

Hannu Koskinen
Department of Physics
Hannu Koskinen / Principal Investigator

Postal address:
PL 64 (Gustaf Hällströmin katu 2)
C227
HELSINGIN YLIOPISTO
Finland

Email: Hannu.E.Koskinen@helsinki.fi
Phone: +358-504155356
<http://www.helsinki.fi/~hejkoski/>

Curriculum Vitae

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Hannu Erkki Juhani Koskinen
Born January 7, 1954, Keuruu, Finland

University degrees

- *Master of Science*, University of Helsinki, Helsinki, Finland, April 5, 1979
- *Licentiate of Philosophy*, University of Helsinki, Helsinki, Finland, May 5, 1983
- *Doctor of Philosophy*, Uppsala University, Uppsala, Sweden, November 20, 1985
- *Docent in Space Physics* at the University of Helsinki, June 14, 1989.

Present position

- *Professor in Space Physics* at the Department of Physics of the University of Helsinki, from August 1, 1997

Director of the Department of Physics, from January 1, 2014

Previous professional positions

- *Director of the Division of Geophysics and Astronomy*, January 1, 2010 – December 31, 2013
- *Director of Kumpula Space Centre*, January 1, 2006 – April 25, 2014
- *Senior Scientist* funded by the Academy of Finland, August 1, 2008 – July 31, 2009.
- *Head of the Space Research Unit* of the Finnish Meteorological Institute, Helsinki, October 1, 2005 – September 30, 2006. (On leave from the University of Helsinki)
- *Head of the Space Physics Division / Research Group*, Finnish Meteorological Institute, 1991–1997
- *Senior Research Scientist*, Finnish Meteorological Institute, Helsinki, 1987 – 1991.
- *Research Assistant / Associate Scientist*, Uppsala Ionospheric Observatory, Sweden, 1981–1987.

Scientific work at other institutes

- Cornell University, School of Electrical Engineering, Ithaca, NY, U.S.A., June 21 – July 9, 1982
- Massachusetts Institute of Technology, Center for Space Research, Cambridge, MA, U.S.A., as a Visiting Scientist, November 9, 1984 – March 31, 1985
- Laboratory of Atmospheric and Space Physics, University of Colorado, Boulder, CO, USA. Visiting Scholar, September 1 – December 13, 2008.
- International Space Science Institute, Bern, CH. Visiting Scientist, February 2 – April 30, 2009.

Academies

- International Academy of Astronautics, Member of Section 1 (Basic Sciences) of the, 2009– (Corresponding member 2004–2009)
- Finnish Society of Sciences and Letters: Member 2005 –; Member of the Board 2011 –
- Finnish Academy of Sciences and Letters: Member 2006 –; Chair of the Geosciences group 2015

Honors and awards

- 1997 Editors' Citation for Excellence in Refereeing for JGR-Space Physics.
- Teacher of the year 2001, elected by students of the Department of Physical Sciences of the University of Helsinki.
- Theodor Homén's price of the Finnish Society of the Sciences and Letters, 2010.
- Knight, First Class, of the Order of the White Rose of Finland, 2015.

Activities within the European Space Agency

- Member of the Solar System Working Group of ESA, 1993–1996.
- Member of the Rosetta SSP Advisory Group of ESA, 1994.
- Member of Assessment Study Science Team for the STORMS mission, Consultant to ESA, 2000.
- Finnish Delegate in the Science Programme Committee, November 2002 – 2016
- Finnish Delegate in the Programme Board of the Space Situational Awareness Preparatory Programme, August 2010 – June 2011; Chair of the Programme Board, July 2011 – June 2014.

National committees

- Finnish Space Committee: Secretary of the Research and Education section 1989 – 1992; Advisor 2004–2010, Chairman of the Scientific support group, 2010–
- Finnish National Committee of COSPAR (1998–; Chair 2000–2011), IUGG (1998–2015), URSI (2000–)
- Member of the Steering Committee of the *Graduate School in Solar-Terrestrial Physics*, 1995–1998 and of the Steering Committee of the *Graduate School in Astronomy and Space Physics*, 1999–2013
- Member of the Board of Metsähovi Radio Observatory, Member 2006–2011
- Member of the Board of the Finnish Centre for Astrophysics with ESO (FINCA), 2010–
- Member of the Publications Forum in Finland, 2011–
- Member of the Board of Helsinki Institute of Physics, 2014– (substitute member 2010–2013)
- Member of the Board of the LUMA Centre of University of Helsinki, 2014–
- Member of the Board of Kumpula Space Centre, 2014–

Bi-lateral, international, and foreign committees

- Secretary of the Working Group for Space Activities of the Science and Technology Commission between Finland and Russia, 1992–1997.
- Adherent Representative from Finland in the Scientific Committee on Solar-Terrestrial Physics (SCOSTEP), 1994–2012
- Member of S-RAMP Steering Committee of SCOSTEP, 1998–2002
- Representative of Finland in COSPAR, 2000–
- Member of the European Space Science Committee (ESSC) of ESF, 2000–2003
- Member of EISCAT Council, 2001–2003
- Finnish Delegate in the ESA Science Programme Committee, 2002–
- Member of the MOWG of Living With a Star(LWS) program of NASA, 2003–2005
- Finnish Delegate in the Programme Board of the Space Situational Awareness Preparatory Programme, August 2010 – June 2011; Chair of the Programme Board, July 2011 – June 2014
- Chairmanships with the Swedish Research Council
NT-3: Vice-Chair 2013, 2014; Chair 2015, 2016

Supervision and other activities with doctoral dissertations

- Main supervisor of 8 PhD theses (co-supervisor or administrative supervisor of 1 theses)
- Faculty opponent of 5 Ph.D. dissertations; Preliminary examiner of 16 Finnish Ph.D. theses

Participation in experimental space projects

- Co-investigator in the wave experiment on the Swedish Viking satellite (launched 1986)
- Co-investigator in particle and wave instruments on the Swedish Freja satellite (launched 1992).
- Co-investigator in the Swedish micro satellite Astrid (launched 1995)
- Co-investigator in the PROMICS-3 plasma instruments on the two Russian Interball spacecraft (launched 1995 and 1996).
- Co-investigator in the ASPERA-C particle instrument on the Russian Mars-96 spacecraft (destroyed in launch failure, 1996)
- Positions in the Rosetta Lander project (launched 2004)
 - Member of the Rosetta Lander (Philae) Steering Committee 1995 – 2004 and 2007–, Chairman of the Steering Committee 2009–2013
 - Member of the RoLand Science Advisory Group (for RoLand instrument selection, 1995)
- Co-I in the ion composition analyzer ICA on Rosetta (launched March 2, 2004)
- Co-investigator in ASPERA-3 instrument on the ESA Mars Express mission (launched 2003)
- Lead proposer of the STORMS mission for the ESA F2/F3 missions, January 2000.
- Chair of the Finnish Steering Committee of the SPEDE instrument for SMART-1 spacecraft (launched 2003), 2001–2003.
- Co-investigator in ASPERA-4 instrument on the ESA Venus Express mission (launched 2005)
- Co-investigator in the SIXS X-ray instrument for the ESA BepiColombo spacecraft
- Member of the Science Support Group of the student satellite Aalto-1, 2011–
- Member of the ESA Euclid Steering Committee, 2012–

ESA contracts

- Study manager of “Study of plasma and energetic electron environment and effects”, 1996–1998.
- Manager of the FMI participation in the “ESA Space Weather Study”, 2000–2001
- Study manager of “Magnetospheric Propulsion (eMPii)”, 2002–2004.

EU projects

- Partner in the FP7 study “SPACECAST – Protecting space assets from high energy particles by developing European dynamic modeling and forecasting capabilities”, 2011–2014.

Editorial position:

- Editor in Chief of *Arkhimedes*, a Finnish Journal for Physicists and Mathematicians, 6 issues per year, 2005–2007; Editor 2008.

Acted as a scientific referee or evaluator for

- J. Geophys. Res.; Geophys. Res. Lett.; Planet. Space Sci.; Ann. Geophysicae; J. Atmosph. and Solar-Terr. Phys.; J. Geophys. and Geomagn.; EOS; AGU monographs and other refereed conference proceedings; NASA, NSF, NERC, EU, ESF, INTAS, etc. applications; Academy of Finland; Austrian Science Fund, Canadian Space Agency; Chilean Research Fund Council; Research Council of Norway; Royal Swedish Academy of Sciences; Swedish National Space Board; Swedish Research Council; Väisälä Foundation; Magnus Ehrnrooth Foundation; Max-Planck-Gesellschaft, Universities of Helsinki, Oulu, Turku, Umeå, KTH,

Publications

Quantifying the non-linear dependence of energetic electron fluxes in the Earth's radiation belts with radial diffusion drivers

Osmane, A., Savola, M. E., Kilpua, E., Koskinen, H., Borovsky, J. E. & Kalliokoski, M., 25 Jan 2022, In: *Annales Geophysicae*. 40, 1, p. 37-53 17 p.

Physics of Earth's Radiation Belts: Theory and Observations

Koskinen, H. & Kilpua, E., 2022, Cham: Springer Nature Switzerland AG. 272 p. (Astronomy and Astrophysics Library)

Outer Van Allen Radiation Belt Response to Interacting Interplanetary Coronal Mass Ejections

Kilpua, E. K. J., Turner, D. L., Jaynes, A., Hietala, H., Koskinen, H. E. J., Osmane, A., Palmroth, M., Pulkkinen, T. I., Vainio, R., Baker, D. & Claudepierre, S., 12 Mar 2019, In: *Journal of geophysical research. Space physics*. 124, 3, p. 1927-1947 21 p.

Kaikenlaista rohkeutta

Hetemäki, I. (ed.), Koskinen, H. E. J. (ed.), Pulkkinen, T. K. (ed.) & Väliverronen, E. T. (ed.), 8 Jan 2019, Helsinki: Gaudeamus. 323 p.

Achievements and Challenges in the Science of Space Weather

Koskinen, H. E. J., Baker, D. N., Balogh, A., Gombosi, T., Veronig, A. & von Steiger, R., 2017, In: *Space Science Reviews*. 212, 3-4, p. 1137–1157 21 p.

Coronal mass ejections and their sheath regions in interplanetary space

Kilpua, E., Koskinen, H. E. J. & Pulkkinen, T. I., 2017, In: *Living Reviews in Solar Physics*. 14, 83 p., 5.

Elektrodynamiikka

Koskinen, H. E. J., 2017, Helsinki: LIMES. 245 p.

Introduction to Plasma Physics

Kilpua, E. K. J. & Koskinen, H. E. J., 2017, 1 ed. Helsinki: LIMES. 147 p.

Evolution of the ion environment of comet 67P/Churyumov-Gerasimenko

Nilsson, H., Wieser, G. S., Behar, E., Wedlund, C. S., Kallio, E., Gunell, H., Edberg, N. J. T., Eriksson, A. I., Yamauchi, M., Koenders, C., Wieser, M., Lundin, R., Barabash, S., Mandt, K., Burch, J. L., Goldstein, R., Mokashi, P., Carr, C., Cupido, E., Fox, P. T. & 11 others, Szego, K., Nemeth, Z., Fedorov, A., Sauvaud, J. -A., Koskinen, H., Richter, I., Lebreton, J. -P., Henri, P., Volwerk, M., Vallat, C. & Geiger, B., Nov 2015, In: *Astronomy & Astrophysics*. 583, 8 p., A20.

Properties and drivers of fast interplanetary shocks near the orbit of the Earth (1995-2013)

Kilpua, E. K. J., Lumme, E., Andreeova, K., Isavnin, A. & Koskinen, H. E. J., Jun 2015, In: Journal of geophysical research. Space physics. 120, 6, p. 4112-4125 14 p.

Unraveling the drivers of the storm time radiation belt response

Kilpua, E. K. J., Hietala, H., Turner, D. L., Koskinen, H. E. J., Pulkkinen, T. I., Rodriguez, J. V., Reeves, G. D., Claudepierre, S. G. & Spence, H. E., 16 May 2015, In: Geophysical Research Letters. 42, 9, p. 3076-3084 9 p.

Birth of a comet magnetosphere: A spring of water ions

Nilsson, H., Wieser, G. S., Behar, E., Wedlund, C. S., Gunell, H., Yamauchi, M., Lundin, R., Barabash, S., Wieser, M., Carr, C., Cupido, E., Burch, J. L., Fedorov, A., Sauvaud, J.-A., Koskinen, H., Kallio, E., Lebreton, J.-P., Eriksson, A., Edberg, N., Goldstein, R. & 9 others, Henri, P., Koenders, C., Mokashi, P., Nemeth, Z., Richter, I., Szego, K., Volwerk, M., Vallat, C. & Rubin, M., 23 Jan 2015, In: Science. 347, 6220, 4 p., 0571.

A semi-analytical foreshock model for energetic storm particle events inside 1 AU

Vainio, R., Pönni, A., Battarbee, M., Koskinen, H. E. J., Afanasiev, A. & Laitinen, T., 20 Feb 2014, In: Journal of space weather and space climate . 4, 11 p., A08.

Analysis of double-step response to an interplanetary shock in the dayside magnetosphere

Andreeova, K., Juusola, L., Kilpua, E. K. J. & Koskinen, H. E. J., 2014, In: Annales Geophysicae. 32, 10, p. 1293-1302 10 p.

Wave dispersion in the hybrid-Vlasov model: verification of Vlasiator

Kempf, Y., Pokhotelov, D., von Alfthan, S., Vaivads, A., Palmroth, M. & E. J. Koskinen, H., 26 Nov 2013, In: Physics of Plasmas. 20, 11, 6 p., 112114.

Interpreting Solar EUV Wave Observations from Different Viewing Angles Using an MHD Model

Hoiijoki, S., Pomoell, J., Vainio, R., Palmroth, M. & Koskinen, H. E. J., 1 Sep 2013, In: Solar Physics. 286, 2, p. 493-507 15 p.

Spatial variation of energy conversion at the Earth's magnetopause: Statistics from Cluster observations

Anekallu, C. R., Palmroth, M., Koskinen, H. E. J., Lucek, E. & Dandouras, I., May 2013, In: Journal of geophysical research. Space physics. 118, 5, p. 1948-1959 12 p.

Analysis of the substructure within a complex magnetic cloud on 3-4 September 2008

Andreeova, K., Kilpua, E. K. J., Hietala, H., Koskinen, H. E. J., Isavnin, A. & Vainio, R., 2013, In: Annales Geophysicae. 31, 3, p. 555-562 8 p.

Forecasting the Earth's radiation belts and modelling solar energetic particle events: Recent results from SPACECAST: Recent results from SPACAST

Horne, R. B., Glauert, S. A., Meredith, N. P., Koskinen, H., Vainio, R., Afanasiev, A., Ganushkina, N. Y., Amariutei, O. A., Boscher, D., Sicard, A., Maget, V., Poedts, S., Jacobs, C., Sanahuja, B., Aran, A., Heynderickx, D. & Pitchford, D., 2013, In: Journal of space weather and space climate . 3, 14 p., A20.

Ion distributions upstream and downstream of the Earth's bow shock: first results from Vlasiator

Pokhotelov, D., von Alfthan, S., Kempf, Y., Vainio, R., Koskinen, H. E. J. & Palmroth, M., 2013, In: Annales Geophysicae. 31, 12, p. 2207-2212 6 p.

Magnetic field and dynamic pressure ULF fluctuations in coronal-mass-ejection-driven sheath regions

Kilpua, E. K. J., Hietala, H., Koskinen, H. E. J., Fontaine, D. & Turc, L., 2013, In: Annales Geophysicae. 31, 9, p. 1559-1567 9 p.

On the relationship between interplanetary coronal mass ejections and magnetic clouds

Kilpua, E. K. J., Isavnin, A., Vourlidas, A., Koskinen, H. E. J. & Rodriguez, L., 2013, In: Annales Geophysicae. 31, 7, p. 1251-1265 15 p.

Space Weather: From Solar Storms to the Technical Challenges of the Space Age

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Supermagnetosonic subsolar magnetosheath jets and their effects: from the solar wind to the ionospheric convection

Hietala, H., Partamies, N., Laitinen, T. V., Clausen, L. B. N., Facsko, G., Vaivads, A., Koskinen, H. E. J., Dandouras, I., Reme, H. & Lucek, E. A., 2012, In: *Annales Geophysicae*. 30, 1, p. 33-48 16 p.

Grad-Shafranov reconstruction of magnetic clouds

Isavnin, A., K. J. Kilpua, E. & E. J. Koskinen, H., 8 Aug 2011, In: *Solar Physics*. 273, 1, p. 205-219 15 p.

Aurinko yllätti jälleen, miksi sen pitäisi meitä kiinnostaa?

Koskinen, H., 2011, In: *Sphinx*. p. 7-10

Grad-Shafranov Reconstruction of Magnetic Clouds: Overview and Improvements

Isavnin, A., Kilpua, E. & Koskinen, H., 2011, In: *Solar Physics*. 273, 1, p. 205-219

In situ observations of particle acceleration in shock-shock interaction

Hietala, H., Agueda, N., Andreeva, K., Vainio, R., Nylund, S., Kilpua, E. & Koskinen, H., 2011, In: *Journal of Geophysical Research*. 116, p. A10105 12 p.

Johdatus plasmafysiikkaan ja sen avaruussovellutuksiin

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Physics of Space Storms: From the Solar Surface to the Earth

Koskinen, H. E. J., 2011, Berlin, Heidelberg: Springer-Verlag. 437 p.

Quantifying energy transfer at the magnetopause

Palmroth, M., Koskinen, H., Pulkkinen, T. I., Anekallu, C. R., Laitinen, T., Lucek, E. A. & Dandouras, I., 2011, *The Dynamic Magnetosphere*. Liu, W. & Fujimoto, M. (eds.). Springer, p. 27-27 (IAGA Special Publication Series; vol. 3).

Suomalaisen tähtitieteen historiasta englanniksi: Arvio julkaisusta Raimo Lehti and Tapio Markkanen, History of Astronomy in Finland

Koskinen, H., 2011, In: *Arkhimedes*. 2011, 2-3, p. 33-34 2 p.

Kannen suunnittelu: Klassinen mekaniikka

Koskinen, H., Vainio, R. (ed.) & Hietala, H., 2010

Klassinen mekaniikka

Koskinen, H. & Vainio, R., 2010, Helsinki: LIMES.

Magnetospheric feedback in solar wind energy transfer

Palmroth, M., Koskinen, H. E. J., Pulkkinen, T. I., Toivanen, P. K., Janhunen, P., Milan, S. E. & Lester, M., 2010, In: *Journal of geophysical research : Space Physics*. 115, 14 p.

Magnetospheric modes and solar wind energy coupling efficiency

Pulkkinen, T. I., Palmroth, M., Koskinen, H. E. J., Laitinen, T. V., Goodrich, C. C., Merkin, V. G. & Lyon, J. G., 2010, In: *Journal of Geophysical Research*. 115, p. A03207 9 p.

Solar Intensity X-ray and particle Spectrometer (SIXS)

Huovelin, J., Vainio, R., Andersson, H., Valtonen, E., Alha, L., Malkki, A., Grande, M., Fraser, G. W., Kato, M., Koskinen, H., Muinonen, K., Naranen, J., Schmidt, W., Syrjasuo, M., Anttila, M., Vihavainen, T., Kiuru, E., Roos, M., Peltonen, J., Lehti, J. & 3 others, Talvioja, M., Portin, P. & Prydderch, M., 2010, In: *Planetary and Space Science*. 58, 1-2, p. 96-107 12 p.

Space Research in Finland: Report to COSPAR 2010

Koskinen, H. (ed.), Merikallio, S. (ed.) & Stigell, P. (ed.), 2010, Helsinki: Tekes. 106 p.

Timing of changes in the solar wind energy input in relation to ionospheric response

Pulkkinen, T. I., Palmroth, M., Pekka, J., Koskinen, H., McComas, D. J. & Smith, C. W., 2010, In: Journal of geophysical research : Space Physics. 115, 115, p. A00I09 9 p.

Venusian bow shock as seen by the ASPERA-4 ion instrument on Venus Express

Whittaker, I., Guymer, G., Grande, M., Pinter, B., Barabash, S., Federov, A., Mazelle, C., Sauvaud, J. A., Lundin, R., Russell, C. T., Futaana, Y., Fraenz, M., Zhang, T. L., Andersson, H., Grigoriev, A., Holmstrom, M., Yamauchi, M., Asamura, K., Baumjohann, W., Lammer, H. & 23 others, Coates, A. J., Kataria, D. O., Linder, D. R., Curtis, C. C., Hsieh, K. C., Koskinen, H. E. J., Kallio, E., Riihela, P., Schmidt, W., Kozyra, J., McKenna-Lawlor, S., Thocaven, J. J., Orsini, S., Cerulli-Irelli, R., Mura, A., Milillo, M., Maggi, M., Roelof, E., Brandt, P., Frahm, R. A., Sharber, J. R., Wurz, P. & Bochsler, P., 2010, In: Journal of geophysical research : Space Physics. 115, p. A09224 13 p.

Avaruussää: Auringon myrskyistä avaruusajan teknologisiin haasteisiin

Koskinen, H., 2009, *Maan ytimeistä avaruuteen: toimittaneet Ilmari Haapala ja Tuija Pulkkinen*. Helsinki: Suomen Tiedeseura, p. 197-209 13 p. (Bidrag till kännedom av Finlands natur och folk).

Supermagnetosonic jets behind a collisionless quasiparallel shock

Hietala, H., Laitinen, T. V., Andreeva, K., Vainio, R., Vaivads, A., Palmroth, M., Pulkkinen, T. I., Koskinen, H. E. J., Lucek, E. A. & Rème, H., 2009, In: Physical Review Letters. 103, 24, p. art. 245001 4 p.

Comparative analysis of Venus and Mars magnetotails

Fedorov, A., Ferrier, C., Koskinen, H. & Bochsler, P., 2008, In: Planetary and Space Science. 56, p. 812-817 6 p.

ENA detection in the dayside of Mars: ASPERA-3 NPD statistical study

Mura, A., Orsini, S., Koskinen, H. & Sharber, J. R., 2008, In: Planetary and Space Science. 56, p. 840-845 6 p.

First observation of energetic neutral atoms in the Venus environment

Galli, A., Wurz, P., Koskinen, H. E. J. & Sharber, J. R., 2008, In: Planetary and Space Science. 56, p. 807-811 5 p.

Ionospheric photoelectrons at Venus: Initial observations by ASPERA-4 ELS

Coates, A. J., Frahm, R. A., Koskinen, H. & Grande, M., 2008, In: Planetary and Space Science. 56, p. 802-806 5 p.

Jos metsään haluat mennä nyt: kirja-arvostelu

Koskinen, H., 2008, In: Arhimedes. 2008, 3, p. 25-25 1 p.

Location of the bow shock and ion composition boundaries at Venus - initial determinations from Venus Express ASPERA-4

Martinez, J., Fränz, A., Woch, J., Krupp, N., Roussos, E., Dubinin, E., Motschmann, U., Barabash, S., Lundin, R., Holmstrom, M., Andersson, H., Yamauchi, M., Grigoriev, A., Futaana, Y., Brinkfeldt, K., Gunell, H., Frahm, R. A., Winningham, J. D., Sharber, J. R., Scherrer, J. & 35 others, Coates, A. J., Linder, D. R., Kataria, D. O., Kallio, E., Sales, T., Schmidt, W., Riihela, P., Koskinen, H. E. J., Kozyra, J. U., Luhmann, J., Russell, C. T., Roelof, E. C., Brandt, P., Curtis, C. C., Hsieh, K. C., Sandell, B. R., Grande, M., Sauvaud, J. A., Fedorov, A., Thocaven, J., Mazelle, C., McKenna-Lawler, S., Orsini, S., Cerulli-Irelli, R., Maggi, M., Mura, A., Milillo, A., Wurz, P., Galli, A., Bochsler, P., Asamura, K., Szego, K., Baumjohann, W., Zhang, T. L. & Lammer, H., 2008, In: Planetary and Space Science. 56, p. 780-784 5 p.

Mars Express and Venus Express multi-point observations of geoeffective solar flare events in December 2006

Futaana, Y., Barabash, S., Koskinen, H. E. J. & Bochsler, P., 2008, In: Planetary and Space Science. 56, p. 873-880 8 p.

Ruoki päätäsi! kirja-arvostelu

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Space Research in Finland: Report to COSPAR 2008

Koskinen, H. (ed.), Merikallio, S. (ed.) & Stigell, P. (ed.), 2008, Tekes. 90 p.

Sputnikista universiumun alkuhetkiin: 50-vuotta avaruuslentoja

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The Venusian induced magnetosphere: a case study of plasma and magnetic field measurements on the Venus Express mission

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Vahdinvaihto: pääkirjoitus

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Differences in geomagnetic storms driven by magnetic clouds and ICME sheath regions

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Ei ole helppo huipulle kavuta: pääkirjoitus

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En muista - en ymmärrä: pääkirjoitus

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Energia ratkaisut - haaste fysiikalle

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Energisation of O⁺ and O²⁺ ions at Mars: An analysis of a 3-d quasi-neutral hybrid model simulation

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Pilviä Vilhonvuorenkadun taivaalla: pääkirjoitus

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