

# Odilon Joël HOUNDEGNONTO

*Ph.D. - Physical Oceanography and Environment*

NASA Jet Propulsion Laboratory/Caltech,  
M/S 300-323, 4800 Oak Grove Drive,  
Pasadena, CA 91109, United States  
☎ +1 (818) 393-7404  
✉ [odilon.joel.houndegnonto@jpl.nasa.gov](mailto:odilon.joel.houndegnonto@jpl.nasa.gov)

— • [ResearchGate](#) • [ORCID](#) • [LinkedIn](#) • —  
<https://ojhoundegnonto.github.io/>

My research interests are focused on ocean physics with linkage and applications for societal needs, especially: the response of the ocean in the dynamic of climate change through air-sea interaction from regional to global scales, freshwater plumes dynamics (Rivers, sea-ice melting and precipitation), thermohaline stratification of the upper ocean layers, the role of stratification on the sea surface temperature conditions, the contribution of temperature and salinity on sea level changes and ocean heat content variations, from regional to global scales. I am used to In situ and remote sensing observations, with the combined of numerical model simulation output.

## Education

- 2018-2021** - **Ph.D.**, *Physical Oceanography and Environment*, Topic: Analysis of freshwater plumes thermohaline variations from intra-seasonal to seasonal scales in the Gulf of Guinea, at Laboratory for Ocean Physics and Satellite remote sensing, LOPS - IRD/UBO/Ifremer/IUEM - Brest, France, with Dr. Christophe Maes and Dr. Nicolas Kolodziejczyk, with Honors
- 2016-2017** - **Research Master of science in Physical Oceanography and Applications /Sciences de l'océan, de l'atmosphère et du climat**, jointly accredited by Paul Sabatier University of Toulouse (UPS, France) and International Chair in Mathematical Physics and Applications (ICMPA UNESCO- Chair) of University of Abomey Calavi (UAC, Benin), **Rank : 1<sup>st</sup>**
- 2014-2015** - **Maîtrise ès-sciences Physiques, specialization: Physics**, Faculty of Sciences and Technologies - FAST/UAC, Benin
- 2013-2014** - **Licence ès-sciences Physiques, specialization: Physics**, Faculty of Sciences and Technologies - FAST/UAC, Benin
- 2012-2013** - **DUES (Diplôme Universitaire d'Étude Scientifique)**, specialization: **Physics and Chemistry**, Faculty of Sciences and Technologies - FAST/UAC, Benin

## Awards

- July 2018** - **Laureate of Make Our Planet Great Again - MOPGA**, of french government by Mr. Emmanuel MACRON for my PhD project and co-funded by IRD, France, (Rank: 8<sup>th</sup>)

---

## Publications

### *Peer Reviewed Publication*

- [02] **Rousseau, V.**, Fraudeau, R., Hammond, M., **Houndegnonto, O. J.**, Ablain, M., Blazquez, A., Calafat, F. M., Desbruyères, D., Foti, G., Llovel, W., Marti, F., Meyssignac, B., Restano, M. & Benveniste, J., (2023), Monitoring the regional Ocean Heat Content change over the Atlantic Ocean with the space geodetic approach. *Earth Syst. Sci. Data Discuss. [preprint]*, <https://doi.org/10.5194/essd-2023-236>
- [01] **Houndegnonto, O. J.**, Kolodziejczyk, N., Maes, C., Bourlès, B., Da-Allada, C. Y., & Reul, N. (2021), Seasonal variability of freshwater plumes in the eastern Gulf of Guinea as inferred from satellite measurements. *Journal of Geophysical Research: Oceans*, 126, e2020JC017041. <https://doi.org/10.1029/2020JC017041>

### *In Preparation*

- [03] **Houndegnonto O. J.**, Fournier, S. and Fenty, I. (2023), Assessment of SMOS and SMAP salinity in the framework of SASSIE in situ measurements in the Arctic Ocean. *Journal of Atmospheric and Oceanic Technology. (in pre.)*
- [02] **Houndegnonto O. J.**, Kolodziejczyk, N., Maes, C., Bourlès, B., Dobler, D., Grima, N., & Reul, N (2023), Upper Ocean staircases thermohaline stratification of far field Congo freshwater plume. *Journal of Geophysical Research: Oceans. (in pre.)*
- [01] **Houndegnonto O. J.**, Fenty, I. and Fournier, S. (2023), Mixing contribution to the ocean surface freezing by 1D surface forcing model in the Beaufort Sea. *(in pre.)*

---

## Review activities

- 2023 to present - Reviewer for NASA Solicitation and Proposal Integrated Review and Evaluation System (NSPIRES): Future Investigators in NASA Earth and Space Science and Technology - Physical Oceanography (FINESST PO)
- Reviewer for IOP Science, Environmental Research Letters
  - Reviewer for Marine Pollution Bulletin
- 2022 to present - Reviewer for the Journal of Geophysical Research: Oceans

---

## Mentorship

- 2023 - Collaborative mentorship work with Bingham Frederick (UNCW, USA) for John Oklu (intern) on Investigating fresh water pathways in the Arctic Ocean using modeling., August, 2023 to present

---

## Selected Conference Attended

- 2023 - **Houndegnonto O. J.**, , Kolodziejczyk, N., Maes, C., Bourlès, B., Dobler, D., Grima, N., Da-Allada, C. Y., & Reul, N. : Upper Ocean staircases thermohaline stratification of far field Congo freshwater plume. **VEPOSSSS** - April 19<sup>th</sup> (as invited speaker, virtual)

- 2022** - **Houndegnonto O. J.**, , *W. Llovel & D. Desbruyères*, : 4DAtlantic-OHC v0.4 validation against in situ observations in the Subpolar North Atlantic. **4DAtlantic - OHC project: Mid Term Review** - September 22<sup>th</sup>-23<sup>th</sup>, 2022, Magelium company site, Toulouse, **France** (as speaker)
- **Houndegnonto O. J.**, , *Kolodziejczyk, N., Maes, C., Bourlès, B., Dobler, D., Grima, N., Da-Allada, C. Y., & Reul, N.*, : On the formation of thermohaline stratification off Congo River plume. **2022 Ocean Salinity Conference** - June 6<sup>th</sup>-9<sup>th</sup>, 2022, University of Columbia, New York, **USA** (Poster, virtual)
- **Houndegnonto O. J.**, , *Llovel, W. & Desbruyères, D.*, : Full-depth temperature and salinity contribution to regional sea level changes in the north Atlantic subpolar gyre during 2002-2018 from repeated hydrographic transects. **Sea Level Workshop 2022** - June 1<sup>st</sup>-3<sup>th</sup>, 2022, Brest, **France** (as speaker)
- 2021** - **Houndegnonto O. J.**, , *Kolodziejczyk, N., Maes, C., Bourlès, B., Dobler, D., Grima, N., Da-Allada, C. Y., & Reul, N.*, : On the formation of thermohaline stratification off Congo River plume. **TACCOVAR 2021** - Sep. 27<sup>th</sup>-30<sup>th</sup>, 2021, Cotonou, **Benin** (as speaker, virtual)
- 2019** - **Houndegnonto O. J.**, *Kolodziejczyk, N., Maes, C., Bourlès, B., Da-Allada, C. Y., & Reul, N.*, : Seasonal variability of Congo and Niger Rivers plumes in the Gulf of Guinea. **TACCOVAR 2019** - Sep. 23<sup>th</sup> -27<sup>th</sup>, 2019, Cotonou, **Bénin** (as speaker)
- **Houndegnonto O. J.**, *Kolodziejczyk, N., Maes, C., Bourlès, B., Da-Allada, C. Y., & Reul, N.*, : Seasonal variability of Congo and Niger Rivers plumes in the Gulf of Guinea. Summer School at **École Polytechnique de Paris Saclay**, July, 1<sup>st</sup> - 12<sup>th</sup>, 2019, Palaiseau, **France** (Poster)
- **Houndegnonto O. J.**, *Kolodziejczyk, N., Maes, C., Bourlès, B., Da-Allada, C. Y., & Reul, N.*, : Seasonal variability of Congo and Niger Rivers plumes in the Gulf of Guinea. **Living Planet Simposium 2019 (LPS19)**, May, 13<sup>th</sup> - 17<sup>th</sup>, 2019, Milan / **Italie** (as speaker)
- **Houndegnonto O. J.**, *Kolodziejczyk, N., Maes, C., Bourlès, B., Da-Allada, C. Y., & Reul, N.*, : Seasonal variability of Congo and Niger Rivers plumes in the Gulf of Guinea. **EGU 2019** (European Geosciences Union) General Assembly, Apr. 7<sup>th</sup> - 12<sup>th</sup>, 2019, Vienne/**Autriche** (as speaker)
- 2018** - **Houndegnonto O. J.**, *Kolodziejczyk, N., Maes, C., Bourlès, B., Da-Allada, C. Y., & Reul, N.*, : Characterization of Niger and Congo rivers plumes in the Gulf of Guinea. **2018 Ocean Salinity Sciences Conference** - Nov. 6<sup>th</sup>-9<sup>th</sup>, 2018, Sorbonne University, Paris/**France** (as speaker)

## Research training and professional experience

- Jan. 2023-present** - **JPL PostDoc Researcher**, *NASA Jet Propulsion Laboratory/Caltech* - *Salinity and Stratification at Sea Ice Edge* - *SASSIE project*, supervised by *Severine Fournier and Ian Fenty*.
- Quantifying the 3D structure of near-surface stratification anomalies generated by melting sea ice (summer ice retreat), and understanding its precondition into the upper ocean for autumn ice advance.

- Mar-Dec** - **PostDoc Researcher**, *CNRS/LOPS, Brest, France (4DAtlantic-OHC project)*
- 2022**
- Validation of the Ocean Heat Content derived from satellite products (estimated from Gravimetry and Altimetry) with In situ observations (CTD) along OVIDE transects (Portugal to Greenland) and Argo floats profiles.
  - Temperature and Salinity contributions to regional sea level changes in the north Atlantic subpolar gyre along the OVIDE transects (Portugal to Greenland)
- 2021** - **Associate researcher** , : *Projects and Research collaboration at the CIPMA-UNESCO Chair, UAC, Benin*, from Dec. 2021 to present
- **PhD Thesis Research**, *IRD-UBO/LOPS, Brest, France*, Analysis of freshwater plumes thermohaline variations from intra-seasonal to seasonal scales in the Gulf of Guinea, (<https://hal.archives-ouvertes.fr/tel-03615021>): from Oct. 2018 to Dec. 2021
    - Study of Seasonal variability of freshwater plumes in the Gulf of Guinea
    - Study of the influence of the dynamics of the Congo River plume on the thermohaline stratification in the South-East of the Gulf of Guinea
    - The three-dimensional dynamics of interactions between the Congo River plume and subtropical water masses through a Lagrangian approach
  - **Training in Scientific integrity in the research community** , (*in French: Intégrité scientifique dans les métiers de la recherche*), University of Bordeaux via FUN MOOC, - France, from Sep. 2019 to Apr. 2021
- 2019** - **Summer School on Fluid Dynamics of Sustainability and the Environment at Ecole Polytechnique of Paris, France**, from 1<sup>st</sup> to 12<sup>th</sup> July, 2019
- **Training in Data Sciences for Geosciences: initiation to machine Learning and Deep Learning with Python**, *Plouzané - France*, from 14<sup>th</sup> to 18<sup>th</sup> January 2019
- 2018** - **Training in sampling techniques and methods, data analysis and interpretation of results**, *GEOMAR - Kiel, Germany*, July 2018
- **Participant of**, Oceanographic research cruises (M148 cruise) in the tropical Atlantic, R/V Meteor - from 24th May to 29th June 2018; Position: **CTD, UCTD, ADCP** measurements, Microstructure, **Argo** and **Glider** float deployment + Physical analyzes
  - **Regional training in oceanographic coastal modeling (SYMPHONIE)**, *co-organized by Laboratoire d'Études en Géophysique et Océanographie Spatiales (LEGOS), Laboratoire d'Aérodynamique (LA) of Toulouse/France, IRD/Bénin and, ICMPA UNESCO-Chair, Cotonou, Benin*, from 2<sup>nd</sup> to 6<sup>th</sup> April 2018
- 2017** - **Scientific cruises on Lake Nokoué (ADCP, CTD, Turbidity, Ph and, Bathymetry with echo-sounder measurements)** , IRD Bénin & IRHOB  
**Period:** 08-09/11/2017 and 31/09 to 01/10/2017
- 2012-2016** - **Tutor:**, *individual tutoring of secondary school students in Physics, Chemistry and Technics*, Abomey-Calavi, Benin

## Voluntary Positions

- 2023** - **Volunteer**, Judge of The Doris S. Perpall SURF Speaking Award, California Institute of Technology (Caltech, Pasadena, USA) - **Period:** 21st October 2023

- **Volunteer**, Judge of The Vodopia-Hasson Summer Poster Competition, California Institute of Technology (Caltech, Pasadena, USA) - **Period**: 24th August 2023
- 2018** - **Volunteer**, hydrographer on board of Oceanographic research cruises (M148 cruise) in the tropical Atlantic, R/V Meteor - **Period**: 24th May to 29th June 2018.
- **Volunteer researcher**, Working with new Master students in Physical Oceanography and Applications, in their training and internship. (CIMPA UNESCO-Chair / UAC, Benin) - **Period**: October 2017 to May 2018

## Community Service

**2020-2021** Spokesperson for non-permanent researchers on the board and scientific college of LOPS, Brest, France

## Languages and Computing Skills

**Languages spoken:** French (Full Professional), English (Good), Fongbé (Mother tongue)

**Driving:** Car driving license B; Boat driving license: coastal option

**Skills:**

**Languages and OS:** Matlab, Python, Fortran (beginner), Julia (beginner), GitHub, Shell Bash, LaTeX, Microsoft Office, Open Office – Mac, Linux, Windows (+WSL) & Docker images

**Model:** ARIANE, Oceanic langrangian analysis software/Model – SYMPHONIE, Coastal oceanography model - KPP 1D Diffusion-Convection model – MITgcm