TERM PAPER GUIDELINES, ASTR 497/ ESS 490

The paper is short: up to 4 pages long, **excluding** the references list (which can be as long as you like) or appendices of tables/figures. The paper must be at least 1.5-spaced, 12-point font, with 1 inch top+bottom+side margins, or the grade will be reduced depending on how much you have ignored these stipulations.

CITATIONS:

Citations in the reference list should be extensive: i.e., authors, date, title of article, title of journal, page range. Examples:

- Catling, D. C., et al., 2006. Light-toned layered deposits in Juventae Chasma, Mars. Icarus. 181, 26-51.
- McLennan, S. M., Grotzinger, J. P., The sedimentary rock cycle on Mars. In: J. Bell, (Ed.), The Martian Surface: Composition, Mineralogy and Physical Properties. Cambridge Univ. Press, New York, 2008, pp. 541-577).

In the text, you can use numbers (i.e. [1] or supercripts[1]) or the "author, date" format (i.e., Smith, 2003), I don't mind.

You're not allowed to *cite* Wikipedia as a reference because I consider it invalid for the following reasons:

(a) it is untraceable, i.e., authors hide behind anonymity

(b) it can change from day-to-day and so what you cite may not exist tomorrow,

(c) a few Wikipedia science articles are really bad and written by people who are a bit clueless, in my opinion.

However, it's perfectly OK and sensible to use Wikipedia, but you should use and cite the real references that Wikipedia lists as primary sources. Primary sources are books or academic journal articles written by people who actually know what they're talking about because they're the researchers who uncover the original findings and provide new knowledge.

HOW THE PAPER WILL BE ASSESSED:

- A highly graded paper would succinctly review a particular topic and clearly explain the underlying physics/chemistry/biology/geology/etc. behind that topic without any errors.
- A very highly graded paper would also demonstrate some creativity by the student, such as calculations or a critical evaluation of data. For example, the latter might take the form of some graphs that the student plots
- A poorly graded paper would be a result of failing to review key aspects of the relevant literature, having numeric or conceptual errors, or being very unoriginal by simply reworking an existing review paper. Also papers that rely heavily on a single source will not receive good grades.
- The university requires you to avoid plagiarism (http://depts.washington.edu/grading/pdf/AcademicResponsibility.pdf),

noting that search engines make it easy for instructors to detect plagiarism. Any plagiarism automatically results in a grade of zero for the paper.

DEADLINE #1:
As a first step: Please gather your thoughts into a short summary of what you intend to write about. **If you feel unsure about whether the topic is suitable, please e-mail a preliminary title and 2-3 sentences and I'll provide useful comments and pointers on it**.

DEADLINE #2: The completed paper is due on the Monday of the last teaching week, Monday March 9. Please provide your paper in two formats: (1) As an e-mail attachment (either as a Word .doc or docx. file or .PDF) and (2) a hardcopy in my mailbox, Room 062, JHN.

Below are some suggestions for topics but please feel free to pursue your own ideas.

-David Catling

A selection of possible topics:
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Evidence for a subsurface ocean on Europa: Is there life there?

Subsurface oceans on Enceladus/ Titan/ Ganymede

The origin of eukaryotes: how did complex cells form? The endosymbiosis hypothesis.

How can we remotely detect life on exoplanets? A review of the means to detect life through spectroscopy of atmospheres.

Are there signs of life in the oldest Martian meteorite? An assessment of for and against arguments.

Chirality in biomolecules: An investigation of recent ideas about The origin of chirality.

RNA World: Solutions and issues.

Extremophiles: A review of extremophilic behavior and its relevance to the search for life elsewhere in the Solar System.

Volcanic activity and life: The Toba eruption and fatalities: was there really a
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bottleneck in humans?
The physics of volcanic aerosol injection into the stratosphere raising the albedo of the planet.

Recent water flow on Mars: evidence and theories about gullies.

Is there likely to be life on Mars?: An argument for or against

Tidal processes on Io, the most volcanic body in the Solar System

Tidal processes on Europa.

Atmospheric evolution on Mars: How did Mars' atmosphere change over time.

The planet Titan: The origin of its atmosphere and the nature of the organic chemistry on the planet. Could life exist in the subsurface of Titan?

Tectonic styles on the planets: Mars, Earth, Venus. What's the geophysics behind the different surfaces of Venus and Mars?

Neptune's moon Triton: Could Triton support life?

Was there once life on Venus before the runaway greenhouse? How would be know?

Impact processes on Mars versus the Moon

Small nodules and concretions in sedimentary rocks on Mars: Biotic or abiotic?