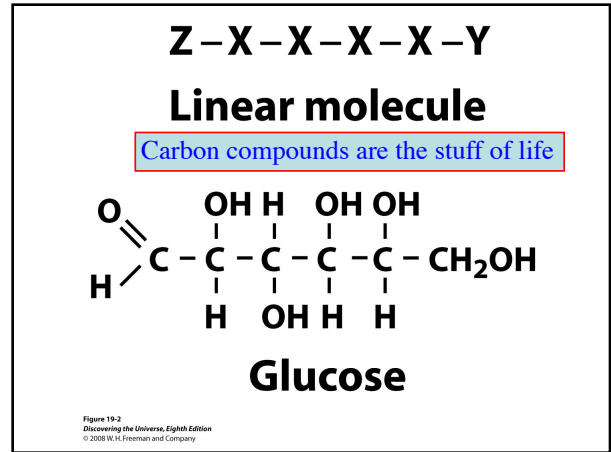


1



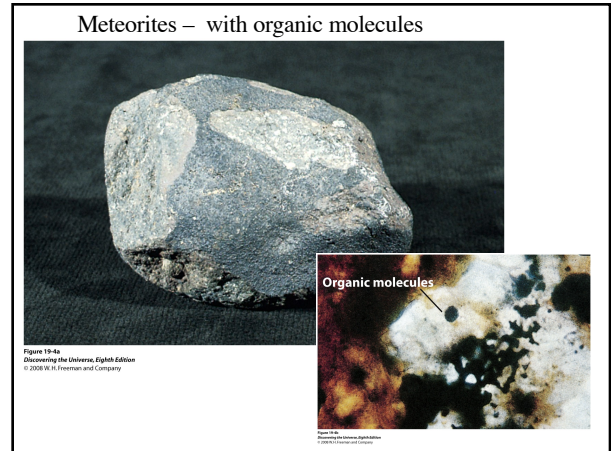
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Biology based on organic molecules with silicon compounds?

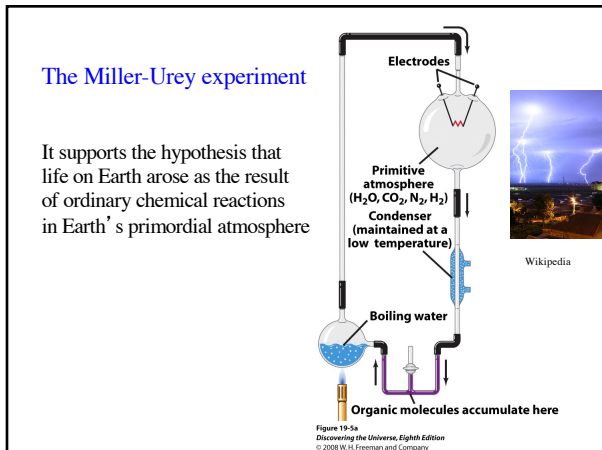
Bad qualities - reactions take far too long to support the evolution of life

Figure 19-3  
 Discovering the Universe, Eighth Edition  
 © 2008 W. H. Freeman and Company

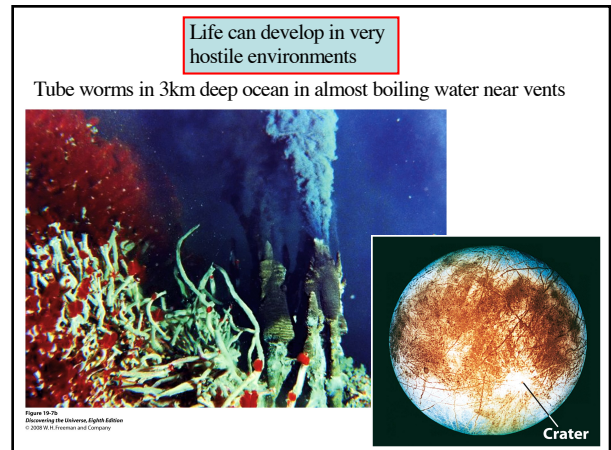
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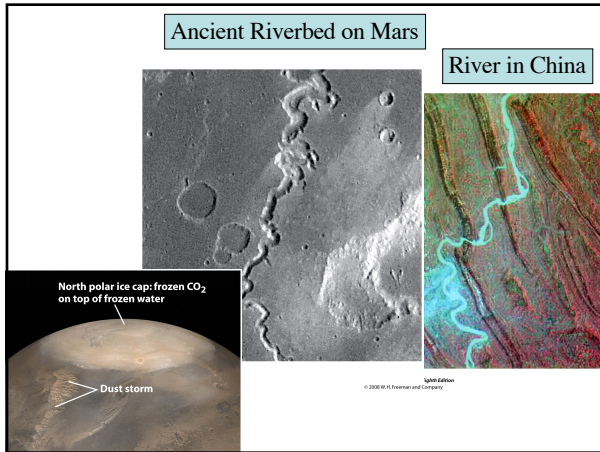
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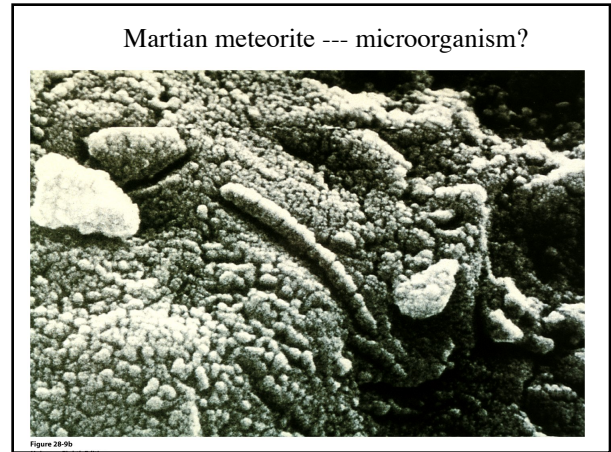
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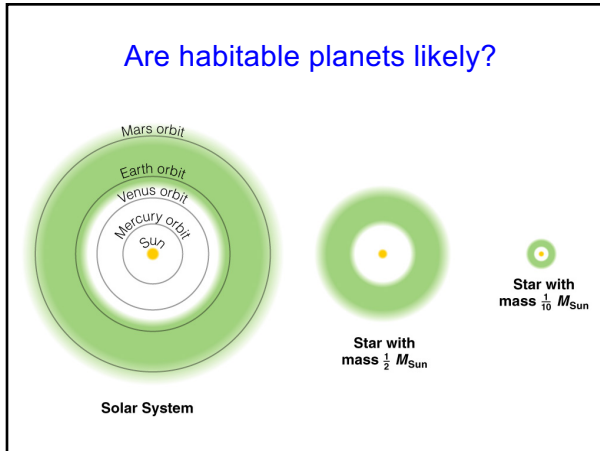
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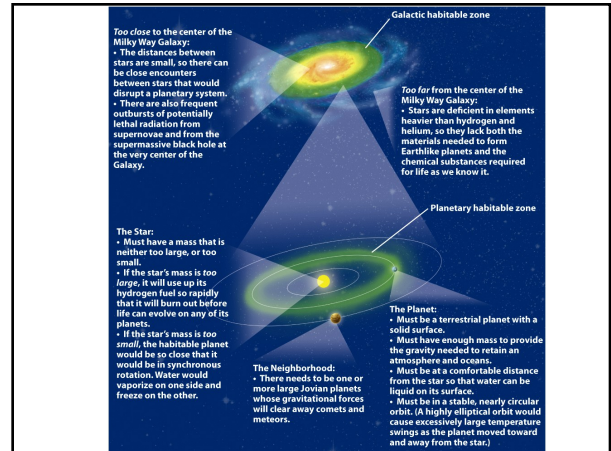
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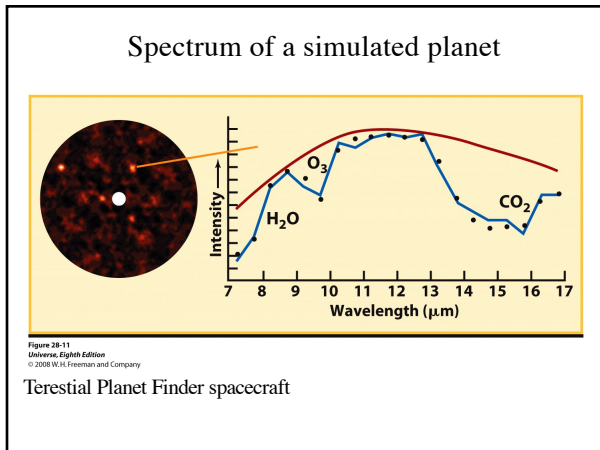
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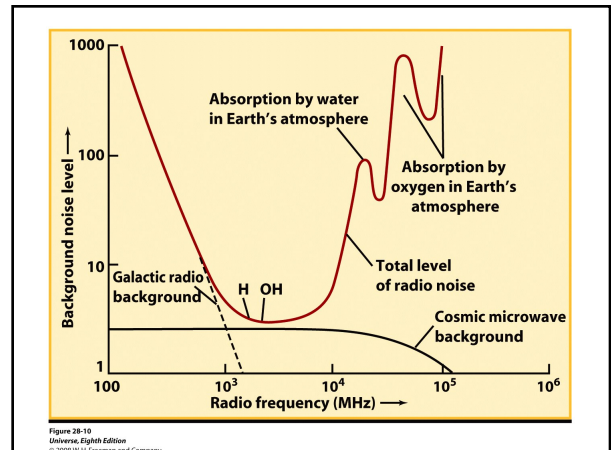
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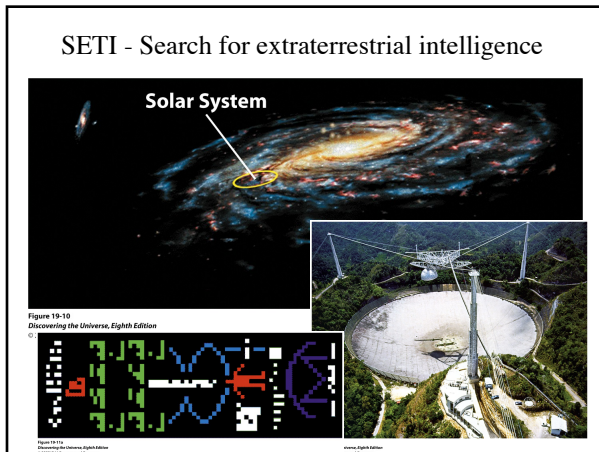
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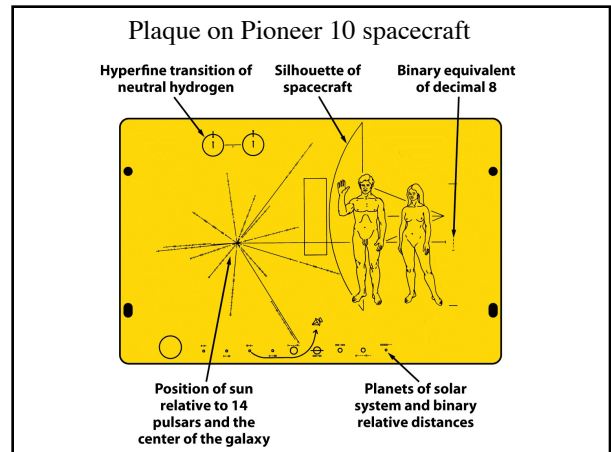
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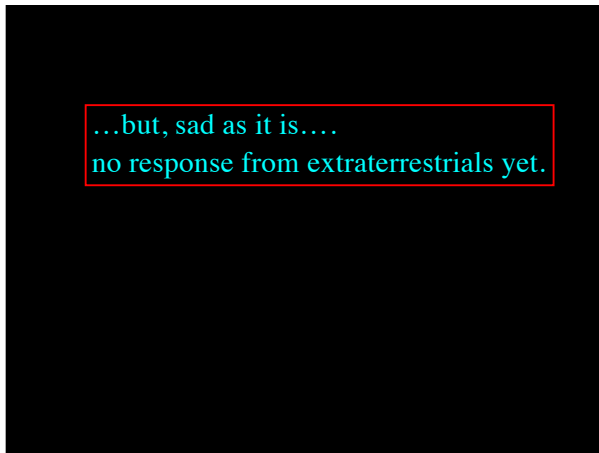
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13



14



15



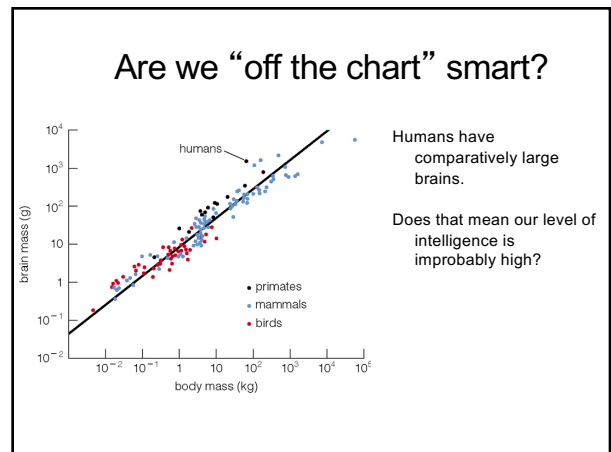
16

### The Drake equation

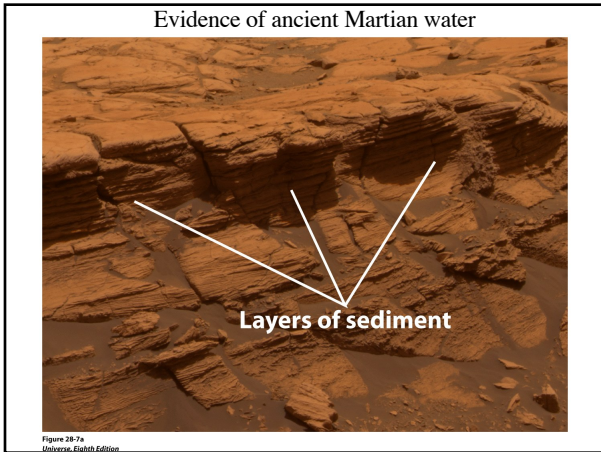
$$N = R f_p n_e f_l f_i f_c L$$

**N:** number of technologically advanced civilisations  
**R:** rate at which solar-type stars form in the galaxy  
**f<sub>p</sub>:** fraction of solar-type stars that have planets  
**N<sub>e</sub>:** number of planets per solar-type star suitable for life  
**f<sub>l</sub>:** fraction of such planets with life  
**f<sub>i</sub>:** fraction of those lifeforms that evolve into intelligent species  
**f<sub>c</sub>:** fraction of those species that send signal to us  
**L:** lifetime of such species

17



18



19