

Solar Forecast: 1.5 Billion Years of Habitability



- Previously estimated time limits for the habitability of Earth's surface due to increasing solar insolation have been extended.
- The Sun is growing steadily brighter and warmer over its lifetime, meaning that there is a limited duration of habitability before the Earth enters a period of moist and then runaway greenhouse climates.

- Initial one-dimensional modeling indicated that, with the 1% increase in solar constant every 110 million years, the Earth's would enter a catastrophic thermal runaway state in 650 million years, or at 6% increase.
- A new three-dimensional model, which better accounts for cloud cover and water saturation in the atmosphere, indicates that surface habitability may be maintained much longer, ~1.5 billion years, or a 15.5% increase.
- This study also suggests an increase the solar habitable zone around stars, important for the study of exoplanets.