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Date of Birth: February 09, 1954
Place of Birth: Wilhelmshaven, Germany
Nationality: German

Degrees: 1990 Habilitation Gießen University, Germany
1984 PhD, Kiel University, Germany
1980 Degree/Diploma in Geology, Kiel University

Positions: 2003 - present Professor (Arctic Ocean Paleoceanography),
Bremen University, Germany
1991 - 2002 Privatdozent, Bremen University, Germany
1991 - present (Senior) Research Scientist, Alfred Wegener
Institute Bremerhaven, Germany
1986 - 1990 Assistent Professor at Gießen University,
Germany
1984 - 1986 Research Scientist Institute for Petroleum and
Organic Geochemistry, KFA Jülich, Germany

Research Work: Overall goal of my research is the reconstruction of paleoclimate and paleoceanography of the High Northern Latitudes on different time scales, i.e., the long-term evolution from Greenhouse to Icehouse conditions during late Cretaceous/Early Cenozoic times and the short-term centennial-millennial variability during Quaternary times. Of special interest are the history of Arctic sea ice and circum-Arctic ice sheets as well as the Arctic Ocean organic carbon cycle (marine vs. terrigenous organic carbon flux; reconstruction of surface-water productivity, sea-ice cover, oxygenation of water masses). Large part of the research is embedded in the Integrated Ocean Drilling Program (IODP). Working areas include the Arctic Ocean and adjacent marginal seas, the North Atlantic, and the North Pacific/Bering Sea. Methods to be used are sedimentological and mineralogical investigations (X-Ray diffraction, MSCL logging, XRF scanning, microscopy, grain size) of terrigenous sediment fraction and organic-geochemical analyses (determination of organic geochemical bulk parameters and biomarkers by means of elemental analysis, Rock-Eval pyrolysis, and GC and GC/MS techniques).

Professional Activities: 2014 – present Member of ECORD Industry Liaison Panel (ILP)
2013 – present International (Canadian-German) Research
Training Group “ArcTrain“, vice-speaker of
German part of the program
2012 – present Member of the *Arctic in Rapid Transition (ART)*
Scientific Advisory Board
2011 – 2015 Member of the *Magellan-Plus Steering
Committee*
2011 - 2013 Member of the IODP Science Implementation
and Policy Committee (SIPCOM)
2009 - 2011 Member of the IODP Science Planning

	Committee (SPC) (2009 - 2011)
2009 - 2011	Chair of ESSAC
2007 - 2015	Member of the ECORD Science Support and Advisory Committee (ESSAC)
2005 - 2007	Co-chair of SSEP
2004 - 2007	Member of the IODP Science Steering and Evaluation Panel (SSEP)
2003 - present	Member of the NAD (Nansen Arctic Drilling) Steering Committee
2001 - present	Member of the Editorial Board of GeoMarine Letters
2000 - 2003	„Siberian River Run-off (SIRRO)“; Leader of Subproject „Terrigenous input and particulate organic matter: Sources, transport, accumulation, and variability“
1998 - present	Member of the Editorial Board of International Journal of Earth Sciences
1998 - 2003	Chairman of the AOSB (Arctic Ocean Sciences Board) program "Arctic Paleo-River Discharge (APARD)"
1997 - 2006	Member of the Editorial Board of Marine Geology
1994 - 1997	„System Laptev Sea“, Leader of Subproject „Organic carbon flux in the Laptev Sea: Productivity vs. terrigenous input“
1992 - 1998	Marine Geology Working Group of IASC (International Arctic Science Committee) (1996 - 1998 Chairman)
1992 - 1996	Steering Committee of the ESF-PONAM Programme (Polar North Atlantic Margin)
1991 - present	Member of the Review Board of RV Sonne
1989 - 1990	Member of the ODP Ocean History Panel (OHP)
1987 - 1989	Member of the ODP Sediment and Ocean History Panel (SOHP)

Participant of international expeditions (DSDP-ODP-IODP expeditions underlined)

- * Meteor-Cruise 60 (NE-Atlantic, Mar-Apr 1982)
- * DSDP-Leg 90 (SW-Pacific, Nov 82-Jan 1983)
- * ODP-Leg 105 (Baffin Bay, Labrador Sea; Aug-Oct 1985)
- * ODP-Leg 108 (NE Atlantic; Feb-Mar 1986)
- * ODP-Leg 128 (Japan Sea, Aug-Oct 1989)
- * Polarstern-Cruise ARK-VIII/3 (Central Arctic, Aug-Oct 1991)
- * ODP-Leg 151 (Arctic Gateways, Aug-Oct 1993)
- * Polarstern-Cruise ARK-X/2 (East Greenland Continental Margin, Aug-Oct 1994)
- * Polarstern-Cruise ARK-XI/1 (Kara/Laptev Sea and adjacent continental margin)
- * ACSYS-Expedition (Swedish Icebreaker Oden; Central Arctic Ocean, Jul-Sep 1996)
- * Polarstern-Cruise ARK-XIII/2 (Yermak Plateau, Jun-Aug 1997; Chief-scientist)
- * Polarstern-Cruise ARK-XIV/1a (Alpha Ridge, Lomonosov Ridge; Aug-Sep 1998)
- * Akademik Boris Petrov Cruise 1999 (Kara Sea, Aug-Sep; Co-chief-scientist)
- * Akademik Boris Petrov Cruise 2000 (Kara Sea, Aug-Sep; Co-chief-scientist)
- * Akademik Boris Petrov Cruise 2001 (Kara Sea, Aug-Sep; Co-chief-scientist)
- * Polarstern-Cruise ARK-XX/3 (Yermak Plateau, Sep-Oct 2004; Chief-scientist)
- * IODP-Leg 302 (Lomonosov Ridge, Aug 2004; Member of Science Party)
- * IODP-Leg 306 (North Atlantic Paleoceanography, Mar-Apr 2005; Co-chief scientist)
- * Polarstern-Cruise ARK-XXIII/3 (Mendeleev Ridge/East Sib. Sea, Aug-Oct 2008)
- * Merian-Cruise MSM 12/2 (Eirik Drift/Labrador Sea, Jun-Jul 2009)
- * Polarstern-Cruise ARK-XXVIII/3 (Mendeleev Ridge/East Sib. Sea, Aug-Oct 2014; Chief scientist)
- * Polarstern-Cruise ARK-XXIX/2.1 (Fram Strait, Jun-Jul 2015; Chief scientist)
- * IODP-Expedition 377 (Lomonosov Ridge, Aug-Oct 2018; Co-chief scientist)

Peer-reviewed articles (last five years / 2012 – 2017)

2012

- Fahl, K. and **Stein, R.**, 2012. Modern seasonal variability and deglacial/Holocene change of central Arctic Ocean sea-ice cover: New insights from biomarker proxy records. *Earth Planet. Sci. Lett.* 351-352C, 123-133; doi:10.1016/j.epsl.2012.07.009.
- Müller, J., Werner, K., **Stein, R.**, Fahl, K., Moros, M., and Jansen, E., 2012. Holocene cooling culminates in sea ice oscillations in Fram Strait. *Quaternary Science Reviews*, 47, 1-14, doi:10.1016/j.quascirev.2012.04.024.
- Naafs, B.D.A., Hefter, J., Acton, A., Haug, G.H., Martinez-Garcia, A., Pancost, R., and **Stein, R.**, 2012. Strengthening of North American dust sources during the late Pliocene (2.7 Ma). *Earth Planet. Sci. Lett.* 317/318, 8-19.
- Naafs, B.D.A., Hefter, J., and **Stein, R.**, 2012. Application of the novel Long-chain Diol Index (LDI) palaeothermometer to the early Pleistocene (MIS 96). *Org. Geochem.* 49, 83-85.
- Stärz, M., Gong, X., **Stein, R.**, Darby, D.A., Kauker, F., and Lohmann, G., 2012. Glacial shortcut of Arctic sea-ice transport. *Earth Planet. Sci. Lett.*, 357-358, 257-267.
- Stein, R.** and Fahl, K., 2012. A first southern Lomonosov Ridge (Arctic Ocean) 60 ka IP₂₅ sea-ice record. *Polarforschung* 82, 83-86, [hdl:10013/epic.40434.d001](https://doi.org/10.10013/epic.40434.d001).
- Stein, R.**, Fahl, K., and Müller, J., 2012. Proxy reconstruction of Arctic Ocean sea ice history: „From IRD to IP₂₅“. *Polarforschung* 82, 37-71, [hdl:10013/epic.40432.d001](https://doi.org/10.10013/epic.40432.d001).
- Uenzelmann-Neben, G., Schmidt, D., Niessen, F., and **Stein, R.**, 2012. Intraplate volcanism off South Greenland: Caused by glacial rebound? *Geophys. Journ. Int.*, doi: 10.1111/j.1365-246X.2012.05468.x.

2013

- Jang, K., Han, Y., Huh, Y., Nam, S., **Stein, R.**, Mackensen, A., Matthiessen, J., 2013. Glacial freshwater discharge events recorded by authigenic neodymium isotopes in sediments from the Mendeleev Ridge, western Arctic Ocean. *Earth Plan. Sci. Lett.* doi.org/10.1016/j.epsl.2013.03.018.
- Méheust, M., Fahl, K., **Stein, R.**, 2013. Variability in modern sea-surface temperature, sea ice and terrigenous input in the sub-polar North Pacific and Bering Sea: Reconstruction from biomarker data. *Org. Geochemistry* 57, 54-64.
- Müller-Michaelis, A., Uenzelmann-Neben, G., **Stein, R.**, 2013. Onset of drift building at the Eirik Drift during the Miocene: Evidence from high-resolution seismic reflection data. *Marine Geology* 340, 1-15.
- Naafs, B.D.A., Hefter, J., Grützner, J., **Stein, R.**, 2013. Warming of surface waters in the mid-latitude North Atlantic during Heinrich Events. *Paleoceanography* 28. doi: 10.1029/2012PA002354.
- Naafs, B.D.A., Hefter, J., **Stein, R.**, 2013. Review of millennial-scale ice rafting events and Hudson Strait Heinrich(-like) Events during the late Pliocene and Pleistocene. *Quaternary Science Reviews*, accepted.
- Niessen, F., Hong, J.K., Hegewald, A., Matthiessen, J., **Stein, R.**, Kim, H., Kim, S., Jensen, L., Jokat, W., Nam, S.-I., Kang, S.-H. (2013). Repeated Pleistocene glaciation of the East Siberian Continental Margin. *Nature Geoscience*, 11.08.2013 (DOI 10.1038/NGEO1904).
- Riefstahl, F., Estrada, S., Geissler, W.H., Jokat, W., **Stein, R.**, Kämpf, H., Dulski, P., Naumann, R., Spiegel, C., 2013. Provenance and characteristics of rocks from the Yermak Plateau, Arctic Ocean: Geochemical and petrographic constraints. *Marine Geology*, doi:10.1016/j.margeo.2013.06.00
- Schreck, M., Méheust, M., **Stein, R.**, Matthiessen, J., 2013. Response of marine palynomorphs to Neogene climate cooling in the Iceland Sea (ODP Hole 907A). *Mar. Micropaleont.* 101: 49-67, doi:10.1016/j.marmicro.2013.03.003.
- Stein, R.** and Fahl, K., 2013. Biomarker proxy IP₂₅ shows potential for studying entire Quaternary Arctic sea-ice history. *Org. Geochemistry* 55, 98-102; doi: 10.1016/j.orggeochem.2012.11.005.
- Xiao, X., Fahl, K., and **Stein, R.**, 2013. Biomarker distributions in surface sediments from the Kara and Laptev Seas (Arctic Ocean): Indicators for organic-carbon sources and sea-ice coverage. *Quat. Sci. Rev.*, doi.org/10.1016/j.quascirev.2012.11.028.

2014

- Ho, S.L., Mollenhauer, G., Fietz, S., Martinez-Garcia, A., Lamy, F., Rueda, G., Schipper, K., Méheust, M., Rosell-Melé, A., **Stein, R.**, Tiedemann, R., 2014. Appraisal of the TEX₈₆ and TEX₈₆^L thermometries in the subpolar and polar regions. *Geochimica et Cosmochimica Acta*, 131, pp. 213-226. doi: 10.1016/j.gca.2014.01.001.
- Jakobsson, M., Andreassen, K., Bjarnadottir, L.R., Dive, D., Dowdeswell, J.A., England, J.H., Funder, S., Hogan, K., Ingolfsson, O., Jennings, A., Larsen, N.K., Kirchner, N., Landvik, J.Y., Mayer, L., Mikkelsen, N., Möller, P., Niessen, F., Nilsson, J., O'Regan, M., Polyak, L., Nørgaard-Pedersen, N., **Stein, R.**, 2014. Arctic Ocean glacial history. *Quaternary Science Reviews* 92, 40-67.
- Krylov, A.A., **Stein, R.**, Ermakova, L.A., 2014. Clay minerals as indicators of late Quaternary sedimentation constraints in the Mendeleev Ridge, Amerasian Basin, Arctic Ocean. *Lithology and Mineral Resources* 49, 103-116.
- Meinhardt, A.-K., März, C., **Stein, R.**, Brumsack, H.-J., 2014. Regional variations in sediment geochemistry on a transect across the Mendeleev Ridge (Arctic Ocean). *Chemical Geology* 369, 1-11.
- Müller, J., **Stein, R.**, 2014. High-resolution record of late glacial and deglacial sea ice changes in Fram Strait corroborates ice-ocean interactions during abrupt climate shifts. *Earth Plan. Sci. Lett.* 403, 446-455.
- Naafs, B.D.A., Hefter, J., **Stein, R.**, 2014. Dansgaard-Oeschger forcing of sea-surface temperature variability in the mid-latitude North Atlantic between 500 and 400 ka (MIS12). *Paleoceanography* 29, 1024-1030, doi:10.1002/2014PA002697.

Stein, R., Weller, P., Backman, J., Brinkhuis, H., Moran, K., Pälike, H., 2014. Cenozoic Arctic Ocean Climate History: Some highlights from the IODP Arctic Coring Expedition (ACEX). In: Stein, R., Blackman, D. Inagaki, F., and Larsen, H.-C. (Eds.), *Earth and Life Processes Discovered from Subseafloor Environment - A Decade of Science Achieved by the Integrated Ocean Drilling Program (IODP)*, Series Developments in Marine Geology, Vol. 7, Elsevier Amsterdam/New York, p. 259-293.

2015

Husum, K., Hald, M., **Stein, R.**, and Weißschnur, M., 2015. Recent foraminifera in the Arctic Ocean and Kara Sea continental margin. *Arktos* 1, doi 10.1007/s41063-015-0005-9.

Kaminski, M., Niessen, F., Bazhenova, E., De La Guardia, L., Coakley, B., de Vernal, A., Eagles, G., Eisermann, H., Forwick, M., Gebhardt, C., Geissler, W., Horner, T., Jensen, L., Jin, H., Jokat, W., Kaboth, S., Kimmel, B., Kolling, H., Kopsch, C., Kudriavtseva, A., Matthiessen, J., Nam, S. I., Petersen, F., Prim, A., Riefstahl, F., Sauermilch, I., Schreck, M., Spielhagen, R. F., **Stein, R.** and Stolle, C., 2015. Modern agglutinated Foraminifera from the Hovgaard Ridge, Fram Strait, west of Spitzbergen: Evidence for a deep bottom current. *Annales Societatis Geologorum Poloniae* 85, 309-320.

Maier, E., Méheust, M., Abelmann-Gersonde, A., Gersonde, R., Chaplignin, B., Jian Ren, J., **Stein, R.**, Meyer, H., Tiedemann, R., 2015. Deglacial subarctic Pacific surface water hydrography and nutrient dynamics and links to North Atlantic climate variability and atmospheric CO₂. *Paleoceanography* 30, doi:10.1002/2014PA002763, 20 pages.

Méheust, M., **Stein, R.**, Fahl, K., Max, L., Riethdorf, J.-R., 2015. High-resolution IP₂₅-based reconstruction of sea-ice variability in the western North Pacific and Bering Sea during the past 18,000 years. *GeoMarine Letters*, DOI: 10.1007/s00367-015-0432-4.

Perner, K., Moros, M., Lloyd, J.M., Jansen, E., **Stein, R.**, 2015. Mid to late Holocene strengthening of the East Greenland Current linked to warm subsurface Atlantic water. *Quaternary Science Reviews* 129, 296-307.

Spielhagen, R.F., Müller, J., Wagner, A., Werner, K., Lohmann, G., Prange, M., **Stein, R.**, 2015. Holocene Environmental Variability in the Arctic Gateway. In: Schulz, M., Paul, A. (Eds.), *Integrated Analysis of Interglacial Climate Dynamics (INTERDYNAMIC)*, SpringerBriefs in Earth System Sciences, pp. 37-42, DOI 10.1007/978-3-319-00693-2_7.

Stein, R., Jokat, W., Niessen, F., Weigelt, E., 2015. Exploring the long-term Cenozoic Arctic Ocean Climate History – A challenge within the International Ocean Discovery Program (IODP). *Arktos* 1, doi: 10.1007/s41063-015-012-x.

Xiao, X., Fahl, K., Müller, J., **Stein, R.** 2015. Sea-ice distribution in the modern Arctic Ocean: biomarker records from Trans-Arctic Ocean surface sediments. *Geochim. Cosmochim. Acta* 155, 16-29.

Xiao, X., **Stein, R.**, Fahl, K., 2015. MIS 3 to MIS 1 temporal and LGM spatial variability in Arctic Ocean sea-ice cover: Reconstruction from biomarkers. *Paleoceanography* 30, doi: 10.1002/2015PA002814, 15 pages.

2016

Andrews, J., **Stein, R.**, Moros, M., Perner, K., 2016. Late Quaternary changes in sediment composition on the NE Greenland margin (~73°N) with a focus on the fjords and shelf. *Boreas*, doi 10.1111/bor.12169. ISSN 0300-9483.

Hörner, T., **Stein, R.**, Fahl, K., Birger, D., 2016. Post-glacial variability of sea ice cover, river run-off and biological production in the western Laptev Sea (Arctic Ocean) - A high-resolution biomarker study. *Quaternary Science Reviews* 143, 133-149.

Hoff, U., Rasmussen, T.L., Stein, R., Ezat, M., Fahl, K., 2016. Sea ice and millennial scale climate change in the Nordic seas 90 ka BP to Present. *Nature Communications* 7:12247, DOI: 10.1038/ncomms12247.

Kristoffersen, Y., Tholfsen, A., Hall, J., **Stein, R.**, 2016. Scientists spend Arctic winter adrift on sea ice, *Eos*, 97, doi:10.1029/2016EO060711. Published on 11 October 2016.

Stein, R., K. Fahl, Schreck, M., Knorr, G., Niessen, F., Forwick, M., Gebhardt, C., Jensen, L., Kaminski, M., Kopf, A., Matthiessen, J., Jokat, W., and Lohmann, G., 2016. Evidence for ice-free summers in the late Miocene central Arctic Ocean. *Nature Communications* 7:11148, doi:10.1038/ncomms11148.

2017

Bazhenova, E., Fagel, N., **Stein, R.**, 2017. Origin of late Quaternary "pink-white" layers at the Mendeleev Ridge (Arctic Ocean): New insights from lead and neodymium isotope composition of detrital sediment component. *Marine Geology* 386, 44-55.

Han, D., Nam, S.-I., Kim, J.-H., **Stein, R.**, Niessen, F., Joe, Y.J., Park, Y.-H., Hur, H.-G., 2017. Microbial biogeography in the Arctic Holocene sediments and its implications for paleoceanographic reconstructions. *Nature Scientific Reports*, accepted 20 July 2017.

Hörner, T., **Stein, R.**, Fahl, K., 2017. Holocene centennial to millennial cyclic variability in sea ice cover in the southern Kara Sea. *Geomarine Letters*, DOI 10.1007/s00367-017-0501-y.

Kolling, H., **Stein, R.**, Fahl, K., Perner, K., Moros, M., 2017. Short-term variability in late Holocene sea-ice cover on the East Greenland Shelf and its driving mechanisms. *Palaeogeogr. Palaeoclim. Palaeoecol.*, <https://doi.org/10.1016/j.palaeo.2017.06.024>.

Stein, R., Fahl, K., Gierz, P., Niessen, F., Lohmann, G., 2017. Arctic Ocean sea ice cover during the penultimate glacial and the last interglacial. *Nature Communications* 8: doi: 10.1038/s41467-017-00552-1.

Stein, R., Fahl, K., Schade, I., Manerung, A., Wassmuth, S., Niessen, F., Nam, S.-I., 2017. Holocene variability in sea ice cover, primary production, and Pacific-Water inflow and climate change in the Chukchi and East Siberian Seas (Arctic Ocean). *Journal of Quaternary Science* 32, 362-379.

Supervision of PhD students (last five years / 2012 – 2017)

- Tanja Hörner (2016). Late Quaternary variability in sea ice cover, primary productivity and terrigenous input along the Transpolar Drift System, Arctic Ocean: A biomarker approach. (University of Bremen).
- Hao Zou (2016). Late Quaternary history of circum-Arctic ice sheets and its relationship to the paleoceanographic circulation pattern in the central Arctic Ocean. (University of Bremen).
- Xiaotong Xiao (2014). Reconstruction of late Quaternary variability of Arctic sea ice and primary production: High-resolution study of biomarkers in circum-arctic marginal ice zones and the central Arctic Ocean. (University of Bremen).
- Marie Méheust (2013). Late Quaternary variability of surface-water characteristics and terrigenous input in the (sub-) polar North and South Pacific: A biomarker approach. (University of Bremen).
- Evgenia Bazhenova (2012). Late Quaternary glacial/ interglacial regimes in the Arctic: reconstructions based on sedimentary records from the Mendeleev Ridge. (University of Bremen).
- Michael Schreck (2012). Reconstruction of Neogene paleoenvironmental conditions across the Fram Strait (Arctic Ocean) by means of palynomorphs. (University of Bremen).

Ongoing PhDs (expected year of completion and working titles):

- Jeetendra Kumar Saini (2019). Deglacial-Holocene variability in Greenland meltwater discharge, sea-ice formation, and primary production in Baffin Bay and climate change. (University of Bremen).
- Nicole Syring (2019). Arctic Freshwater Discharge, Sea-Ice Formation and Deglacial to Holocene Climate Change – A Biomarker Approach. (University of Bremen).
- Anne Kremer (2018). Natural variability of Arctic sea ice and its significance for global climate change and organic carbon cycle. (University of Bremen).
- Henriette Kolling (2017). Variability of Arctic sea ice, meltwater discharge and primary production through last glacial to Holocene times: A biomarker approach. (University of Bremen).
- (co-supervising) Caroline Clouten (2017). Changes in sea-ice and climate in the Nordic seas during Pliocene times. (University of Bergen, Norway).
- (co-supervising) Henrik Sadatzki (2018). Variations in sea ice cover in the Nordic seas over Dansgaard-Oeschger cycles. (University of Bergen, Norway).