

Ge128 Term Project: Cosmochemistry

In the past, the class has examined in detail a certain aspect of cosmochemistry or exobiology (such as the delivery of complex organics to the early earth and prebiotic chemistry). This year we'll be more flexible. Mechanically, here's how it will go:

(1) Each student will give a short (10-15 minute) presentation in class, sometime the week of the 30th of May (since we have graduate students/seniors in the class). The topic may be one of the ones listed below, or it may be your own idea. I'd like to know the topics in advance so I can ensure that duplication, etc. is kept to a minimum.

(2) Each student will write a brief (4-5 pages) paper that addresses their topic, and should consider how the topic you're covering relates to the larger scale chemical evolution and solar system formation we have been considering during the course.

- 1) Chemistry and high redshift: the first generation of stars.
- 2) Organic components of dust in the diffuse ISM.
- 3) Shock chemistry at high and low density.
- 4) Chemistry in the infalling envelopes around YSOs.
- 5) Can dust grain growth/chemical modification be observed in YSOs?
- 6) The sizes of and conditions in circumstellar disks and pre-solar nebulae.
- 7) Kuiper belt objects and icy planetesimals (comets, w/upcoming missions).
- 8) Complex molecule formation in irradiated ices/on grain surfaces.
- 9) Short-lived isotopes in meteorites.
- 10) Relic interstellar grains (carbides and oxides).
- 11) Jovian planet formation and gas dissipation time scales.
- 12) Does planetary system formation depend strongly on stellar type?
- 13) D/H ratios in the solar system.
- 14) Titan and its chemistry.
- 15) Chemistry on meteorite parent bodies (aqueous or not?).
- 16) Volatile delivery to the early earth with and w/o Jupiter.
- 17) Chirality on the early earth and pre-solar nebula.
- 18) Prebiotic chemistry in terrestrial environments.
- 19) Searches for other planetary systems.
- 20) How does atmospheric chemistry/composition affect the "habitable zone"?

Good luck!!

Geoff Blake 5/15/05