

CURRICULUM VITAE
Sven Alexander Kranz
Assistant Professor
Florida State University

Earth, Ocean and Atmospheric Science Department
117 North Woodward Avenue
Rogers Building - OSB 517
Florida State University
Tallahassee, FL 32306, USA
E-MAIL: skranz@fsu.edu
TEL: 850-645-0954

PROFESSIONAL EXPERIENCE

- 08/2014-current **Assistant Professor**, Department of Earth, Ocean and Atmospheric Science, Florida State University, Tallahassee, FL.
- 09/2011-08/2014 **Postdoctoral Research Associate**, Department of Geosciences, Princeton University, Princeton, NJ, advisor: Prof. François Morel.
- 2010-09/2011 **Postdoctoral Research Associate**, Department of Marine Biogeoscience / ERC Young Investigator Group PhytoChange, Alfred-Wegener Institute for Polar and Marine Research (AWI) Bremerhaven, Germany, advisor: Dr. Bjoern Rost.
- 02/2008-06/2008 **Visiting Scientist**, University of Technology Sydney, Australia, advisor: Prof. Peter Ralph.
- 2006-2010 **Research Associate**, Department of Marine Biogeoscience Alfred-Wegener Institute for Polar and Marine Research (AWI) Bremerhaven, Germany, advisor: Prof. Wolf-Gladrow, Dr. Bjoern Rost.

EDUCATION

- 2010 **Ph.D.**, Department of Marine Biogeoscience, Alfred-Wegener Institute for Polar and Marine Research (AWI) Bremerhaven/Helmholtz Graduate School POLMAR/University of Bremen, Germany.
- 2006 **Diploma**, Department of Botany, Technical University of Kaiserslautern, Germany.

RESEARCH INTERESTS

Phytoplankton ecology, environmental change, primary productivity and C-acquisition by phytoplankton, N₂ fixation by marine cyanobacteria, Southern Ocean phytoplankton, pCO₂ effects on phytoplankton, biogeochemical cycles.

FIELD RESEARCH EXPERIENCE

- 09-12/2012 Participant in field experiment on Palmer Station/Antarctica: The seasonal dynamics of CO₂, primary production, and DMS in the Western

Antarctic Peninsula: Measurements of pools and processes using mass spectrometry. Francois Morel, PI, Princeton University; Philippe Tortell, Co-PI, University of British Columbia; John Dacey, Co-PI, Woods Hole Oceanographic Institution.

- 10-11/2010 ANT-XXVII/1 Polarstern expedition: On-board testing of a newly developed seagoing membrane-inlet mass spectro-meter (MIMS) and setup of pCO₂/iron experiments with natural Southern Ocean phytoplankton populations; Sampling of POM for biomarker analysis. Bjoern Rost, PI, Alfred-Wegener-Institute for Polar and Marine research.
- 04-05/2009 Participant in field experiment in Cape Verde: Identification of diazotrophs and phytoplankton communities and their responses on nutrient addition at different CO₂ concentrations. Julie LaRoche, PI, IFM Geomar, Kiel, Germany; Ilana Berman-Frank, Co-PI, Bar Ilan University, Tel Aviv, Israel.

TEACHING EXPERIENCE

- Fall 2016 OCB 5565, Florida State University, Marine Primary Production. Spring 2016 EVR 1001, Florida State University, Introduction to Environmental Science
- Fall 2015 OCB 5050/OCE4940, Florida State University, Basic Biological Oceanography
- Spring 2015 OCB 5565, Florida State University, Marine Primary Production.
- Spring 2012 Co-lecturer FRS 124, Princeton University, The Everglades Today and Tomorrow: Global Change and the Impact of Human Activities on the Biosphere.
- Summer 2010 Teaching assistant at the Alfred Wegener Institute, Marine Phytoplankton under Global Change.

LIST OF PUBLICATIONS

- 2016 Petrou K., **Kranz S.A.**, Trimborn S., Hassler C. S., Blanco Ameijeiras, S. , Sackett O., Ralph P. J., Davidson A.T., Southern Ocean phytoplankton physiology in a changing climate, *Journal of Plant Physiology*, 203(20) 135-150
- 2015 Young, Y. N., **Kranz, S. A.**, Goldman, J. A. L., Tortell, P. D., & Morel, F. M. M. Antarctic phytoplankton down-regulate their carbon concentrating mechanisms under high CO₂ with no change in growth rates. *Marine Ecology Progress Series*, 532, 13-28.
- 2015 Mackey, K.R.M., Morris, J.J., Morel, F.M.M., and **Kranz, S.A.** Response of photosynthesis to ocean acidification. *Oceanography* 28 (2):74–91.

- 2015 Eichner M., Thoms S., **Kranz, S.A.**, and Rost, B. Cellular inorganic carbon fluxes in the diazotroph *Trichodesmium*: A combined approach of measurements and modeling. *Journal of experimental Biology* 66 (3), pp 749-759.
- 2015 **Kranz, S.A.**, Young, J.N., Hopkinson, B., Goldman, J.A.L., Tortell, P., Morel, F.M.M. Low temperature reduces the energetic requirement for the CO₂ concentrating mechanism in diatoms. *New Phytologist*, DOI: 10.1111/nph.12976.
- 2015 Goldman, J.A.L, **Kranz, S.A.**, Young, J.N., Tortell, P., Bender, M.L., Morel, F.M.M. Physiological Mechanisms supporting high net productivity in the Western Antarctic Peninsula: Photosynthesis and Respiration. *New Phytologist*, DOI: 10.1111/nph.13125.
- 2015 Young, J.N., Goldman, J.A.L., **Kranz, S.A.**, Tortell, P.D., Morel, F.M.M. Slow carboxylation of Rubisco constrains the rate of carbon fixation during Antarctic phytoplankton blooms. *New Phytologist*, DOI: 10.1111/nph.13021.
- 2014 Tortell, P.D., Asher, E.C., Dacey, J.W.H., Ducklow, H., Grzymalski, J., Goldman, J., Young, J.N., **Kranz, S.A.**, Bernard K.S., and Morel, F.M.M. Metabolic balance of coastal Antarctic waters revealed by autonomous *p*CO₂ and ΔO₂/Ar measurements. *Geophysical Research Letters*, DOI: 10.1002/2014GL061266.
- 2014 Eichner M., Rost, B and **Kranz, S.A.** Diversity of ocean acidification effects on marine N₂ fixers. *Journal of Experimental Marine Biology and Ecology*, 457, 199-207. DOI: 10.1016/j.jembe.2014.04.015.
- 2014 Eichner, M., **Kranz, S.A.**, Rost, B. Combined effects of different CO₂ levels and N sources on the diazotrophic cyanobacterium *Trichodesmium*. *Physiologia Plantarum*, DOI:10.1111/pp.12172.
- 2014 Trimborn, S., Thoms, S., Petrou, K., **Kranz, S.A.**, Rost, B. Photophysiological response of Southern Ocean phytoplankton to changes in CO₂ concentrations, short term versus acclimation effects. *Journal of Experimental Marine Biology and Ecology*, 451, pp. 44-54. DOI: 10.1016/j.jembe.2013.11.001.
- 2013 Shi, D., **Kranz S.A.**, Kim J-M., Morel F. M. M. Ocean acidification slows down nitrogen fixation and growth in the dominant diazotroph *Trichodesmium* under low iron conditions. *Proceedings of the National Academy of Sciences*, DOI: 10.1073/pnas.1216012109.
- 2012 Petrou, K., **Kranz, S.A.**, Doblin, M., Ralph, P. Photophysiological responses of *Fragilariopsis cylindrus* (Grunow) to nitrogen depletion at two temperatures. *Journal of Phycology*, 48(1), 127-136.
- 2011 **Kranz, S.A.**, Eichner, M., Rost, B. Interactions between CCM and N₂ fixation in *Trichodesmium*. *Photosynthesis Research*. DOI: 10.1007/s11120-010-9611.
- 2011 **Kranz S.A.**, Wolf-Gladrow D., Nehrke, G., Langer G., Rost B. Calcium carbonate precipitation induced by the growth of the marine cyanobacterium *Trichodesmium*. *Limnology and Oceanography*, 55(6), 2563-2569, DOI:10.4319/lo.2010.55.6.2563.

- 2010 **Kranz, S.A.**, Levitan, O., Richter, K. -U., Prasil, O., Berman-Frank, I., Rost, B. Combined effects of CO₂ and light on the N₂ fixing cyanobacterium *Trichodesmium* IMS101: Physiological responses. *Plant Physiology*, 154, 334-345. DOI: 10.1104/pp.110.159145.
- 2010 Levitan, O., **Kranz, S.A.**, Spungin, D., Prasil, O., Rost, B., Berman-Frank, I. Combined effects of CO₂ and light on the N₂ fixing cyanobacterium *Trichodesmium* IMS101: A mechanistic view. *Plant Physiology*, 154, 346-356. DOI: 10.1104/pp.110.159285.
- 2010 Ralph, P., Wilhelm, C., Lavaud, J., Jakob, T., Petrou, K., **Kranz, S.A.** Fluorescence as a tool to understand changes in photosynthetic electron flow regulation. Eds. D. Suggett, O. Prasil, MA Borowitzka, *Developments in Applied Phycology 4; Chlorophyll a Fluorescence in Aquatic Sciences: Methods and Applications*, Chapter 12, 75-89, DOI: 10.1007/978-90-481-9268-7.
- 2009 **Kranz, S.A.**, Sültemeyer, D., Richter, K.U., Rost, B. Carbon acquisition in *Trichodesmium*: the effect of pCO₂ and diurnal changes. *Limnology and Oceanography*. 54(3): 548-559.
- 2007 Rost, B., **Kranz, S.A.**, Richter, K.U., Tortell, P. D. Isotope disequilibrium and mass spectrometric studies of inorganic carbon acquisition by phytoplankton. *Limnology and Oceanography: Methods*, 5, 328-337.

+Submitted publication:

+Ongoing work

Shi, D. **Kranz, S.A.** et al.: Global reductions in nitrogen fixation by the dominant marine diazotroph *Trichodesmium* in an acidified ocean. To be submitted to *science*

Van de Waal, D., Brandenburg, K., Trimborn, S., **Kranz S. A.**, Rokitta, S., and Rost, B., Evolutionary plasticity of carbon concentrating mechanisms in a future ocean. To be submitted to *Nature Climate Change*

Kranz, S.A., Berceel, T. Photophysiological characterization of the dinoflagellate *Karenia brevis* under varying CO₂ concentrations

Kranz, S.A., Rost, B. Giordano, M., Carbon acquisition in dinoflagellates – invited article to *Experimental Botany* special issue

PROFESSIONAL PRESENTATIONS

Invited talks:

- 2016 **Kranz, S. A.** Biochemical constraints on marine productivity - limitations, trade-offs and climate change. FSU, Coastal and Marine Research Initiative Seminar Series.
- 2016 **Kranz, S. A.** Biochemical constraints on marine productivity in polar regions - understanding limitations and trade-offs in physiological pathways. FSU, EOAS Department.

- 2016 **Kranz, S. A.** Phytoplankton in a changing world - from cellular processes to global impact. University of Georgia Athens - Department of Marine Science, Athens, Department Seminar.
- 2016 **Kranz, S. A.** Sensitivity of marine phytoplankton to climate change - physiological mechanisms and biogeochemical implications. FSU - Department of Biology, Ecology and Evolution Lecture Series.
- 2014 **Kranz, S.A.** Phytoplankton in a changing ocean. Physiological responses of tropical N₂ fixing cyanobacteria and Antarctic diatoms. University of Virginia, Department of Environmental Sciences, VA, USA.
- 2014 **Kranz, S.A.** Phytoplankton in a changing ocean: Physiological responses of tropical N₂ fixing cyanobacteria and Antarctic diatoms. Florida State University, Department of Earth, Ocean and Atmospheric Science, FL, USA.
- 2014 Young, J.N., **Kranz, S.A.**, Goldman, J.A.L., Tortell, P.D., Morel, F.M.M. Physiological mechanisms supporting high net primary productivity in the coastal Western Antarctic Peninsula. Rutgers University, Department of Environmental Science, NJ, USA.
- 2014 **Kranz, S.A.**, Young, J.N., Goldman, J.A.L., Tortell, P.D., Morel, F.M.M. Physiological adaptation of Phytoplankton to cold temperatures and its influence on biogeochemical cycles. Alfred-Wegener-Institute, Department of Marine Biogeoscience, Bremen, Germany.
- 2011 **Kranz, S.A.** *Trichodesmium* - a diazotroph in a changing world. Princeton University, Department of Geosciences, NJ, USA.
- 2011 **Kranz, S.A.**, Wolf-Gladrow, D., Nehrke, G., Langer, G. and Rost, B. Calcium carbonate precipitation by the marine cyanobacterium *Trichodesmium*. Max Planck Institute for Marine Microbiology Bremen, Bremen, Germany.
- 2011 Rost, B., **Kranz, S.A.** and Eichner, M. Interactions and limitations of CO₂ and N₂ fixation in *Trichodesmium*. 111th General Meeting American Society for Microbiology, LA, USA.
- 2008 **Kranz, S.A.**, Richter, K.U. and Rost, B. Effect of global change on the N₂-fixing cyanobacteria *Trichodesmium*. Centre for Water and Waste Technology School of Civil and Environmental Engineering, The University of New South Wales, Sydney, Australia.
- 2008 **Kranz, S.A.**, Richter, K.U. and Rost, B. Trends in environmental research - new approaches to assess responses of phytoplankton to global change - using the example of *Trichodesmium*. University of Technology Sydney, Department of environmental science, Sydney, Australia.

Conference Talks:

- 2012 Eichner, M. **Kranz, S.A.** and Rost, B. Combined effects of different CO₂ levels and N sources on *Trichodesmium*. Third Symposium on the Ocean in a High CO₂ World, Monterey, USA.
- 2011 **Kranz, S.A.**, Wolf-Gladrow, D., Nehrke, G., Langer, G. and Rost, B. Calcium Carbonate

Precipitation by the marine cyanobacterium *Trichodesmium*. Goldschmidt, Prague, Czech Republic.

- 2011 Eichner, M., **Kranz, S.A.** and Rost, B. Ocean acidification responses of a N₂-fixing cyanobacterium - mechanisms and implications. Youmares 2nd German Young Marine Scientist Meeting.
- 2010 **Kranz, S.A.**, Rost, B. and Richter, K.U. New approaches to assess the responses of phytoplankton to global change. AWI-IUP seminar "Polar Processes II".
- 2010 **Kranz, S.A.**, Levitan, O. Berman-Frank, I. and Rost, B. CO₂-dependend energy allocation in *Trichodesmium*. VIIth International Symposium on Inorganic Carbon Utilization by Aquatic Photosynthetic Organisms, Japan.
- 2009 **Kranz, S.A.**, Levitan, O., Berman-Frank, I., Richter, K.U., Prasil, O. and Rost, B. CO₂ and light effects on growth, photosynthesis, carbon acquisition and nitrogen fixation of the diazotrophic cyanobacteria *Trichodesmium*. Aquatic Science Meeting, Nice, France.
- 2009 Trimborn, S. Sweet, E., Petrou, K., **Kranz, S.A.**, Tortell, P. D., Payne, C. D., Li, Y., Richter, K.U. and Rost, B. Effects of CO₂ on growth, photosynthesis and carbon acquisition of key diatom species of the Southern Ocean. Aquatic Science Meeting, Nice, France.
- 2007 **Kranz, S.A.**, Sültemeyer, D. and Rost, B. CCM regulation in *Trichodesmium*: diurnal rhythm and effect of pCO₂. The VIth International Symposium on Inorganic Carbon Utilization by Aquatic Photosynthetic Organisms, Malaga, Spain.

Conference Posters:

- 2016 **Kranz, S. A.**, Young, Jodi, N., Goldman, J., Tortell, P., & Morel, Francois, M.M.. Antarctic Phytoplankton down-regulate Their Carbon-Concentrating Mechanisms under High CO₂ with no Change in Growth Rates. Poster presentation at Ocean Sciences Meeting, ASLO / AGU, New Orleans, USA.
- 2014 **Kranz, S.A.**, Tortell, P., Morel, F.M.M. Inorganic carbon acquisition of phytoplankton during a spring bloom. Ocean Sciences Meeting, Hawaii, USA.
- 2013 **Kranz, S.A.**, Young, J.N., Goldman, J.A.L., Tortell, P., Morel, F.M.M. Carbon acquisition of Southern Ocean phytoplankton in the Western Antarctic Peninsula: Response to natural and experimental CO₂ gradients. The VIIIth International Symposium on Inorganic Carbon Utilization by Aquatic Photosynthetic Organisms, New Orleans, USA.
- 2013 Eichner, M., **Kranz, S.A.**, Morel, F.M.M. and Rost, B. Cellular inorganic carbon fluxes in the diazotroph *Trichodesmium* under different nitrogen sources and pCO₂ levels. The VIIIth International Symposium on Inorganic Carbon Utilization by Aquatic Photosynthetic Organisms, New Orleans, USA.
- 2010 **Kranz, S.A.**, Eichner, M., Levitan, O., Berman-Frank, I. and Rost, B. CO₂-dependent energy allocation in *Trichodesmium*. BIOACID / EPOCA / UKOARP Meeting Bremerhaven, Germany.
- 2007 **Kranz, S.A.**, Ralph, P. J., Richter, K.U. and Rost, B. Integration of Fluorescence and Mass Spectrometry. Chlorophyll Fluorescence in Aquatic Sciences Meeting, Nove Hardy, Czech Republic.

REFEREE SERVICE

National Science Foundation, Nature Climate Change, Limnology and Oceanography, Biogeochemistry, Environmental Microbiology and Environmental Microbiology Reports, Microbiology Reports, Journal of Phycology, Journal of Photobiology.

SOCIETY MEMBERSHIPS

American Society of Limnology and Oceanography

STUDENT MENTORING

Current:

Tristyn Bercel, Department of EOAS, Florida State University.

Perry, Knight (FSU)

Kennedy Wohlgemuth (FSU)

Yulyia Danyuk (FSU)

Previous:

Daniel Owens, Honors student at Florida State University

Dr. Meri Eichner, Department of Biological and Environmental Sciences, Gothenburg University, Gothenburg, Sweden.

Daniel Corbett, Florida State University

Kathryn Ferguson, Florida State University

COLLABORATIONS

Department of Geosciences, Princeton University (Prof. Morel); EOAS Department, University of British Columbia, Canada (Prof. Tortell); AWI, Germany (Dr. Rost); Department of Marine Science, University of Georgia, (Prof. Hopkinson), Mote Laboratory, Sarrasota, FL (Dr. Vince Lovko), Florida Fish and Wildlife, St. Petersburg, FL (Dr. Hubbard and Dr. Robert)