The central theme will be on the historical setting and origins of the Monte Carlo Method. The scene was post-war Los Alamos Scientific Laboratory. There was an inevitability about the Monte Carlo Event: the ENIAC had recently enjoyed its meteoric rise (on a classified Los Alamos problem); Stan Ulam had returned to Los Alamos; John von Neumann was a frequent visitor. Techniques, algorithms, and applications developed rapidly at Los Alamos. Soon, the fascination of the Method reached wider horizons. The first paper was submitted for publication in the spring of 1949. In the summer of 1949, the first open conference was held at the University of California at Los Angeles.

Of some interest perhaps is an account of Fermi's earlier, independent application in neutron moderation studies while at the University of Rome.

The quantum leap expected with the advent of massively parallel processors will provide stimuli for very ambitious applications of the Monte Carlo Method in disciplines ranging from field theories to cosmology, including more realistic models in the neurosciences. A structure of multi-instruction sets for parallel processing is ideally suited for the Monte Carlo approach. One may even hope for a modest hardening of the soft sciences.
MONTE CARLO: IN THE BEGINNING AND SOME GREAT EXPECTATION

INTRODUCTION

I should like to thank the Organizing Committee for the invitation to participate in this conference.

My remarks shall begin with the early history of the Monte Carlo Method. They will be somewhat discursive and episodic but perhaps not too nostalgic.

It is of interest to be reminded of the historical setting, beginning in 1946:

1. Scientists at Los Alamos had tried to cope with some compelling nonlinear problems during the war. Their only recourse was a numerical approach using some electromechanical devices plodding along noisily in a very tortuous manner.

2. Toward the end of World War II, the first general purpose electronic computer, the ENIAC, became operational. (It is a sad reflection on our civilization when it takes a global catastrophe to enable such research.)

THE CENTRAL ROLE OF THE ENIAC

Since the ENIAC undoubtedly provided the spark, not only for Monte Carlo but also for other developments, it is perhaps worthwhile to dwell briefly on it.

It was the creature of John Mauchly and Presper Eckert, physicist and electronics engineer respectively. John was familiar with Geiger counters and their associated electronic circuits. The key thought was that if electronic circuits could count, then arithmetic can be realized and differential equations can be integrated. So when he saw at Ballistics Research Laboratory in Aberdeen, Maryland a large hall with seemingly endless rows of desks each occupied with a woman computing firing tables by cranking away on an electromechanical desk calculator (now museum pieces) Mauchly became inspired. Why not propose (to the Government, i.e., the U.S. Army) that the process be automated—electronically. The project was consummated at the Moore School, University of Pennsylvania, for the Ballistics Laboratory.