

II- Curriculum Vitae

Dr. Zouhair Lachkar
Senior Scientist
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Education

2007	Ph.D.	Oceanography, Pierre & Marie Curie University, Paris, France
2002	M.Sc.	Atmosphere, Ocean & Environment, Paul Sabatier University, Toulouse, France
	M.Sc.Eng.	Meteorology, Ecole Nationale de Météorologie (ENM), Toulouse, France
	M.Sc.Eng.	Meteorology & Environment, Hassania Institute of Civil Engineering (EHTP), Casablanca, Morocco

Positions

Dec 2014- present	Senior research scientist, Center for Prototype Climate Modeling, New York University Abu Dhabi, Abu Dhabi, UAE.
Aug 2014- Dec 2014	Visiting scientist, Courant Institute of Mathematical Sciences, New York University, New York, USA.
2010-2014	Lecturer (oberassistent), Environmental Physics, ETH Zurich, Zurich, Switzerland.
2007-2010	Postdoctoral Fellow, Environmental Physics, ETH Zurich, Zurich, Switzerland.
2003-2007	Research Associate, Laboratoire des Sciences du Climat et de l'Environnement, Saclay, France.
2002-2003	Meteorologist, Moroccan Weather Service, Casablanca, Morocco.

Main Areas of Research

Ocean biogeochemical modeling; Ocean circulation; Mesoscale eddies; Climate change; Marine carbon cycle; Ocean deoxygenation; Oxygen minimum zones; Ocean acidification; Coastal upwelling systems; Marine biological productivity.

Awards and Recognition

- Swiss NSF grant (co-PI), project N 200021_149384, US\$450 000, (2013-2017).
- Keynote speaker (Gordon Research Conference (GRC), International Liege Colloquium on Ocean Dynamics, ASLO Ocean Sciences Meeting, EGU General Assembly meeting)
- Invited talk at NYUAD institute (Oct 2019): [Oceans Under Climate Stress Warming Up, Losing Breath, Turning Sour](#)
- Conference session chair (Open Science Conference, Bergen, Norway, 2014; ASLO Ocean Sciences Meeting, CA, USA, 2020).
- Member of the RECCAP2 (REgional Carbon Cycle Assessment and Processes- phase 2) initiative (2019-).
- Associate Editor for Frontiers in Marine Science - Marine Biogeochemistry (2021).
- Guest Editor for Deep Sea Research journal (2020-2021).
- Top 10% most downloaded paper 2019 (Geophysical Research Letters)
- IMBER (Integrated Marine Biosphere Research) Best Young Scientist award (2010).
- CEA Fellowship from the French Atomic Energy Authority, awarded for Ph.D. research (2003-2007).
- BGF award , French Government excellence scholarship (2000-2002).
- Regular reviewer for research journals (Nature Geosciences, Geophysical Research Letters, Deep Sea Research, Progress in Oceanography, Global Biogeochemical Cycles...) and research proposals (NSF, NOAA, French ANR, German DFG,...).

Mentoring & Teaching Experience

2015-2019	Supervisor of 3 research associates (D. Hailegeorgis, M. Salim, M. Futui) Advisor for 3 postdoctoral researchers (M. Al Azhar, A. de Verneil, P. Vallivattathillam)
2010-2015	Supervisor of 4 Master's theses (C. Rieper, Q. Shuangyi, P. Pika, F. Lacroix) co-Supervisor of 2 PhD thesis projects (G. Turi, E. Lovecchio)
Feb 2015	Lecturer at NIO winter school on marine mathematical modeling, Goa, India
2012-2014	Coordinator of "Systems Analysis", Environmental Sciences Department, ETH Zurich, [Bachelor Level]
2010-2012	Lecturer for "Global Biogeochemical Cycles and Climate", Environmental Sciences Department, ETH Zurich, [Master Level]
2009-2012	Tutor for "Term paper in Biogeochemistry and Pollutant Dynamics", Environmental Sciences Department, ETH Zurich, [Master Level]

Research Impact

(source Google Scholar Feb 2021)

Number of publications: 35

Number of citations: 1487

H-index: 19

i10-index: 23

Press coverage

- January 23, 2020: Shifting Desert Winds Could Turn Arabian Fisheries Barren, [Al Fanar Media](#)
- October 28, 2019: No Oxygen, No Life Feature, [The Sustainabilist Magazine, October Issue](#)
- September 26, 2019: Desert dust is key to sustaining marine ecosystem, [Dubai Gazette](#)
- September 25, 2019: Desert dust is key to sustaining Arabian Sea's marine ecosystem: Study [Emirates News Agency](#)
- September 25, 2019: Desert dust sustains life in Arabian Sea, UAE research finds [Khaleej Times](#) | [NYUAD Press Release](#)
- June 16, 2019: World's largest marine dead zone may reach UAE's shores, [The National](#)
- June 16, 2019: NYUAD researchers look into Arabian Sea dead zone expansion, [Gulf News UAE](#)
- May 29, 2019: Global warming could enlarge world's largest dead zone, [Nature Middle East](#)
- July 17, 2018: Expanding 'dead zone' in Arabian Sea raises climate change fears, [Arabian Business](#) | [Yahoo News](#) | [France 24](#) | [Gulf News](#) | [Physics.org](#) | [The Straits Times](#)

Journal Publications (peer reviewed)

- **Lachkar, Z.**, Anticipated effects of climate change on Gulf marine ecosystem, *Geophysical Research Letters*, in prep.
- De Verneil, A., **Lachkar, Z.**, Smith, S., Levy, M., Evaluating the Arabian Sea as a regional source of atmospheric CO₂: seasonal variability and drivers, *Biogeosciences Discuss.*, submitted.
- Vallivattathillam, P., Suresh, I., Lengaigne, M., Vialard, J., Izumo, T., Sadhvi, K., **Lachkar, Z.**, and Uskaikar, H., Mechanisms of the Southern Arabian Sea summer Primary Productivity weakening in response to anthropogenic forcing in CMIP5 models, *Journal of Geophysical Research, Biogeosciences*, submitted.
- Shinoda, T., Jensen, T., G., **Lachkar, Z.**, Masumoto, Y., Seo, H., Modeling the Indian Ocean, Chapter in *The Indian Ocean and its role in the global climate system*, Elsevier, submitted.
- Hood, R., R., Rixen, T., Levy, M., Hansell, D., **Lachkar, Z.**, Huggett, J., Indian Ocean Biogeochemistry and pH variability, Chapter in *The Indian Ocean and its role in the global climate system*, Elsevier, submitted.
- Levy, M., Resplandy, L., Palter, J., B., Couespel, D. and **Lachkar Z.**, The crucial contribution of mixing to present and

future ocean oxygen distribution, Chapter in Ocean mixing - Drivers, Mechanisms and Impacts, Elsevier, accepted.

- **Lachkar, Z.**, Mehari, M., Al Azhar M., M. Levy and Smith, S., Fast local warming of sea-surface is the main factor of recent deoxygenation in the Arabian Sea, *Biogeosciences Discuss.*, doi: 10.5194/bg-2020-325, 2020.
- Rixen, T., Cowie, G., Gaye, B., Goes, J., do Rosario Gomes, H., Hood, R., R., **Lachkar, Z.**, Schmidt, H., Segschneider, J., and Singh, A., Reviews and syntheses: Present, past, and future of the oxygen minimum zone in the northern Indian Ocean, *Biogeosciences*, 17, 6051-6080, doi:10.5194/bg-17-6051-2020, 2020.
- Hailegeorgis D., **Lachkar Z.** Rieper C., and N. Gruber, A Lagrangian study of the contribution of the Canary upwelling to the nitrogen budget of the open North Atlantic, *Biogeosciences*, doi:10.5194/bg-17-1-2020, 2020.
- Guieu C. Al Azhar M., Aumont O., Mahowald N., Levy M., Ethe C. and **Lachkar Z.**, Major impact of dust deposition on the productivity of the Arabian Sea, *Geophysical Research Letters*, doi:10.1029/2019GL082770, 2019.
- **Lachkar, Z.**, Smith, S. and M. Levy, Strong intensification of the Arabian Sea Oxygen Minimum Zone in response to Arabian Gulf warming, *Geophysical Research Letters*, doi:10.1029/2018GL081631, 2019.
- **Lachkar, Z.**, Levy, M. and S. Smith, Intensification and deepening of the Arabian Sea Oxygen Minimum Zone in response to increase in Indian monsoon wind intensity, *Biogeosciences*, 15, 159-186, 2018.
- Al Azhar M., **Lachkar, Z.**, Levy, M. and Smith, S.: Oxygen minimum zone contrasts between the Arabian sea and Bay of Bengal implied by differences in remineralization depth, *Geophysical Research Letters*, doi: 10.1002/2017GL075157, 2017.
- Lovecchio, E., Gruber, N., Münnich, M., and **Lachkar, Z.**: On the long-range offshore transport of organic carbon from the Canary Upwelling System to the open North Atlantic, *Biogeosciences*, 14, 3337-3369, doi:10.5194/bg-14-3337-2017, 2017.
- **Lachkar, Z.**, S. Smith M. Levy and O. Pauluis: Eddies reduce denitrification and compress habitats in the Arabian Sea, *Geophysical Research Letters*, doi: 10.1002/2016GL069876, 2016.
- Turi, G., N., Gruber, **Z., Lachkar** and M. Münnich: Climatic modulation of recent trends in ocean acidification in the California Current System, *Environmental Research Letters*, doi:10.1088/1748-9326/11/1/014007, 2016.
- Nagai, T., N. Gruber, H. Frenzel, **Z. Lachkar**, J. C. McWilliams and G.-K. Plattner: Dominant role of eddies and filaments in the offshore transport of carbon and nutrients in the California Current System, *Journal of Geophysical Research Oceans*, doi: 10.1002/2015JC010889, 2015.
- Levin, L., Liu, K.-K., Emeis, K.-C., Breitburg, D.-L., Cloern, J., Deutsch, C., Giani, M., Goffart, A., Hofmann, E. E., **Lachkar, Z.** et al., Comparative biogeochemistry–ecosystem–human interactions on dynamic continental margins, *Journal of Marine Systems*, doi:10.1016/j.jmarsys.2014.04.016, 2014.

- Fendereski, F., M. Vogt, M. R. Payne, **Z. Lachkar**, N. Gruber, A. Salmanmahiny, and S. A. Hosseini: Biogeographic classification of the Caspian Sea, *Biogeosciences*, 11, 6451-6470, doi:10.5194/bg-11-6451-2014, 2014.
- **Lachkar, Z.**: Effects of upwelling increase on ocean acidification in the California and Canary Current systems, *Geophysical Research Letters*, doi: 10.1002/2013GL058726, 2014.
- G. Turi, **Lachkar, Z.** and Gruber., N.: "Spatiotemporal variability and drivers of pCO₂ and air-sea CO₂ fluxes in the California Current System: An eddy-resolving modeling study", *Biogeosciences*, 11, 671-690, doi:10.5194/bg-11-671-2014, 2014.
- Salihoglu, B., Neuer, S., Painting, S., Murtugudde, R., Hofmann, E. E., Steele, J. H., Hood, R. R., Legendre, L., Lomas, M. W., Wiggert, J., Ito, S., **Lachkar, Z.**, Hunt, G., Drinkwater, K. F., Sabine, C. L. (2013): Bridging marine ecosystem and biogeochemistry research: Lessons and recommendations from comparative studies, *J. Mar. Syst.*, Volumes 109–110, Pages 161-175, 2013.
- **Lachkar, Z.**, and N. Gruber, Response of biological production and air-sea CO₂ fluxes to upwelling intensification in the California and Canary Current Systems, *J.Mar. Syst.*, Volumes 109–110, Pages 149-160, doi:10.1016/j.jmarsys.2012.04.003, 2013.
- Hauri, C., Gruber, N., Vogt, M., Doney, S. C., Feely, R. A., **Lachkar, Z.**, Leinweber, A., McDonnell, A. M. P., Munnich, M., and Plattner, G.-K., Spatiotemporal variability and long-term trends of ocean acidification in the California Current System, *Biogeosciences*, 10, 1-21, 2013.
- **Lachkar, Z.**, and Gruber. N.: A comparative study of biological production in eastern boundary upwelling systems using an artificial neural network, *Biogeosciences*, 9, 293-308, 2012.
- Gruber, N., Hauri, C., **Lachkar, Z.**, Loher, D., Frolicher, T., L., and Plattner, G.K.: Rapid Progression of Ocean Acidification in the California Current System, *Science*, vol 337, 6091, pp. 220-223, doi: 10.1126/science.1216773, 2012.
- Gruber, N., **Z. Lachkar**, H. Frenzel, P. Marchesiello, M. Münnich, J. C. McWilliams, T. Nagai, and G.-K. Plattner, Eddy-induced reduction of biological production in eastern boundary upwelling systems, *Nature Geoscience*, 4, 11, 787-792, doi:10.1038/ngeo1273, 2011.
- **Lachkar, Z.**, and Gruber., N., What controls biological production in coastal upwelling systems? Insights from a comparative modeling study, *Biogeosciences*, 8, 2961-2976, 2011.
- **Lachkar, Z.**, Orr, J.C., Dutay, J.C., and Delecluse, P., On the role of mesoscale eddies in the ventilation of Antarctic Intermediate Water, *Deep Sea Research I*, vol 56, 6, 909-925, 2009.
- **Lachkar, Z.**, Orr, J.C. and Dutay, J.C, Seasonal and mesoscale variability of oceanic transport of anthropogenic CO₂, *Biogeosciences*, 6, 2509-2523, 2009.
- Leloup, J., **Lachkar, Z.**, Boulanger, J. P., and Thiria, S., Detecting decadal changes in ENSO using neural networks, *Climate*

Dynamics, Vol 28, 2-3, 147-168, doi:s00382-006-0173-1, 2007.

- **Lachkar, Z.**, Orr, J.C., Dutay, J.C., and Delecluse, P., Effect of mesoscale eddies on global ocean distributions of CFC-11, C-14, and CO₂, *Ocean Science*, 3, 461-482, 2007.

Other Publications

- G Turi, **Z Lachkar**, M Münnich, N Gruber, D Loher, "Recent climatic changes enhance ongoing ocean acidification in the California Current System", *IMBER Update Newsletter*, 2014.
- **Z. Lachkar** and N. Gruber: "Exploring the Future Evolution of Multiple Stressors in Eastern Boundary Upwelling Systems", *Ocean Carbon and Biogeochemistry News*, vol 5, N2, 2012.
- S. Alin, S. Siedlecki, B. Hales, J. Mathis, W. Evans, M. Stukel, G. Gaxiola-Castro, J. M. Hernandez-Ayon, L. Juranek, M. Goñi, G. Turi, J. Needoba, E. Mayorga, **Z. Lachkar**, N. Gruber, J. Hartmann, N. Moosdorf, R. Feely, F. Chavez : "Coastal Carbon Synthesis for the Continental Shelf of the North American Pacific Coast (NAPC): Preliminary Results", *Ocean Carbon and Biogeochemistry News*, vol 5, N1, 2012.
- **Z. Lachkar** and N. Gruber: "Biological Production Response to Coastal Upwelling Intensification: Insights from a Comparative Modeling Study", *IMBER Update Issue 16* , 2010.
- Hauri, C., N. Gruber, **Z. Lachkar**, and G. K. Plattner, "Accelerated acidification in eastern boundary current systems", *Geochim. Cosmochim. Acta*, 73(13), A503–A503, 2009.
- **Z. Lachkar**, "Rôle des tourbillons de méso-échelle océaniques dans les flux air-mer de CO₂ anthropique à l'échelle globale", Thèse de l'université Paris 6 Pierre et Marie-Curie, 2007.
- J.-M. Molines, A.M. Treguier, B. Barnier, L. Brodeau, J. Le Sommer, G. Madec, T. Penduff, S. Theetten, Y. Drillet, C. Talandier, J. Orr, and **Z. Lachkar**, "Le modèle DRAKKAR de la variabilité océanique globale, 1958-2004", *IDRIS Newsletter*, 2006.
- **Z. Lachkar**, "Classification des évènements El Nino par des méthodes neuronales", Mémoire d'Ingénieur, Ecole Nationale de la Météorologie et Université Paul Sabatier - Toulouse III, 2002.

International Conferences

- **Z. Lachkar**, M. Mehari, M. Azhar, M., Levy, S. Smith, "Regional ocean deoxygenation in the Indian Ocean", ASLO Ocean Sciences meeting 2020, San Diego, Ca., USA.

- **Z. Lachkar**, M. Levy, S. Smith, “Ocean deoxygenation in the Arabian Sea, quantifying the recent trends and exploring their drivers”, EGU General Assembly 2019, Apr 2019, Vienna, Austria.
- **Z. Lachkar**, M. Levy, S. Smith, “Strong intensification of the Arabian Sea oxygen minimum zone in response to Arabian Gulf warming”, Ocean Deoxygenation Conference, Sep 2018, Kiel, Germany.
- **Z. Lachkar**, “Dynamics of Oxygen Minimum Zones: Role of Downward Fluxes of Organic Matter”, GRC conference on ocean biogeochemistry, Jul 2018, Hong Kong.
- **Z. Lachkar**, S. Smith, M. Levy, “Intensification of the Arabian Sea oxygen minimum zone driven by warming of the Red Sea and the Arabian Gulf”, EGU General Assembly 2018, Apr 2018, Vienna, Austria.
- **Z. Lachkar**, M. Levy, S. Smith, “Intensification and deepening of the Arabian Sea Oxygen Minimum Zone in response to increase in Indian monsoon wind intensity”, EGU General Assembly 2017, Apr 2017, Vienna, Austria.
- **Z. Lachkar**, S. Smith, M. Levy, “Effects of mesoscale eddies on the dynamics of the Arabian Sea oxygen minimum zone”, GRC conference on ocean biogeochemistry, Jun 2016, Hong Kong.
- **Z. Lachkar**, S. Smith, M. Levy, O. Pauluis, “Effects of mesoscale eddies on suboxia and hypoxia in the Arabian Sea”, Ocean Sciences Meeting, Feb 2016, New Orleans, USA.
- **Z. Lachkar**, S. Smith, M. Levy, O. Pauluis, “Eddies deepen suboxia and reduce denitrification in the Arabian Sea”, Indian Ocean Symposium, Dec 2015, Goa, India.
- **Z. Lachkar**, “Exploring the dynamics of the Arabian Sea oxygen minimum zone in O2 coordinates ”, Workshop on thermodynamic analysis for atmospheric and oceanic flows, Jan. 2016, Abu Dhabi, UAE.
- **Z. Lachkar**, “Introduction to marine biogeochemical modeling”, Feb. 2015, NIO winter school, Goa, India.
- **Z. Lachkar**, “Effects of Climate Forcing on Ocean Acidification and De-oxygenation in Eastern Boundary Upwelling Systems: Insights from Regional Eddy-Resolving Simulations”, Seminar at Princeton University, Sep. 2014, USA.
- **Z. Lachkar**, “The evolution of multiple stressors in the Canary upwelling system over the 21st century”, IMBER Future Oceans Conference, Jun. 2014, Bergen, Norway.
- **Z. Lachkar**, “Eastern Boundary upwelling systems (EBUS) as natural SOLAS laboratories”, Keynote talk at the 46th International Liège Colloquium on Ocean Dynamics, May 2014, Liège, Belgium.
- **Z. Lachkar**, “Cross shelf exchange of carbon, nitrogen and oxygen in Eastern Boundary Upwelling Systems”, Gordon Research Conference on coastal ocean circulation, Jun. 2013, Biddeford, ME, USA.
- **Z. Lachkar** and N. Gruber, “Modeling multiple stressors in eastern boundary upwelling systems”, IMBIZO-3 meeting, 30 January 2013, Goa, India.
- **Z. Lachkar** and N. Gruber, “The future evolution of multiple stressors in eastern boundary upwelling systems”, SOLAS MTS Workshop, 27 November 2012, Lima, Peru.
- **Z. Lachkar**, “How do ocean mesoscale eddies affect biogeochemical processes? Insights from model simulations and satellite observations”, SOLAS MTS Workshop, 28 November 2012, Lima, Peru.

- **Z. Lachkar** and N. Gruber, "The future coastal ocean: the impact of increased stratification on biological production and carbon cycling", EGU General Assembly 2012, Vienna, Austria.
- **Z. Lachkar** and N. Gruber, "The future of coastal upwelling ecosystems: the impact of potential wind changes on ocean acidification and coastal hypoxia", EGU General Assembly 2012, Vienna, Austria.
- **Z. Lachkar**, N. Gruber, and G. Turi: "The future of eastern boundary upwelling systems: potential changes and vulnerabilities", ASLO Aquatic Sciences Meeting, San Juan, Puerto Rico, Feb. 2011.
- **Z. Lachkar** and N. Gruber "Biological production response to coastal upwelling intensification: insights from a comparative modeling study", IMBER IMBIZO2 meeting, Crete, Greece, Oct. 2010.
- **Z. Lachkar**, N. Gruber and C. Hauri "Carbon and nutrient recycling in Eastern Boundary Upwelling Systems", OSM, Portland, OR, USA, Feb. 2010.
- **Z. Lachkar**, N. Gruber and G. K. Plattner: "Modeling the coastal carbon cycle with an emphasis on Eastern Boundary Upwelling Systems", Coastal Carbon Cyc. Workshop, Paris, France, Jun. 2009.
- **Z. Lachkar**, N. Gruber, G. -K. Plattner, and C. Hauri: "Coastal upwelling systems under changing climate and high CO₂", EGU General Assembly 2009, Vienna, Austria, Apr. 2009.
- **Z. Lachkar**, N. Gruber, G. -K. Plattner, and C. Hauri: "The future coastal ocean: the impact of acidification and wind changes on coastal productivity and carbon cycling", ASLO Aq. Sc. Meeting, Nice, France, Jan. 2009.
- **Z. Lachkar**, N. Gruber, G. -K. Plattner, and F. Hartmut: "Can eddies alter the response of productivity in EBCs to increases in upwelling favorable winds?", 2008 ROMS European workshop, Grenoble, France, Oct. 2008.
- **Z. Lachkar**, N. Gruber, G. K. Plattner, and D. Loher: « Biological productivity in Eastern Boundary Current systems: a comparative study », Eastern Boundary Upwelling Ecosystems Symposium, Gran Canaria, Jun. 2008.
- **Z. Lachkar**, N. Gruber, G. K. Plattner, and D. Loher: « What controls biological productivity in Eastern Boundary Current systems? », Ocean Sciences Meeting 2008, Orlando, Florida, Mar. 2008.
- **Z. Lachkar**, N. Gruber, G. -K. Plattner, and D. Loher : "Coastal biogeochemical processes and ocean carbon cycling in Eastern Boundary Current systems", EURO-OCEAN 2007 Upwelling Systems Workshop, Santiago de Compostella, Spain, Oct. 2007.
- **Z. Lachkar**, N. Gruber, G. -K. Plattner, and F. Hartmut: "Biological productivity in Eastern Boundary Current systems: the Canary vs the California Current system", 2007 ROMS/TOMS users workshop, UCLA, Los Angeles, Oct. 2007.
- **Z. Lachkar**, J.C. Orr, J.C. Dutay, and P. Delecluse: "Antarctic Intermediate Water Formation and Anthropogenic CO₂ Uptake", EGU General Assembly, Vienna, Austria, Apr. 2007
- **Z. Lachkar**, J.C. Orr, J.C. Dutay, and P. Delecluse: "Role of mesoscale eddies in ocean global distributions of CFC-11, C14, and CO₂", Seminar at IFM-GEOMAR, Kiel, Germany, Sept. 2006
- **Z. Lachkar**, J.C. Orr, J.C. Dutay, and P. Delecluse: "High resolution modelling of marine carbon cycle", Seminar at the Swiss Federal Institute of Technology, Zurich, Switzerland, Aug. 2006
- **Z. Lachkar**, J.C. Orr, J.C. Dutay, and P. Delecluse: "Effect of ocean mesoscale eddies on global distributions of CFC-11, C-14, and CO₂", EGU General Assembly, Vienna, Austria, Apr. 2006

- **Z. Lachkar**, J.C. Orr, J.C. Dutay, and P. Delecluse: “Role of Ocean Mesoscale Eddies in Global-scale Uptake, Storage, and Meridional Transport of CFC-11, Bomb-C14, and Anthropogenic CO₂”, AGU Ocean Sciences Meeting, Honolulu, Hawaii, Feb. 2006
- **Z. Lachkar**, J.C. Orr, J.C.: “Importance of eddies in absorption and transport of CFC-11 & C-14”, 3 rd DRAKKAR meeting, Grenoble, France, Jan. 2006
- **Z. Lachkar**, J.C. Orr, J.C.: “Tracers in OPA9 model”, DRAKKAR meeting, Grenoble, France, 2005
- **Z. Lachkar**, J.C. Orr, J.-C. Dutay: “CFC-11 simulations in the global model ORCA05: preliminary results”, DRAKKAR meeting, Kiel, Germany, Sept. 2004
- **Z. Lachkar**, S. Thiria, J.-P. Boulanger, and C. Menkes: “Classifying El Nino and La Nina events using the Kohonen maps”, AMS 3rd Conference on Artificial Intelligence Applications to the Environmental Sciences, February, Long Beach, CA, Feb. 2003.

Other Skills & Competencies

Languages:	Arabic (mother tongue), English (fluent), French (fluent), German (basic)
Computer Science:	Matlab, Fortran 77/90, Python, Unix/Linux, Linux cluster, Ferret, R, Latex
Mathematical Modeling:	Numerical Modeling (e.g., ROMS, NEMO), Machine Learning (e.g., neural networks, self-organizing maps), Lagrangian Modeling, Dynamical Systems Theory