Welling on “The ionospheric source of magnetospheric plasma”

Memberships

- Young Center for Advanced Studies (CAS) at LMU
- Deutscher Hochschulverband (DHV)
- European Geophysical Union (EGU)
- International Astronomical Union (IAU)

Administration

2016–2024 Administration of the project granted by Volkswagen Foundation

Short list positions

2024 Professor for Computational Data Science at Technische Hochschule Ingolstadt, Germany

2021 University of Rostock (W3), director of DLR institite for Solar-Terrestrial Physics, Germany

2020 Assistant/Associate Professor in Experimental/Instrumental Space Plasma Physics at the West Virginia University, USA, 2nd place

2020 Assistant/Associate Professor in space physics, at the University of Texas at Arlington USA

Teaching

My teaching activities at LMU until present are:

- **Space weather** (MSc), 11 lectures + 3 tutorials (2016/2017 – 2024/2025 WS)
  Content: space weather hazards, solar and solar wind dynamics, the magnetosphere and ionosphere with a focus on the cause of geomagnetic field disturbances
- **Special topics in Space Plasma Physics** (MSc), 14 tutorials (2025 SS)
  Content: Plasma dynamics in the near-Earth space and applications of machine learning methods
- **Practical Big Data Science** (MSc), 8 tutorials (2020 SS)
  Content: advising on joint project with Institute for Informatics at the LMU "Modeling of Earth's radiation environment"
- **Mathematical Geophysics** (MSc), 11 tutorials (2017/2018 WS)
  Content: harmonic oscillator, lagrangian mechanics, discrete oscillating systems, vibrating string, elastic membrane, Fourier transform, convolution product, normal modes of a sphere
- **Geo- and Paleomagnetism** (BSc), 4 tutorials (2017 SS)
  Content: Exercises related to electromagnetodynamics (Maxwell equations, induction), calculations of simple magnetic fields and spherical harmonics
- **Modern Paleo- and Geomagnetism** (MSc), 2 lectures + 1 tutorial (2016–2023 SS)
  Content: a brief introduction to the magnetosphere and the ionosphere with a focus on the cause of geomagnetic field disturbances
- **The Earth's core and Geodynamo** (MSc), 2 lectures + 1 tutorial (2016 SS)
  Content: Application of magnetohydrodynamics to the external geomagnetic field

I am was the chair of the PhD defense committee of *Sandra Hahn* at the LMU; member of the PhD committees of *Artem Smirnov* at GFZ Potsdam, *Louis Richard* at IRF (Sweden), *Marjolijn Adolfs* at the University of Potsdam and *Katyrina Lubyk* at the University of Rostock.
I mentored 21 Bachelor and Master students, plus 2 PhD students, e.g.,:

Felix Schweikl, "Time Series Analysis for Prediction of Geomagnetic Indices", (MSc), 2025
Nicolas Doepke, "Understanding Differences in Earth's Ionospheric Cold Ion Outflow Originating on either day- or night-side Using Machine Learning", (BSc), 2024
Simon Mischel, "Evaluation proton intensities for the SMILE mission", (BSc), 2023
Songyan Li, "Ion Dynamics in the Inner Magnetosphere", (PhD), 2022
Katharina Maetschke, "Effects of the Magnetospheric Tail Activity on the Earth´s Ionosphere", (BSc), 2021
Anna Sedlmeir, "Prediction of proton intensities in the Earth's magnetosheath: machine learning approach", (BSc), 2021
Alexandra Hardt, "Prediction of soft-proton contamination in XMM-Newton by Cluster observations: a machine learning approach", (BSc), 2021

Currently I mentor 2 Master and 2 PhD students:
Simon Mischel, "Soft Proton flux Analysis for the SMILE Mission", (MSc), expected in August 2025
Nicolas Doepke, "Predictive Analytics of Cold Ion Outflow from the Earth's Ionosphere", (MSc), expected in August 2026
Dmitrii Gurev, "'Electron seed population and its impact on ring current, ionosphere and thermosphere dynamics', (PhD), expected in November 2028

Peer-reviewed publications

Bachelor and Master students are marked with *, Ph.D students with ** and Postdocs with ***. The publications from Volkswagen project are marked with #. In total 114 and 25 first author publications.

2025

***Smirnov, A., Y. Shprits, H. Lühr, A. Pignalberi, **E. Kronberg**, F. Prol, C. Xiong, Extreme two-phase change of ionospheric electron temperature overshoot during geomagnetic storms, *Scientific Reports,* Vol. 15, 1, doi:10.1038/s41598-025-89602-z, 2025

Liu, C. M., J. B. Cao, Y. Y. Liu, **E. A. Kronberg**, X. N. Xing, B. N. Zhao, P. W. Daly, Autogenous Electron Acceleration by Ion Flow Vortex in Space Plasmas, *Astrophysical Journal,* Vol. 979, 2, doi:10.3847/1538-4357/ada269, 2025

2024

*Mischel, S., **E. A. Kronberg**, and C. P. Escoubet, Evaluating Proton Intensities for the SMILE Mission, *Space Weather,* 22(12), doi:10.1029/2024SW003934, 2024

#Kozak, L., I. Ballai, V. Fedun, **E. A. Kronberg**, A. Blöcker, B. Petrenko, Changes in turbulent processes caused by atmospheric gravity waves from troposphere, *Frontiers in Astronomy and Space Sciences,* Vol. 265(id. 1226200), doi: 10.3389/fspas.2023.1226200, 2023

#Blöcker, A.***, **E. A. Kronberg**, E. E. Grigorenko, R. W. Ebert and G. Clark, Plasmoids and Magnetic Field Dipolarizations During Juno's First 47 Orbits: Is Ion Acceleration Always Observed in the Dipolarizations?, *J. Geophys. Res.,* doi:10.1029/2024JA032853, 2024

Cao, Xin , et al., Science return of probing magnetospheric systems of ice giants , vol. 11(id. 1203705), doi: 10.3389/fspas.2024.1203705, 2024

Bashir, M. Fraz, **E. A. Kronberg**, and L. J. Chen, L. J., Editorial: Circulation of heavy ions and their role in regulating the near-earth plasma dynamics , 11, doi: 10.3389/fspas.2024.1382511, 2024

Carter, J. A. , et al. (2024), Ground-based and additional science support for SMILE , vol. 8, issue 1, pp. 275-298, doi: 10.26464/epp2023055, 2024

2023

Li, S. Y., **E. A. Kronberg, C. G. Mouikis, H. Luo, Y. S. Ge, A. M. Du, Prediction of Proton Pressure in the Outer Part of the Inner Magnetosphere Using Machine Learning , Volume 21, Issue 9, doi: 10.1029/2022SW003387, 2023

*Maetschke, K. N., **E. A. Kronberg**, N. Partamies and E. E. Grigorenko, A possible mechanism for the formation of an eastward moving auroral spiral , vol. 10, doi: 10.3389/fspas.2023.1240081, 2023

Stolle, C., J. Baerenzung, **E. A. Kronberg**, J. Kusche, H. Liu and H. Shimizu, Special issue "DynamicEarth: Earth's interior, surface, ocean, atmosphere, and near space interactions", Volume 75, Issue 1, doi: 10.1186/s40623-023-01893-6, 2023

#Blöcker, A.***, **E. A. Kronberg**, E. E. Grigorenko, E. Roussos and G. Clark, Dipolarization Fronts in the Jovian Magnetotail: Statistical Survey of Ion Intensity Variations Using Juno Observations, *J. Geophys. Res.,* doi:10.1029/2023JA031312, 2023

Borovsky, J. G. L. Delzanno, **E. A. Kronberg** and C. Norgren, Editorial: Cold-ion populations and cold-electron populations in the Earth's magnetosphere and their impact on the system,

Frontiers in Astronomy and Space Sciences, doi:10.3389/fspas.2023.1180235, 2023

Ren, J., Q. Zong, S. Fu, H. Yang, Z. Hu, X. Zhang, X. Zhou, C. Yue, L. Kistler, P. Daly, **E. A. Kronberg** R and Rankin, The Dynamics of Earth's Cusp in Response to the Interplanetary Shock, *Universe*, Vol. 9, issue 3, doi: 10.3390/universe9030143, 2023

Grigorenko, E. E., Malykhin A. Y., **E. A. Kronberg** and E. V. Panov, Quasi-parallel Whistler Waves and Their Interaction with Resonant Electrons during High-velocity Bulk Flows in the Earth's Magnetotail, *Astrophysical Journal,* Vol. 943, 2, doi:10.3847/1538-4357/acaf52, 2023

#Kozak, L., **E. A. Kronberg**, B. Petrenko, A. Blöcker, R. Akhmetshyn, I. Ballai and V. Fedun, Turbulent dipolarization regions in the Earth's magnetotail: ion fluxes and magnetic field changes , vol. 10(id. 1226200), doi: 10.3389/fspas.2023.1226200, 2023

#Cheremnykh, O. K., A. K. Fedorenko, O.S. Cheremnykh and **Kronberg, E. A.**, (2023), Acoustic-gravity waves with height-independent amplitude in the isothermal atmosphere , vol. 39, issue 5 (pp. 280-286), doi: 10.3103/S0884591323050021, 2023

#Cheremnykh, O. K., A. K. Fedorenko, O.S. Cheremnykh and **Kronberg, E. A.**, Splitting of the wave disturbance spectrum in the isothermal atmosphere due to its rotation , vol. 39, issue 6, pp. 3-23, doi: 10.15407/kfnt2023.06.003, 2023

#Petrenko, B., L. Kozak, **E. A. Kronberg.** and Akhmetshyn, R., Multispacecraft wave analysis of current sheet flapping motions in the Earth's magnetotail, *Frontiers in Astronomy and Space Sciences*, doi:10.3389/fspas.2022.1071824, 2023

2022

Roussos, E. et al., The in-situ exploration of Jupiter's radiation belts, *Experimental Astronomy*, doi:10.1007/s10686-021-09801-0, 2022

Branduardi-Raymont, G. et al., Exploring solar-terrestrial interactions via multiple imaging observers, *Experimental Astronomy*, doi:10.1007/s10686-021-09784-y, 2022

Kronberg, E. A., Data analysis in space physics: My experience and lessons learned, *Frontiers in Astronomy and Space Sciences*, doi:10.3389/fspas.2022.1008888, 2022

Rae, J. et al., What are the fundamental modes of energy transfer and partitioning in the coupled Magnetosphere-Ionosphere system?, *Experimental Astronomy*, doi:10.1007/s10686-022-09861-w, 2022

#Blöcker, A.***, **Kronberg, E. A.**, E. E. Grigorenko, G. Clark, L. Kozak, M. Vogt and E. Roussos, Plasmoids in the Jovian Magnetotail: Statistical Survey of Ion Acceleration Using Juno Observations, *J. Geophys. Res.,* doi:10.1029/2022JA030460, 2022

#Kozak, L. V., B. A. Petrenko, E. E. Grigorenko and **E. A. Kronberg**, Comparison of Ground-Based and Satellite Geomagnetic Pulsations during Substorms, *Kinematics and Physics of Celestial Bodies,* 38, doi:10.3103/S0884591322010044, 2022

2021

#Kronberg, E. A., J. Gorman*, K. Nykyri, A. G. Smirnov*, J. W. Gjerloev, E. E. Grigorenko, L. V. Kozak, X. Ma, K. J. Trattner and M. Friel, Kelvin-Helmholtz Instability Associated with Reconnection and Ultra Low Frequency Waves at the Ground: A Case Study, *Frontiers in Physics*, doi:10.3389/fphy.2021.738988, 2021

Kronberg, E. A., E. E. Grigorenko, R. Ilie, L. Kistler and D. Welling, Impact of ionospheric ions on magnetospheric dynamics, *AGU book "Magnetospheres in the solar system"*,

doi:10.1002/9781119507512, 2021

Ilie, R., F. Bashir, **E. A. Kronberg E.,** A brief review of the ring current and outstanding problems, *AGU book "Magnetospheres in the solar system"*, 10.1002/9781119815624.ch23, 2021

Kronberg, E. A., T. Hannan*, J. Huthmacher*, M. Münzer*, F. Peste*, Z. Zhou*, M. Berrendorf, E. Faerman, F. Gastaldello, S. Ghizzardi, P. Escoubet, S. Haaland, A. Smirnov*, N. Sivadas, R. Allen, A. Tiengo and R. Ilie, Prediction of Soft Proton Intensities in the Near-Earth Space Using Machine Learning, *Astrophysical Journal,* Vol. 921, 2, doi:10.3847/1538-4357/ac1b30, arXiv:2105.15108, 2021

Vaivads, A., Yu. V. Khotyaintsev, A. Retinò, H. S. Fu, **E. A. Kronberg,** P.W. Daly, Cluster Observations of Energetic Electron Acceleration Within Earthward Reconnection Jet and Associated Magnetic Flux Rope, *J. Geophys. Res.,* 126, doi:10.1029/2021JA029545, 2021

Nykyri, K., J. Johnson, **Kronberg, E. A.**, D. Turner, S. Wing, I. Cohen, K. Sorathia, X. Ma, B. Burkholder, G. Reeves and J. Fennell, Magnetospheric Multiscale observations of the Source Region of Energetic Electron Microinjections along the Dusk-side, High-latitude Magnetopause Boundary Layer, *Geophys. Res. Lett.,* 10.1029/2021GL092466, 2021

Tao, C., T. Kimura, **E. A. Kronberg**, F. Tsuchiya, G. Murakami, A. Yamazaki, M. F. Vogt, B. Bonfond, K. Yosihoka, I. Yoshikawa, Y. Kasaba, H. Kita, and S., Variation of Jupiter's Aurora Observed by Hisaki/EXCEED: 4. Quasi-Periodic Variation, *J. Geophys. Res.,* 126, 10.1029/2020JA028575, 2021

Roussos et al., The in-situ exploration of Jupiter's radiation belts, *Experimental Astronomy*, 10.1007/s10686-021-09801-0, 2021

Branduardi-Raymont et al., Exploring solar-terrestrial interactions via multiple imaging observers, *Experimental Astronomy*, doi:10.1007/s10686-021-09784-y, 2021

#**Kronberg, E. A.**, P. W. Daly, E. E. Grigorenko, A. G. Smirnov*, B. Klecker and A. Yu. Malykhin, Energetic Charged Particles in the Terrestrial Magnetosphere: Cluster/RAPID Results,*J. Geophys. Res.,* 126, doi:10.1029/2021JA029273, 2021

#Kozak, L. V., B. Petrenko, **E. A. Kronberg**, P. W. Daly, Processes in the current disruption region: from turbulence to dispersion relation, *J. Geophys. Res.,* 126, doi:10.1029/2020JA028404, 2021

2020

Kronberg, E. A., F. Gastaldello, S. Haaland, A. Smirnov*, M. Berrendorf, S. Ghizzardi, K. Kuntz, N. Sivadas, R. Allen, A. Tiengo, R. Ilie, Y. Huang and L. Kistler, Prediction and understanding of soft proton contamination in XMM-Newton: a machine learning approach, *Astrophysical Journal,* Vol. 903, 2, doi:10.3847/1538-4357/abbb8f, https://arxiv.org/abs/2009.13156, 2020

Smirnov, A. G.*, M. Berrendorf, Y. Y. Shprits **E. A. Kronberg**, H. Allison, N. A. Aseev, I. Zhelavskaya, S. Morley, G. Reeves, M. Carver, F. Effenberger, Medium Energy Electron Flux in Earth's Outer Radiation Belt (MERLIN): A Machine Learning Model, *Space Weather,* doi: 10.1029/2020SW002532, 2020

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