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**Jan Bouwe van den Berg\***, Vu University Amsterdam, Amsterdam, 1081 HV. *Introduction:  
General Setup And An Example That Forces Chaos*

In this lecture the basic concepts of rigorous computing in a dynamical systems context will be outlined. We often simulate dynamics on a computer, or calculate a numerical solution to a partial differential equation. This gives very detailed, stimulating information. However, mathematical insight and impact would be much improved if we can be sure that what we see on the screen genuinely represents a solution of the problem. In particular, rigorous validation of the computations allows such objects to be used as ingredients of theorems.

The past few decades have seen enormous advances in the development of computer assisted proofs in dynamics. In this introductory talk we discuss the basic functional analytic setup underlying the rigorous computational method that is the central topic of this AMS short. As the central example we will use the problem of finding a particular periodic orbit in a nonlinear ordinary differential equation that describes pattern formation in fluid dynamics. This simple setting keeps technicalities to a minimum. Nevertheless, the rigorous computation of this single periodic orbit implies chaotic behavior via topological arguments. (See more at <http://www.ams.org/meetings/short-courses/short-course-general#ber>.) (Received December 03, 2015)