Bjarke Nilsson

PhD Student

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Research Experience

2024 - present — **PhD Student** — *DTU Space, Geodesy and Earth Observation*
PhD in High-Resolution Marine Geodesy from Satellite Altimetry
Research Focus Areas:
- High-resolution marine gravity and bathymetry using SWOT altimetry
- Machine-learning based inversion of satellite gravity data
- Next-generation marine reference fields: the DTU25MSS mean sea surface and the DTU26GRA marine gravity field

2021 - 2024 — **Graduate Research Assistant** — *DTU Space, Geodesy and Earth Observation*
Assisting in academic tasks related to the analysis and modeling of satellite data in the section of Geodesy and Earth Observation with the Hydrology group.

Education

2024 - present — **PhD**
Technical University of Denmark (DTU), Kgs. Lyngby, Denmark
Supervisors: Ole B. Andersen, Per Knudsen and Carsten Ludwigsen

2022 - 2024 — **MSc Eng. in Earth Observation**
Technical University of Denmark (DTU), Kgs. Lyngby, Denmark
Programme: Earth and Space Physics and Engineering

2018 - 2022 — **BSc Eng. in Geophysics and Space Technology**
Technical University of Denmark (DTU), Kgs. Lyngby, Denmark
Programme: Earth and Space Physics and Engineering

Research Visits

2026 Oct.–Nov. — **Visiting PhD Researcher**
National Yang Ming Chiao Tung University (NYCU), Hsinchu, Taiwan
Focus: Joint gravity inversion with ML
Visiting Supervisor: Prof. Cheinway Hwang

2026 Jun.–Jul. — **Visiting PhD Researcher**
Scripps Institution of Oceanography (SIO), UCSD, La Jolla, California, USA
Visiting Supervisor: Prof. David T. Sandwell

2026 Jan. — **Collaboration Visit** (1 week), CLS, Toulouse, France
Focus: Mean sea surface development

2025 Jun.–Sep. — **Visiting PhD Researcher**
Scripps Institution of Oceanography (SIO), UCSD, La Jolla, California, USA
Focus: Bathymetry inversion using ML
Visiting Supervisor: Prof. David T. Sandwell

2023 Aug.–Oct. — **Visiting Student Researcher (VSR Programme)**
Korea Advanced Institute of Science & Technology (KAIST), Daejeon, South Korea
Visiting Supervisor: Prof. Sung Yong Kim

Other Experience

2019 - 2021 — **Coordinator of the Bachelor Study Start** — *PF, Polyteknisk Forening*
One of 30 elected coordinators responsible for the study start of new bachelor students at DTU, including the recruiting and training of 300 tutors.

Publications

11 peer-reviewed publications (5 first-author).

2026

1. Hjort, C., Andersen, O. B., & **Nilsson, B.** (2026). Iceberg-Generated Waves From SWOT: Disintegration of Iceberg A-76A in the Southern Ocean. Geophysical Research Letters, 53(21), e2026GL122406. doi:10.1029/2026GL122406
2. Dale, B., Forsberg, R., **Nilsson, B.**, Jensen, T. E., Andersen, O. B., Breili, K., & Omang, O. C. D. (2026). Airborne gravimetry mapping of coastal and glacial regions in Norway with implications for the next Nordic geoid model. Journal of Geodesy, 100(12). doi:10.1007/s00190-026-02130-0
3. **Nilsson B**, Phrampus BJ, Salajegheh F, Lu B, Yu Y, Sandwell D, Andersen OB, Smith WHF, Elmore P, Kirby JF, Altamirano L (2026). Bathymetry prediction with SWOT gravity anomaly using machine learning methods: Paper 2—Model evaluation and uncertainty analysis. *Journal of Geophysical Research: Solid Earth*, 131(8), e2025JB033502. doi:10.1029/2025JB033502
4. Sandwell D, Phrampus BJ, Salajegheh F, **Nilsson B**, Lu B, Yu Y, Harper H, Andersen OB, Smith W, Elmore P, Kirby J, Beale J, Roberts J, Altamirano L (2026). Bathymetry prediction with SWOT gravity anomaly using machine learning methods: Paper 1—Model development. *Journal of Geophysical Research: Solid Earth*, 131(8), e2025JB032798. doi:10.1029/2025JB032798
5. **Nilsson B**, Andersen OB, Knudsen P (2026). The DTU25 mean sea surface: From and for SWOT. *Earth System Science Data*, 18(7), 5027–5051. doi:10.5194/essd-18-5027-2026
6. Sepúlveda I, **Nilsson B**, Yu Y, Carvajal M, Brandin M, Gabriel A, Sandwell D (2026). SWOT detects dispersive tsunami tied to a near-trench source in the 2025 Kamchatka earthquake. *Science*. doi:10.1126/science.aeb8634

2025

7. Arildsen RL, Andersen OB, **Nilsson B** (2025). Tidal bore revealed by SWOT: A case study from the Severn River. *Scientific Reports*. doi:10.1038/s41598-025-99597-2
8. **Nilsson B**, Andersen OB, Knudsen P (2025). Assessment of the performance of SWOT for observing the static ocean topography. *Geophysical Research Letters*, 52, e2024GL112290. doi:10.1029/2024GL112290

2024

9. Franze SE, Andersen OB, **Nilsson B**, Nielsen K (2024). Lake gravity anomalies from ICESat-2 laser altimetry and geodetic radar altimetry. *Advances in Space Research*. doi:10.1016/j.asr.2024.08.053
10. **Nilsson B**, Nielsen K (2024). Validation of Sentinel-6MF based lake levels – an assessment with in-situ data and other satellite altimetry data. *Advances in Space Research*. doi:10.1016/j.asr.2024.04.006

2022

11. **Nilsson B**, Andersen OB, Ranndal H, Rasmussen ML (2022). Consolidating ICESat-2 ocean wave characteristics with CryoSat-2 during the CRYO2ICE campaign. *Remote Sensing*, 14, 1300. doi:10.3390/rs14061300

In Review

12. Zilberman NV, Scanderbeg M, **Nilsson B**, Balem K, Benkiran M, Chen Z, Hosoda S, Sato K, Schmitt T, Van Wijk E, Sandwell D. Extension of ocean bathymetry measurements using Deep Argo floats and assessment of their impact on ocean bathymetry predictions. In Review.
13. Lu B, Forsberg R, Cob S, Saad S, Yacob H, Kadir M, **Nilsson B**, Andersen OB. Complex regional bathymetry derived from SWOT and airborne gravimetry – advances and limitations. Submitted.
14. Zhang J, Luo Z, Zhou H, Lu B, Forsberg R, **Nilsson B**, Andersen OB, Smith WHF. SWOT_MFGG: a global marine full-tensor gravity gradient dataset from SWOT-informed DOV fields using latitude-adaptive regional spectral processing. Submitted.

In Preparation

15. **Nilsson B**, Andersen OB, Knudsen P. DTU26GRA: Global marine gravity from SWOT with spatially adaptive filtering.
16. **Nilsson B**, Tomic M, Dugoni M, Hart-Davis MG, Torunski BE, Andersen OB. Validation and case study of using SWOT raster product for MSS determination in fjords.
17. Salajegheh F, Andersen OB, Coleman R, Deng X, **Nilsson B**. Aus26SWOT-G: Coastal marine gravity recovery from SWOT observations around the Australian coast.

Datasets

2025	Andersen OB, **Nilsson B** (2025). DTU25MSS Mean Sea Surface. Technical University of Denmark. Dataset. doi:10.11583/DTU.29412275.v1 (∼13,800 downloads as of Nov. 2026)

Teaching Experience

Teaching Assistant

2025–26	Land Surveying, Sisimiut, Greenland
2026	"Satellite Altimetry for Geodesy", one-week workshop, DTU
2025	"Bathymetric Prediction", course for the Department of Survey and Mapping Malaysia (JUPEM), Malacca, Malaysia
2021–26	Continuous and Discrete Time Signals (Course 30160), 2021, 2025 and 2026
2020	Engineering Practices (Course 30100)

Guest Lecturer

2024–26	Satellite Geodesy (Course 30552)

Supervision

2026	*MSc thesis*, Constance Hjort: "SWOT Sea Surface Heights and Velocities in Coastal Regions: Evaluation and Initial Data Assimilation Studies Along the Norwegian Coast"
2025	*Pre-bachelor engineering project*, Anna Leer and J. Amalie van Holt: "Using SWOT in coastal regions with periodic ice"

Invited Talks & Seminars

Nov. 2026	Seminar "Marine Geodesy in an age of SWOT", NYCU, Hsinchu, Taiwan
Oct. 2026	Invited talk, Seabed 2030 Indo-Pacific Mapping Meeting & Data Sprint, Kuala Lumpur, Malaysia
Oct. 2026	Talk at the workshop "Detecting Ocean Dynamics and Gravity Signals at Seamounts (ODYS-SEA)", GEOMAR, Kiel, Germany
Jul. 2026	Seminar "Geodesy from SWOT", Jet Propulsion Laboratory, Pasadena, CA, USA
Jun. 2025	Seminar "Mean Sea Surface from SWOT", Geodesy from SWOT seminar, Scripps Institution of Oceanography, La Jolla, California, USA

Conference Presentations

2026	AGU26 Fall Meeting (upcoming); Ocean Surface Topography Science Team Meeting (OSTST); Gravity, Geoid and Height Systems (GGHS)
2025	AGU25 Fall Meeting; SWOT Science Team Meeting
2024	AGU24 Fall Meeting; EGU24 General Assembly; 30 Years of Progress in Radar Altimetry Symposium; Dragon Symposium
2022	Dragon Symposium; ESA Living Planet Symposium

Obtained Grants

Travel Grants (11)

2026	Knud Højgaards Fond (8,600 DKK)
2025	Kaj og Hermilla Ostenfelds Fond, Thomas B. Thriges Fond, William Demant and P. A. Fiskers Fond, for research stay at SIO, UCSD (51,000 DKK)
2024	Otto Mønsteds Fond, for AGU Fall Meeting 2024 (6,726 DKK)
2023	KAIST visiting grant, Julie Damms Studiefond, William Demant, Stibo-Fonden and Vera og Carl Johan Michaelsens Legat, for research stay at KAIST, Korea (51,135 DKK)
2022	Otto Mønsteds Fond, for ESA Living Planet Symposium 2022

Outreach

2026	Contributed figures for the Swedish textbook (Titled: ”Geodesi – vetenskap och mätningsteknik”, authors Lars Sjöberg and Majid Abrehdary) on geodesy in chapter for Hydrography and Satellite Altimetry.
2026	Contributed the gravity and bathymetry chapters to the earth science booklet “Den Dynamiske Jord” (The Dynamic Earth) for all Danish high-school science classes
Nov. 2024	EGU Geodesy Campfire: “High-Resolution Marine Geodesy from Satellite Altimetry”, online talk

Professional Service

Peer review (13)

2024–26	AGU Earth and Space Science (3), Geophysical Journal International (2), Earth System Science Data (ESSD) (1), EGU Ocean Science (1), IEEE Transactions on Geoscience and Remote Sensing (2), Marine Geodesy (1), Communications Earth and Environment (1), International Journal of Applied Earth Observation and Geoinformation (1), International Journal of Digital Earth (1),

Media

Coverage of SWOT observations of the dispersive tsunami from the 2025 Kamchatka earthquake (Science, 2026)

2026	**UC San Diego Today**. *New satellite observations close blind spot in tsunami science*. Also published by Scripps Institution of Oceanography News.
2026	**DTU News** (in Danish). *Satellit fangede unikt fingeraftryk fra gigantisk jordskælv i Stillehavet* [Satellite captured unique fingerprint of giant Pacific earthquake].
2026	**Science & Vie** (in French). *Première mondiale : des chercheurs ont filmé la naissance d’un tsunami en haute mer* [World first: researchers filmed the birth of a tsunami in the open ocean].
2025	Featured as Scientist Spotlight in the NASA/JPL SWOT Summer 2025 Newsletter

Volunteering

2025–26	Organiser of the annual PhD poster event at DTU Space
2018–21	During BSc and MSc: volunteer tutor at PF (2019); mechanical engineering team, student rocket club DanSTAR (2018–2020); board member, National Student Association for Physics Students (FSID, 2020/21)

Skills

Skills	Python (NumPy, xarray, PyTorch, PyGMT), HPC, Bash, Deep Learning
Data	Satellite Altimetry (SWOT, CryoSat-2, ICESat-2, SARAL/AltiKa), Copernicus Sentinel-1/2/3/6
Languages	Danish (native), English (fluent), Dutch (limited), German (limited)