



# Active Matter, Emergence and the Stuff of Life

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## Committee Room 1

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**4.30pm – 5.30pm**

All welcome. Talk, followed by discussion over tea and coffee

Registration preferred, to assist with catering provision, but not essential.

To register, or for any questions, please contact: [creme@ioe.ac.uk](mailto:creme@ioe.ac.uk)

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**We generally suppose that matter is inert. Everything is simply composed of smaller and smaller mechanical parts, each responding to the forces applied on it by a vast interacting system. Even the delicate clockwork of life has been seen as a machine, the cogs and wheels of passive matter ticking away according to fixed and steady rules.**

But there has long been an undercurrent of doubt about the passivity of matter. Might there not be some 'life force' for example, imbuing special substances with agency, potency, or, at least, activity? Such vitalism has been out of fashion for centuries but it still lurks behind our thinking about the physical world.

While passive matter is undeniably ubiquitous, there are also many examples of systems composed of active parts. Flocks of starlings and swarms of lymphocytes exhibit startling properties, what we call "emergence", in the right situations. Such systems of "active matter" evince remarkable similarities with one another across a vast range of scales and an incredible variety of contexts. But they remain somewhat ill-understood, awaiting unifying theories and generalized approaches.

**This talk will introduce some of the fascinating issues in emergence and present a new and striking example of active matter. Tiny molecular machines perfuse every cell in our bodies. They swarm and wheel, merge and separate. And, in their dance, they appear to facilitate the essential flows of nutrients and information upon which life is based. And, for the first time, we are able to reproduce these molecules in bulk and study them in the laboratory. We will examine the early results of that study and question the implications of such base-level activity for the traditional corpuscular/mechanical view of a world built from passive matter.**

**Special Interest Group:**

**Education and Religion**