

## **Daniele Iudicone**

Nationality: Italian  
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Position: Senior researcher, Stazione Zoologica Anton Dohrn (SZN), villa comunale, 80121 Napoli, Italy

ERC sectors: PE 10\_8, LS8\_1, PE6\_7

### **Formation**

PhD in Physical Oceanography, IUEM (Brest, France) February 2007.  
University degree (Laurea) in Physics, Università di Roma "La Sapienza". Mark: 110/110 cum laude in 29/05/1995.

### ***Expeditions and research cruises***

Participation to 8 oceanographic cruises (one as chief scientist).

**Scientific director** (with C. Bowler and C. de Vargas) of the Tara Oceans expedition "Mission Microbiomes" (2020-2022), 70.000 km, 21 months, 14 countries involved, in the Pacific and Atlantic Oceans.

### **Contracts/awards**

1996-1998: ISAC-CNR and at ENEA (Italy).  
1998-2001: ISAC-CNR, Rome (Italy).  
2001-2003: CNRS (France).  
2003-2009: SZN (Italy) (Contract)  
2007-2012 Visiting scientist at Princeton University (two weeks per year)  
2009-present: SZN, Napoli (Italy)

### **Outreach**

Several outreach events on newspapers, national radio and TV broadcasters.  
Since January 2021, regular weekly broadcast on RAI Isoradio (within "La temperatura della terra")

### **International working groups and advisory boards**

- Member for Italy of the G7 Expert working group "Future of the Seas and Oceans" (2016- on). Co-ordination of Action 1: "Support the development of a global initiative for an enhanced, global, sustained sea and ocean observing system" and of the Sub-Action on Augmented Marine Observatories.
- Member of the coordination team of the international Consortium Tara Oceans since 2009 (it has managed > 60M Euro)
- Member of the International Advisory Board of the Marine Station D-Smart-MEL (Xiamen, China) (2019-ongoing)
- Member of the International Advisory Board of EMBRC-France (2019-2022)

### **Editorial and review activities**

Reviewer for several journals and national agencies and for the European Science Foundation.  
Editorial article for Nature Geoscience (27/01/2020)

### **Workshops (organization)**

"Environmental changes and the evolution of marine Ecosystems", in "Atelier de Reflexion Prospective", French ANR and Tara OCEANS (<http://oceans.taraexpeditions.org>), June 6-7 2011.  
TARA physical and biogeochemical oceanography, May 2012.

“Biogeography, DNA regionalisation and mutations”, Ischia, April 2016.

“Briefing and alignment event on European Regional Genomic Observatories: operationalizing omics & eDNA in regional ocean observation”, virtual, November 2020.

**Invited speaker / chair at over 20 institutions or meetings.**

### **Mentoring**

Co-supervision of 2 master thesis

Supervision of 3 PhD plus one on going.

Supervision of 8 postdocs.

External examiner for 4 French PhD and one for the University of Tasmania, Australia.<sup>[1]</sup><sub>[SEP]</sub>

Participated to French 5 thesis committees

### **Projects**

Participation to over 25 national and international projects (EU, France, US)

Since 2017:

PI (with Dr. Civitarese) of the MIUR NExt generation Marine Observatories project. Budget: 1.2M Euro.

EU H2020 “Eurosea” (BG07-B, 2020-2024). Task leader and SZN team leader. SZN: 220K Euro.

EU H2020 “TechOceanS” (BG07-C, 2020-2024). Task leader and SZN team leader. SZN: 400K Euro.

PI of the H2020 EU AtlantECO (Atlantic ECOsystems assessment, forecasting & sustainability) project. EU grant 862923: 2020-2024. 36 partners (EU, Brazil and South Africa; <https://www.atlanteco.eu/>). Budget: 10.932.573 Euro.

### **Teaching**

Fixed term Professor (one year) at the University Federico II (Naples): “Principles of Oceanography” course within the Master “Laurea Mare” (2020-2021).

### **Publications**

*I'm the author of > 100 scientific articles on international (ISI) journals (six in Science and two in Nature, in addition to papers in Cell, PNAS, ISMEJ, Nature Geosciences and Annual review of Marine Science), 9 proceedings (with peer review), a policy brief and of one book chapter.*

H-index (Google Scholar; 6/09/2023): 44

Citations (Google Scholar; 6/09/2023): 16.036

**D. Iudicone** (male), a physicist, has extended the theory of oceanic water masses formation to the ocean biogeochemistry (including carbon). He directed large-scale, multidisciplinary studies merging oceanography with ecology, genomics and chemistry. A coordinator of the Tara Oceans 3-year global survey, during the G7 group activities he developed the concept of genomic “augmented observatory”, which inspired two EU Flagship calls (Blue Growth 07bc), the EMBRC observatory network EMOBON and gave him a role as adviser in various international contexts. This deep integration between oceanography, laboratories and data science served to also design a new Augmented Observatory, NEREA, in the Gulf of Naples made of monthly mini-cruises with full genomics. It has already attracted 1.3M Euro. He then translated these innovative approaches into a large scale EU program for assessing the Atlantic microbiome health (AtlantECO.eu), started in September 2020. He is also the scientific director (with the CNRS) of the flagship expedition Mission Microbiomes, 21 months of highly advanced genomic sampling across two oceans.

## Selected publications

- de Boyer Montégut, C., G. Madec, A. S. Fischer, A. Lazar, **Iudicone D. (IT)** (2004) Mixed layer depth over the global ocean: An examination of profile data and a profile-based climatology. *J. Geophys. Res.*, 109, C12003, doi:10.1029/2004JC002378. WOS:000225585400002  
. WOS:000280006100005
- Liccardo A., Fierro A., **Iudicone D. (IT)**, Bouruet-Aubertot P. & Dubroca L. (2013) Response of the deep chlorophyll maximum to fluctuations in vertical mixing intensity. *Progress in Oceanogr.* 109:33-46, 10.1016/j.pocean.2012.09.004. WOS:000315059200003
- Pascual A., Ruiz S., Buongiorno Nardelli B., Guinehut S., **Iudicone D. (IT)** & Tintoré J. (2015) Net primary production in the Gulf Stream sustained by quasi-geostrophic vertical exchanges, *Geophys. Res. Lett.* 42:441–449, doi:10.1002/2014GL062569. WOS:000349956000033
- Maffucci F., Corrado R., Palatella L., Borra M., Marullo S., Hochscheid S., Lacorata G. & **Iudicone D. (IT)** (2016) Seasonal heterogeneity of ocean warming: a mortality sink for ectotherm colonizers, *Scientific Reports*, 6, doi:10.1038/srep23983 (D. Iudicone is a contact author). WOS:000373373600001
- Lacour, L., Ardyna, M., Stec, K. F., Claustre, H., Prieur, L., Poteau, A., Ribera D'Alcalà M. & **Iudicone, D. (IT)** (2017) Unexpected winter phytoplankton blooms in the North Atlantic subpolar gyre. *Nature Geoscience*, doi:10.1038/ngeo3035. WOS:000414031600013
- Amato, A., Dell'Aquila, G., Musacchia, F., Annunziata, R., Ugarte, A., Maillet, N., Iudicone D. (IT) Ferrante, M. I. (2017). Marine diatoms change their gene expression profile when exposed to microscale turbulence under nutrient replete conditions. *Scientific Reports*, 7:3826.
- Buongiorno Nardelli, B., Mulet, S., **Iudicone, D. (IT)** (2018). Three-Dimensional Ageostrophic Motion and Water Mass Subduction in the Southern Ocean. *J. of Geophys. Res. Oceans*, 123(2), 1533-1562. WOS:000427970400047
- Groeskamp, S., Griffies, S. M., **Iudicone, D. (IT)**, Marsh, R., Nurser, A. G., & Zika, J. D. (2019). The water mass transformation framework for ocean physics and biogeochemistry. *Annual review of marine science*, 11, 271-305. WOS:000456386600013. WOS:000456386600013
- Watteaux, R., Sardina, G., Brandt, L., & **Iudicone, D. (IT)** (2019). On the time scales and structure of Lagrangian intermittency in homogeneous isotropic turbulence. *Journal of Fluid Mechanics*, 867, 438-481. WOS:000462506900001
- Annunziata, R., Mele, B. H., Marotta, P., Volpe, M., Entrambasaguas, L., Mager, S., Stec, K., Ribera d'Alcalà, M., Sanges, R., Finazzi, G., **Iudicone, D. (IT)**, Montresor, M., & Ferrante, M. I. (2022). Trade-off between sex and growth in diatoms: Molecular mechanisms and demographic implications. *Science Advances*, 8(3), eabj9466.

81. Sunagawa, S., Acinas, S.G., Bork, P. *et al.* *Tara Oceans: towards global ocean ecosystems biology*. *Nat Rev Microbiol* 18, 428–445 (2020). <https://doi.org/10.1038/s41579-020-0364-5> (IF: 34.648)