第４回物理学教室談話会

講演題目： **Biohybrid active matter**

— how amoeboid cells actuate passive micro-cargo

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日 時：10 月 4 日（金）14：50～16：20

場 所：大学院講義室　B-212（W1-B-212 室）

要　旨

Cell-driven micro-transport – the movement of micron-sized cargo particles by motile cells – is one of the most prominent applications in the emerging field of biohybrid systems. Here, we demonstrate that motile amoeboid cells can act as efficient and versatile transport agents, relying on chemotactic and collective locomotion. The motile properties of the carrier cells result from mechanical interactions with the passive cargo particles and reveal an optimal cargo size that enhances the locomotion of the load-carrying cells, even exceeding their motility in the absence of cargo. Our experimental findings are discussed in terms of an active particle model that provides an estimate of the long-time transport coefficients. We also consider the collective transport of micro-cargo by many amoeboid cells, revealing non-Gaussian displacement statistics that originates from heterogeneities in the actuation of the cargo particles. Finally, we estimate transport forces under different environmental conditions, aiming at an overall understanding of this novel type of composite active matter.

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