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**David M Ambrose\***, Department of Mathematics, Drexel University, 3141 Chestnut Street,  
Philadelphia, PA 19104. *Time-Periodic Interfacial Fluid Flows.*

We introduce a numerical method for computing time-periodic solutions of nonlinear partial differential equations. As an application of this method, we study time-periodic solutions of the Benjamin-Ono equation. We find a large number of such solutions. In particular, we find continua of genuinely time-periodic solutions connecting different traveling waves. This investigation leads us to exact, explicit formulas for these solutions. If time allows, time-periodic solutions for the vortex sheet with surface tension or water waves will be discussed. This is joint work with Jon Wilkening. (Received February 02, 2009)