In the search for aliens, we need ‘a robust definition’ of life

Even though we still struggle with finding a satisfactory definition of life, that doesn’t mean that we can’t think about ways that life might be so different, so alien, that we would also struggle with noticing its existence.

…

[W]hat if complex, thinking biological life is fleeting on the cosmic scale but its machine progeny are more robust and more widespread? Such entities might also be very hard for us to recognize as such, either whizzing around at high velocities between the stars or massively encrypted in their fundamental design.

…

[C]onsider a chunk of complex rock, a mixture of minerals and carbon chemistry. It may be bathed for a billion years in cosmic rays and indigenous particle radiation. It changes over that timescale, electrons are freed and captured, slow, slow chemistry and structural variation happens. Your pet rock might be just that, except you’re living too fast to notice.
Of course, rather frustratingly, to make proper hypotheses for these options we need a robust definition of life, but to make that robust definition we may need to first know the extent of options for life in the universe.

That’s why we need to both look for life as we know it, and at the same time keep track of the things lurking right in front of us.

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