"Agent-based modeling: from manifestos to manifestations"

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Agent-based modelling is no longer a new approach but exists for more than 20 years. Initial excitement about this approach, which allows to link behavior of agents to systems dynamics, was high but progress was much slower than expected. To date, ABMs are used in virtually every field dealing with agent-based complex systems (ACS), but testable predictions are still rare and a general theory of systems did not yet emerge. Over the last decade, though, agent-based modelling has been maturating: standard languages and protocols for model development are increasingly discussed and used, the much-needed shift in focus from representation to model analysis has started in various field, and the need for finding the middle ground between simple toy models and overly complex systems model is increasingly acknowledged. Time has thus come to demonstrate that in several fields ABMs are already far beyond manifestos and provide robust answers to complex questions. Still, within the ABM community manifestos regarding improving coherence and efficiency in model development, communication, analysis, and development of theories and systems are needed. This will ultimately lead to a general theory and science of ACS, which also takes into account ontological differences between ACS comprised of cells, social insects, organisms, or human actors and institutions.