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B.S.E., Duke University, 1979

S.M., Massachusetts Institute of Technology, 1982

Ph.D., Massachusetts Institute of Technology, 1985

Postdoctoral Investigator, 1985, Department of Civil Engineering, Massachusetts Institute of Technology.

Postdoctoral Fellow, 1985–1986; Postdoctoral Investigator, 1986–1987; Assistant Scientist, 1987–1991; Associate Scientist, 1991–2000, tenure awarded, 1995; Senior Scientist, 2000–present, Woods Hole Oceanographic Institution.

J. S. Johnson Chair as Education Coordinator, Department of Physical Oceanography, 2001–2006.

Member, American Geophysical Union, American Meteorological Society, American Physical Society

Honors: Fellow, American Physical Society, Division of Fluid Dynamics, 2001**Research Interests:** Theoretical and laboratory studies in geophysical fluid dynamics: stratified flows and internal waves, hydraulic phenomena, abyssal circulation in the presence of topography, geological fluid dynamics.**Refereed Publications:**Helfrich, K. R., W. K. Melville, and J. W. Miles, 1984. On interfacial solitary waves over variable topography. *Journal of Fluid Mechanics*, **149**, 305–317.Helfrich, K. R., and W. K. Melville, 1986. On long nonlinear internal waves over slope–shelf topography. *Journal of Fluid Mechanics*, **167**, 285–308.Whitehead, John A., and Karl R. Helfrich, 1986. The Korteweg–de Vries equation from laboratory conduit and magma migration equations. *Geophysical Research Letters*, **13**, 545–546.Melville, W. K., and K. R. Helfrich, 1987. Transcritical two-layer flow over topography. *Journal of Fluid Mechanics*, **178**, 31–52.Helfrich, Karl R., and Uwe Send, 1988. Finite-amplitude evolution of two-layer geostrophic vortices. *Journal of Fluid Mechanics*, **197**, 331–348.Whitehead, John A., and Karl R. Helfrich, 1988. Wave transport of deep mantle material. *Nature*, **336**, 59–61.Helfrich, Karl R., and John A. Whitehead, 1989. Solitary waves on conduits of buoyant fluid in a more viscous fluid. *Geophysical and Astrophysical Fluid Dynamics*, **51**, 35–52.Adams, E. E., D. J. Cosler, and K. R. Helfrich, 1990. Evaporation from heated water bodies: predicting combined force plus free convection. *Water Resources Research*, **26**(3), 425–435.Whitehead, J. W., and K. R. Helfrich, 1990. Magma waves and diapiric dynamics. *Magma Transport and Storage*, Michael L. Ryan, editor, John Wiley & Sons, Chichester, pp. 53–76.

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- Helfrich, Karl R., 1995. Time-dependent two-layer hydraulic exchange flows. *Journal of Physical Oceanography*, **25**(3), 359–373.
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- Pratt, L. J. and K. R. Helfrich. On the stability of ocean overflows. *Journal of Fluid Mechanics*, accepted.
- Helfrich, K. R. and R. H. J. Grimshaw. Nonlinear disintegration of the internal tide. *Journal of Physical Oceanography*, accepted.
- White, B. L. and K. R. Helfrich. Gravity currents and internal waves in a continuously stratified fluid. *Journal of Fluid Mechanics*, submitted.
- Helfrich, K. R. Continuously stratified nonlinear low-mode internal tides. *Journal of Marine Research*, submitted.

Non-refereed Publications

- Pratt, Lawrence J., and Karl R. Helfrich, 1990. Current research problems. *The Physical Oceanography of Sea Straits*, L. J. Pratt, editor, Kluwer, Dordrecht; pp. 577–580.
- Helfrich, K. R., 1987. Experiments on baroclinic eddy evolution and stability in continuously stratified systems. Proceedings of the *Third International Conference on Stratified Flows*, California Institute of Technology, Pasadena, California, February 1987.
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Thesis

- Helfrich, K. R., 1985. On long nonlinear internal waves over bottom topography. Ph.D. Thesis, Massachusetts Institute of Technology, 272 pp.