

# ASTRID PACINI

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Woods Hole Oceanographic Institution

266 Woods Hole Road ◊ Woods Hole, MA 02543

## EDUCATION

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### MIT-WHOI Joint Program

2016-2021

PhD in Physical Oceanography

*Thesis:* Structure, variability, and dynamics of the West Greenland boundary current system

*Advisor:* Dr. Robert S. Pickart

### Yale University

2012-2016

B.S. in Mechanical Engineering, with distinction

B.S. in Geology & Geophysics, with distinction

Certificate in Energy Studies

## PUBLICATIONS

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- [12] **Pacini, A.** and Pickart, R.S., 2022. Meanders of the West Greenland Current near Cape Farewell. *Deep-Sea Research I*, 179, 103664. <https://doi.org/10.1016/j.dsr.2021.103664>
- [11] **Pacini, A.**, Pickart, R.S., Le Bras, I.A., Straneo, F., Holliday, N.P., and Spall, M.A., 2021. Cyclonic eddies in the West Greenland Boundary Current System. *Journal of Physical Oceanography*, 51, 2087-2102. <https://doi.org/10.1175/JPO-D-20-0255.1>
- [10] Li, F. and 31 co-authors, 2021. Subpolar North Atlantic western boundary density anomalies and the Meridional Overturning Circulation. *Nature Communications*, 12, 3002. <https://doi.org/10.1038/s41467-021-23350-2>
- [9] Tian, F., Pickart, R.S., Lin, P., **Pacini, A.**, Moore, G.W.K., Stabeno, P., Weingartner, T., Itoh, M., Kikuchi, T., Dobbins, E., Bell, S., Woodgate, R., and Wang, Z., 2021. Mean and seasonal circulation of the eastern Chukchi Sea from moored timeseries in 2013-2014. *Journal of Geophysical Research: Oceans*, 126, e2020JC016863. <https://doi.org/10.1029/2020JC016863>
- [8] **Pacini, A.**, Pickart, R.S., Bahr, F., Torres, D.J., Ramsey, A.L., Holte, J., Karstensen, J., Olmanns, M., Straneo, F., Le Bras, I.A., Moore, G.W.K., and de Jong, M. F., 2020. Mean conditions and seasonality of the West Greenland Boundary Current System near Cape Farewell. *Journal of Physical Oceanography*, 50, 2849-2971. <https://doi.org/10.1175/JPO-D-20-0086.1>
- [7] **Pacini, A.**, Moore, G.W.K., Pickart, R.S., Nobre, C., Bahr, F., Våge, K., and Arrigo, K.R., 2019. Characteristics and transformation of Pacific winter water on the Chukchi Sea shelf in late spring. *Journal of Geophysical Research: Oceans*, 124, 7153– 7177. <https://doi.org/10.1029/2019JC015261>
- [6] Creamean, J.M., Cross, J.N., Pickart, R.S., McRaven, L.T., Lin, P., **Pacini, A.**, Hanlon, R., Schmale, D.G., Cenicerros, J., Aydell, T., Colombi, N., Bolger, E., and DeMott, P.J., 2019. Ice nucleating particles carried from below a phytoplankton bloom to the Arctic atmosphere. *Geophysical Research Letters*, 46, 8572-8581. <https://doi.org/10.1029/2019GL083039>
- [5] Colwyn, D.A., Brandon, M.T., Hren, M.T., Hourigan, J., **Pacini, A.**, Cosgrove, M.G., Midzik, M., Garreaud, R., and Metzger, C., 2019. Growth and steady state of the Patagonian Andes. *American Journal of Science*, 319, 431-472. <https://doi.org/10.2475/06.2019.01>
- [4] Renfrew, I., and 64 co-authors, 2019. The Iceland Greenland Seas Project. *Bulletin of the American Meteorological Society*, 100, 1795-1817. <https://doi.org/10.1175/BAMS-D-18-0217.1>

- [3] Pratt, L.J., Voet, G., **Pacini, A.**, Tan, S., Alford, M.H., Carter, G.S., Girtton, J.B., and Menemenlis, D., 2019. Pacific abyssal transport and mixing: through the Samoan Passage vs. around the Manihiki Plateau. *Journal of Physical Oceanography*, 49, 1577-1592. <https://doi.org/10.1175/JPO-D-18-0124.1>
- [2] Lin, P., Pickart, R.S., Torres, D.J., and **Pacini, A.**, 2018. Evolution of the Freshwater Coastal Current at the southern tip of Greenland, *Journal of Physical Oceanography*, 48, 2127-2140. <https://doi.org/10.1175/JPO-D-18-0035.1>
- [1] Lowry, K.E., Pickart, R.S., Mills, M.N., **Pacini, A.**, Selz, V., Lewis, K.M., Joy-Warren, H., Nobre, C., van Dijken, G.L., and Arrigo, K.R., 2018. Under-ice phytoplankton bloom dynamics controlled by spring convective mixing in refreezing leads of open water. *Journal of Geophysical Research: Oceans*, 123, 90-109. <https://doi.org/10.1002/2016JC012575>

## FIELD WORK

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**USCGC Healy:** Chief Scientist: Robert S. Pickart Fall 2021 **[32 days]**  
 Perform an extensive hydrographic survey in Baffin Bay to understand the heat and freshwater transport through Davis Strait and into glacial fjords from the West Greenland Current.

**R/V Neil Armstrong:** Chief Scientist: Robert S. Pickart Summer 2020 **[37 days]**  
 Service moorings and perform high-resolution hydrographic survey of Cape Farewell as part of the Overturning of the Subpolar North Atlantic Program ([OSNAP](#)).

**R/V Neil Armstrong:** Chief Scientists: Leah McRaven & Mathieu Dever Fall 2019 **[5 days]**  
 Perform rigorous CTD conductivity calibration, test AHC on CTD winch, test X-Spar buoy, test EcoCTD, calibrate Multibeam.

**R/V Neil Armstrong:** Chief Scientists: **Astrid Pacini** & Mara Freilich Fall 2019 **[3 days]**  
 Characterize properties and dynamics of frontal zone in LTER line on Northeast U.S. Shelf. Training cruise for first-year graduate students.

**USCGC Healy:** Chief Scientist: Robert S. Pickart. Fall 2018 **[25 days]**  
 Service moorings and perform high-resolution hydrographic survey of Chukchi and Beaufort Shelf as part of the Arctic Observing Network ([AON](#)).

**R/V Neil Armstrong:** Chief Scientist: Robert S. Pickart. Summer 2018 **[37 days]**  
 Service moorings and perform high-resolution hydrographic survey of Cape Farewell as part of the Overturning of the Subpolar North Atlantic Program ([OSNAP](#)).

**NRV Alliance:** Chief Scientist: Robert S. Pickart. Winter 2018 **[27 days]**  
 Storm-chasing cruise to conduct coupled air-sea measurements in the Nordic Seas during active convection. Perform high resolution CTD and XCTD surveys, deploy mooring, deploy and recover gliders as part of the Iceland-Greenland Seas Project ([IGP](#)).

**USCGC Healy:** Chief Scientist: Robert S. Pickart. Summer 2017 **[22 days]**  
 Characterize changing Pacific-Arctic ecosystem from interdisciplinary sampling approach as part of the Distributed Biological Observatory ([DBO](#)).

**R/V Neil Armstrong:** Chief Scientist: Robert S. Pickart. Summer 2016 **[40 days]**  
 Service moorings and perform high-resolution hydrographic survey of Cape Farewell as part of the Overturning of the Subpolar North Atlantic Program ([OSNAP](#)).

**R/V Bjarni Sæmundsson:** Chief Scientist: Héðinn Valdimarsson & Steingrímur Jónsson. **[16 days]**  
 Service moorings and perform high-resolution hydrographic survey of Iceland during summer 2015.

**Patagonia Field Program:** Chief Scientists: Mark Brandon & David Colwyn. **[17 days]**  
 Geologic survey of central Andes to understand generation timescale of the range during winter 2016 ([Yale Geology & Geophysics](#)).

**USCGC Healy:** Chief Scientists: Kevin Arrigo & Robert S. Pickart. Spring 2014 [42 days]  
Characterize early spring conditions in the Chukchi Sea and how the spring phytoplankton bloom forms as part of the Study of Under-Ice Blooms in the Chukchi Ecosystem ([SUBICE](#)).

## TALKS

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- Pacini, A.** Eddy variability in the West Greenland Current and its impact on the Labrador Sea. *Arctic-Subarctic Ocean Fluxes Meeting*. October 2021.
- Pacini, A.** Mean conditions and seasonality of the West Greenland Boundary Current system near Cape Farewell. *MIT Sack Lunch Seminar*. September 2021.
- Pacini, A.**, Pickart, R.S., Le Bras, I.A., Straneo, F., Holliday, N.P., and Spall, M.A. Cyclonic eddies in the West Greenland Boundary Current System. *European Geosciences Union General Assembly*. vPICO. April 2021.
- Pacini, A.**, and Pickart, R.S., Meanders of the West Greenland Current *OSNAP Early Career Meeting*. Mar. 2021. Recording available [here](#).
- Pacini, A.**, Pickart, R.S., Bahr, F., Ramsey, A., Torres, D.J., Karstensen, J., Oltmanns, M., Holte, J., de Jong, F., le Bras, I., Straneo, F., and Moore, K., Deconstructing the seasonality of the West Greenland boundary current system. *Ocean Sciences Meeting*. Feb. 2020.
- Li, F. and the OSNAP Observations Team, Volume, heat and freshwater transports across the OSNAP array: 2014-2018. *Ocean Sciences Meeting*. Feb 2020.
- Creamean, J.M., Cross, J.N., Pickart, R.S., McRaven, L.T., Lin, P., **Pacini, A.**, Hanlon, R., Schmale, D.G., Cenicerros, J., Aydele, T., Colombi, N., Bolger, E., and DeMott, P.J., From the Ocean Floor to the Air: Biological Processes As a Source of Seeds for Cloud Ice Formation in the Arctic. *15th Conference on Polar Meteorology and Oceanography; American Meteorological Society*. May 2019.
- Pacini, A.**, Pickart, R.S., Bahr, F., Ramsey, A.L., Torres, D.J., and Karstensen, J., Structure and variability of the West Greenland boundary current system. *European Geosciences Union General Assembly*. April 2019.
- Bower, A.S., **Pacini, A.**, le Bras, I.A., Furey, H.H., Lozier, M.S., Pickart, R.S., Ramsey, A.L., Straneo, F., and Zou, S., Abundant Cyclonic Eddies in the Deep Boundary Current around southern Greenland. *European Geosciences Union General Assembly*. April 2019.
- Auerbach, D., Brandon, M.T., Hren, M.T., Hourigan, J.K., **Pacini, A.**, Cosgrove, M., Midzik, M., Garreaud, R., and Metzger, C., New evidence for long-lived Cenozoic topography in the Patagonian Andes. *Geological Society of America Fall Conference*. Oct. 2017.
- Auerbach, D., Hren, M.T., and **Pacini, A.**, Abrupt Terrestrial Cooling at the Eocene-Oligocene Transition in the Southern Hemisphere. *American Geophysical Union Fall Meeting*. Dec. 2016.
- Lowry, K.E., Pickart, R.S., Mills, M.M., **Pacini, A.**, Nobre, C., and Arrigo, K.R., Does active convection within leads in sea ice delay phytoplankton blooms? *Ocean Sciences Meeting*. Feb. 2016.

## POSTERS

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- Freilich, M., **Pacini, A.**, Suca, J., Lobert, L., Crockford, E.T., Granzow, B.N., Chen, J., Cones, S., Duffy, F., Gaul, A., Gong, J., Hersh, C., Jahns, M., Jones, A., Krinos, A., Ma, L., Poemnamthip, P., Santos, M., Streanga, I., Sun, R., Taenzer, L., and Gawarkiewicz, G., Hurricane Dorian impacts on Northeast US shelf marine hydrography and ecosystem. *Ocean Sciences Meeting*. Feb. 2020.
- Colwyn, D.A., Brandon, M.T., Hren, M.T., Hourigan, J.K., **Pacini, A.**, Cosgrove, M., Midzik, M., Garreaud, R., and Metzger, C., A Cenozoic water isotope record of the evolution of the Patagonian Andes. *American Geophysical Union Fall Meeting*. Dec. 2017.

- Pacini, A.**, Pickart, R.S., Moore, G.W.K., and Våge, K., Hydrographic Structure and Modification of Pacific Winter Water on the Chukchi Sea Shelf in Late Spring. *Ocean Outlook Meeting*. April 2017.
- Lowry, K.E., Pickart, R.S., Mills, M.M., **Pacini, A.**, Selz, V., Lewis, K.M., Joy-Warren, H., Nobre, C., van Dijken, G.L., and Arrigo, K., Under-ice phytoplankton bloom dynamics controlled by convective mixing in refreezing leads. *Gordon Research Conference on Polar Marine Science*. Mar. 2017.
- Auerbach, D., Hren, M.T., **Pacini, A.**, A global terrestrial climate shift at the Eocene-Oligocene transition: evidence from mid-latitude South America. *Geologic Society of America Fall Conference*. Sept. 2016.
- Auerbach, D. Hren, M.T., **Pacini, A.**, Breen P., Garreaud, R., and Brandon, M.T., A large shift in the hydrologic cycle associated with the Eocene-Oligocene transition in Patagonia. *Northeastern Geobiology Symposium*. April 2016.
- Pacini, A.**, Pickart, R.S., Moore, G.W.K., and Våge, K., Hydrographic Structure and Modification of Pacific Winter Water on the Chukchi Sea Shelf in Late Spring. *Ocean Sciences Meeting*. Feb. 2016.
- Cosgrove, M.G.\*, **Pacini, A.\***, Auerbach, D.J., Brandon, M.T., and Hren, M.T. A Paleoelevation History of the Patagonian Andes from Hydrated Volcanic Glass. *Geologic Society of America Fall Conference*. Nov. 2015.

\* indicates equal contribution

## PAST RESEARCH EXPERIENCE

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|---|-------------------|
| <b>Undergraduate research assistant, Yale University</b>            | Jan 2015-May 2016 |
| Advisor: Mark Brandon & David Colwyn                                |                   |
| Perform volcanic glass extraction in mineral separation laboratory. |                   |
| <b>Summer student fellow, Woods Hole Oceanographic Institution</b>  | May-August 2015   |
| Advisor: Robert S. Pickart  |                   |
| Investigate water mass transformation in the Chukchi Sea.           |                   |
| <b>Guest student, Oxford University</b>                             | July-August 2014  |
| Advisor: Andrew Fowler  |                   |
| Explore ice sail formation and how to model these features.         |                   |

## TEACHING & MENTORING

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| <b>Kaufman Teaching Certificate Program</b>   | Fall 2020      |
| Semester-long teaching training course through the MIT Teaching and Learning Lab.   |                |
| <b>12.808 Introduction to Observational Physical Oceanography</b>   | Fall 2019      |
| Teaching assistant for the 25 students. Held office hours, provided a coding tutorial, graded assignments and exams. <i>Overall rating: 6.6/7.0.</i>  |                |
| <b>Graduate mentor</b>  |                |
| Katy Abbott ( <i>MIT-WHOI student</i> )   | 2020-present   |
| Jeff Grabon ( <i>MIT-WHOI Navy Masters student</i> )  | 2018-2020      |
| Mari McCarthy ( <i>High school student working with Glen Gawarkiewicz</i> )   | Summer 2019    |
| Riely Wadehra ( <i>Summer Student Fellow working with Chris Piecuch</i> )   | Summer 2019    |
| <b>Resource for Easing Friction and Stress (REFS)</b>   | 2019 - present |
| MIT and WHOI REFS ( <a href="#">EAPS REFS</a> and <a href="#">WHOI REFS</a> ): trained in conflict management, we offer confidential peer-to-peer mentorship, support, and coaching for students. |                |
| <b>JP Applicant Support &amp; Knowledgebase (JP ASK)</b>  | 2019-present   |
| Mentor for prospective graduate students through the <a href="#">JP ASK</a> program, which seeks to increase the  |                |

diversity of future admitted classes by supporting and advising prospective students from underrepresented backgrounds.

## OUTREACH

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### **USCGC Healy Science Lecture** October 2021

Spoke at science lecture onboard USCGC Healy. Lecture is targeted to the general public, with both Coast Guard and science party in attendance. Title: The West Greenland Current: Observations from the windiest place in the world ocean.

### **WHOI PO Buoy Lunch** January 2021

Spoke at informal monthly physical oceanography lunch meeting: Al Plueddemann, Astrid Pacini, and Isabela le Bras: Pandemic sea stories.

### **MIT EAPS Takeover** August 2020

Performed an [EAPS Takeover](#), where a student takes over the social media accounts of the MIT Earth, Atmosphere, Planetary Sciences department and presents their research and daily life for a broader audience.

### **WHOI School Visits**

Assisted in various school visits to WHOI, including giving a presentation about the Arctic (working with [WHOI Broader Impacts Group](#)), another about how we take velocity measurements (working with [WHOI Sea Grant](#)), and providing tours of the *R/V Neil Armstrong*.

### **MIT Museum Girls Day** March 2018

Presented on the Gulf Stream at [MIT Museum Girls Day](#).

### **MIT EAPS feature** February 2019

Participated in a [story](#) for MIT EAPS on participation in an October-November cruise aboard the USCGC Healy.

### **SUBICE outreach effort** May 2014

Participated in a [story](#) for the Study of Under Ice Blooms in the Chukchi Ecosystem (SUBICE) outreach effort.

### **Yale University interviewer** 2016-present

Interview candidates for the Yale University admissions office (~5 candidates per year).

## AWARDS AND PROFESSIONAL ACTIVITIES

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**Arctic Service Medal**, *United States Coast Guard*

**Early Career Scientist Travel Support**, *European Geophysical Union*

**Participant at the International Summer School** on the Labrador Sea and the North Atlantic Subpolar Gyre (ISNAO), Bonne Bay Laboratory, Western Newfoundland. July 2017.

**William R. Belknap Prize**, *Yale University*, awarded "to a senior for excellence in geological studies." May 2016.

**Reviewer:** *Journal of Geophysical Research: Oceans; Geophysical Research Letters*