# Invited Keynote: Answering the Call of Open-Endedness

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## Keynote Abstract

Of all the fascinating properties of life on Earth, among the most incredible is that it is open-ended. Life has continued its evolution into virtually endless diverse and often increasingly-complex forms for more than a billion years. Photosynthesis, flight, and human intelligence are but a tiny sampling of the boundless feats of evolution, often far exceeding anything yet built through human engineering. In short, evolution on Earth is as close as we have seen to a never-ending algorithm – a prolific generator that continues to invent and diverge over eons without ceasing. The field of artificial life, which dares to explore beyond the confines of conventional optimization, is the natural home for the study of open-endedness. Indeed, open-ended evolution is an active field of research within our community. Yet why has the field not caught fire despite its profound potential to transform our understanding of search algorithms and even ourselves? The argument can even be made that open-endedness may be one of the few, if not the only, viable path to brain-level complexity, and hence a vital link in the pursuit of AI and machine learning. It therefore deserves the status of a grand challenge, and all the mind-share and talent such a status entails. This talk argues for why the field is now poised to be elevated, and how the alife community sits front and center of this new frontier.