



Dr. CHRISTIAN KATLEIN

Sea Ice Physicist

Bremen
Germany

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SUMMARY

- Sea ice physics
- Marine optics
- Observation technology
- Field expeditions
- Radiative transfer modeling
- Ecosystem

[seicestories.katlein.de](https://www.youtube.com/channel/UCseicestories)
twitter.com/CKatlein



PERSONAL SKILLS

- Mountaineering & Climbing
- Arctic trekking guide and ship guide and lecturer since 2006
- Instructor for the German Alpine Club: youth groups and youth group leader education
- Car drivers license
- Boating license
- Forklift license



PROFESSIONAL SKILLS

- MATLAB, C, PHP
- ArcGIS
- Adobe Illustrator
- Microsoft Office
- Languages:
 - German (native)
 - English (fluent)
 - Norwegian, French, Spanish (basic skills)



EXPERIENCE

SEA ICE PHYSICIST

(2015 - Present)

Alfred-Wegener-Institut Helmholtz Zentrum für Polar und Meeresforschung - Bremerhaven, Germany

Postdoctoral researcher for the projects "Frontiers in Arctic Marine Monitoring (FRAM)" and "Multidisciplinary Observatory for the Study of Arctic Climate (MOSAIC)":

- Development, integration, deployment and data management of the BEAST under-ice ROV
- Development and deployment of interdisciplinary autonomous observatories
- Scientific evaluation and publication of the acquired results, particularly in the field of marine optics and interdisciplinary applications

POSTDOCTORAL RESEARCH FELLOW

(2018 - 2019)

TAKUVIK, Université Laval – Quebec City, Canada

Invited Sentinel North postdoctoral research fellowship: "In-situ optical measurements in sea ice"

- Development and evaluation of in-ice optical sensor probes for polar environments.
- Summer school and workshop lecturer on sea ice, optics and sensors



EDUCATION

PHD IN GEOSCIENCES

(2012-2015)

JACOBS UNIVERSITY - Bremen, Germany

Thesis title: "Spatial variability of light regimes under Arctic sea ice"

DIPLOM PHYSICIST

(2006-2012)

EBERHARD-KARLS-UNIVERSITÄT - Tübingen, Germany

Main subjects: Astrophysics & Geophysics

Thesis title: "ROV based investigation of the spatial variability of light transmission through arctic sea ice in summer"

(2009-2010, 2011)

UNIVERSITY CENTRE IN SVALBARD (UNIS) - Longyearbyen, Spitsbergen

Courses: Arctic Technology & Arctic Geophysics



RESEARCH INTERESTS

OBSERVATION TECHNOLOGY

Development and deployment of remotely operated vehicles (ROV) and autonomous platforms (AUV/buoys) in extreme polar marine environments

SEA ICE PHYSICS

Spatial variability of physical sea ice properties.
Optics and radiative transfer.
Thermodynamics

INTERDISCIPLINARY RESEARCH

Primary production, carbon pump, micro plastics in polar seas

Dr. Christian Katlein - Sea-Ice Physicist

Bremen, Germany

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Date of birth: 14 April 1986



Education & Career:

- 2019 – ongoing Postdoctoral researcher, MOSAiC, Sea-ice geophysics section at the Alfred-Wegener-Institut Helmholtz-Zentrum für Polar- und Meeresforschung, Bremerhaven, Germany
- 2018 – 2019 Invited postdoctoral research fellow, Takuvik Laboratory, Université Laval, Quebec City, Canada
- 2015 – 2018 Postdoctoral researcher, Frontiers in Arctic Marine Monitoring (FRAM), Sea-ice geophysics section at the Alfred-Wegener-Institut Helmholtz-Zentrum für Polar- und Meeresforschung, Bremerhaven, Germany
- 2012 – 2015 PhD in geosciences (sea-ice physics) at the Alfred-Wegener-Institut Helmholtz-Zentrum für Polar- und Meeresforschung, Jacobs University Bremen, Germany:
- PhD thesis “Spatial variability of light regimes under Arctic sea ice”
 - supervisors: Marcel Nicolaus, Rüdiger Gerdes, and Vikram Unnithan
 - member of the graduate school POLMAR
 - research stay at the Cold Regions Research and Engineering Laboratory and Dartmouth College (Hanover, NH, USA) visiting Don Perovich (February-March 2015)
- 2006 – 2012 Diplom physicist, Eberhard-Karls University Tübingen, Germany:
- Astronomy & Astrophysics, Geophysics
 - Diploma thesis „ROV based investigation of the spatial variability of light transmission through arctic sea ice in summer “ at the Alfred-Wegener-Institut Helmholtz-Zentrum für Polar- und Meeresforschung (Grade 1.0)
- 2009 – 2010 Studies abroad at the University Centre on Svalbard (UNIS), Longyearbyen, Spitsbergen:
- Arctic Technology (sea-ice physics, permafrost engineering, geohazards)
 - Arctic Geology (seismics, georadar, GPS)
- 2005 – 2006 Civilian service in the administration of the natural park Upper Danube, Beuron, Germany
- 1996 – 2005 Abitur (Grade 1.3), secondary school, Albert-Schweitzer Gymnasium, Gundelfingen, Germany

Languages: German: native speaker
English: highly proficient in spoken and written English
Norwegian: basic skills (Norwegian 1 – 4, University of Tübingen, Germany)
Spanish: basic communication skills
French: basic communication skills

Field experience: - seven research cruises with RV Polarstern to the Central Arctic (TransArc 2011, IceArc 2012, Aurora 2014, TRANSSIZ 2015, KARASIK 2016, SIPCA 2017, MOSAiC 2019/2020) operating oceanographic equipment and remotely operated vehicles (ROV) underneath sea ice and deploying autonomous stations
- land based expedition, heading under-ice ROV work in the “Last Ice Area” out of CFB Alert 2018
- research cruise on IB Oden to the North Pole (AO18) 2018 operating an under-ice ROV, microstructure turbulence profiling, deploying and recovering ice tethered ocean profilers and other autonomous sea-ice observatories
- research cruise on CCGS Amundsen in Baffin Bay, June 2018, leading all ice floe based work.
- various cryospheric field and freezer lab work during studies at UNIS, Longyearbyen (sea-ice, glaciers, permafrost, snow)
- Trekking guide on Spitsbergen (summer: 2006, 2007, 2009, 2011, winter: 2008, 2009) for Spitsbergen Tours, ship lecturer and field guide for Oceanwide Expeditions and Tallship Company on Spitsbergen (summer 2011, 2014, 2015, 2016, 2017)

Leadership skills: - Group leader sea-ice physics, Expedition “Aurora ARK-28/3”, RV Polarstern 2014
- Team leader ROV & physical sea ice work, Expedition “TRANSSIZ”, RV Polarstern 2015
- Group leader, Expedition “Last Ice, Alert 2018”, CFS Alert 2018
- Workpackage leader “sea ice optics” during the International PhD School onboard icebreaker CCGS Amundsen, Juli 2018
- Lecturer and field guide, SV Antigua, “Around Spitsbergen”, Tallship-Company 2014, 2015, 2016, 2017, 2019
- Trekking and field guide, MV Plancius, “Basecamp Spitsbergen”, Oceanwide Expeditions 2011
- Expedition leader, Spitzbergen expedition of the youth of the German alpine club (JDAV), climbing and mountaineering in central Svalbard, 2009
- Leading board member as environmental consultant, youth of the German alpine club (JDAV), 2008-2012

Teaching skills: - Invited lecturer and mentor during the CREATE-SMAART & Sentinel North Bootcamp “Designing cool devices : from development to deployment of an optical tool in a northern environment”, Forêt Montmorency, Université Laval (26 – 28 February 2019)
- Invited lecturer and mentor during the Sentinel North International PhD School “Light and marine ecosystems” onboard CCGS Amundsen, Baffin Bay, Université Laval (12 – 24 July 2018)
- Invited guest lecturer (“sea ice geophysics”) in the “introduction to geophysics” lecture of Prof. Vikram Unnithan, Jacobs University, Bremen (2015)

- Direct supervisor PhD thesis: Ran Tao, Alfred-Wegener-Institut Helmholtz-Zentrum für Polar- und Meeresforschung (ongoing)
- Direct supervisor PhD thesis: Philipp Anhaus, “Spectral properties of light transmission through sea ice”, Alfred-Wegener-Institut Helmholtz-Zentrum für Polar- und Meeresforschung (ongoing)
- Co-supervisor master thesis: Raphael Larouche, “Measuring the in-ice radiance distribution using fisheye cameras”, Université Laval (ongoing)
- Co-supervisor master thesis: Christophe Perron, “In situ measurement of sea ice inherent optical properties using reflectance spectroscopy”, Université Laval (ongoing)
- Co-supervisor master thesis: Yasmine Alikacem, “In situ measurement of nutrient concentrations in sea ice”, Université Laval (ongoing)
- Supervisor of student assistant: Max Heiligenthal, “Design of an under-ice AUV payload”, Alfred-Wegener-Institut Helmholtz-Zentrum für Polar- und Meeresforschung (2018)
- Supervisor master thesis: Jakob Belter, “Impact of water properties on the vertical variation of the under-ice light field”, Alfred-Wegener-Institut Helmholtz-Zentrum für Polar- und Meeresforschung (2017)
- Supervisor master thesis: Veronica Coppolaro, “3D sea-ice bottom topography mapped by multibeam sonar”, Alfred-Wegener-Institut Helmholtz-Zentrum für Polar- und Meeresforschung (2017)
- Supervisor internship Fynn Renner, Alfred-Wegener-Institut Helmholtz-Zentrum für Polar- und Meeresforschung (2016)
- Supervisor internship Jakob Belter, Alfred-Wegener-Institut Helmholtz-Zentrum für Polar- und Meeresforschung (2015)
- Supervisor internship Clara Stolle, Alfred-Wegener-Institut Helmholtz-Zentrum für Polar- und Meeresforschung (2013)
- Instructor of the youth of the German alpine club (JDAV), education for youth group leaders, topics: leading groups, pedagogics, climbing, mountaineering, environmental education (2009-ongoing)
- Youth group leader for the youth of the German alpine club (JDAV) in Bremen (2013-2018) and Freiburg (2003-2006)

Computer skills: Windows operating systems, Microsoft Office, ArcGIS, Adobe Illustrator, Programming languages: Matlab (advanced), PHP, HTML, Java, R, C, Python (basic knowledge), ...

Licenses: Car driving license (B)
 Forklift license
 Boating license (Sportbootführerschein See)
 Climbing instructor (Trainer B, alpine climbing)
 Youth group leader
 Expert (“Sachkundiger”) for personal protective equipment against falls from heights

Scientific reviewer: “Journal of Geophysical Research”, “The Cryosphere”, “Annals of Glaciology”, Journal of Glaciology”, “Philosophical Transactions A of the Royal Society”, “Cold Regions Science and Technology”, “Marine Ecological Progress Series”, “remote sensing”

Professional memberships:

German society for polar research (DGP), German physical society (DPG), Association of Polar Early Career Scientists (APECS)

Organisation/Outreach:

- elected chair of the Gordon Research Seminar on Polar Marine Science in Italy 16-17 March 2019
- founding member of the board of APECS Germany national committee (2015-2019)
- participation in AWI's open ship events, media appearances
- Schoolvisit: Teaching three classes of 9th grade school kids, Jakob-Emele-Realschule, Bad Schussenried, Germany, 2017
- YouTube channel "Sea Ice Stories"

Awards:

Best poster, Arctic frontiers conference 2015 (Tromsö):
"Distribution of algal aggregates under summer sea ice in the Central Arctic"

Current research interests:

- Interdisciplinary observations of the ice ocean climate and ecosystem using advanced robotic technologies (ROV, AUV & Buoys) underneath pack ice in the Central Arctic
- Optical properties of sea-ice, light transmittance, spatial variability
- Radiative energy transfer in sea-ice and the upper ocean
- Solar heating of the upper ocean and ice melt due to ocean heat flux
- Primary production and its relation to the light field
- Biomass export processes in ice covered seas