Introduction

CAM-8 is parallel, uniform, scalable architecture offering unprecedented performance in the fine-grained modeling of spatially-extended systems. It provides a general-purpose instrument for the systematic exploration of *a new band of the computational spectrum.*

This brochure is a first attempt at putting under one cover some material that would illustrate CAM-8's particular orientation. The subject is *space*, *time*, and *matter*—the latter evolving according to an internally consistent *dynamics*. The stress is on interactive, real-time access to the entire simulation volume through "senses" similar to the ones used in a physical experiment: direct illumination and visualization, counting and weighing, coarse-grained averaging, event detection, and so on.

All of the images in the following pages come from real-time simulations performed on a small CAM-8 prototype. Using an amount and kind of technology comparable to that of a low-end workstation, this unit is about as good at large cellular automata calculations as any existing supercomputer. Larger units are currently being assembled, and much larger ones will be available soon.

We plan to continue expanding and updating this brochure; eventually, it will become an illustrated table of contents for a full-size book that we are working on. Perhaps an appropriate title for this book will be *Programmable Matter*, referring both to CAM-8 itself, which is indeed a very flexible computational medium, as well as to the different kinds of concrete and abstract "matters" that will come to life within the machine itself.