

# CSC/SETI Institute Colloquium Series



## Tori Hoehler

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NASA Ames Research Center**

**Wednesday, Mar. 19, 12:00 noon  
The SETI Institute, Europa room**

## The Energetics of Habitability

Energy is required by all living things. Known organisms exhibit two distinct requirements, analogous to the voltage and power requirements of electrical devices, which must be met simultaneously in order to support metabolism. Quantification of these requirements, and of their sensitivity to environmental factors and organismal specifics, establishes energetic boundary conditions on 'habitability'. These constraints are likely among the chief determinants of the possible distribution of life in the deep subsurface and in other energy-starved systems. The biochemistry of energy metabolism has largely been understood through laboratory models, but quantification of the minimum biological requirements for energy must rely on study of natural populations that are adapted to chronic energy starvation. This talk will present a general energy-balance formulation of habitability and describe the quantification of microbial minimum free energy requirements in a natural ecosystem.



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