

## PAUL G. FALKOWSKI

Date of Birth: 4 January 1951  
 Place of Birth: New York City, New York  
 Married, two children

### Educational Background

<i>Degree</i>	<i>Institution Conferring</i>	<i>Field</i>	<i>Year</i>
B.S.	City College of the City University of New York	Biology	1972
M.A.	City College of the City University of New York	Biology	1973
Ph.D.	University of British Columbia	Biology	1975

### Professional Background

Post-Doctoral Research Associate, University of Rhode Island	1975-76
Assistant Scientist, Brookhaven National Laboratory	1976-78
Associate Scientist, Brookhaven National Laboratory	1978-80
Scientist, Brookhaven National Laboratory (with tenure from 1984)	1980-1993
Visiting Research Scientist, National Institute for Basic Biology (with Dr. Y. Fujita), Okazaki, Japan	1985
Visiting Research Scientist, Dept. of Pure and Applied Biology, Imperial College of Science and Technology (with Dr. J. Barber), London	1985
Visiting Lecturer in summer courses at Hawaii Institute of Marine Biology	1984, 5, 9
Adjunct Senior Scientist, Israel Oceanographic and Limnological Research Institute, Haifa	1985-
Head, Oceanographic Sciences Division, Brookhaven National Laboratory	1987-1991
Visiting Lecturer, Marine Molecular Biology Course, UCLA	1989
Adjunct Full Professor, State University of New York, Stony Brook	1990-
Visiting Research Director, CNRS - Laboratoire de physique et chimie marines, Villefranche-sur-Mer, France (with Dr. A. Morel)	1992
Senior Scientist, Brookhaven National Laboratory	1993-98
Deputy Chairman for Environmental Research, Department of Applied Science, Brookhaven National Laboratory	1994-98
Head, Environmental Biophysics and Molecular Biology Program, Brookhaven National Laboratory	1995-98
Distinguished Professor, Department of Geological Sciences and Institute of Marine and Coastal Science, Rutgers University	1998-
Distinguished Visiting Scholar, University of Hawaii	2002
Board of Governors Professor in Geological and Marine Science, Rutgers University	2005-
Director, Rutgers Energy Institute	2006-18
Visiting Research Director, CNRS – Station Biologique, Roscoff, France (with C. de Vargas)	2009
Bennett L. Smith Chair in Business and Natural Resources, Rutgers University	2012-

## Awards

Medical Research Council Fellowship in Biophysics (1976)  
 Distinguished Visiting Professor, University of Maryland (1989)  
 Distinguished Visiting Professor, University of Rhode Island (1991)  
 John Simon Guggenheim Fellow (1992-1993)  
 Ida and Cecil Green Distinguished Professor (1995-96)  
 Thomas Byrne Award - University of British Columbia (1997)  
 Huntsman Medal (1998)  
 Hutchinson Award (2000)  
 Board of Trustees Award for Excellence in Research, Rutgers University (2000)  
 Fellow, American Geophysical Union (2001)  
 Fellow, American Academy of Arts and Sciences (2003)  
 Vernadsky Medal, European Geosciences Union (2005)  
 Board of Governors Professor, Rutgers University (2005)  
 Member, National Academy of Sciences (2007)  
 Fellow, American Academy of Microbiology (2008)  
 Gerald W. Prescott Award (2008)  
 Commemorative Medal Prince Albert 1<sup>ER</sup> de Monaco (2010)  
 Ecology Institute Prize in Marine Ecology (2010)  
 Governing Council, National Academy of Sciences (2010-2013)  
 Grass Fellow, Radcliffe Institute for Advanced Studies (2011)  
 Fellow, Ecological Society of America (2012)  
 Einstein Professor, Chinese Academy of Sciences (2012)  
 The Rockefeller Foundation, The Bellagio Center, Academic Writing Residency (2017)  
 Tyler Prize (2018)

## Recent Grants (partial listing)

NASA Astrobiology Institute - ENIGMA: **E**volution of **N**anomachines **I**n **G**eospheres and **M**icrobial **A**ncestors (2018-2023)  
 NASA Exobiology - The Chemical Transformation of Minerals by Light and the Evolution of Prebiotic Metabolism (2016-20)  
 Gordon and Betty Moore Foundation - Constructing an Annotated Metabolic Map of Earth's Coupled Microbial Redox Reactions (2015-19)

## Current Research Interests

Biogeochemical cycles, photosynthesis, plant physiology, biological oceanography, molecular biology, biochemistry and biophysics, physiological adaptation, evolution, mathematical modeling, symbiosis.

## Member

National Academy of Sciences

American Geophysical Union  
American Society of Limnology and Oceanography  
American Society of Plant Physiologists  
American Phycological Society  
The Oceanography Society  
Executive Committee, NASA SeaWiFS Science Team  
Member, Joint Global Ocean Flux Study Working Group on Primary Productivity  
Chairman, Brookhaven Symposium in Biology 1980: Primary Productivity in the Sea  
Chairman, First Gordon Conference on Biochemistry and Genetic Engineering of Microalgal Products (August 1988)  
Associate Editor, Journal of Phycology (1984-1986)  
Chairman, Brookhaven Symposium in Biology 1991: Primary Productivity and Biogeochemical Cycles in the Sea  
Chairman, DOE Workshop on Molecular Bases of Ecology, 1991  
Member, Joint Global Ocean Flux Study Working Group on Optics  
Member, National Research Council Review Committee of Office of Naval Research Alternative Fluorocarbon Environmental Assessment Study - Ecological Effects Advisory Committee  
Guest Editor, Special Volume of Photosynthesis Research on Global Change (1992-1993)  
Associate Editor: Global Change Biology (1995 to present)  
Co-Chair, NATO Advanced Study Institute on Molecular Ecology of Aquatic Microbes (1994)  
Chairman, DOE Initiative for Molecular Ecology Research - Convened Asilomar and Belmont Conferences and wrote/edited conference reports  
Chairman, NASA Ocean Primary Productivity Working Group  
Member, Scientific Advisory Board - Stazione Zoologica Anton Dohrn, Naples (1994-1999)  
Guest Editor, Special Issue of Deep Sea Research (1994, 2001)  
Associate Editor, Limnology and Oceanography (1995- 2006)  
U.S. Coordinator for IPCC reports on ocean research  
Member, US Joint Global Ocean Flux Science Steering Committee  
Member, Earth System Science and Applications Advisory Committee (NASA)  
Chairman, NASA Biological Oceanography Advisory Board  
Member, American Society of Microbiology Workshop on Global Change and Human Health (1997)  
Co-organizer, XIth International Photosynthesis Congress  
Member, Mars Architecture Planning Committee (NASA)  
Member, International JGOFS Science Steering Committee  
Board of Reviewing Editors, Science  
Member, Astrobiology Oversight Committee (NASA)  
Member, US SOLAS Advisory Committee (NSF)  
Member, EDOCC Planning Committee (NSF)  
Member, DOE Ocean Carbon Sequestration Program  
Member, US Carbon Cycle Science Steering Committee  
Associate Editor, Encyclopedia of Biodiversity (Academic Press)  
Associate Editor, Photosynthesis Research  
Associate Editor, Protist (1995-1999)

Associate Editor, *Ecosystems* (1999-2003)  
 Member, The New York Academy of Sciences  
 Member, Sigma Xi  
 Member, International Geosphere Biosphere Program GAIM  
 Co-Chair, International Geosphere Biosphere Program—Carbon Cycle Working Group  
 Member, Astrobiology Roadmap Team, NASA (2002)  
 Section Head, Faculty of 1000  
 Member, National Research Council Committee on Defining and Advancing the Conceptual Basis of Biology  
 Member, Terrestrial Planet Finder Science Working Group  
 Associate Editor, *Encyclopedia Oceanography*, Elsevier  
 Director, Rutgers Energy Institute (2006- )  
 Co-Director, Center for Marine Biotechnology, Rutgers University (2005- )  
 Associate Editor, *Treatise on Geochemistry*, Vol. 11 Organic Geochemistry (2013)  
 Advisor, National Geographic Television (Atlas Media)  
 Board of Reviewing Editor – *eLife*  
 Editorial Advisory Board, *The Year in Ecology and Conservation Biology*, *Annals of the New York Academy of Sciences*  
 Chair, Section 63, Environmental Sciences and Ecology, National Academy of Sciences (2016 - present)  
 Member, NSF Advisory Committee on Geosciences (2016 – present)  
 Member, NSF Advisory Committee on the State of the Sciences in Astrobiology  
 Technical Advisory Board, NASA Center for Utilization of Biological Engineering in Space (CUBES), (2018 - present)  
 Committee Member, NAS Astrobiology Science Strategy for the Search for Life in the Universe. (2018-present)  
 Science Advisor, Tara Oceans Project (2019 – present)

### **Cruise Experience** (partial listing – over 44 cruises)

R/V Knorr	Northwest Atlantic	1981
R/V Oceanus	Northwest Atlantic	1984
R/V Cape Hatteras (Chief Scientist)	Middle Atlantic Bight	1988
R/V Endeavor (Chief Scientist)	Middle Atlantic Bight	1989
R/V A'talant	Subtropical Atlantic/ Northwest Africa upwelling region	1992
R/V Atlantis/RSS Alvin	Juan de Fuca Ridge	2000
R/V Knorr	Black Sea	2001
R/V Oceanus	Sargasso Sea	2004
R/V Gould	Antarctica	2016

### **Peer-Reviewed Publications**

1. Falkowski, P.G. 1973. The respiratory physiology of hemocyanin in *Limulus polyphemus*. *J. Exp. Zool.* 186: 1-6.

2. Falkowski, P.G. 1974. Facultative anaerobiosis in *Limulus polyphemus*: phosphoenolpyruvate carboxykinase and heart activities. *Comp. Biochem. Physiol.* **49B**: 749-759.
3. Falkowski, P.G. 1975. Nitrate uptake in marine phytoplankton: (nitrate, chloride)-activated adenosine triphosphatase from *Skeletonema costatum* (Bacillariophyceae). *J. Phycol.* **11**: 323-326.
4. Falkowski, P.G. 1975. Nitrate uptake in marine phytoplankton: comparison of half-saturation constants from seven species. *Limnol. Oceanogr.* **20**: 412-417.
5. Falkowski, P.G. and D.P. Stone. 1975. Nitrate uptake in marine phytoplankton: energy sources and the interaction with carbon fixation. *Mar. Biol.* **32**: 77-84.
6. Falkowski, P.G. and R.B. Rivkin. 1976. The role of glutamine synthetase in the incorporation of ammonium in *Skeletonema costatum* (Bacillariophyceae). *J. Phycol.* **12**: 448-450.
7. Falkowski, P.G. 1977. A theoretical description of nitrate uptake kinetics in marine phytoplankton based on bisubstrate kinetics. *J. theo. Biol.* **64**: 375-379.
8. Falkowski, P.G. 1977. The adenylate energy charge in marine phytoplankton: The effect of temperature on the physiological state of *Skeletonema costatum* (Grev.) Cleve. *J. exp. mar. Biol. Ecol.* **27**: 37-45.
9. Falkowski, P.G. and T.G. Owens. 1978. The effects of light intensity on photosynthesis and dark respiration in six species of marine phytoplankton. *Mar. Biol.* **45**: 289-295.
10. Owens, T.G., D.M. Riper, and P.G. Falkowski. 1978. Studies of delta-aminolevulinic acid dehydrase from *Skeletonema costatum*, a marine plankton diatom. *Plant Physiol.* **62**: 516-521.
11. D.M. Riper, T.G. Owens, and P.G. Falkowski. 1979. Chlorophyll turnover in *Skeletonema costatum*, a marine plankton diatom. *Plant Physiol.* **64**: 49-54.
12. Falkowski, P.G., T.S. Hopkins, and J.J. Walsh. 1980. An analysis of factors affecting oxygen depletion in the New York Bight. *J. Mar. Res.* **38**: 479-506.
13. Owens, T.G., P.G. Falkowski, and T.E. Whitledge. 1980. Diel periodicity of chlorophyll in marine phytoplankton. *Mar. Biol.* **59**: 71-77.
14. Falkowski, P.G. and T.G. Owens. 1980. Light-shade adaptation: two strategies in marine phytoplankton. *Plant Physiol.* **66**: 592-595.
15. Falkowski, P.G. and Z. Dubinsky. 1981. Light-shade adaptation of *Stylophora pistillata*, a hermatypic coral from the Gulf of Eilat. *Nature* **289**: 172-174.
16. Falkowski, P.G. 1981. Light-shade adaptation and assimilation numbers. *J. Plankton Res.* **3**: 203-216.
17. Falkowski, P.G. and C.D. Wirick. 1981. A simulation model of the effects of vertical mixing on primary productivity. *Mar. Biol.* **65**: 69-75.
18. Falkowski, P.G., T.G. Owens, A.C. Ley, and D. Mauzerall. 1981. The effect of growth irradiance on the ratio of reaction centers in two species of marine phytoplankton. *Plant Physiol.* **68**: 969-973.
19. Falkowski, P.G. and J. Sucher. 1981. Rapid, quantitative separation of chlorophylls and their degradation products by high-performance liquid chromatography. *J. Chromatogr.* **213**: 349-351.
20. Falkowski, P.G. and T.G. Owens. 1982. A technique for estimating phytoplankton division rates using a DNA-binding fluorescent dye. *Limnol. Oceanogr.* **27**: 776-782.

21. Owens, T.G. and P.G. Falkowski. 1982. Enzymatic degradation of chlorophyll *a* by marine phytoplankton *in vivo*. *Phytochem.* 21: 979-984.
22. Falkowski, P.G. 1983. Vertical mixing and light-shade adaptation: a comparative field study. *J. Mar. Res.* 41: 215-237.
23. Precali, R. and P.G. Falkowski. 1983. Incorporation of <sup>14</sup>[C]-glutamate into proteins and chlorophylls in *Dunaliella tertiolecta*, a marine chlorophyte. *Biol. Plant.* 25: 187-195.
24. Malone, T.C., P.G. Falkowski, T.S. Hopkins, G.T. Rowe, and T.E. Whitledge. 1983. Mesoscale response of diatom populations to a wind event in the plume of the Hudson River. *Deep-Sea Res.* 30: 149-170.
25. Falkowski, P.G., J. Vidal, T.S. Hopkins, G.T. Rowe, T.E. Whitledge, and W.G. Harrison. 1983. Summer nutrient dynamics of the Middle Atlantic Bight: primary production and utilization of phytoplankton carbon. *J. Plankton Res.* 5: 515-537.
26. Harrison, W.G., D. Douglas, P.G. Falkowski, G.T. Rowe, and J. Vidal. 1983. Summer nutrient dynamics of the Middle Atlantic Bight: nitrogen uptake and regeneration. *J. Plankton Res.* 5: 539-556.
27. Raps, S., K. Wyman, H.W. Siegelman, and P.G. Falkowski. 1983. Adaptation of the cyanobacterium, *Microcystis aeruginosa*, to light intensity. *Plant Physiol.* 72: 829-832.
28. Falkowski, P.G. 1984. Kinetics of light intensity adaptation in *Dunaliella tertiolecta*: a marine plankton chlorophyte. *Photosynthetica* 18: 62-68.
29. Malone, T.C., T.S. Hopkins, P.G. Falkowski, and T.E. Whitledge. 1983. Production and transport of phytoplankton biomass over the continental shelf of the New York Bight. *Cont. Shelf Res.* 1: 305-337.
30. Falkowski, P.G. 1984. Physiological responses of phytoplankton to natural light regimes. *J. Plankton Res.* 6: 295-307.
31. Falkowski, P.G., K. Wyman, and D. Mauzerall. 1984. Effects of continuous background irradiance on xenon-flash-induced fluorescence yields in marine microalgae. *Proc. Sixth Int'l. Photosynthesis Cong., Brussels* 1: 163-166.
32. Muscatine, L., P.G. Falkowski, and Z. Dubinsky. 1983. Carbon budgets in symbiotic associations. In *Proc. 2nd int. Coll. Endocytobiology*, W. Schwemmler and H. Schenk, eds., de Gruyter and Co. Pub., p. 649-658.
33. Dubinsky, Z., P.G. Falkowski, L. Muscatine, and J.W. Porter. 1984. The absorption and utilization of radiant energy by light and shade-adapted colonies of the symbiotic coral *Stylophora pistillata*. *Proc. Roy. Soc. Lond. B* 222B: 203-214.
34. Muscatine, L., P.G. Falkowski, J.W. Porter, and Z. Dubinsky. Fate of photosynthetically fixed carbon in light and shade-adapted colonies of the symbiotic coral, *Stylophora pistillata*. *Proc. Roy. Soc. Lond. B* 222B: 181-202.
35. Porter, J.W., L. Muscatine, Z. Dubinsky, and P.G. Falkowski. Primary production and photoadaptation in light and shade-adapted colonies of the symbiotic coral, *Stylophora pistillata*. *Proc. Roy. Soc. Lond. B* 222B: 161-180.
36. Falkowski, P.G., Z. Dubinsky, L. Muscatine, and J.W. Porter. 1984. Light and the bioenergetics of a symbiotic coral. *Bioscience* 34: 705-709.
37. Falkowski, P.G., Z. Dubinsky, and K. Wyman. 1985. Growth-irradiance relationships in phytoplankton. *Limnol. Oceanogr.* 30: 311-321.
38. Post, A., K. Wyman, Z. Dubinsky, and P.G. Falkowski. 1984. Kinetics of light intensity adaptation in a marine diatom. *Mar. Biol.* 83: 231-238.

39. Falkowski, P.G., Z. Dubinsky, and G. Santostefano. 1985. Light-enhanced dark respiration in phytoplankton. *Verh. Internat. Verein. Limnol.* 22: 2830-2833.
40. Falkowski, P.G., K. Wyman, A.C. Ley, and D. Mauzerall. 1986. Relationship of steady-state photosynthesis to fluorescence in eucaryotic algae. *Biochim. Biophys. Acta* 849: 183-192.
41. Dubinsky, Z., P.G. Falkowski, and K. Wyman. 1986. Light harvesting and utilization in phytoplankton. *Plant Cell Physiol.* 27: 1335-1349.
42. Post, A.F., Z. Dubinsky, K. Wyman, and P.G. Falkowski. 1985. Physiological responses to light intensity transitions in a marine plankton diatom. *Mar. Ecol. Prog. Ser.* 25: 141-149.
43. Falkowski, P.G. and D.A. Kiefer. 1985. Chlorophyll *a* fluorescence: Relationship to primary production and phytoplankton biomass. *J. Plankton Res.* 7: 715-731.
44. Park, Y., E.J. Carpenter, and P.G. Falkowski. 1986. Ammonium excretion and glutamic dehydrogenase activity of zooplankton in Great South Bay, New York. *J. Plankton Res.* 8: 489-503.
45. Falkowski, P.G., Y. Fujita, A.C. Ley, and D.C. Mauzerall. 1986. Evidence for cyclic electron flow around photosystem II in eucaryotic algae. *Plant Physiol.* 81: 310-312.
46. Falkowski, P.G., C.N. Flagg, G.T. Rowe, S.L. Smith, T.E. Whiteledge, and C.D. Wirick, 1988. The fate of a spring phytoplankton bloom: export or oxidation. *Cont. Shelf. Res.* 8: 457-484.
47. Sukenik, A., J. Bennett, and P.G. Falkowski. 1987. Light saturated photosynthesis: limitation by electron transport or carbon fixation? *Biochim. Biophys. Acta.* 891: 205-215.
48. Sukenik, A., J. Bennett, and P.G. Falkowski. 1988. Changes in the abundance of individual LHC I and LHC II apoproteins with growth irradiance in the marine chlorophyte, *Dunaliella tertiolecta*. *Biochim. Biophys. Acta* 932: 206-215.
49. Mortain-Bertrand, A. and P.G. Falkowski. 1989. Mise en evidence d'une relation entre fluorescence et carotenoides: une possibilite d'ameliorer les modeles de production primaire. *C.R. Acad. Sci. Paris* 309: 13-18.
50. Rowe, G., R. Theroux, W. Phoel, H. Quinby, R. Wilke, D. Koschoveck, T. Whitley, P.G. Falkowski, and C. Fray. 1988. Benthic carbon budgets for the continental shelf south of New England. *Cont. Shelf Res.* 8: 511-527.
51. Wyman, K.D., Z. Dubinsky, J.W. Porter, and P.G. Falkowski. 1987. Light absorption and utilization among hermatypic corals: A study in Jamaica, West Indies. *Mar. Biol.* 96: 283-292.
52. Rowe, G.T., S. Smith, P.G. Falkowski, and others. 1986. Do continental shelves export organic matter? *Nature* 324: 559-561.
53. Sukenik, A., P.G. Falkowski, and J. Bennett. 1987. The potential enhancement of photosynthetic energy conversion in algal mass culture. *Biotech. Bioeng.* 30: 970-977.
54. Berner, T., and others. 1986. The measurement of primary productivity in a high-rate oxidation pond (HROP). *J. Plankton Res.* 8: 659-672.
55. Sukenik, A., K.D. Wyman, J. Bennett, and P.G. Falkowski. A novel mechanism for regulating the excitation of Photosystem II in a green alga. *Nature* 327: 704-707.
56. Sukenik, A., J. Bennett, and P.G. Falkowski. 1989. Energy transfer of LHC II in *Dunaliella tertiolecta* is unusually sensitive to Triton X-100. *Photosyn. Res.* 21: 37-44.
57. Dubinsky, Z., P.G. Falkowski, A.F. Post, and U.M. van Hes. 1987. A system for measuring phytoplankton photosynthesis in a defined light field with an oxygen electrode. *J.*

- Plankton Res. 9: 607-612.
58. Zehr, J., P.G. Falkowski, and D. Capone. 1988. Coupling between  $^{13}\text{N}$  ammonium uptake and incorporation in a marine diatom. *Limnol. Oceanogr.* 33: 518-527.
  59. Falkowski, P.G., Z. Kolber, and Y. Fujita. 1988. Dynamics of electron flow around photosystem II during steady-state photosynthesis in eucaryotic algae. *Biochim. Biophys. Acta* 933: 432-443.
  60. Kolber, Z., J. Zehr, and P.G. Falkowski. 1988. Effects of growth irradiance and nitrogen limitation on photosynthetic energy conversion in Photosystem II. *Plant Physiol.* 88: 923-929.
  61. Kolber, Z., K.D. Wyman, and P.G. Falkowski. 1990. Natural variability in photosynthetic energy conversion efficiency: A field study in the Gulf of Maine. *Limnol. Oceanogr.* 35: 72-79.
  62. Zehr, J., D.C. Capone, and P.G. Falkowski. Rapid incorporation of  $^{13}\text{NO}_3$  by  $\text{NH}_4$ -limited phytoplankton. *Mar. Ecol. Prog. Ser.* 51: 237-251.
  63. Muscatine, L., P.G. Falkowski, Z. Dubinsky, P.A. Cook, and L. McCloskey. 1989. The effect of external nutrient resources on the population dynamics of zooxanthellae in a reef coral. *Proc. R. Soc. Lond.* B236: 311-324.
  64. Rahav, O., Z. Dubinsky, Y. Aчитuv, and P.G. Falkowski. 1989. Ammonium metabolism in the symbiotic coral, *Stylophora pistillata*. *Proc. R. Soc. Lond.* B236: 325-337.
  65. Zehr, J. and P.G. Falkowski. 1988. Pathway of ammonium assimilation in a marine diatom determined with the radiotracer  $^{13}\text{N}$ . *J. Phycol.* 24: 588-591.
  66. Mortain-Bertrand, A. and P.G. Falkowski. 1990. Photoregulation of the light-harvesting chlorophyll complex associated with Photosystem II in *Dunaliella tertiolecta*. Evidence that LHCII apoproteins are stable without chlorophyll. *Plant Physiol.* 94: 304-311.
  67. Berner, T., K. Wyman, and P.G. Falkowski. 1989. Photoadaptation and the "package" effect in *Dunaliella tertiolecta* (Chlorophyta). *J. Phycol.* 25: 70-78.
  68. Herzig, R. and P.G. Falkowski. 1989. Nitrogen limitation in *Isochrysis galbana* (Haptophyceae). I. Photosynthetic energy conversion and growth efficiencies. *J. Phycol.* 25: 462-471.
  69. Falkowski, P.G., A. Sukenik, and R. Herzig. 1989. Nitrogen limitation in *Isochrysis galbana* (Haptophyceae). II. Relative abundance of chloroplast proteins. *J. Phycol.* 25: 471-478.
  70. LaRoche, J., J. Bennett, and P.G. Falkowski. 1990. Characterization of a cDNA encoding for a 28.5 kDa LHC II apoprotein from the unicellular marine chlorophyte *Dunaliella tertiolecta*. *Gene* 95: 165-171.
  71. Falkowski, P.G. 1991. Species variability in the fractionation of  $^{13}\text{C}$  and  $^{12}\text{C}$  by marine phytoplankton. *J. Plankton Res.* 13: 21-28.
  72. Wegner, H.C., R. Herzig, P.G. Falkowski, and D.H. Turpin. 1989. Respiratory losses in the light in a marine diatom: Measurements by short-term mass-spectrometry. *Limnol. Oceanogr.* 34: 1153-1161.
  73. Sukenik, A., J. Bennett, A. Mortain-Bertrand, and P.G. Falkowski. 1990. Adaptation of the photosynthetic apparatus to irradiance in *Dunaliella tertiolecta* - A kinetic study. *Plant Physiol.* 92: 891-898.
  74. Dubinsky, Z., N. Stambler, M. Ben-Zion, L.R. McCloskey, L. Muscatine, and P.G. Falkowski. 1990. Effects of external nutrient sources on the optical properties and

- photosynthetic efficiency of *Stylophora pistillata*. Proc. Roy. Soc. B 239: 231-246.
75. Falkowski, P.G. and J. LaRoche. 1990. Molecular biology in studies of ocean processes. Int. Rev. Cytol. 128, 261-303.
  76. Ohki, K., J. Zehr, P.G. Falkowski, and Y. Fujita. 1991. Regulation of nitrogenase in the marine, non-heterogeneous cyanobacterium *Trichodesmium* sp. Arch. Microbiol. 156: 335-337.
  77. Falkowski, P.G. and J. LaRoche. 1991. Acclimation to spectral irradiance in algae. J. Phycol. 27(1): 8-14.
  78. Falkowski, P.G., D. Ziemann, Z. Kolber, and P.K. Bienfang. 1991. Role of eddy pumping in enhancing primary production. Nature 352: 55-58.
  79. Sancetta, C., T. Villareal and P.G. Falkowski. 1991. Massive fluxes of Rhizosolenid diatoms: A common occurrence? Limnol. Oceanogr. 36: 1452-1457.
  80. Greene, R., R. Geider, and P.G. Falkowski. 1991. Effect of iron limitation on photosynthesis in a marine diatom. Limnol. Oceanogr. 36: 1772-1782.
  81. LaRoche, J., A. Mortain-Bertrand, and P.G. Falkowski. 1991. Light-intensity induced changes in cab mRNA and light-harvesting complex II apoprotein levels in the unicellular chlorophyte *Dunaliella tertiolecta*. Plant Physiol. 97: 147-153.
  82. Sukenik, A., R.S. Levy, Y. Levy, P.G. Falkowski, and Z. Dubinsky. 1991. Optimizing algal biomass production in an outdoor pond: A simulation model. J. Appl. Phycol. 3: 191-201.
  83. Falkowski, P.G., Y.-S. Kim, Z. Kolber, C. Wilson, C. Wirick, and R. Cess. 1992. Distinguishing between anthropogenic and natural factors affecting low-level cloud albedo over the North Atlantic Ocean. Science 256: 1311-1313.
  84. Falkowski, P.G. and C. Wilson. 1992. Phytoplankton productivity in the North Pacific in relation to the absorption of anthropogenic CO<sub>2</sub>. Nature 358: 741-743.
  85. Greene, R.M., R.J. Geider, Z. Kolber, and P.G. Falkowski. 1992. Iron-induced changes in light harvesting and photochemical conversion processes in eucaryotic marine algae. Plant Physiol. 100: 565-575.
  86. Falkowski, P.G. 1992. Biotechnology and global climate change. Current Opinion in Biotechnology 3: 286-290.
  87. Falkowski, P.G., P. Biscaye, and C. Sancetta. 1994. The lateral flux of biogenic particles from the Eastern North American continental margin to the North Atlantic Ocean. Cont. Shelf Res. 41: 583-601.
  88. Falkowski, P.G., Z. Dubinsky, L. Muscatine, and L. McCloskey. 1993. Population control in symbiotic corals. BioScience 43: 606-611.
  89. Falkowski, P.G. and Z. Kolber. 1993. Estimating phytoplankton photosynthesis by active fluorescence. In *Ocean Productivity: From Molecules to Space*, S. Maestrini and W. Li, eds., Int. Cons. Explor. Mer. 197: 92-103.
  90. LaRoche, J., R. Geider, and P.G. Falkowski. 1993. Molecular biology in studies of oceanic primary production. In *Ocean Productivity: From Molecules to Space*, S. Maestrini and W. Li, eds., Int. Cons. Explor. Mer. 197: 42-51.
  91. Falkowski, P.G., R.M. Greene, and R.J. Geider. 1992. Physiological limitations on phytoplankton productivity in the ocean. Oceanography 5: 84-91.
  92. Kolber, Z. and P.G. Falkowski. 1993. Using active fluorescence to derive phytoplankton photosynthesis *in situ*. Limnol. Oceanogr. 38: 1646-1665.

93. Kemp, P.F., P.G. Falkowski, C. Flagg, W. Phoel, S. Smith, D.W.R. Wallace, and C.D. Wirick. 1994. Modeling vertical oxygen and carbon flux during stratified spring and summer conditions on the continental shelf, Middle Atlantic Bight, eastern U.S.A. *Deep-Sea Res.* 41: 629-655.
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- Photosyn. Cong.*, P. Mathis, ed., Montpellier.
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  60. Falkowski, P. G., & Freeman, K. H. (Eds.) 2014. Volume 12 Organic Geochemistry *In H. D. Holland & K. K. Turekian (Eds.), Treatise on Geochemistry (Second Edition)* (pp. xxiii-xxiv). Oxford: Elsevier.
  61. Falkowski, P.G., 2015. *Life's Engines: How Microbes Made Earth Habitable*. Princeton University Press.

62. Wright, S.A., Sherwood Lollar, B., Atreya, S., Boss, A.P., Falkowski, P., Farmer, J.D., Guyon, O., Joyce, G.F., Kasting, J.F., Meadows, V. and Neches, P.M., 2019, January. Astrobiology Science Strategy for the Search for Life in the Universe. In American Astronomical Society Meeting Abstracts# 233 (Vol. 233).
63. Falkowski, P.G., 2019. 2. A Carbon Budget for the Northeast Continental Shelf Ecosystem: Results of the Shelf Edge Exchange Process Studies. Food Chains, Yields, Models, and Management of Large Marine Ecosystems.
64. Hazen, R.M., Bromberg, Y., Downs, R.T., Eleish, A., Falkowski, P.G., Fox, P., Giovannelli, D., Hummer, D.R., Hystad, G., Golden, J.J. and Knoll, A.H., 2019. Deep Carbon through Deep Time: Data-Driven Insights in Whole Earth Carbon.

### **Other Publications**

1. Falkowski, PG. 2003. When politics trumps science. New York Times 21 June.
2. Falkowski, PG. 2001. A climate pact without America. New York Times 25 July.
3. Falkowski, PG. 2000. The environment, and our votes. New York Times 31 August.
4. Falkowski, PG. 2007. Secret life of plants. (book review) Nature 447: 778).
5. Falkowski, PG. 2008. Find our energy expertise. New York Times 13 July.
6. Falkowski, PG. 2015. Taking the Oxygen Out of the Room. Huffington Post Science 20 August.
7. Falkowski, PG. 2015. Two Solutions That Cut Down on Fossil Fuels. Huffington Post Science 27 August.

### **Radio, Television, Podcasts**

NPR radio- Leonard Lopate Show, NPR news with Richard Harris, NHK television, National Geographic Television, NJTV News.

Blue Dot Podcast - 165: The Environmental Science Version of The Nobel Prize: Tyler Laureates

### **Invited Lectures and Meetings**

- 2006      Louisiana State University, School of the Coast and Environment  
 Central Caribbean Marine Institute for Educational Fundraising, London  
 AAAS - Invited speaker  
 Lehigh University  
 PSA Meeting - Juneau, Alaska  
 ASLO/AG Meeting - Honolulu, HI  
 Peking University, Beijing  
 Center for Quaternary Research, Xian  
 University of Xiamen  
 Chinese Academy of Sciences Eighth International Conference on Development  
 of Drylands Feb 25-28, 2006 - Invited speaker

- 2007      Natural Science Foundation - NRC Committee  
Conceptual Basis of Biology Meetings - Seattle, Washington  
European Phycological Congress - Invited speaker, Oviedo, Spain  
International Photosynthesis Congress - Invited speaker, Glasgow, Scotland  
The Royal Society - London, UK  
Jacques Monod Conferences - Roscoff, France  
NASA Science Update Panel SeaWiFS Anniversary  
AQUAFLUO Conference - Invited speaker, Prague, Czech Republic
- 2008      Sagan Lecture - AGU  
Plenary Lecture Ocean Sciences  
University of Tokyo, Japan  
University of Nagoya, Japan  
University of Kyoto, Japan  
University of Paris, France  
St. Andrews University, UK  
University of Dundee, UK
- 2009      Revelle Lecture - Washington DC  
Yale University  
Scripps Institute of Oceanography  
Marine Biological Laboratory  
Lamont Doherty Earth Observatory  
CNRS - Roscoff, France  
GRC - Marine Microbial Ecology, Italy  
SGM Spring Conference - EICC, Edinburgh, UK
- 2010      Ecology Prize Lecture, Germany  
University of Pennsylvania  
CNRS - Paris  
Princeton University  
NASA Ames Conference  
Canadian Society for Ecology and Evolution Conference – Quebec, Canada
- 2011      GRC - Metals in Biology  
Harvard University  
Massachusetts Institute of Technology  
Keystone Symposia, Singapore, China  
International Conference on Science – STHESCA, University of Krakow, Poland  
Brazilian Congress of Marine Biology, Natal, Brazil  
Aharon Katzir-Katchalski 30<sup>th</sup> Annual Lecture - Weizmann Institute of  
Science, Israel

- 2012      Wiese Lecture - University of Southern Alabama  
Royal Society, London, UK  
Chinese Academy of Sciences, Beijing, China  
USP Conference - University of Sao Paulo, Brazil
- 2013      GRC - Geobiology, University of Southern California  
City College of New York  
Santa Fee Institute  
University of Rhode Island  
Cambridge University, Clare College, Cambridge, UK  
Oxford University, Oxford, UK  
European Science Foundation  
Warsaw Technical University  
University College of London  
Wildlife Conservation Society  
Algae Biomass Summit  
Schmidt Ocean Research Symposium
- 2014      Institut de Ciències del Mar (ICM), Barcelona, Spain  
Comparative genomic approaches to understanding the architecture of metazoans,  
Coral Workshop, Rutgers University  
University of Michigan  
Kellogg Biological Station, Michigan State University  
American Museum of Natural History  
Monterey Bay Aquarium Research Institute (MBARI)  
Earth Life Science Institute, 2<sup>nd</sup> ELSI International Symposium, Tokyo, Japan  
Sorbonne University, Paris, France  
CNRS - Roscoff, France  
International Society for Applied Phycology (ISAP), Sydney, Australia  
GRC – Biomineralization, Colby-Sawyer College  
Massachusetts Institute of Technology  
Carnegie Institute of Washington  
Geological Society of America, Vancouver, Canada  
Utrecht University, Amsterdam, Netherlands  
American Geophysical Union, San Francisco
- 2015      Second Xiamen Symposium on Marine Environmental Sciences, China  
Eastern Photosynthesis Conference, Woods Hole  
University of Montana  
McMaster University, Canada  
CNRS - Roscoff, France  
La Sorbonne, University Marie and Pierre Curie  
CNRS - Ville de Franche-Sur-Mer Oceanographic Laboratory, France  
Oceanographic Institute, Monaco  
Carnegie Institute of Washington

UNESCO World Oceans Day, France  
 Positive Economy Forum, Le Havre, France  
 GSA Annual Meeting 2015, Baltimore

- 2016 Harvard University  
 AGU - ASM Colloquium, American Geophysical Union, Washington  
 Institute for Advanced Study, Princeton  
 Eastern Photosynthesis Conference, Woods Hole  
 Ocean and Evolution of Earths Biogeochemical Cycles Symposium, Rutgers  
 Tongji University, China  
 ASM Microbe 2016, Boston  
 Leon H. Charney School of Marine Sciences, University of Haifa, Israel  
 Global Co-Evolution of the Ocean Environment and its Ecology Workshop,  
 University of Bristol, England  
 17<sup>th</sup> International Congress on Photosynthesis Research, Maastricht, Netherlands  
 IMBC2016 Conference, Baltimore  
 Oceans World Meeting, Woods Hole  
 GSA, Denver  
 The Royal Society, London  
 Goddard Space Flight Center, Maryland  
 2016 Symposium on Biomaterials, Islen, NJ  
 Frontiers in Genomics, Nation Autonomous University of Mexico (UNAM),  
 Mexico City
- 2017 Antarctic Cruise, R/V ARSV Laurence M. Gould  
 QuEBS 2017, Workshop on Quantum Effects in Biological Systems, Jerusalem  
 NSF Geosciences AC-GEO, Washington D.C.  
 NASA Europa Lander Mission Concept Town Hall, Mesa, Arizona  
 The Rockefeller Foundation, The Bellagio Center, Writing Residency, Italy  
 Goldschmidt Conference 2017, Paris, France  
 BergamoScienza Festival 2017, Bergamo, Italy  
 C3 2017 Colloquium Aquafluo II, Sydney, Australia
- 2018 ELSI International Symposium 2018, Tokyo, Japan  
 GRC - Metals in Biology, Ventura, California  
 Harvard University – Dean’s Lecture  
 American Museum of Natural History  
 Princeton Plasma Physics Laboratory  
 Columbia University  
 Flatiron Institute, Simons Foundation  
 University of California, Berkeley  
 University of California, Davis – Storer Lecture  
 Rutgers University  
 Old Dominion University – Dean’s Lecture Series

2019 Cuban Society of Chemistry, Havana, Cuba  
 CIFAR International Assessment Panel, Toronto, Canada  
 World Science Festival Brisbane 2019 (WSFB), Brisbane, Australia  
 Korean Polar Research Institute, South Korea  
 University of Haifa, Leon Charney School of Marine Science, Israel  
 Hebrew University of Jerusalem, Israel  
 AbSciCon 2019, Seattle  
 Humboldt Symposium of Natural Sciences, Cayo Santa Clara, Cuba  
 Sagan Exoplanet Summer Workshop: Astrobiology for Astronomers, Caltech,  
 Pasadena  
 Tara Oceans GO-SEE 2019, Barcelona, Spain  
 Princeton University  
 Rockefeller University, The Joshua Lederberg – John von Neumann Symposium,  
 New York City

## Students

D.M. Riper - SUNY at Stony Brook, M.Sc. 1979  
 J. Budin - SUNY at Stony Brook  
 J. Sucher - Southampton College  
 N. Noy - SUNY at Stony Brook  
 G. Santostefano - Southampton College  
 Y. Park - SUNY at Stony Brook, Ph.D. 1988  
 T. Arroll - Southampton College, B.Sc. 1990  
 M. Tedesco - SUNY at Stony Brook, M.Sc. 1991  
 D. Henry - SUNY at Stony Brook, M.Sc. 1991  
 A. Milligan - SUNY at Stony Brook, M.Sc. 1991  
 M. Olaizola - SUNY at Stony Brook, Ph.D. 1993  
 A. Subramaniam - SUNY at Stony Brook, Ph. D. 1995  
 J. Bauman - SUNY at Stony Brook, M.Sc. 1993  
 S. Tozzi - Rutgers University, M.Sc. 2002  
 Z. Finkel - Rutgers University, Ph. D. 2004  
 T. Shi - Rutgers University, Ph. D. 2006  
 M. Oliver - Rutgers University, Ph. D. 2006  
 F. Wolfe - Rutgers University, Ph. D. 2006  
 S. Whittaker - Rutgers University, M.Sc. 2008  
 G. Robbins - Rutgers University, M.Sc. 2010  
 C. Yan - Rutgers University, M.Sc. 2012  
 J. D. Kim - Rutgers University, Ph.D. 2013  
 D. Lyons - Rutgers University, M Sc. 2014  
 J. Harrold - Rutgers University, Ph.D. 2014  
 J. Drake - Rutgers University, Ph.D. 2015  
 J. Kim - Rutgers University, Ph.D. 2016  
 J. Casey - University of Hawaii, Ph.D. 2016  
 B. Jelen - Rutgers University, Ph.D. 2018

A. Agarwal - Rutgers University, Ph.D. (in progress)  
 W. Liu - Rutgers University, Ph.D. (in progress)  
 Y. Sherman - Rutgers University, Ph.D. (in progress)  
 K. Yu Cheong - Rutgers University, Ph.D. (in progress)

#### **Ph.D. Advisor for**

Elizabeth Cosper - Columbia University, Ph D. 1980  
 Stephen Schaffer - New York University, Ph D. 1984  
 Ivor Elrifi - Queens University, Kingston, Ontario Ph. D. 1988  
 Richard Greene - SUNY at Stony Brook, Ph. D. 1994  
 Richard Reynolds - University of Southern California, Ph. D. 1993  
 Ming-Yi Sun - SUNY at Stony Brook, Ph. D. 1992  
 Zachary Johnson - Duke University, Ph. D. 2000  
 Jay Cullen - Rutgers University, Ph D. 2000  
 Joseph Grzymiski - Rutgers University, Ph. D. 2001  
 Tricia Bergmann - Rutgers University, Ph.D. 2003  
 Nicolas Cassar - University of Hawaii, Ph. D. 2003  
 Matthew Oliver - Rutgers University, Ph.D. 2006  
 Yongchen Ji - Rutgers University, Ph.D. 2006  
 Alex Kahl - Rutgers University, Ph.D. 2008

#### **Visiting Scientists** (Scientists who have worked in my laboratory)

Dr. Zvy Dubinsky, Bar Ilan University, Ramat Gan, Israel  
 Robert Precali, Ruder Boskovic Institute, Rovinj, Yugoslavia  
 Dr. Anton Post, Laboratory of Microbiology, University of Amsterdam  
 Dr. Robert Kinzie, Dept. of Zoology, University of Hawaii  
 Dr. Tamar Berner, Dept. of Life Sciences, Bar Ilan University  
 Dr. James Aiken, Inst. of Marine Environmental Research, Plymouth, U.K.  
 Dale Robinson, University of Southern California  
 Dr. Leonard Muscatine, University of California, Los Angeles  
 Dr. Richard Geider, College of Marine Science, University of Delaware  
 Dr. Kaori Ohki, National Institute for Basic Biology, Ikazaki, Japan  
 Dr. Ondrej Prasil, Institute of Microbiology, Czech Academy of Sciences, Trebon,  
 Czech Republic  
 Dr. Ian Davison, Dept. of Botany, University of Maine, Orono  
 Dr. Joseph Berry, Carnegie Institute for Plant Science, Stanford, California  
 Dr. Jean-Marc Ducruet, Dept. Of Biophysics, Saclay, France  
 Dr. Barry Osmond, Australian National University  
 Dr. Heather Stoll, Harvard  
 Dr. Mario Giordano, University of Ancona, Italy  
 Dr. Yong Park, Inha University, Korea  
 Dr. Maria Segovia, Queens University, Belfast  
 Dr. Sang Hoon Lee, Oceanographic Research and Development Institute, Korea

Dr. Amos Israel, University of Haifa  
 Dr. Rosalind Rickaby, Oxford University  
 Dr. Jean Paul Gattuso, CNRS – France  
 Dr. Alan Townsend, University of Colorado  
 Dr. Joon-Baek Lee, Cheju National University, Korea  
 Dr. Moshe Ben-Tzion, Bar-Ilan University, Israel  
 Dr. Sinjae Yoo, Korean Ocean Research and Development Institute, Inchon, Korea  
 Dr. Frederico Pereira Brandini, Oceanographic Institute of São Paulo University, Brazil  
 Dr. Qiang Hao, State Key laboratory of Satellite Ocean Environment Dynamics (SOED),  
 China  
 Dr. Nir Keren, Hebrew University of Jerusalem

### **Post-doctoral Fellows**

Dr. Assaf Sukenik (Senior Scientist, Israel Oceanographic & Limnological Research)  
 Dr. Zbigniew Kolber (Research Engineer, UCSC)  
 Dr. Jonathan Zehr (Professor of Marine Science, UC Santa Cruz)  
 Dr. Ronny Herzig (Professor, University of Haifa - deceased)  
 Dr. Julie LaRoche (Professor, Dalhousie University)  
 Dr. Anne Mortain-Bertrand (Professor, University of Bordeaux)  
 Dr. Paul Kemp (Professor, University of Hawaii)  
 Dr. Richard Greene (Research Scientist, EPA)  
 Dr. Jean-Michel Escoubas (Research Scientist, CNRS)  
 Dr. Ilya Vasil'ev (Senior Scientist, Lasertech -deceased)  
 Dr. John Berges (Professor, University of Wisconsin, Milwaukee)  
 Dr. Michael Behrenfeld (Research Scientist, Goddard Space Flight Center; Professor  
 Oregon State)  
 Dr. Ondrej Prasil (Director of Research, Trebon, Czech Republic)  
 Dr. Juan Vergara (Associate Professor, University of Cadiz)  
 Dr. Dion Durnford (Professor, University of New Brunswick, Canada)  
 Dr. Maxim Gorbunov (Research Professor, Rutgers University)  
 Dr. Ilana Berman-Frank (Professor, University of Haifa)  
 Dr. Yibu Chen (Information Technology Specialist, University of Southern California)  
 Dr. Debora Iglesias-Rodriguez (Professor, University of California, Santa Barbara)  
 Dr. Yorum Gerchman (Associate Professor, Haifa University)  
 Dr. Yi Sun (Research Associate, Waksman Institute)  
 Dr. Michal Koblizek (Research Scientist, Trebon, Czech Republic)  
 Dr. Antoinetta Quigg (Professor, Texas A&M)  
 Dr. Daniel Grzebyk (Professor, University Montpellier)  
 Dr. Kay Bidle (Professor, Rutgers University)  
 Dr. Elena Litchman (Professor, University of Michigan)  
 Dr. Andrew Irwin (Professor, Dalhousie University)  
 Dr. Danny Tchernov (Vice President, University of Haifa)  
 Dr. Bas van Schootbrugge (C2 Professor, Johann Wolfgang Goethe University, Frankfurt)  
 Dr. Trevor Bailey (Lecturer, University of Cardiff)

Dr. Thomas Bibby (Professor, Southampton Oceanography Centre)  
 Dr. Lin Jiang (Professor, Georgia Institute of Technology)  
 Dr. Allen Milligan (Associate Research Professor, Oregon State University)  
 Dr. Diana Nemergut (Associate Professor, deceased)  
 Dr. Huiyan Yang (Assistant Professor, University of Texas at El Paso)  
 Dr. Yael Helman (Professor, The Hebrew University of Jerusalem)  
 Dr. Pedro Cermeno (Senior Research Scientist, Instituto de Ciencias del Mar, Universidad de Vigo)  
 Dr. Tracy Quan (Professor, Oklahoma State University)  
 Dr. Assaf Vardi (Professor, Weizmann Institute of Science)  
 Dr. Matthew Johnson (Scientist, Woods Hole Oceanographic Institute)  
 Dr. Michele Vitadello (Professor, Medgar Evers College, NYC)  
 Dr. Miguel Frada (Senior Lecturer, Hebrew University)  
 Dr. Eric Hajanirana Andrianasolo (Research Associate, University of Ottawa)  
 Dr. Stefan Senn (Post-doctoral Associate, University of Salzburg)  
 Dr. Tali Mass (Associate Professor, Haifa University)  
 Dr. Jorge Dinamarca (Scientist II, Synthetic Genomics)  
 Dr. Benjamin Bailleul (Director of Research, IBPC Sorbonne University)  
 Dr. Arye Harel (Research Scientist, Volcani Institute)  
 Dr. Hanzhi Lin (Post-doctoral Associate, University of Maryland Center for Environmental Science)  
 Dr. Fedor Kuzminov (Scientist II, Synthetic Genomics)  
 Dr. Orly Levitan (Assistant Research Professor, Rutgers University)  
 Dr. Stanilas Von Euw (Trinity College, Dublin)  
 Dr. Elisha Moore (Assistant Professor, Rowan University)  
 Dr. John Kim (Technical Staff, Bell Labs)  
 Dr. Hagai Raanan (Technical Staff, Hebrew University of Jerusalem)  
 Dr. Manjula Mummadisetti (present post-doc)  
 Dr. Andrew Mutter (Merck)  
 Dr. Saroj Poudel (present post-doc)  
 Dr. Joshua Mancini (present post-doc)  
 Dr. Bhanu Prakash Jagilinki (present post-doc)  
 Dr. Jennifer Timm (present post-doc)

### **Consultant**

Algenol Biofuels  
 Reliance Industries  
 Satlantic  
 Sapphire Energy

### **Patents**

Pump and probe fluorometer (with Z. Kolber). U.S. Patent No. 4,942,303 (July 17, 1990).  
 Fast repetition rate fluorometer and method for measuring fluorescence and photosynthetic

- parameters (with Z. Kolber) U.S. Patent No. 5,426,306 (June 20, 1995).
- Fast repetition rate (FRR) flasher (with Z. Kolber) U.S. Patent No. 5,602,446 (February 11, 1997)
- Multiple protocol fluorometer and method (with Z. S. Kolber) U.S. Patent No. 6,121,053 (September 19, 2000).
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