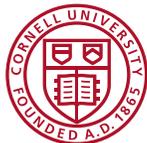


September 20, 2021



Cornell University

The Giometto Lab (<https://giometto.cee.cornell.edu>) at Cornell University is seeking applications for a Ph.D. student interested in quantitative biology and/or biological physics.

The student will combine techniques of synthetic biology and experimental evolution with quantitative modeling inspired by biological and soft matter physics to study the **evolutionary dynamics of microbial communities** in spatially structured populations. The applicant may find the following publications useful for getting a sense of the study questions investigated in the lab:

<https://doi.org/10.1073/pnas.1809587115>

<https://doi.org/10.1101/2020.09.08.288423>

<https://doi.org/10.1038/s41396-020-00863-0>

Available research projects include investigating **evolutionary and co-evolutionary dynamics in spatially extended landscapes**, how **biological interactions (e.g., antagonism and cooperation)** shape **spatially structured microbial populations**, and the **mechanics and biological physics of dense microbial populations**. We are looking for creative and talented tinkerers with a background in physics, engineering, computer science, biology, or related fields, who are **passionate about the physical and biological sciences** and have strong analytical and computational skills. Prior experience in experimental biology is not required, but the applicant should have a strong interest in working in a microbiology lab and learning the techniques of molecular biology and synthetic biology.

The interested applicant should apply to the graduate program of the School of Civil and Environmental Engineering (Environmental Processes focus area) **before October 15, 2021**. Information on the graduate program can be found at <https://www.cee.cornell.edu/cee/programs/graduate-programs>. Please review carefully the materials required for the application, which include TOEFL or IELTS score for non-native English speakers. **We welcome and embrace diversity of people, backgrounds, identities, and cultures**. A competitive salary including tuition fees, health insurance and full employee benefits are offered in accordance with the University guidelines. Feel free to contact me directly at giometto@cornell.edu for more information and for further details on the projects available. If interested in applying, please send me your CV, a brief description of research interests and motivation, transcripts of records and contact information of up to three references.

Example study system. A droplet containing cells of two yeast strains (A) expressing different fluorescent proteins (shown in yellow and blue) deposited on a gel forms a colony that expands radially (A, B). Here, yellow cells divide faster than blue ones, and so they form funnel-like sectors that expand within the colony (B). At the micron scale (A), these non-motile cells push each other while dividing, and these mechanical interactions have consequences for the patterns found at the centimeter scale (B), affecting the population genetics of the system (e.g., how fast fitter mutants spread). The dynamics of this population can be understood by treating the colony as a multi-phase, viscous and self-replicating fluid (C-E).

