H. Gould & J. Tobochnik,
"An Introduction to
Computer Simulation Methods",
2nd edition,
Addison-Wesley, Reading 1996.

*h. ...dom lattice is to use an ... enumeration method is ... me $t+1$, is determined ... ghbors of site i at time ... ray and introduce two ... es i in the cluster. Use ... 4.11). Spatial averages ... ed from the probability ... method and the results ... ed walks of 5000 steps ... lts over 1000 different

Diffusion-limited aggregation (DLA). Many objects in nature grow by the random addition of subunits. Examples include snow flakes, lightning, crack formation along a geological fault, and the growth of bacterial colonies. Although it might seem unlikely that such phenomena have much in common, the behavior observed in many models that have been developed in recent years gives us clues that these and many other natural phenomena can be understood in terms of a few unifying principles. One

Homework #13 (due April 1)
1. Read this DLA description
2. Work on your program.
3. Come to individual meeting as signed up (see our webpage for link)
4. Comments welcome!

No requirement to answer any of above assignments (no email due April 1) but spend necessary hours on 2.

model that has provided much insight is known as *diffusion lin* DLA. The model provides an example of how random motion can self-similar clusters.

The first step is to occupy a site with a seed particle. Next, a from the perimeter of a large circle whose center coincides with th undergoes a random walk, i.e., diffuses, until it reaches a perimeter sticks. Then another random walker is released and allowed to w a perimeter site of one of the two particles in the cluster and sti repeated many times (typically on the order of several thousand to s a large cluster is formed. A typical DLA cluster is shown in Fig. properties of DLA clusters are explored in Problem 14.9.

Problem 14.9 Diffusion limited aggregation

a. Write a program to generate diffusion limited aggregation lattice. Let each walker begin at a random site on a circle of 2, where R_{max} is the maximum distance of any cluster parti To save computer time, assume that a walker that reache from the seed site is removed and a new walker is placed circle of r

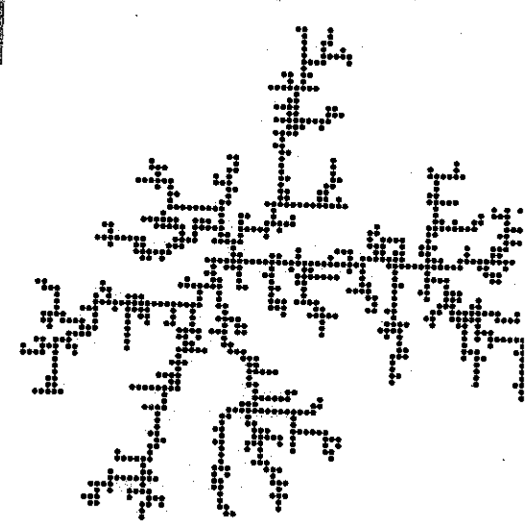

Fig. 14.12 An example of a DLA cluster of 1000 particles on a squ