

# Location of the Sun and Moon

The SUN-MOON program, prepared by E.R. Schiffmacher, gives the position of the Sun and Moon for any observer latitude/longitude and selected time (in universal time, UT). The solar and lunar local transit, rise and set times, and location with respect to the observer at any given hour and minute (UT) are specified. The solar zenith angle,  $\theta$ , given in this program, is  $90^\circ$  minus the elevation angle of the Sun. The square-root of the cosine of this solar zenith angle (called the Chapman function; see Section 2.3) is used when discussing the ionospheric E-region ionization and electrical conductivity for the quiet-time dynamo currents of thermospheric wind and tidal origin. To run the program, insert the disk in the computer, select the drive letter for the disk, enter SUN-MOON and follow the directions. An example screen is shown below:

```
This program modified by E. R. Schiffmacher from

** ALMANAC FOR A WEATHER PERSON **
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Enter Longitude <decimal degrees, EAST POSITIVE>: -105.
Enter Latitude <decimal degrees>: 40.

Enter UT DAY? 175
Enter MONTH (#)? 6
Enter YEAR <4 digits!>? 2002_

ALMANAC - Longitude -105 east, Latitude 40
FRIDAY 175 JUN 2002
DAYNUMBER 326 JULIAN DAY 2452601

      SUN
DECL -20.05 , DIST .9877309
RISE 13 53 UT SET 23 39 UT
TRANSIT 18 46 UT

      MOON
RISE 0 51 UT SET 16 26 UT
TRANSIT 8 36 UT
PHASE .92 MEAN AGE 17.62 DAYS

Enter HOUR, MINUTE <UT>? 10,0

          DATA FOR 10 0 UT

OBJECT      ALTITUDE      AZIMUTH      DISTANCE      SQRTCOSCHI
SUN         -44.269        79.024        .9876487        0.000
MOON        67.092        234.478        2.632233E-3

LOCAL SIDERIAL TIME: 7 h 6 m

[Algain runs program again; any other key Quits:
```