

## Yasuhito Narita

Last name, first name            Narita, Yasuhito  
Academic title                    Privatdozent Dr. rer. nat.

Group Leader  
Theoretical Space Plasma Physics  
Space Research Institute / Austrian Academy of Sciences  
Schmiedlstraße 6, A-8042 Graz, Austria  
Phone +43 316 4120 574    Fax +43 316 4120 490  
Email: yasuhito.narita@oeaw.ac.at

### Academic track

- 2011    Habilitation (extraterrestrial physics) at Technische Universität Braunschweig, Germany  
          Supervisor: Prof. Karl-Heinz Glassmeier
- 2010    Awards (COSPAR Zeldovich medal and ESA Outstanding Scientist Award)
- 2006    PhD in physics (with distinction) at Technische Universität Braunschweig, Germany  
          Supervisor: Prof. Karl-Heinz Glassmeier  
          (Heinrich-Büssing prize awarded to the thesis)
- 2002    Master in Earth and planetary science at University of Tokyo, Japan  
          Supervisor: Prof. Toshifumi Mukai
- 2000    Thesis work at Swedish Institute of Space Physics, Kiruna, Sweden  
          Supervisor: Prof. Ingrid Sandahl
- 2000    Bachelor in physics, Tokyo Metropolitan University, Japan  
          Supervisor: Prof. Satoru Saito

### Professional career

- 2012-        Group leader, Space Research Institute, Austrian Academy of Sciences, Graz, Austria
- 2011-        Faculty member, Physics, Technische Universität Braunschweig, Germany
- 2011-2012    Senior scientist Institut für Geophysik und extraterrestrische Physik, Germany
- 2011        Researcher at Kavli Institute for Theoretical Physics, Santa Barbara, California
- 2002-2011    Scientific staff at Institut für Geophysik und extraterrestrische Physik, Germany
- 2000-2002    Research assistant, Institute of Space and Astronautical Science, Japan
- 1999-2000    Research assistant, Swedish Institute of Space Physics, Kiruna, Sweden

### Teaching experience

more than 15 full lectures, exercise courses, and intensive courses on the undergraduate and graduate levels at TU Braunschweig and International Max-Planck Research School

### Publications

56 publications total  
43 regular articles, 2 monographs, 1 review article, 3 proceeding papers (all peer-reviewed)  
24 refereed papers as the first author, H index 13

### Contribution to science community

Editorial board member, Frontiers in Physics (2013-)

## Lecture list

- 2006 Introduction to plasma physics, full semester, TU Braunschweig
- 2007 Astrophysical turbulence, full semester, TU Braunschweig
- 2008 Planetary magnetospheres, full semester, TU Braunschweig
- 2008 Plasma astrophysics, full semester, TU Braunschweig
- 2008 Solar physics, exercise course at Solar System School IMPRS
- 2009 Solar physics, full semester, TU Braunschweig
- 2009 Sun-planet connections, intensive course at Solar System School IMPRS
- 2010 General relativity, exercise course, TU Braunschweig
- 2010 Modern physics (planet Mercury), intensive course, TU Braunschweig
- 2011 Astro-particle physics, full semester, TU Braunschweig
- 2011 Modern physics (planetary magnetospheres), intensive course, TU Braunschweig
- 2012 Mathematical methods in physics, full semester, TU Braunschweig
- 2012 Modern physics (neutrino astrophysics), intensive course, TU Braunschweig
- 2013 Astro-particle physics, intensive course, TU Braunschweig
- 2013 Sun-planet connections revisited, intensive course at Solar System School IMPRS
- 2013 Particle cosmology, intensive course, TU Braunschweig

## Grants

- Multi-scale simulation of plasma turbulence in the heliosphere and beyond, JuRoPa x86 Nehalem, NIC6628, HNO-00 Jülich Supercomputing Centre, 0.85 Mio. CPU-hours (equivalent to 41440 EUR), 2013-2014
- DFG CRC963 Astrophysical Flows, Instabilities and Turbulence (co-proposer), 2012-2015, Collaborative Research Center at German Science Foundation, 2012-2015, funding 1.6 Mio. EUR per year
- FP7-SPACE 2012-1 Collaborative 313038 STORM (co-proposer), 2013-2015, Solar system plasma turbulence: observations, intermittency, and multifractals, funding 2.0 Mio EUR total
- RO12/2014, ULF-MAG (Ultra-Low-Frequency waves in the Earth magnetosphere), bilateral project Austria-Romania, funding ca. 14000 EUR total, 2014-2015

## Publication list

### Textbook / Monograph

- Narita, Y.: Plasma Turbulence in the Solar System, SpringerBriefs in Physics, Springer-Verlag, Heidelberg, 2012.
- Narita, Y.: Multi-Point Measurements of Turbulence in Space Plasma, uni-edition, Berlin, 2011.

### Regular articles (peer-reviewed)

- Narita, Y., Four-dimensional energy spectrum for space-time structure of plasma turbulence, *Nonlin. Processes Geophys.*, 21, 41-47, doi:10.5194/npg-21-41-2014, 2014
- Perschke, C., Narita, Y., Gary, S. P., Motschmann, U., and Glassmeier, K.-H., Dispersion relation analysis of turbulent magnetic field fluctuations in fast solar wind, *Ann. Geophys.*, 31, 1949-1955, doi:10.5194/angeo-31-1949-2013, 2013
- Narita, Y., Nakamura, R., and Baumjohann, B.: Cluster as current sheet surveyor, *Ann. Geophys.*, 31, 1605-1610, doi:10.5194/angeo-31-1605-2013, 2013
- Comişel, H., Verscharen, D., Narita, Y., and Motschmann, U.: Spectral evolution of two-dimensional kinetic plasma turbulence in the wavenumber-frequency domain, *Phys. Plasmas*, 20, 090701, doi:10.1063/1.4820936, 2013
- Narita, Y., Glassmeier, K.-H., Motschmann, U., and Wilczek, M.: Doppler shift and broadening in solar wind turbulence, *Earth Planets Space*, 65, e5-e8, doi: 10.5047/eps.2012.12.002, 2013.
- Wilczek, M., and Narita, Y.: Wave-number frequency spectrum for turbulence from a random sweeping hypothesis with mean flow, *Phys. Rev. E*, 86, 066308, doi:10.1103/PhysRevE.86.066308, 2012
- Guicking, L., Glassmeier, K.-H., Auster, H.-U., Narita, Y., and Kleindienst, G.: Low-frequency magnetic field fluctuations in Earth's plasma environment observed by THEMIS, *Ann. Geophys.*, 30, 1271-1283, 2012.
- Vaivads, A., Andersson, G., Bale, S. D., Cully, C. M., de Keyser, J., Fujimoto, M. Grahm, S., Haaland, S., Ji, H., Khotyaintsev, Yu. V., Lazarian, A., Lavraud, B., Mann, I. R., Nakamura, R., Nakamura, T. K. M., Narita, Y., Retino, A., Sahraoui, F., Schekochihin, A., Schwartz, S. J., Shinohara, I., and Sorriso-Valvo, L. EIDOSCOPE: particle acceleration at plasma boundaries, *Experimental Astron.*, 33, 491-527, 2012.
- Narita, Y., Glassmeier, K.-H., Goldstein, M. L., Motschmann, U., and Sahraoui, F.: Three dimensional spatial structures of solar wind turbulence from 10 000-km to 100-km scales, *Ann. Geophys.*, 29, 1731-1738, 2011.
- Narita, Y., Glassmeier, K.-H., and Motschmann, U.: High-resolution wave number spectrum using multi-point measurements in space – The Multi-point Signal Resonator (MSR) technique, *Ann. Geophys.*, 29, 351-360, 2011.
- Narita, Y., Gary, S. P., Saito, S., Glassmeier, K.-H., and Motschmann, Dispersion relation analysis of solar wind turbulence, *Geophys. Res. Lett.*, 38, L05101, doi:10.1029/2010GL046588, 2011.
- Tsurutani, B. T., Lakhina, G. S., Verkhoglyadova, O. P., Echer, E., Guarnieri, F. L., Narita, Y., and Glassmeier, K.-H., Interplanetary Magnetic Decreases (MDs) and Magnetosheath Mirror Mode Structures: Differences and Distinguishing Features, *J. Geophys. Res.*, 116, A02103, doi:10.1029/2010JA015913, 2011.

- Narita, Y., Glassmeier, K.-H., Sahraoui, F., and Goldstein, M. L.: Wave-vector dependence of magnetic-turbulence spectra in the solar wind, *Phys. Rev. Lett.*, 104, 171101, 2010.
- Narita, Y., and Gary, S. P., Inertial-range spectrum of whistler turbulence, *Ann. Geophys.*, 28, 597-601, 2010.
- Narita, Y., and Glassmeier, K.-H.: Anisotropy evolution of magnetic field fluctuation through the bow shock, *Earth, Planets Space*, 62, e1-e4, 2010.
- Narita, Y., Sahraoui, F., Goldstein, M. L., and Glassmeier, K.-H.: Magnetic energy distribution in the four-dimensional frequency and wave vector domain in the solar wind, *J. Geophys. Res.*, 115, A04101, doi:10.1029/2009JA014742, 2010.
- Guicking, L., Glassmeier, K.-H., Auster, H.-U., Delva, M., Motschmann, U., Narita, Y., and Zhang, T. L.: Low-frequency magnetic field fluctuations in Venus' solar wind interaction region: Venus Express observations, *Ann. Geophys.*, 28, 951-967, 2010.
- Gary, S. P., Saito, S., and Narita, Y.: Whistler turbulence wavevector anisotropies: Particle-in-Cell simulations, *Astrophysical J.*, 716, 1332-1335, 2010.
- Glassmeier, K.-H., Auster, H.-U., Heyner, D., Okrafka, K., Carr. C., Berghofer, G., Anderson, B. J., Balogh, A., Baumjohann, W., Cargill, P., Christensen, U., Delva, M., Dougherty, Fornaçon, K.-H., Horbury, T. S., Lucek, E. A., Magnes, W., Manda, M., Matsuoka, A., Matsushima, M., Motschmann, U., Nakamura, R., Narita, Y., O'Brien, H., Richter, I., Schwingenschuh, K., Shibuya, H., Slavin, J. A., Sotin, C., Stoll, B., Tsunakawa, H., Vennerstrom, S., Vogt, J., and Zhang, T.: The fluxgate magnetometer of the BepiColombo mercury planetary orbiter, *Planet. Space Sci.*, 58, 287-299, doi:10.1016/j.pss.2008.06.018, 2010.
- Milillo, A., Fujimoto, M., Kallio, E., Kameda, S., Leblanc, F., Narita, Y., Cremonese, G., Laakso, H., Laurenza, M., Massetti, S., McKenna-Lawlor, S., Mura, A., Nakamura, R., Omura, Y., Rothery, D. A., Seki, K., Storini, M., Wurz, P., Baumjohann, W., Bunce, E., Kasaba, Y., Helbert, J., Sprague, A., and Hermean Environment WG: The BepiColombo mission: An outstanding tool for investigating the Hermean environment, *Planet. Space Sci.*, 58, 40-60, doi:10.1016/j.pss.2008.06.005, 2010.
- Saito, S., Gary, S. P., and Y. Narita: Magnetic spectrum of whistler turbulence: PIC simulation, *Phys. Plasmas*, 17, 122316, 2010.
- Zhang, Y., Shen, C., Liu Z., and Narita, Y.: Magnetic helicity of a flux rope in the magnetotail: THEMIS results, *Ann. Geophys.*, 28, 1687-1693, 2010.
- Narita, Y., Kleindienst, G., and Glassmeier, K.-H.: Evaluation of magnetic helicity density in the wave number domain using multi-point measurements in space, *Ann. Geophys.*, 27, 3967, 2009.
- Narita, Y., and Glassmeier, K.-H.: Spatial aliasing and distortion of energy distribution in the wave vector domain under multi-spacecraft measurements, *Ann. Geophys.*, 27, 3031-3042, 2009.
- Constantinescu, O. D. , Glassmeier, K.-H., Plaschke, F., Auster, U., Angelopoulos, V., Baumjohann, W., Fornaçon, K.-H., Georgescu, E., Magnes, W., McFadden, J. P., Nakamura, R., and Narita, Y.: THEMIS observations of dusk side compressional Pc 5 waves, *J. Geophys. Res.*, 114, A00C25, doi:10.1029/2008JA013519, 2009.
- Narita, Y., Glassmeier, K.-H., Décréau, P. M. E., Hada, T., Motschmann, U., and Nariyuki, Y.: Evaluation of bispectrum in the wave number domain based on multi-point measurements, *Ann. Geophys.*, 26, 3389-3393, 2008.

- Auster, H. U., Glassmeier, K.-H., Magnes, W., Aydogar, O., Baumjohann, W., Constantinescu, D., Fischer, D., Fornaçon, K.-H., Georgescu, E., Harvey, P., Hillenmaier, O., Kroth, R., Ludlam, M., Narita, Y., Nakamura, R., Okrafka, K., Plaschke, F., Richter, I., Schwarzl, H., Stoll, B., Valavanoglou, A., and Wiedemann, M.: The THEMIS Fluxgate Magnetometer, *Space Sci. Rev.*, 141, 235-264, doi:10.1007/s11214-008-9365-9, 2008.
- Broughton, M. C., Engebretson, M. J., Glassmeier, K.-H., Narita, Y., Keiling, A., Fornaçon, K.-H., Parks, G. K., and Rème, H.: Ultra-low frequency waves and associated wave vectors observed in the plasma sheet boundary layer by Cluster, *J. Geophys. Res.*, 113, A12217, doi:10.1029/2008JA013366, 2008.
- Glassmeier, K.-H., Auster, H.-U., Constantinescu, D., Fornaçon, K.-H., Narita, Y., Plaschke, F., Angelopoulos, V., Georgescu, E., Baumjohann, W., Magnes, W., Nakamura, R., Carlson, C., Frey, S., McFadden, J. P., Phan, T., Mann, I., Rae, I. J., and Vogt, J.: Magnetospheric quasi-static response to the dynamic magnetosheath: A THEMIS case study, *Geophys. Res. Lett.*, 35, L17S01, 2008.
- Saito, S., Gary, S. P., Li, H., and Narita, Y.: Whistler turbulence: Particle-in-cell simulations, *Phys. Plasmas*, 15, 102305, 2008.
- Vogt, J., Narita, Y., and Constantinescu, D.: The wave surveyor technique for fast plasma wave detection in multi-spacecraft data, *Ann. Geophys.*, 26, 1699-1710, 2008.
- Narita, Y., Glassmeier, K.-H., Fränz, M., Nariyuki, Y., and Hada, T.: Observations of linear and nonlinear processes in the foreshock wave evolution, *Nonlin. Processes Geophys.*, 14, 361-371, 2007.
- Glassmeier, K.-H., Grosser, J., Auster, U., Constantinescu, D., Narita, Y., and Stellmach, S.: Electromagnetic Induction Effects and Dynamo Action in the Hermean System, *Space Sci. Rev.*, 132, 511-527, 2007.
- Narita, Y., Glassmeier, K.-H., and Treumann, R. A.: Wave-number spectra and intermittency in the terrestrial foreshock region, *Phys. Rev. Lett.*, 97, 191101, 2006 (highlighted in *Physics News Updates*, Nov. 2006)
- Narita, Y., and Glassmeier, K.-H.: Propagation pattern of low frequency waves in the terrestrial magnetosheath, *Ann. Geophys.*, 24, 2441-2444, 2006.
- Narita, Y., Glassmeier, K.-H., Fornaçon, K.-H., Richter, I., Schäfer, S., Motschmann, U., Dandouras, I., Rème, H., and Georgescu, E.: Low frequency wave characteristics in the upstream and downstream regime of the terrestrial bow shock, *J. Geophys. Res.*, 111, A01203, doi:10.1029/2005JA011231, 2006.
- Narita, Y., and Glassmeier, K.-H.: Dispersion analysis of low-frequency waves through the terrestrial bow shock, *J. Geophys. Res.*, 110, A12215, doi:10.1029/2005JA011256, 2005.
- Eastwood, J. P., Lucek, E. A., Mazelle, C., Meziane, K., Narita, Y., Pickett, J., and Treumann, R. A.: The foreshock, *Space Sci. Rev.*, 118, 41-94, doi:10.1007/s11214-005-3824-3, 2005.
- Gurgiolo, C., Goldstein, M. L., Narita, Y., Glassmeier, K.-H., and Fazakerley, A. N.: A phase locking mechanism for non-gyrotropic electron distributions upstream of the Earth's bow shock, *J. Geophys. Res.*, 110, A06206, doi:10.1029/2005JA011010, 2005.
- Schäfer, S., Glassmeier, K.-H., Narita, Y., Fornaçon, K.-H., Dandouras, I., and Fränz, M.: Statistical phase propagation and dispersion analysis of low frequency waves in the magnetosheath, *Ann. Geophys.*, 23, 3339-3349, 2005.
- Narita, Y., Glassmeier, K.-H., Schäfer, S., Motschmann, U., Fränz, M., Dandouras, I., Fornaçon, K.-

H., Georgescu, E., Korth, A., Rème, H., and Richter, I.: Alfvén waves in the foreshock propagating upstream in the plasma rest frame: statistics from Cluster observations, *Ann. Geophys.*, 22, 2315-2323, 2004.

- Narita, Y., Glassmeier, K.-H., Schäfer, S., Motschmann, U., Sauer, K., Dandouras, I., Fornaçon, K.-H., Georgescu, E., and Rème, H.: Dispersion analysis of ULF waves in the foreshock using cluster data and the wave telescope technique, *Geophys. Res. Lett.*, 30, SSC 43-1, CiteID 1710, doi:10.1029/2003GL017432, 2003.
- Høymork, S. H., Yamauchi, M., Ebihara, Y., Narita, Y., Norberg, O., and Winningham, D.: Dense ion clouds of 0.1 - 2 keV ions inside the CPS-region observed by Astrid-2, *Ann. Geophys.*, 19, 621-631, 2001.

#### **Review articles (peer-reviewed)**

- Narita, Y., Glassmeier, K.-H., and Motschmann, U.: Wave vector analysis methods using multi-point measurements, *Nonlin. Processes Geophys.*, 17, 383-394, 2010.

#### **Proceeding (peer-reviewed)**

- Narita, Y.: Foreshock turbulence, in *Advances in Geosciences*, 21, pp. 119-128, M. Duldig, W.-H. Ip (eds.), World Scientific Publishing, Singapore, 2010.
- Narita, Y., Glassmeier, K.-H., Gary, S. P., Goldstein, M. L. und Treumann, R. A.: Wave number spectra in the solar wind, the foreshock, and the magnetosheath, *The Cluster Active Archive, Astrophysics and Space Science Proceedings*, pp. 363, H. Laakso, M. G. T. T. Taylor, and C. P. Escoubet (eds.), Springer Verlag, 2010.
- Narita, Y., Glassmeier, K.-H., Goldstein, M. L., and Treumann, R. A.: Cluster observations of shock-turbulence interactions, *Turbulence and Nonlinear Processes in Astrophysical Plasmas*, D. Shaikh and G. P. Zank (eds.), pp. 215-220, American Institute of Physics, 2007.

#### **Proceeding (non-reviewed)**

- Narita, Y., and Glassmeier, K.-H.: Low-frequency waves in the bow shock environment, *Proc. the Cluster and Double Star Symposium - 5th Anniversary of Cluster in Space*, K. Fletcher (ed.), SP-598, ESA Publications Division, The Netherlands, 2006.

#### **Lecture scripts**

- Narita, Y., Introduction to astro-particle physics, Technische Universität Braunschweig, 2013
- Motschmann, U., Kriegel, H., and Narita, Y.: Rechenmethoden der Physik, Institut für Theoretische Physik, Technische Universität Braunschweig, 2013
- Motschmann, U., Simon, S., Narita, Y., and Kriegel, H.: Allgemeine Relativitätstheorie, Institut für Theoretische Physik, Technische Universität Braunschweig, 2013

#### **Others**

- Narita, Y.: Low-frequency waves upstream and downstream of the terrestrial bow shock, PhD thesis abstract, *Planet. Space Sci.*, 55, 243-244, 2007.
- Narita, Y.: Low-frequency waves upstream and downstream of the terrestrial bow shock, PhD thesis, TU Braunschweig, Copernicus, 2006.
- Narita, Y., Glassmeier, K.-H., and Donovan, E., Addressing the question, what is a substorm?, EOS

94, 90, 2013.