

Curriculum Vitae, Professor Hans Thybo

Personal Details:

Addresses: Eurasia Institute of Earth Sciences, Istanbul Technical University,
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Degrees: PhD in Geology 1987, Aarhus University (AU), Denmark.
M.Sc. in Geophysics 1982 and B.Sc. in Mathematics and Physics 1979 AU

Employment:

1981: *Visiting scholar*, Technische Hogeschool Delft, The Netherlands.
1982-86: *PhD. student*, Geological Institute, University of Aarhus
1986-2001: *Ass. Professor* of Geophysics, Geological Institute, University of Copenhagen
1994: *Visiting Professor* at Stanford University, California.
2001-2017: *Professor* of Geophysics, Geological Institute, University of Copenhagen
2004 -2009: *Institute Chair*, Geological Institute; *Deputy Chair* (2001-2004)
2016-2021 *Professor*, Centre for Earth Evolution and Dynamics, Univ. of Oslo
2017-: *Professor*, Eurasia Institute of Earth Sciences, Istanbul Technical University
2019- : *Honorary Professor*, China University of Geosciences, Wuhan

Honours:

1998: *Elected member* of Royal Danish Academy of Sciences and Letters
2003-2010: *Presidium member* of Royal Danish Academy of Sciences and Letters
2004: *Elected Fellow* of Royal Astronomical Society, London
2004: *Elected member* of Academia Europaea (European Academy of Sciences)
2004-2008: *External council member*, Science Faculty, University of Oslo
2006-2017: *Danish representative* to ICSU (International Committee of Scientific Unions)
2010: *Elected member* of Norwegian Academy of Sciences and Letters
2011-2017: *Vicepresident* of Royal Danish Academy of Sciences and Letters
2012: *Elected member* of Danish Academy of Natural Sciences
2013-2017: *Overseas Expert* for Chinese Academy of Sciences (CAS)
2014-: *Board Member* of Danish Academy of Natural Sciences
2014: *Elected Fellow* of Geological Society of America
2014-2016: *President*, European Geosciences Union, *Vicepresident* 2013 & 2017
2016-: *Honorary Editor* of Tectonophysics
2017-: *President* International Lithosphere Program (ILP), *President-elect* 2015-17
2018: *1000 Talents' Award*, China

Selected International and National Posts:

2002: *Founding member*, European Geosciences Union (EGU)
2002-2007: *President* (seismology) for the EGU (1999-2002 for EGS)
2004-2008: *Executive board*, science committee, Int. Geological Congress 2008
2007-2012: *General Secretary* of European Geosciences Union.
2010-2016: *Council member* of European Plate Observatory System (EPOS)
2010-: *Board member* of International Lithosphere programme (ILP)
2013-: *Panel member*, Albert Einstein Award from World Cultural Council (post Nobel Laureate)
2017-: *Chair*, Inge Lehmann Foundation
2018-20: *Chair*, Panel on Stimulus of Human resources, FCT Portugal
2018-19: *Chair*, Panel on Evaluation of Centres of Excellence, FCT Portugal
2019-: *Scientific advisory committee* for DDE (Deep Digital Earth) of IUGS
2019-: *Member of Committee for Freedom and Responsibility in Science* for Int. Science Council
2020-2021: *Chair*, Panel for Earth Sciences and Engineering, FCT Portugal

Panel member: ERC Starting Grants; GeoPRISMS, NSF (USA); International Continental Drilling Programme (ICDP); VR Sweden; FCT Portugal; FNU Denmark; Geoscience evaluation, Netherlands; Integrated Solid Earth Science, Netherlands; Russian Science Foundation; Institut Universitaire Francaise;

Department assessments, Croatia; SINOPROBE, China.

PI projects:

PI, co- and initiator on ca. 60 international scientific geophysical-tectonic projects, mainly involving seismology, since 1989 on four continents, including most of Europe, Greenland, Siberia, Africa, and North America. Expedition leader to Siberia, East Africa and the ice sheet in Greenland. Leader of acquisition of a comprehensive database of potential fields in Europe in the early 1990'ies post Wall Europe.

Invited Lectures:

Invited lectures at institutions: Aarhus, Ankara, Beijing (CAS, CGAS, SinoProbe), Barcelona, Berkeley, Berlin, Caltech, Chengdu, Dahlian, El Paso, GEOMAR, The Hague, Houston, Istanbul, Karlsruhe, Kiel, Kiev, Laramie WY, Leeds, London, Moscow, Nanjing, Nice, Novosibirsk, Oslo, Ottawa, Potsdam, Princeton, Santa Fe, St. Peterburg, Stanford, Strasbourg, Tokyo, Trabzon, UCLA, Uppsala, Utrecht, Vienna, Warsaw, Wuhan and Yale. About 70 invited talks at meetings of the EGU, EGS, EUG, AGU, IGC, Deep Seismix, EGT, Europrobe, and TopoEurope Symposia.

Editorial activities:

Guest editor of 10 special issues of scientific journals and one book since 1996.

1999-2006: *Editorial board*, Journal of Applied Geophysics
2000-2016: *Editor in Chief*, Tectonophysics; *Honorary Editor* since 2016
2003-2017: *Editorial board*, Geophysical Surveys, geophysical Journal, eEARTH
2009-2016: *Associate Editor*, Solid Earth, since 2017 *Advisory board*, Solid Earth
2019-: *Associate Editor*, Mediterranean Geoscience Reviews
2020-: *Editor in Chief*, Earth and Planetary Science Letters (EPSL)

Outreach:

My research has been described in more than 50 articles in Danish newspapers, in four TV programmes, three radio programmes as well as a series of TV and radio news with interviews.

Teaching and supervision:

Supervisor for 22 Assistant Professors and postdocs, 38 PhD. students, 80 M.Sc. theses and 49 B.Sc. theses. Teaching since 1983 in all aspects of geophysics and science philosophy at undergraduate and graduate level; co-director of the Copenhagen Elite PhD School of Geophysics with annual courses taught by internationally distinguished lecturers, attracting students from the whole world.

Research:

Broadly oriented research in seismology, other geophysics and tectonics. Significant contributions to understanding the evolution and structure of the lithosphere by integrated geophysical-tectonic interpretation. Development of seismic methodology to e.g. imaging fine scale heterogeneity in the crust and mantle and the core-mantle boundary. Main results include:

- Detection of Proterozoic collision (Plate tectonics) from seismic reflection data, 1990 & 1997;
- Discovery of the Mid-Lithospheric Discontinuity, 1997;
- Explanation of the “teleseismic Pn wave” in terms of whispering gallery waves, 1999
- Reflection seismic image of the Core-Mantle Boundary, 2002
- Proposal of a new model for basin formation based on magmatic intrusion, 2008
- Discovery of Magma-Compensated Crustal Thinning in continental rift zones, 2009
- Discovery of strong crustal anisotropy in cratons, 2019
- Discovery of West Antarctica as a back-arc system, not continental lithosphere, 2020
- Discovery of new type of crust without a mafic lower layer in Tibet, 2021

Selected biography for Hans Thybo:

244 scientific articles (49 as first author) with review, 80 other publications, 10 special issues of scientific journals and ca. 650 abstracts. Editor-in-Chief for ca.180 volumes of *Tectonophysics*.

Google Scholar: 11,655 citations to 512 pub., H=64, i10-index=184, a=H/#active years= 1.9

WoS: 8,361 citations to 212 pub. (39.44 cit./pub.), H=55, a= 1.65, ORCID: 0000-0002-39642-8065

Stars mark key papers related to main discoveries and results

- * BABEL Working Group (S.Klemperer, ... [H. Thybo](#) et al.), 1990. Evidence for early Proterozoic plate tectonics from seismic reflection profiles in the Baltic Shield. *Nature*, 348, 34-38.
- KRISP Working Party (C. Prodehl, J. Mechie, M.A.Khan, P. Maguire, [H. Thybo](#) et al.), 1991. Large scale variation in lithospheric structure along and across the Kenya Rift. *Nature*, 354, 223-227.
- * BABEL Working Group ([H. Thybo](#) et al.), 1993. Deep seismic reflection / refraction interpretation of crustal structure along BABEL profiles A and B in the southern Baltic Sea. *Geophys. J. Int.* 112, 325-343.
- * Abramovitz, T., [Thybo, H.](#), Berthelsen, A., 1997. Proterozoic sutures and terranes in the southeastern Baltic Shield interpreted from BABEL deep seismic data. *Tectonophysics* 270, 259-277.
- * [Thybo, H.](#) and Perchuc, E., 1997. The seismic 8° Discontinuity and Partial Melting in Continental Mantle. *Science* 275, 1626-1629.
- [Thybo, H.](#), 1997, Geophysical characteristics of the Tornquist Fan area, northwest TESZ: Indication of Late Carboniferous to Early Permian dextral transtension. *Geol. Mag.* 134, 597-606.
- * Nielsen, L., [Thybo, H.](#), and Solodilov, L., 1999, Seismic tomographic inversion of Russian PNE data along profile Kraton, *Geoph. Res. Lett.* 26, 3413-3416.
- * [Thybo, H.](#), Maguire, P., Birt, C., and Perchuc, E., 2000. Seismic reflectivity and underplating beneath the Kenya Rift. *Geoph. Res. Lett.*, 27, 2745-2748.
- * [Thybo, H.](#), Zhou, S., and Perchuc, E. 2000, Intraplate earthquakes and a seismically defined lateral transition in the upper mantle. *Geophys Res. Lett.*, 27, 3953-3956.
- [Thybo, H.](#), 2001, Crustal structure along the EGT profile across the Tornquist Fan interpreted from seismic, gravity and magnetic data, *Tectonophysics*, 334, 155-190.
- *[Thybo, H.](#), Nielsen, L., and Perchuc, E., 2003, Seismic scattering at the top of the mantle transition zone. *Earth Plan. Sci. Lett.*, 216, 259-269.
- [Thybo, H.](#), Ross, A.R., and Egorkin, A.V., 2003, Explosion seismic reflections from the Earth's core. *Earth Plan. Sci. Lett.*, 216, 693-702.
- Grad, M. et al. incl. [H. Thybo](#), 2003, Crustal structure of the Trans European suture zone region along POLONAISE'97 seismic profile P4. *J. Geophys. Res.*, 108 doi: 10.1029/2003JB002426.
- Mackenzie G.D., [Thybo, H.](#), and Maguire P.K.H., 2005, Crustal velocity structure across the Main Ethiopian Rift: results from two-dimensional wide-angle seismic modelling. *Geophys. J. Int.*, 162, 994-1006.
- * [Thybo, H.](#), 2006, The heterogeneous Upper Mantle Low Velocity Zone, *Tectonophysics*, 416, 53-79.
- * Lyngsie, S.B., [Thybo, H.](#), Lang, R., 2007, Rifting and lower crustal reflectivity: A case study of the intra-cratonic Dniepr-Donets rift zone, Ukraine, *J. Geophys. Res.*, 112, B12402, doi:10.1029/2006JB004795.
- * Sandrin, A. and [Thybo, H.](#), 2008, Seismic constraints on a large mafic intrusion with implications for the subsidence mechanism of the Danish Basin. *J. Geophys. Res.*, DOI: 10.1029/2007JB005067
- * [H. Thybo](#), and C.A. Nielsen, 2009, Magma-compensated crustal thinning in continental rift zones. *Nature*, doi:10.1038/nature07688.
- Anell, I., [Thybo, H.](#), and Artemieva, I., 2009. Cenozoic uplift and subsidence in the North Atlantic region: Geological evidence revisited. *Tectonophysics*, doi:10.1016/j.tecto.2009.04.006.
- * Nielsen, C., and [Thybo, H.](#), 2009, No Moho uplift below the Baikal Rift Zone: Evidence from a seismic refraction profile across southern Lake Baikal, *J. Geophys. Res.*, doi:10.1029/2008JB005828.
- Bruckl, E., Behm, M., Decker, K., Grad, M., Guterch, A., Keller, G. R., [Thybo, H.](#), 2010, Crustal structure and active tectonics in the Eastern Alps. *Tectonics*, 29, doi:10.1029/2009TC002491.
- Anell, I., [Thybo, H.](#), Stratford, W., 2010, Relating Cenozoic North Sea sediments to topography in southern Norway: The interplay between tectonics and climate. *EPSL*, 300, 19-32, doi:10.1016/j.epsl.2010.09.009
- * Stratford, W. and [Thybo, H.](#), 2011, Crustal structure and composition of the Oslo Graben, Norway, *Earth Plan. Sci. Lett.*, 304, 431-442, doi:10.1016/j.epsl.2011.02.021

- Lassen, A. and Thybo, H., 2012, Neoproterozoic and Palaeozoic evolution of SW Scandinavia based on integrated reflection seismic interpretation. *Precam.Res.*, doi:10.1016/j.precamres.2012.01.008.
- Thybo, H., Artemieva, I., and Kennett, B. (Eds.), 2013, Moho: 100 years after Andrija Mohorovicic. *Edited book*, and also published as special issue of *Tectonophysics*, 609, 639 pp.
- Artemieva, I. M. & Thybo, H., 2013, EUNaseis: A seismic model for Moho and crustal structure in Europe, Greenland, and the North Atlantic region. *Tectonophysics*, doi:10.1016/j.tecto.2013.1008.1004.
- * Thybo, H. & Artemieva, I. M., 2013, Moho and magmatic underplating in continental lithosphere. *Tectonophysics*, doi:10.1016/j.tecto.2013.1005.1032.
- Youssof, M., Thybo, H., Artemieva, I. M. & Levander, A., 2013, Moho depth and crustal composition in Southern Africa. *Tectonophysics*, doi:10.1016/j.tecto.2013.09.001
- Frassetto, A. & Thybo, H., 2013, Receiver function analysis of the crust and upper mantle in Fennoscandia - isostatic implications. *Earth Plan. Sci. Lett.*, 381, 234-246, doi: 10.1016/j.epsl.2013.07.001
- Loidl, B., Behm, M., Thybo, H. and Stratford, W., 2014, Three-dimensional seismic model of crustal structure in Southern Norway, *Geophys. J. Int.*, 96, 1643-1656
- Youssof, M., Thybo, H., Artemieva, I. M., and Levander, A., 2015, Upper mantle structure beneath southern African cratons from seismic finite-frequency P- and S-body wave tomography: *Earth Plan.Sci. Lett.*, 420, 174-186.
- Herceg, M., Artemieva, I.M., Thybo, H., 2016. Sensitivity analysis of crustal correction for calculation of lithospheric mantle density from gravity data. *Geophys. J. Int.* 204, 687-696.
- Shulgin, A. and Thybo, H., 2016, Seismic explosion sources on an ice cap. *Polar Science*, 9, 107-118.
- Artemieva, I.M., Thybo, H., Shulgin, A., 2016. Geophysical constraints on geodynamic processes at convergent margins: A global perspective. *Gondwana Research*, 33, 4-23, doi: 10.1016/j.gr.2015.06.010
- Xia, B., H. Thybo, and I.M. Artemieva, 2017. Seismic crustal structure of the North China Craton and surrounding area: Synthesis and analysis. *J. Geophys. Res.*, 122: 5181-5207.
- Artemieva I.M., Thybo H., Jakobsen K., Sørensen N.K., Nielsen L.S.K., 2017. Heat production in granitic rocks: Global analysis based on a new data compilation GRANITE2017. *Earth Science Reviews*, DOI: 10.1016/j.earscirev.2017.07.003.
- * Yang, H., Chemia, C., Artemieva, I.M., and Thybo, H., 2017. Control on off-rift magmatism: A case study of the Baikal Rift Zone, *Earth Plan. Sci. Lett.*, **482**, 501-509, doi: 10.1016/j.epsl.2017.11.040
- Shulgin, A., Mjelde, R., Faleide, J.I., Høy, T., Flueh, E., Thybo, H., 2018. The crustal structure in the transition zone between the western and eastern Barents Sea. *Geophys.J. Int.* 214, 315-330
- Kraft, H. A., L. Vinnik, and H. Thybo, 2018, Mantle transition zone beneath central-eastern Greenland: Possible evidence for a deep tectosphere from receiver functions, *Tectonophysics*, 728, 34-40
- Buntin, S., Malehmir, A., Koyi, H., Hogdahl, K., Malinowski, M., Larsson, S.A., Thybo, H., Juhlin, C., Korja, A., Gorszczyk, A., 2019. Emplacement and 3D geometry of crustal-scale saucer-shaped intrusions in the Fennoscandian Shield. *Nature Sci. Rep.*, 9, 10.1038/s41598-019-46837-x.
- Artemieva, I.M., Thybo, H., Cherepanova, Y., 2019. Isopycnicity of cratonic mantle restricted to kimberlite provinces. *Earth Plan. Sci. Lett.*, 505, 13-19, 10.1016/j.epsl.2018.09.034.
- Kraft, H.A., Thybo, H. (corresponding author), Vinnik, L.P., Oreshin, S., 2019. Crustal Structure in Central-Eastern Greenland From Receiver Functions. *J. Geophys. Res.*, doi:10.1029/2018JB015919.
- Teknik, V., Ghods, A., Thybo, H. and Artemieva, I., 2019. Crustal density structure of the northwestern Iranian Plateau. *Can. J. Earth Sci.* 56, 1347–1365 (2019) dx.doi.org/10.1139/cjes-2018-0232
- Makushkina, A., Tauzin, B., Tkalčić, H., Thybo, H., 2019, The Mantle Transition Zone in Fennoscandia: Enigmatic High Topography Without Deep Mantle Thermal Anomaly. *Geophys. Res. Lett.*, doi: 10.1029/2018gl081742.
- Thybo, H., Youssof, M., Artemieva, I.M., 2019. Southern Africa crustal anisotropy reveals coupled crust-mantle evolution for over 2 billion years. *Nature Comm.*, 10, 10.1038/s41467-019-13267-2.
- Artemieva I.M. and Thybo H., 2020, Continent size revisited: Geophysical evidence for West Antarctica as a back-arc system. *Earth-Science Rev.*, doi:10.1016/j.earscirev.2020.103106, 18 pp.
- *Wang, G., H. Thybo (corresponding author), and I. M. Artemieva, 2021. No mafic layer in 80 km thick Tibetan crust, *Nature Communications*, 12, doi: 10.1038/s41467-021-21420-z.
- Hans Thybo and 11 co-authors, 2021. ScanArray—A Broadband Seismological Experiment in the Baltic Shield. *Seismological Research Letters*, doi: https://doi.org/10.1785/0220210015