Dr. Christopher Horvat

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Who I am: My scientific research is motivated by the need to understand and model the links between small and large-scale processes in Earth's climate and in human systems. I investigate how small-scale physical processes influence the large-scale and long-range features of the climate system that impact human life and the ecosystem, like the seasonal retreat of the sea ice edge or the initiation of phytoplankton blooms in the ocean.

I believe in continued public engagement, for the advancement of societal and scientific goals. I actively seek broad engagement with the public through film, television and online journalism.

Currently:

Brown University, Providence, RI
NOAA *Climate and Global Change Fellow and* Voss *Postdoctoral Fellow*, Institute at Brown for Environment and Society (2017-present)

Harvard University, Cambridge, MA and **National Institute of Water and Atmospheric Research**, Wellington, NZ
Frank Knox Memorial Fellow, Department of Oceanography (2017-present)

Education

Ph.D in Applied Mathematics, **Harvard University**, (March 2017).
Thesis: *Theory, modeling, and impact of the sea ice floe size distribution*
S.M. in Applied Mathematics, **Harvard University**, (May 2013).
B.S. in Mathematics, B.S. in Physics, **University of Pittsburgh** (August 2011). *Summa Cum Laude.*

Teaching Fellowships:

AM115: Applied Mathematical Modelling (fall 2016) (with Zhiming Kuang).
EPS131: Intro to Physical Oceanography (spring 2014, spring 2016) (with Eli Tziperman).
EPS231: Climate Dynamics (spring 2015) (with Eli Tziperman).
AM115: Applied Mathematical Modelling (fall 2012) (with Bill Bossert).

Media
Enduring Ice (film). Scientific lead, principal subject. (link) (2016-present).
Climate Warriors (television series). Subject. (link). (2017-present).
Associate Editor, EGU Cryosphere Blog (2016-present)
Expert, Applied Math and Climate Change, Science in the News (2015-present)

Professional Leadership and Experience:
Executive Committee, Arctic in Rapid Transition (2016-present)
Council, Assoc. Of Polar Early Career Sciences (APECS) (2016-present)
Council, APECS U.S. Branch (2016-present)
Member: SIAM/AGU/EGU/AMathS/AMetS
Reviewer: NSF/Cryosphere/Geophysical Research Letters

Awards, Honors, Grants

At *Brown University*
Voss Postdoctoral Fellowship, 2017-2019
NOAA Climate and Global Change Postdoctoral Fellowship, 2017-2020

At *Harvard University*:
Knox Memorial Fellowship, 2017-2018

COMNAP Antarctic Research Fellowship 2017
Graduate Climate Conference SCRIM Fellowship, 2016
Butler Conservation Fund Frenchboro Residency, 2016
National Defense Science and Engineering Graduate (NDSEG) Fellowship, 2013-2016
HUCE Graduate Consortium Fellowship (2014-2016)
Smith Fellowship in Applied Mathematics (2011-2012, 2012-2013)
NSF Graduate Research Fellowship Honorable Mention (2011).

At *University of Pittsburgh*:
Culver Prize in Mathematics (2010)
Blumberg Award in Mathematics (2010)
Arts and Sciences Scholarship Award (2010,2011)
NSF Research Training Grant (2008-2010)
Goldwater Award Nominee (2010)
Honors College Scholarship (2007-2011)
Deans List (2007-2011)

Recent Publications:

C. Cuevas, N. Maffezzoli, J. Corella, A. Spolaro, P. Vallelonga, [et al., incl. **C. Horvat**]. Rapid increase in atmospheric iodine levels in the North Atlantic since the mid-20th century. *Submitted to Nature*, 2017.
C. Horvat, D. Rees Jones, S. Iams, D. Schroeder, D. Flocco, D. Feltham. Prediction and timing of sub-ice phytoplankton blooms in the Arctic Ocean. Science Advances, 2017. DOI: 10.1126/sciadv.1601191
C. Horvat and E. Tziperman. The evolution of scaling laws in the sea ice floe size and thickness distribution. J. Geophys. Res. Oceans. 2017, doi 10.1002/2016JC012573
B. Hwang, J. Wilkinson, E. Maksym, H.C. Graber, A. Schweiger, **C. Horvat**, et al.. Winter-to-summer transition of Arctic sea ice breakup and floe size distribution in the Beaufort Sea. Elem Sci Anth. 2017, 5:40. DOI: http://doi.org/10.1525/elementa.232
C. Horvat, E. Tziperman, and J.M. Campin. Effects of the floe size distribution on ocean eddies and sea ice melting. Geophys. Res. Lett. 2017. 43, 8083–8090, doi:10.1002/2016GL069742. 2016
C. Horvat and E. Tziperman. A prognostic model of the sea-ice floe size and thickness distribution, The Cryosphere. 2017, 9, 2119-2134, doi:10.5194/tc-9-2119-2015, 2015.
M. Tronzo, J. Barber, **C. Horvat**, et al. A three-dimensional mathematical and computational model of necrotizing enterocolitis. J. of Theor. Biology. doi: 10.1016/j.jtbi.2012.11.018, 2013
C. Horvat and M. Stoffregen. A solution to the lonely runner conjecture for almost all points. arXiv:1103.1662, 2011.

Invited talks:
(2017) - Isaac Newton Institute, Cambridge, UK; NOAA Climate Seminar; Harvard University; Australia National University; Adelaide University; Otago University; National Institute of Water and Atmospheric Research, Wellington, NZ; University of Washington;
(2016) - Oxford University; Brown University; UK National Oceanography Centre;

Contributed talks
(2016) - EGU Spring Meeting; AGU Fall Meeting; Forum for Arctic Modeling and Synthesis, Woods Hole, USA; Graduate Climate Conference, Seattle, WA; Polar Prediction Workshop, Lamont-Doherty Earth Observatory,
(2015) - Mathematics of Sea Ice Workshop, Vancouver, BC, Canada; AGU Fall Meeting.

Selected media:

Researcher from Arctic to Kayak Arctic Sea, ABC6 News. Link.
Thinning Arctic Sea Ice lets in light, prompts algae-bloom study. Reuters. Link.
'Enduring Ice' Expedition Will Kayak Through the Harshest of Arctic Environments. Seeker. Link.