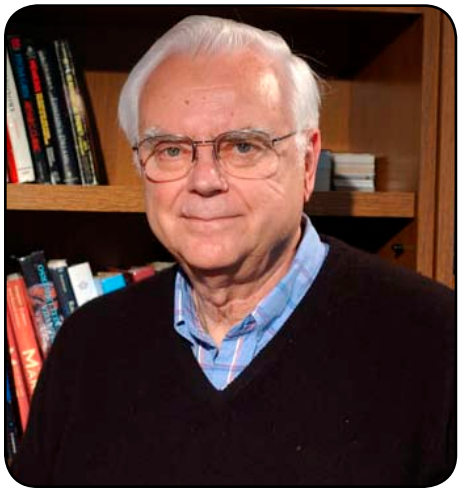
CSC/SETI Institute Colloquium Series



Frank Drake

Director, Carl Sagan Center for the Study of Life in The Universe

Wednesday, Nov. 7, 12:00pm
The SETI Institute, Europa room

The End of the Habitable Zone: Lessons from the Solar System

Phenomena in the Solar System have shown that temperatures can be suitable for life at great distances from a star as a result of the action of various forms of "insulation". The forms of "insulation" include a solid surface, an ocean, and a greenhouse atmosphere. It is interesting to note that there appears to be no plausible atmosphere which produces an "anti-greenhouse", a cooling effect. The existence of insulation greatly extends the habitable zone. In addition, with regard to the ubiquitous M-stars, the observed large fraction of extrasolar planets with substantial eccentricities suggests, if M-stars have a similar distribution of eccentricities, that very few will be in synchronous rotation, even though tidally locked, and thus more likely to be habitable. Insulation in M-stars will extend their habitable zone. Overall, the lessons from the Solar System suggest that the sizes of habitable zones are much larger than older pictures of habitable zones, greatly increasing the number of habitable planets.

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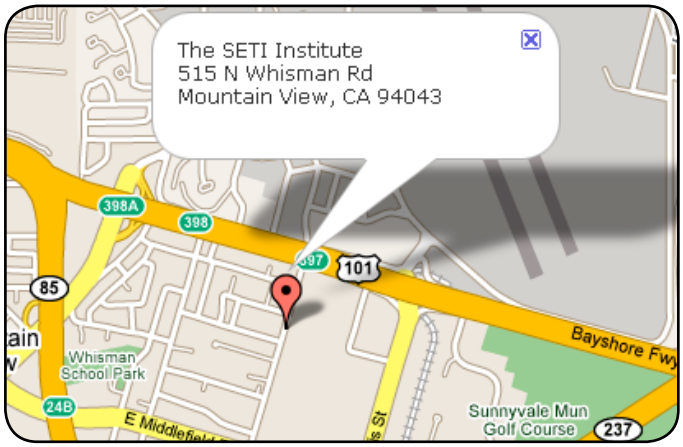

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