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CURRICULUM VITAE

DECEMBER 17, 2007

NAME

David J. Sundkvist

DATE AND PLACE OF BIRTH

December 15, 1975 in Skellefteå, Sweden

FAMILY

Single

CITIZENSHIP AND MOTHER TONGUE

Swedish

FOREIGN LANGUAGES

Fluent in English, basic French and Spanish.

DEGREES AND QUALIFICATIONS

- *Ph. D.*, GradU, Position of Excellence, Specializing in Space Physics, Uppsala University, Sweden, 2000-2005.
- *M. Sc.*, Master of Science in Physics/Mathematics/Computer Science, specializing in Theoretical Physics and Field Theory, Uppsala University, Sweden, 1994-1999.
- Gymnasium, Mathematics and Natural Sciences, Anderstorp Gymnasium, Skellefteå, Sweden, 1991-1994.
- 9 year compulsory school, Skellefteå, Sweden, 1982-1991.

ACADEMIC POSITIONS

- *Assistant Research Physicist*, Space Sciences Laboratory, University of California at Berkeley, December 2007 - present.
- *Postdoctoral researcher*, Space Sciences Laboratory, University of California at Berkeley, April 2006 - November 2007.
- *Researcher*, Swedish Institute of Space Physics (IRF), February 2006 - March 2006.
- *Computer programmer*, Cassini database interface, Swedish Institute of Space Physics (IRF), November 2005 - February 2006.
- *Guest Resercher*, Laboratoire de Physique et Chimie de l'Environnement, CNRS, Orléans, France, (on leave from Swedish Institute of Space Physics, Uppsala, Sweden), February 2004 - March 2005.

- *Graduate School, GradU - Position of Excellence, Uppsala University, affiliated with Swedish Institute of Space Physics (IRF), Uppsala, 2000-2005.*

AWARDS

- Outstanding Student Paper Award, American Geophysical Union Fall Meeting (2005).
- Outstanding contribution to Clusters exploration of geospace, ESA (2005).
- Grad-U Ph. D. Position of excellence. Uppsala University (2000).

TEACHING

- Electromagnetic Field Theory (third year course within M. Sc. Physics curriculum), Uppsala University, 2001, 2002 and 2003.
- Plasma physics and Advanced Plasma Physics, (teaching assistant, lectures), University of California at Berkeley (2007).

SUPERVISING EXPERIENCE

Formulating project and supervising progress of Master of Science thesis student.

BOARD MEMBERSHIPS

Board member of Faculty Board of Department of Astronomy and Space Physics, Uppsala University, 2003.

COMPUTER LITERACY

Systems UNIX/Linux, MS Windows

Programs Matlab, Mathematica, Maple, OpenOffice, \LaTeX

Languages Matlab, C/C++, Java, Pascal, Assembler, HTML, PHP

FIELD OF WORK, AREAS OF INTEREST AND CURRENT PROJECTS

Space plasma physics: Wave-particle interaction, nonlinear waves and structure formation, plasma turbulence, magnetic reconnection, wave mode identification techniques, energy transport.

Theoretical physics: Mathematical physics, group theory in field theories, solitons

Electronics: Assembler programming of microcontroller for multipoint sensors.

Programming: Dynamic web (php) interface for access and plotting of satellite data.

REFEREED PUBLICATIONS

—2007—

1. **Sundkvist D.**, Retinò A., Vaivads A., Bale S.D., Dissipation in turbulent plasma due to reconnection in thin current sheets, *Phys. Rev. Lett.* 99, 025004 (2007), doi:10.1103/PhysRevLett.99.025004.
2. Retinò A., **Sundkvist D.**, Vaivads A., Mozer F., André M. and C.J. Owen, In-situ evidence of magnetic reconnection in turbulent plasma, *Nature Physics*, Vol 3, 236-238 (2007), doi:10.1038/nphys574.
3. Yordanova, E., **D. Sundkvist**, S. C. Buchert, M. André, Y. Ogawa, M. Morooka, O. Margithu, O. Amm, A. N. Fazakerley, and H. Réme (2007), Energy input from the exterior cusp into the ionosphere: Correlated ground-based and satellite observations, *Geophys. Res. Lett.*, 34, L04102, doi:10.1029/2006GL028617.

4. **Sundkvist, D.**, A. Vaivads, Y. V. Bogdanova, V. V. Krasnoselskikh, A. Fazakerley, and P. M. E. Décréau (2006), Shell-instability generated waves by low energy electrons on converging magnetic field lines, *Geophys. Res. Lett.*, 33, L03103, doi:10.1029/2005GL024388.
5. **Sundkvist D.**, Covariant Irreducible Parametrization of Electromagnetic Fields in Arbitrary Spacetime, *J. Math. Phys.* 47, 012901 (2006). doi:10.1063/1.2162107.
6. Pickett, J. S., L.-J. Chen, D. A. Gurnett, J. M. Swanner, O. Santolik, P. M. E. Decreau, C. Béghin, **D. Sundkvist**, B. Lefebvre, M. L. Goldstein, B. Lavraud, E. Lucek, R. Kessel, G. S. Lakhina, S. V. Singh, R. V. Reddy, B. T. Tsurutani, H. Reme, and A. Fazakerley, Shedding New Light on Solitary Waves Observed in Space, Proceedings of the Cluster and Double Star Symposium–5th Anniversary of Cluster in Space, Karen Fletcher, Editor, ESA Publications Division, Noordwijk, The Netherlands, SP-598, January 2006.

7. **Sundkvist D.**, V. Krasnoselskikh, P. K. Shukla, A. Vaivads, M. André, S. Buchert and H. Rème, *In situ* multi-satellite detection of coherent vortices as a manifestation of Alfvénic turbulence, *Nature*, **436**, 825-828, (2005), *Nature*, **437**, 290, (2005).
8. **Sundkvist D.**, A. Vaivads, M. André, J.-E. Wahlund, Y. Hobara, S. Joko, V.V. Krasnoselskikh, Y. V. Bogdanova, S. C. Buchert, N. Cornilleau-Wehrin, A. Fazakerley, J.-O. Hall, H. Reme, G. Stenberg, Multi-spacecraft determination of wave characteristics near the proton gyrofrequency in high-altitude cusp, *Annales Geophysicae*, 23, 983, 2005.
9. Béghin C., P. M. E., Décréau, J. Pickett, **D. Sundkvist**, and B. Lefebvre, Modeling of CLUSTER’s electric antennas in space: application to plasma diagnostics, *Radio Science*, Vol. 40, RS6008, (2005), doi:10.1029/2005RS003264
10. Wahlund, J.-E. , Yilmaz, A., Backrud, M., **Sundkvist, D.**, Vaivads, A., Winningham, D., André, M., Balogh, A., Bonnell, S., Buchert, S., Carozzi, T., Cornilleau, N., Dunlop, M., Eriksson, A.I., Fazakerley, A., Gustafsson, G., Parrot, M., Robert, P., and Tjulin, A., Observations of Auroral Broadband Emissions by CLUSTER, *Geophys. Res. Lett.*, 30(11), 17-1, doi:10.1029/2002GL016335, 2003.
11. André, M., Behlke, R., Wahlund, J.E., Vaivads, A., Eriksson, A., Tjulin, A., Carozzi, T.D., Cully, C., Gustafsson, G., **Sundkvist, D.**, Khotyaintsev, Y., Cornilleau-Wehrin, N., Rezeau, L., Maksimovic, M., Lucek, E., Balogh, A., Dunlop, M. and Lindqvist, P.-A., Multi-spacecraft observations of broadband waves near the lower hybrid frequency at the Earthward edge of the magnetopause. *Annales Geophysicae* (2001) Vol. 19, No. 6, pp 1471-1481.

THESES, BOOKS, REPORTS

- **Sundkvist D.**, Space Plasma Dynamics: Instabilities, Coherent Vortices and Covariant Parametrization, *Ph.D. Thesis*, Uppsala University (2005).
- Belkhe R., **D. Sundkvist**, A. Tjulin, Langmuir Probes, Contributed chapter in *Sensors and Instruments for Space Exploration*, 2.ed, Solveig H. Høymark (editor), Kiruna (2000).
- **Sundkvist D.**, Collective Motion in Interacting Particle Systems - Solitons in Many Body Field Theories, *M. Sc Thesis*, Uppsala University (2000).

PRESS RELEASES (SELECTED)

In English:

- Nature, 10 August 2005, Magnetospheric physics: Turbulence on a small scale.
- Nature Physics, 10 August 2005, New twist on turbulence.
- ESA, 10 August 2005, From “macro” to “micro” - turbulence seen by Cluster.
- IRF, 10 August 2005, Researchers at IRF in Uppsala discover whirlpools in space
- ESA, 27 March 2007, Magnetic fields get reconnected in turbulent plasma too, Cluster reveals.

In Swedish:

- IRF, 23 November 2005, Nya rön visar att stora virvlar finns i rymdplasmat runt jorden
- Uppsala Universitet, 23 November 2005, Nya rön visar att stora virvlar finns i rymdplasmat runt jorden
- Uppsala Universitet, 11 August 2005, Uppsalaforskare upptäcker virvlar i rymden
- IRF, 10 August 2005, Forskare vid IRF i Uppsala upptäcker virvlar i rymden
- IRF, 27 Mars 2007, Fyra rymdfarkoster upptäcker magnetiska explosioner i turbulent plasma

PUBLIC OUTREACH (SELECTED)

- Several radio interviews (*Deutschlandfunk, Vetandets värld, Svenska vetenskapsradion*)
- Popular articles and stories (*ESA web science story, Physics web, Nature News and views, Nature physics, CNRS bulletin, Forskning och Framsteg*)
- Newspaper coverage (*Die Zeit, Wissenschaft, ESA svensk artikel, TT, DN, UNT, NV, NSD*)

INVITED TALKS

1. **Sundkvist, D.**, Microphysics at the dissipation range: Observations of nonlinear structures and coherent dissipation by reconnection, *The Sixth International Workshop on Nonlinear Waves and Turbulence in Space Plasmas*, Fukuoka, Japan (2006).
2. **Sundkvist, D.**, Detection of drift-kinetic vortices as a manifestation of Alfvénic turbulence, *Autumn college on plasma physics*, ICTP, Trieste, Italy, 22 Sep. (2005).
3. Shukla, P. K., Krasnoselskikh, V., **Sundkvist, D.**, Dispersive Alfvén wave vortices and structures in space plasmas, XXVIIIth General Assembly on International Union of Radio Science (URSI), H04 session, New Delhi, India, 23-29 October (2005).