Chia-Te Chien 簡嘉德

Curriculum Vitae

GEOMAR Helmholtz Centre for Ocean Research Kiel
Kiel, Germany

+886-910852610
cchien@geomar.de

Professional Experiences

2021 ~ Present	**GEOMAR - Helmholtz Centre for Ocean Research Kiel** Research Scientist, Earth System Climate Modelling
2017 ~ 2021	**GEOMAR - Helmholtz Centre for Ocean Research Kiel** Postdoc researcher, Earth System Climate Modelling

Education

2017	**University of California, Santa Cruz** Ph.D., Department of Earth and Planetary Sciences Advisor: Dr. Adina Paytan
2010 ~ 2011	**National Central University** Ph.D. student, International Graduate Program for Earth System Science between National Central University and Academia Sinica
2006	**National Taiwan University** M.S., Graduate Institute of Photonics and Optoelectronics Engineering
2004	**National Cheng Kung University** B.S., Department of Earth Sciences

Employment

2009 ~ 2010	Research Center for Environmental Changes, Academia Sinica Research assistant
2007 ~ 2009	United Microelectronics Corporation (UMC) R&D engineer

Research interests

- Combine field experiments and modelling skill to better understand the effects of environmental changes and human activities on global carbon cycle.
- Effect of variable phytoplankton stoichiometry on the marine biogeochemistry in the paleo, present, and future climates.

- Understand the role of marine biogeochemistry in our Earth climate system and its fate in the Anthropocene.

Awards and Grants

- **German Research Foundation (DFG)-funded project as a principal investigator (Eigene Stelle) for 3 years. (222,300 EUR)** (2021)
- **North German Supercomputing Alliance-funded project: Integration and simulation of marine biogeochemistry within an Earth system model. (78,000 EUR)** (2021)
- Friends of the Long Marine Lab Award (500 USD) (2014)
- Student Travel Award, ASLO, Aquatic Sciences Meeting (500 USD) (2013)
- Charles A. Lawson and Jennifer Denney Lawson Student Award in Hydrology, Earth and Planetary Sciences at UCSC (1000 USD) (2012)
- **The scholarship of government sponsorship for overseas study (教育部公費留學) (30000 USD tuition and 17000 USD living expenses per year for 3 years)** (2011-2014)
- Taiwan International Graduate Program scholarship 1000 USD per month (2010-2011)

Research experience

2011-2016	Graduate Student Researcher
2015	International experience for students in coastal zone research in Israel
2013/2014	GEOTRACES Western Philippine Sea Pb isotope project
Feb 2012	Field work, Barbados
Research cruises:	
2014	ORV, Western Philippine Sea. GEOTRACES cruise, 10 days
2013	ORV, Western Philippine Sea. GEOTRACES cruise, 10 days
2010	ORI, South China Sea. 10 days

Computing and Lab skills

- Fortran
- MATLAB
- Ferret
- R
- High resolution inductively coupled plasma mass spectrometer (HR-ICPMS) Thermo-XR
- Inductively coupled plasma optical emission spectrometer (ICP-OES)
- Multi-collector inductively coupled plasma mass spectrometer (MC-ICP-MS) Neptune
- Thermal ionization mass spectrometer (TIMS) VG Sector 54
- Flow Cytometer BD Influx

- Flow-injection nutrient analyzer LACHAT
- High pressure liquid chromatography (HPLC) DIONEX ICS-2000 system
- Clean room and trace metal analyses

Teaching experience

Spring 2019 / 2020 / 2021 / 2022	**Teaching Assistant and lecturer**, GEOMAR Biological Modelling
Winter 2015 / Spring 2016	**Teaching Assistant**, UCSC, Santa Cruz, CA EART 1: Oceanography
Winter 2016 / Fall 2016	**Teaching Assistant**, UCSC, Santa Cruz, CA EART 105: Coastal Geology
Fall 2015	**Teaching Assistant**, UCSC, Santa Cruz, CA EART 110A: Evolution of the Earth Lab

Outreach

October 2012 — **Expanding Your Horizons Workshop**, Salinas CA
Encouraged young girls in middle and high school to pursue scientific studies. Introduced them to the water cycle, nutrient pollution as well as other environmental issues.

Professional service

Journal review:

- Nature Geosciences
- Nature Communications
- Atmosphere
- Journal of Geophysical Research
- Marine Chemistry
- Marine Geology
- Talanta

Publications

In preparation

- Li, Na., C. Somes, A. Landolfi, **C.-T. Chien**, M. Pahlow, M. Schartau, and Andreas Oschlies. Global impact of benthic denitrification on diazotroph physiology and N_2 fixation rates. (In preparation)
- **Chien, C.-T.**, M. Pahlow, M. Schartau, N. Li, C. Somes, A. Landolfi, and A. Oschlies. Variable phytoplankton stoichiometry strengthens homeostasis of ocean biogeochemistry. (In preparation)

In revision

- **Chien, C.-T.**, M. Pahlow, M. Schartau, N. Li, and A. Oschlies. Effects of phytoplankton physiology on global ocean biogeochemistry and climate. (***Science Advances***)

Published

- **Chien, C.-T.**, J. V. Durgadoo, D. Ehlert, I. Frenger, D. P. Keller, W. Koeve, I. Kriest, A. Landolfi, L. Patara, S. Wahl, and A. Oschlies. (2022). FOCI-MOPS v1 - Integration of Marine Biogeochemistry within the Flexible Ocean and Climate Infrastructure version 1 (FOCI 1) Earth system model. *Geosci. Model Dev*., 15, 5987–6024, https://doi.org/10.5194/gmd-15-5987-2022, 2022. (Impact factor 6.56).
- Landolfi, A., A. E. F. Prowe, M. Pahlow, C. Somes, **C.-T. Chien**, M. Schartau, W. Koeve, and A. Oschlies (2021). Can top-down controls expand the ecological niche of marine N2 fixers? *Frontiers in Microbiology*, doi: 10.3389/fmicb.2021.690200 (Impact factor 6.06)
- Kvale, K. F., A. E. F. Prowe, **C.-T. Chien**, A. Landolfi, and A, Oschlies (2021). Zooplankton grazing of microplastic can accelerate global loss of ocean oxygen. *Nature Communications*, 12, 2358, 2021. https://doi.org/10.1038/s41467-021-22554-w (Impact factor 14.92)
- **Chien, C.-T.**, M. Pahlow, M. Schartau, and A. Oschlies (2020). Optimality-Based Non-Redfield Plankton-Ecosystem Model (OPEMv1.1) in the UVic-ESCM 2.9. Part II: Sensitivity Analysis and Model Calibration. *Geosci. Model Dev*., 13, 4691–4712, 2020. https://doi.org/10.5194/gmd-13-4691-2020 (Impact factor 6.56)
- Pahlow, M., **C.-T. Chien**, L. Arteaga, and A. Oschlies (2020). Optimality-Based Non-Redfield Plankton-Ecosystem Model (OPEM v1.1) in the UVic-ESCM 2.9. Part I: Implementation and Model Behaviour. *Geosci. Model Dev*., 13, 4663–4690, 2020. https://doi.org/10.5194/gmd-13-4663-2020 (Impact factor 6.56)
- Kvale, K. F., A. E. F. Prowe, **C.-T. Chien**, A. Landolfi, and A, Oschlies (2020a). The biological microplastic particle sink. *Scientific Reports*. (Impact factor 4.99)
- **Chien, C.-T.**, T. Benaltabet, A. Torfstein, and A. Paytan (2019). Contributions of Atmospheric Deposition to Pb Concentration and Isotopic Composition in Seawater and Particulate Matters in the Gulf of Aqaba, Red Sea. *Environmental Science and Technology*, 53, 6162−6170, doi: 10.1021/acs.est.9b00505 (Impact factor 9.028)
- **Chien, C.-T.**, B. Allen, N.T. Dimova, J. Yang, J. Reuter, G. Schladow, and A. Paytan (2019). Evaluation of atmospheric dry deposition as a source of nutrients and trace metals to Lake Tahoe. *Chemical Geology*, 511, 178-189, https://doi.org/10.1016/j.chemgeo.2019.02.005 (Impact factor 4.015)
- Slovak, N., A. Paytan, J. Rick, and **C.-T. Chien** (2018). Establishing Radiogenic Strontium Isotope Signatures for Chavín de Huántar, Peru. *Journal of Archaeological Science: Reports*, 19, 411-419, https://doi.org/10.1016/j.jasrep.2018.03.014 (Impact factor 1.75)
- **Chien, C.-T.**, T.-Y. Ho, M. E. Sanborn, Q.-Z. Yin, and A. Paytan (2017). Lead concentrations and isotopic compositions in the Western Philippine Sea. *Marine Chemistry*, 189, 10-16, doi: https://doi.org/10.1016/j.marchem.2016.12.007. (Impact factor 3.807)
- Mackey, K. R. M., M. T. Kavanaugh, F. Wang, Y. Chen, F. Liu, D. M. Glover, **C.-T. Chien**, and A. Paytan (2017). Atmospheric and Fluvial Nutrients Fuel Algal Blooms in the East China Sea. *Frontiers in Marine Science*, 4(2), doi: 10.3389/fmars.2017.00002. (Impact factor 3.07)
- **Chien, C.-T.**, K. R. M. Mackey, S. Dutkiewicz, N. M. Mahowald, J. M. Prospero, and A. Paytan (2016). Effects of African dust deposition on phytoplankton in the western tropical Atlantic Ocean off Barbados. *Global Biogeochemical Cycles*, 30(5), 716-734, doi: 10.1002/2015GB005334. (Impact factor 5.703)

- Rahav, E., A. Paytan, **C.-T. Chien**, G. Ovadia, T. Katz, and B. Herut (2016). The Impact of Atmospheric Dry Deposition Associated Microbes on the Southeastern Mediterranean Sea Surface Water following an Intense Dust Storm. *Frontiers in Marine Science*, 3(127), doi: 10.3389/fmars.2016.00127. (Impact factor 3.07)
- Lecher, A. L., **C.-T. Chien**, and A. Paytan (2016). Submarine groundwater discharge as a source of nutrients to the North Pacific and Arctic coastal ocean. *Marine Chemistry*, 186, 167-177, doi: https://doi.org/10.1016/j.marchem.2016.09.008. (Impact factor 2.93)
- Mackey, K. R. M., **C.-T. Chien**, A. F. Post, M. A. Saito, and A. Paytan (2015). Rapid and gradual modes of aerosol trace metal dissolution in seawater. *Frontiers in microbiology*, 5(794), doi: 10.3389/fmicb.2014.00794.
- Mackey, K. R. M., **C.-T. Chien**, and A. Paytan (2014). Microbial and biogeochemical responses to projected future nitrate enrichment in the California upwelling system. *Frontiers in microbiology*, 5(632), doi: 10.3389/fmicb.2014.00632.
- Ho, T.-Y., **C.-T. Chien**, B.-N. Wang, and A. Siriraks (2010). Determination of trace metals in seawater by an automated flow injection ion chromatograph pretreatment system with ICPMS. *Talanta*, 82(4), 1478-1484, doi: 10.1016/j.talanta.2010.07.022.

Conference abstract

- **Chien, C.-T.**, M. Pahlow, M. Schartau, N. Li, and A. Oschlies. (2022). Effects of phytoplankton physiology on global ocean biogeochemistry and climate. (Poster). GEOMAR Science Day 2022.
- **Chien, C.-T**. and M. Pahlow (2021). Optimality-Based Diazotrophy in Different Climate Settings and the Implication to the Marine Nitrogen Cycle. (Oral presentation). Goldschmidt conference 2021.
- **Chien, C.-T**., M. Pahlow, M. Schartau, and A. Oschlies (2020). Decoupling Between N:P Ratios of Particulate Organic Matter and Seawater. (Oral presentation). Ocean Sciences Meeting 2020.
- **Chien, C.-T**., M. Pahlow, M. Schartau, and A. Oschlies (2019). Improved Representation of Biogeochemical Tracer Distributions by An Optimality-Based Non-Redfield Ecosystem Model in the UVic-ESCM. **(**Oral presentation). ASLO Aquatic Sciences Meeting 2019.
- **Chien, C.-T**. M. Pahlow, and A. Oschlies (2018). An Optimality-Based Non-Redfield Ecosystem Model for the UVic-ESCM. Ocean Carbon & Biogeochemistry workshop 2018.
- **Chien, C.-T**. M. Pahlow, and A. Oschlies (2018). An Optimality-Based Ecosystem Model for the UVic-ESCM. International Open Science Conference 2018.
- **Chien, C.-T.** and A. Paytan (2014). Lead Isotopic Composition and Trace Metals in Aerosols for Source Apportionment. American Geophysical Union Fall Meeting 2014.
- **Chien, C.-T.**, T.-Y. Ho, and A. Paytan (2014). Atmospheric Sources of Trace Metals and Pb Isotopic Compositions in the Western Philippine Sea. ASLO 2014.
- A.M. Erhardt, **C.-T. Chien**, A. D. Jacobson, C. M. Moy, D. R. Muhs, and A. Paytan (2013). Characterizing the Pb isotopic contribution of dust to seawater. Goldschmidt 2013.
- **Chien, C.-T.** and A. Paytan (2013). Atmospheric Dry Deposition a Source of Nutrients and Trace Metals to Lake Tahoe. ASLO Aquatic Sciences Meeting 2013.
- **Chien, C.-T.**, K. R. M. Mackey, J. M. Prospero, and A. Paytan (2012). Effects of Atmospheric Dry deposition on Native Phytoplankton in Barbados. American Geophysical Union Fall Meeting 2012.

- **Chien, C.-T.**, R.-G. Chen, and T.-Y. Ho (2010). Dissolved Trace metal distribution in the water column of the shelf sea of the northern South China Sea. American Geophysical Union Fall Meeting 2010.
- Liu, H.-C., **C.-T. Chien**, G.-C. Gong, and T.-Y. Ho (2010). Trace metal distribution of cadmium, copper, manganese, and cobalt in the East China Sea. 2010 GEOTRACES Asia Planning Workshop.
- **Chien, C.-T.**, R.-G. Chen, and T.-Y. Ho (2010). Trace metal distribution in the shelf sea of the northern South China Sea. Western Pacific Geophysics Meeting.
- Chen R.-G., **C.-T. Chien**, and T.-Y. Ho (2009). Trace metal buffered chemostat culture system: Algae metal composition & species competition under low P condition. Taiwan Ocean Science Annual Meeting.