



© 1997–2009, Millennium Mathematics Project, University of Cambridge.

Permission is granted to print and copy this page on paper for non-commercial use. For other uses, including electronic redistribution, please contact us.

May 1997

News

More hailstones...



In the last issue of PASS Maths we presented the hailstone sequence: an unsolved mathematical mystery. Many of our readers have tried out our hailstone sequence generator and others have asked for more information about the problem or simply why it is of interest.

The *hailstone sequence* is **not** the problem's only name. You may also see it referred to as *the Syracuse problem*, *the Collatz problem* or simply as *the $3n+1$ conjecture*. A conjecture is simply a mathematical statement which has not yet been proved. To our knowledge the principal conjecture "the sequence terminates at the value 1 for all starting values greater than 0" is still unproved, despite rumours to the contrary!

To try out even longer sequences (using larger starting values than those offered by our own hailstone generator) you could try combining your Mathematical skills with your German and read Alfred Wassermann's page "Experiment mit der $3n+1$ Folge" (literally "Experiment with the $3n+1$ sequence").

More ambitious readers might like to read the paper "The $3x+1$ problem and its generalizations" by Jeff Lagarias for a mathematical overview of some of the lines of attack on solving the problem and for an insight into other related conjectures.

- [Mathematical mysteries: the hailstone sequence](#) – Issue No 1, January 1997.
 - [Experiment mit der \$3n+1\$ Folge](#) by Alfred Wassermann.
 - [The \$3x+1\$ problem and its generalizations](#) by Jeff Lagarias.
-



Plus is part of the family of activities in the Millennium Mathematics Project, which also includes the [NRICH](#) and [MOTIVATE](#) sites.