ASTRONOMY 150 - MIDTERM Name: _____

April 30, 2009 TA's Name & Section (2 pts): _____

Answer all questions in the space provided. If you have any questions, raise your hand. 100 points possible. NO CALCULATORS OR ANY ELECTRONIC DEVICES.

Four planets are orbiting a star that is identical to our Sun. We have observed these planets and collected the following data. **Use these data for the entire exam!**

Planet	Mass [Earth = 1]	Diameter [Earth = 1]	Density [g/cm^3]	Moment of Inertia factor [K]	Distance from star [AU]
ARDBEG	0.5	0.7	5.8	0.34	0.3
BOWMORE	0.8	0.9	4.4	0.36	0.7
CAOLILA	8.0	2.0	4.0	0.30	1.0
DALMORE	0.1	0.5	3.1	0.40	1.5

1 (3 pts) If we assume that these planets are made of the same materials as our solar system (ice, rock and iron) what is the most likely compositions of the planet DALMORE?

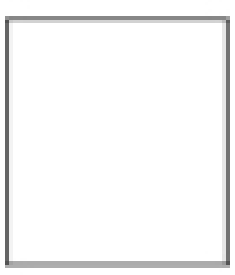
2 (6 pts) Which of the planets is **least** differentiated? Make sure to explain your answer.

3 (8 pts) How does the gravity on CAOLILA compare to the gravity on the Earth? Make sure to show your work.

4 (6 pts) Explain why the planet CAOLILA would be the most likely of the four planets to still be geologically active today.

5 (2 pts) What type of rock would be most common on a geologically active surface of CAOLILA?

6 (8 pts) You already determined how the gravity on CAOLILA compares to the Earth. Based on this, would expect the mountains on CAOLILA to be shorter or taller than the ones on Earth? [Explain your reasoning]



7 (8 pts) What is the type and age of the youngest rock you would expect to find on the surface of DALMORE? Be as specific in the age and type as you can.

8 (8 pts) Explain why you would **not** use a radioactive element like Carbon-14 (half-life = 5,730 years) to determine the age of the surface of DALMORE.