# The Monte Carlo Method in Astrophysics

## ASSIGNMENTS

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# 1st Assignment

➢Write a program that approximates the value of $\pi$ using the method described in the lecture.

➢Make a plot of the fractional error as a function of the number of iterations.

➢Determine the dependency of the functional error on the number of iterations.

# 1st Assignment

Fortran 77 routine

```fortran
 Subroutine randpi(N,M)
*
* It generates N random points
* within the unit square and computes
* the M points that lie within the unit circle.
*

      integer N,M
      real x,y

      M = 0
      do i=1,N
          x = rand()
          y = rand()
          if ((x*x + y*y).lt.1.) M = M + 1
      end do

      return
      end
```

# 1st Assignment