

CSC/SETI Institute Colloquium Series

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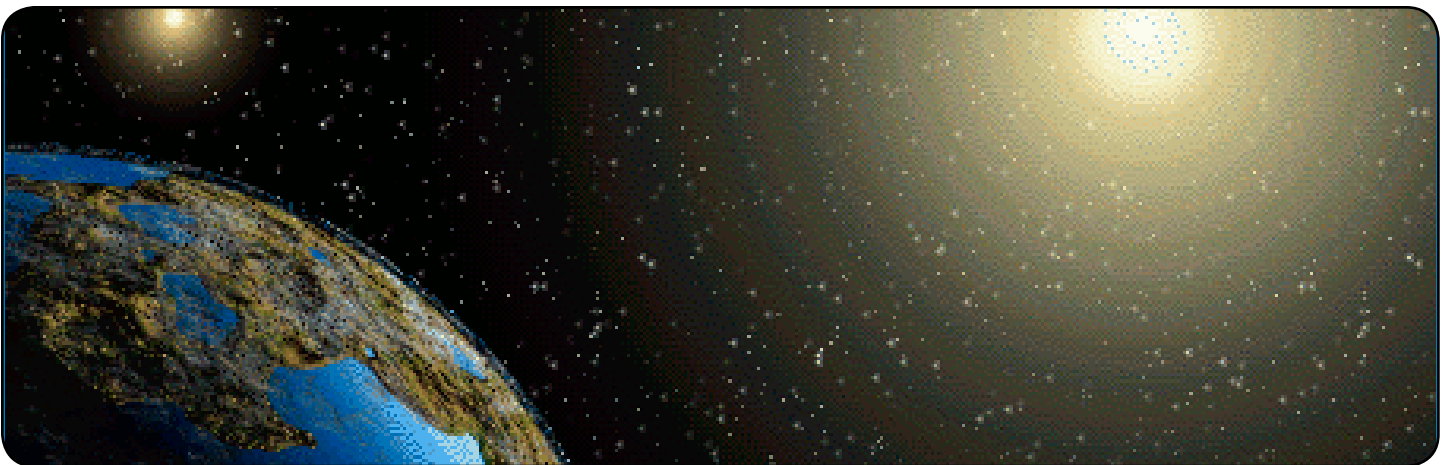
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Wednesday, Feb. 27, 12:00 noon
The SETI Institute, Europa room

Formation and Detectability of Planets around Alpha Cen B



We simulate the formation of planetary systems around Alpha Centauri B. The N-body accretionary evolution of a $1/r$ disk populated with 400-900 lunar-mass oligarchs is followed for 200 Myr. All simulations lead to the formation of multiple-planet systems with at least one planet in the $1-2 M_{\text{Earth}}$ mass range at 0.5-1.5 AU. We examine the detectability of our simulated planetary systems by generating synthetic radial velocity observations including noise based on the radial velocity residuals to the recently published three planet fit to the nearby K0V star HD 69830. Using these synthetic observations, we find that we can reliably detect a $1.8 M_{\text{Earth}}$ planet in the habitable zone of Alpha Centauri B after only three years of high cadence observations. We also find that the planet is detectable even if the radial velocity precision is 3 m/s, as long as the noise spectrum is white. Our results suggest that the most significant barrier to a characterization of the Alpha Cen system is the degree of frequency dependence exhibited by the noise.



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