



Phoebe Tsz-Wai Chan, PhD
VISTA & NSERC Postdoctoral Fellow
Department of Earth Science, University of Bergen
Bjerknes Centre for Climate Research

Address: Jahnebakken 5, Room 2150 • 5007 Bergen, Norway
Phone: (+47) 55589872 • **E-mail:** phoebe.chan@uib.no

Education

- 2016 Ph.D. Earth Science at University of Toronto**
Subarctic crustose coralline algae as recorders of past climatic and environmental change
- 2010 M.Sc. Geology at University of Toronto**
Examining Mg/Ca and Ba/Ca ratios in coralline algae (*Clathromorphum nereostratum*) to reconstruct past freshwater variability of the Alaska Coastal Current
- 2009 H.B.Sc. Biology and Environmental Science at University of Toronto**

Professional Experience

- Visiting Postdoctoral Researcher** 2020 - 2021
Princeton University
- NSERC and VISTA Postdoctoral Fellow** 2018 - 2021
University of Bergen and Bjerknes Centre for Climate Research (BCCR)
- Expedition Leader and Chief Scientist** 2018
Crustose coralline algae collection off Northwestern Svalbard
- Micro-CT Laboratory Research Technician** 2016 - 2018
W.M. Keck Science Department, Claremont McKenna - Pitzer - Scripps Colleges
- Course Instructor** 2017
Planet Earth (ERS 120) University of Toronto at Mississauga
- Course Instructor** 2012
Environmental Geology (ERS 315) University of Toronto at Mississauga

Honours & Awards

- 2018 NSERC and L'Oréal-UNESCO Women in Science Supplement**
Top-ranked female candidate in the field of Earth Sciences
*Nomination - Award only offered to fellows pursuing research in Canada.
- 2018 Alice Wilson Award**
Women of outstanding academic qualifications in the Arts and Humanities, Social Sciences or Science who are entering a career in scholarship or research at the postdoctoral level
* Nomination - Award only offered to fellows pursuing research in Canada.
- 2017 Best Paper Award**
Chemical and Physical Sciences Department, University of Toronto at Mississauga
- 2017 Best Early Career Scientist Oral Presentation Award**
Ecosystem Studies of Subarctic and Arctic Seas (ESSAS) Open Science Meeting
- 2013 Laurence Curtis Teaching Assistant Award**
University of Toronto, Canada
- 2011 Charles A. Ross and June R. P. Ross Research Fund**
Geological Society of America (GSA)
- 2010 Best Graduate Student Oral Presentation Award**
Alaska Marine Science Symposium (AMSS) North Pacific Research Board (NPRB)

Scholarships & Research Grants

VISTA Overseas Research Grant	2020
Norwegian Academy of Science and Letters & Equinor Princeton University visiting postdoctoral research	108,000 NOK
VISTA 3-year Postdoctoral Fellowship with operational funding	2018
Norwegian Academy of Science and Letters & Equinor	3 million NOK
NSERC 2-year Postdoctoral Fellowship	2018
Natural Sciences and Engineering Research Council of Canada	90,000 CAD
BCCR Fast Track Initiatives funding	2018
Bjerknes Centre for Climate Research	200,000 NOK

HKU Seed Funding Program for Basic Research Hong Kong University (<i>P.I. Benoit Thibodeau</i>)	2017 55,400 HKD
A.T. Griffis Memorial Graduate Scholarship University of Toronto	2012 2,000 CAD
Margaret Amelia Miller Scholarship University of Toronto	2012 2,000 CAD
CCOD Summer School Scholarship Canadian Consortium for Ocean Drilling	2012 2,000 CAD
ECORD Summer School Scholarship European Consortium for Ocean Research Drilling	2012 600 EUR
CGCS Graduate Student Research Award Centre for Global Change Science University of Toronto	2011 1,500 CAD
NSERC 3-year Doctoral Post Graduate Scholarship (PGSD-3) Natural Sciences and Engineering Research Council of Canada	2011 63,000 CAD
Ontario Graduate Scholarship (OGS) <i>*Declined for NSERC (15,000 CAD)</i>	2011
GSA Graduate Student Research Grant Geological Society of America	2011 3,500 USD
Queen Elizabeth II Graduate Scholarships in Science and Technology (QEII-GSST)	2010 15,000 CAD
Margaret Amelia Miller Scholarship University of Toronto	2009 2,000 CAD
CGCS Graduate Student Research Award Centre for Global Change Science University of Toronto	2009 2,000 CAD

Peer-Reviewed Publications

1) Williams, B., Chan, P.T.W.*, Halfar, J., Hargan, K., and Adey, W. Arctic crustose coralline alga resilient to recent environmental change. In press at *Limnology and Oceanography*.
Manuscript ID: LO-19-0453.R3

- 2) Rasher, D.B., Steneck, R.S., Halfar, J., Kroeker, K.J., Ries, J.B., Tinker, T.M., Chan P.T.W.*, Fietzke, J., Kamenos, N.A., Konar, B.H., Lefcheck, J.S., Norley, C.J.D., Weitzman, B.P., Westfield, I.T, and Estes, J.A. (2020). Keystone predators govern the pathway and pace of climate impacts in a subarctic marine ecosystem. *Science*. DOI: 10.1126/science.aav7515.

- 3) Chan, P.T.W.*, Halfar, J., Adey, W., Lebednik, P.A., Steneck, R., Norley, C.J.D. and Holdsworth, D.W. (2019). Recent density decline in wild-collected subarctic crustose coralline algae reveals climate change signature. *Geology*. DOI: 10.1130/G46804.1.

- 4) Hou, A., Halfar, J., Adey, A., Wortmann, U.G., Zajacz, Z., Tsay, A., Williams, B., and Chan, P.* (2018). Long-lived coralline alga records multidecadal variability in Labrador Sea carbon isotopes. *Chemical Geology*. DOI: 10.1016/j.chemgeo.2018.02.026.

- 5) Chan, P.*, Halfar, J., Adey, W., Hetzinger, S., Zack, T., Moore, G.W.K., Wortmann, U.G., Williams, B., and Hou, A. (2017). Multicentennial Record of Labrador Sea Primary Productivity and Sea-Ice Variability Archived in Coralline Algal Barium. *Nature Communications*. DOI: 10.1038/ncomms15543.

- 6) Chan, P.*, Halfar, J., Norley, C.J.D., Pollmann, S., Holdsworth, D.W., Adey, W., and Steneck, R. (2017). Micro-Computed Tomography: Applications for High-Resolution Skeletal Density Determinations in Annually-Resolved Crustose Coralline Algae. *Geochemistry, Geophysics, Geosystems*. DOI: 10.1002/2017GC006966.

- 7) Chan, P.*, Halfar, J., Williams, B., Hetzinger, S., Steneck, R., Zack, T., and Jacob D. E. (2011). Freshening of the Alaska Coastal Current recorded by coralline algal Ba/Ca ratios. *Journal of Geophysical Research*. DOI: 10.1029/2010JG001548.

- 8) Halfar, J., Williams, B., Hetzinger, S., Steneck, R., Lebednik, P., Winsborough, C., Omar, A., Chan, P.*, and A.D. Wanamaker Jr. (2011). 225 years of Bering Sea climate and ecosystem dynamics archived by coralline algae. *Geology*. DOI: 10.1130/g31996.1.

Manuscripts in Review or in Preparation

- 1) Williams, B., Chan, P.T.W., Westfield, I., Rasher, D., and Ries, J. Ocean acidification reduces skeletal density of hardground-forming high-latitude crustose coralline algae. In review at *Geophysical Research Letters*. Manuscript ID#: 2020GL089358.

- 2) Chan, P.T.W.*, Halfar, J., Adey, W., Lebednik, P.A., Steneck, R., Rasher, D., Norley, C.J.D. and Holdsworth, D.W. Skeletal density decline in wild-collected subarctic crustose coralline reveals depth-mediated response to climate change in Northwest Pacific. In preparation.

- 3) Chan, P.T.W.*, Ramusson, L., Zajacz, Z., Tsay, A., Halfar, J., Andersson, C., and Jansen, E., High-resolution baseline records of marine productivity in Northwest Svalbard based on isotopic and trace element records in crustose coralline algae. In preparation.

Analytical Research Experience

3D X-ray Micro-CT

visualization and analysis of carbonate skeletal structure using micro-Computed Tomography (Micro-CT). Preclinical Imaging Research Centre (PIRC) - Robarts Research Institute, University of Western Ontario, Canada.

2013 – Present

Trace element analysis using Laser Ablation Inductively Coupled Plasma Mass Spectrometry (LA-ICP-MS)

Earth System Science Research Centre, Johannes Gutenberg-Universität Mainz, Germany and the Magmatic and Ore-Forming Processes Research Laboratory, University of Toronto, Canada.

2010 – Present

High-resolution digital photomosaic rendering

Olympus reflected light microscope (VS-BX) attached to an automated sampling stage-imaging system equipped with Geo.TS (Olympus Soft Imaging Systems) software. Paleoclimate and Sedimentology Research Group, University of Toronto at Mississauga, Canada.

2009 – Present

Fieldwork Experience

Expedition co-leader and chief scientist

Planned and led an Arctic research cruise in Northwestern Svalbard for the collection of crustose coralline algae. Research in Svalbard Database: www.researchinsvalbard.no - Project ID:11030
PIs: Phoebe TW Chan and Lina Rasmusson

Summer 2018

Fieldwork participant

Temperature monitoring and dredging for bivalve shells *Arctica islandica* from Ingøya.

Summer 2018

Graduate field course

Impacts of the cryosphere dynamics from land to ocean.
European Consortium for Ocean Research Drilling/ Integrated Ocean Drilling Program/ IODP Canada (ECORD/IODP/ICDP)

Summer 2012

Graduate fieldweek.

North American Dendroecological Fieldweek.
Mountain Lake Biological Station Virginia, USA.

Summer 2011

Graduate field course

Natural Catastrophes. University Centre of South Iceland and Earthquake Engineering Research Centre, Selfoss, Iceland.

Summer 2011

Teaching Experience

Course instructor <i>Planet Earth</i> University of Toronto at Mississauga	Summer 2017
Teaching Assistant <i>Geology in Public Issues, Planet Earth, Past and Present Global Change, Environmental Geology</i> University of Toronto at Mississauga	2009 – 2017
Guest lecturer <i>Composition of the Earth in Geology in Public Issues</i> University of Toronto at Mississauga	Fall 2015
Teaching Fundamentals Certificate Program Centre for teaching Support and Innovation, University of Toronto	2014 - 2015
Guest lecturer <i>Natural Catastrophes: Volcanic Eruptions. Geology in Public Issues</i> University of Toronto at Mississauga	Fall 2013
Guest lecturer <i>Natural Catastrophes: Earthquakes. Geology in Public Issues</i> University of Toronto at Mississauga	Fall 2013
Guest lecturer <i>Paleoclimatology: Stable oxygen isotopes and other geochemical methods. Past and Present Global Change</i> University of Toronto at Mississauga	Winter 2013
Guest lecturer <i>Climate Archives. Past and Present Global Change</i> University of Toronto at Mississauga	Winter 2013
Course instructor <i>Environmental Geology</i> University of Toronto at Mississauga	Winter 2012

Mentoring

Emerald Stratigopoulos	MSc Student, University of Toronto, 2020
Sukhmani Singh	MSc Student, University of Toronto, 2020
Alessio Scurci	Undergraduate research assistant, University of Toronto, 2020

Tamara Trofimova	PhD student, University of Bergen, 2018
Dafna Bimstein	Undergraduate research thesis, Claremont Colleges, 2017
Siyuan Liu	Undergraduate research thesis, Claremont Colleges, 2017
Kay Garlick-Ott	Summer student internship, Pomona College, 2016

Invited Guest Seminars

- 2019** Department of Earth Sciences, University of Queensland, Australia
- 2016** Department of Earth Sciences, University of Hong Kong, Hong Kong

Presentations at Scientific Meetings

- 2020** **Goldschmidt.** Honolulu, Hawaii.
Session 14B: “Geochemical proxies in high-resolution biogenic climate archives and geochemical fingerprint of seawater in carbonates: Novel approaches to reconstruct incorporation mechanisms, diagenetic overprint, and preservation of elemental and isotopic signatures”
** Invited oral presentation.*
- 2019** **13th International Conference on Paleoceanography.** Sydney, Australia.
Poster presentation.
- 2019** **6th International Sclerochronology Conference.** Split, Croatia.
Oral presentation.
- 2017** **Ecosystem Studies of Subarctic and Arctic Seas Open Science Meeting (ESSAS).** Tromsø, Norway.
Oral & Poster presentation. **Awarded best early career oral presentation.*
- 2017** **European Geosciences Union (EGU) General Assembly.** Vienna, Austria.
Oral presentation.
- 2016** **4th International Sclerochronology Conference.** Maine, USA.
Oral presentation.
- 2016** **Ocean Science Meeting.** New Orleans, USA.
Poster presentation.
- 2014** **American Geophysical Union (AGU) Fall Meeting.** San Francisco, USA.
Oral presentation.
- 2014** **Ocean Science Meeting.** Honolulu, USA.
Poster presentation.
- 2012** **34th International Geological Congress.** Brisbane, Australia.

- Oral presentation.
- 2012** **ICES/PICES Oceans of Change.** Mallorca, Spain.
Oral presentation. **Best oral presentation of the session.*
- 2010** **2nd International Sclerochronology Conference.** Mainz, Germany.
Poster presentation.
- 2010** **Ocean Sciences Meeting.** Portland, USA.
Poster presentation.
- 2010** **Alaska Marine Science Symposium.** Anchorage, USA.
Oral presentation. **Awarded best graduate student presentation.*
- 2009** **Past Global Changes 3rd Open Science Meeting.** Portland, USA.
Poster presentation.

Travel Grants

- 2017** International Council for the Exploration of the Sea (ICES) & Norwegian Institute of Marine Research (Havforskningsinstituttet) Travel Support
- 2016** Chemical and Physical Sciences Conference Travel Grant
- 2012** International Council for the Exploration of the Sea (ICES) and the North Pacific Marine Science Organization (PICES) Conference Travel Support
- 2012** School of Graduate Studies Conference Travel Grant
- 2010** Chemical and Physical Sciences Conference Travel Grant

Service

- 2020** Reviewer for Scientific Reports
- 2020** Reviewer for Palaeogeography, Palaeoclimatology, Palaeoecology
- 2019** Reviewer for Methods in Ecology and Evolution
- 2019** Reviewer for Global Change Biology
- 2018** Reviewer for Global Change Biology
- 2018** Bjerknes Center for Climate Research Seminar Committee
- 2016** Session chair: Climate and Oceans - Past and Present. 4th International Sclerochronology Conference. June 5-9, 2016. Maine, USA.

References

Dr. Jochen Halfar

Department of Chemical & Physical
Sciences,
University of Toronto at Mississauga,
3359 Mississauga Rd. N., Davis Building,
Room DV4044, Mississauga,
ON L5L 1C6
Phone: (905) 828-5419
E-mail: jochen.halfar@utoronto.ca

Dr. Branwen Williams

W.M. Keck Science Department,
Claremont McKenna - Pitzer - Scripps
Colleges,
925 N. Mills Ave Claremont, Keck Science
Center 227, Claremont,
CA 91711
Phone: (909) 607-8017
E-mail: bwilliams@kecksci.claremont.edu

Dr. Eystein Jansen

Department of Earth Sciences,
University of Bergen &
Bjerknes Centre for Climate Research,
Realfagbygget, Allégaten 41
5007 Bergen
Phone: (+47) 55 58 34 91
E-mail: eystein.jansen@uib.no