**ORBITS PROGRAM**

The ORBITS program was written many years ago by a Cyril Gobrecht, under the supervision of Larry Mayer at the University of New Brunswick in the mid 1990’s. The ultimate purpose was to allow us to visualize the impact of orbital parameters (the Milankovitch Cycles) on global climate (more precisely on the insolation). The background and use of the program are documented in the enclosed paper:

*Mayer, L.A., Gobrecht, C., and Pisias, N.G., 1996, Three-dimensional visualization of orbital forcing and climatic response: interactively exploring the pacemaker of the ice-ages, Geologisches Rundschau, v. 85, pp. 505-512.*

When you unzip the package, you must keep all files in the same directory. To run the program just run orbits.exe and you will see a 4 rotating earths representing the position of the earth with respect to the sun at the equinoxes and solstices. You can move forward and back through time with the left/right arrow keys or automatically with the lower-case “m” key or in 1k steps backwards in time with the lower-case “y” key and forwards with the upper-case “Y” key. The “7” key moves in 25 kyr intervals backwards in time and the “&” key moves forward in 25 kyr intervals. As you move you see the earth-sun distance change as a function of the state of the eccentricity, obliquity and the precession of the earth’s orbit around the sun. In response to these conditions the insolation as a function of latitude calculated by Andre Berger (see paper referenced above for details) is color-mapped onto the earth’s surface. You can shut off the individual orbital parameters by clicking on the upper curves or using the o (obliquity), e (eccentricity), and p (precession) keys.

The “z” key allows you to zoom in and the “Z” to zoom out. The “r” key tilts the orbital plane toward you and the “R” key tilts it away. The “a” key rotates the plane around the other axis (June down) and the “A” key rotates the other way (June up). The “s” key rotates the scene counter-clockwise and the “S” key rotates it clockwise. The space bar resets to 0 time (today) and the escape key shuts closes the program.

Have fun, play with it and enjoy the “movement” (not music but you can set it to music) of the spheres.

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