

# NASA TECH BRIEF

## *Lewis Research Center*



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### Monte Carlo Program for the Transport of Neutrons and Gamma Rays

#### **The problem:**

To provide fast and accurate calculations of photon and neutron fluxes at specified points in a complex geometry, and to compute fluxes averaged over specified regions and surfaces of the geometry.

#### **The solution:**

A Monte Carlo computer program, FASTER-III, which computes the transport of neutrons and gamma rays in complex geometries. Importance sampling is employed in all the random sampling phases of the particle histories in order to minimize the variance of calculated fluxes.

#### **How it's done:**

The program uses importance sampling to calculate the resulting number and energy fluxes at specified points, surfaces, and volume detectors. It has the additional capability of calculating the minimum weight shield configuration which will meet a specified dose rate constraint. The program includes the treatment of geometric regions bounded by quadratic and quadric surfaces with multiple radiation sources which have a specified space, angle, and energy dependence.

The documentation includes two volumes, one outlining the theory and the other being a detailed user's manual.

#### **Notes:**

1. This program is written in FORTRAN IV for use on the IBM-7094/360, UNIVAC-1108, CDC-6600 computers.
2. Requests for further information may be directed to:

COSMIC  
112 Barrow Hall  
University of Georgia  
Athens, Georgia 30601  
Reference: B71-10490

#### **Patent status:**

No patent action is contemplated by NASA.

Source: T. M. Jordon of  
A.R.T. Research Corp.  
under contract to  
Lewis Research Center  
(LEW-11403)

Category 09