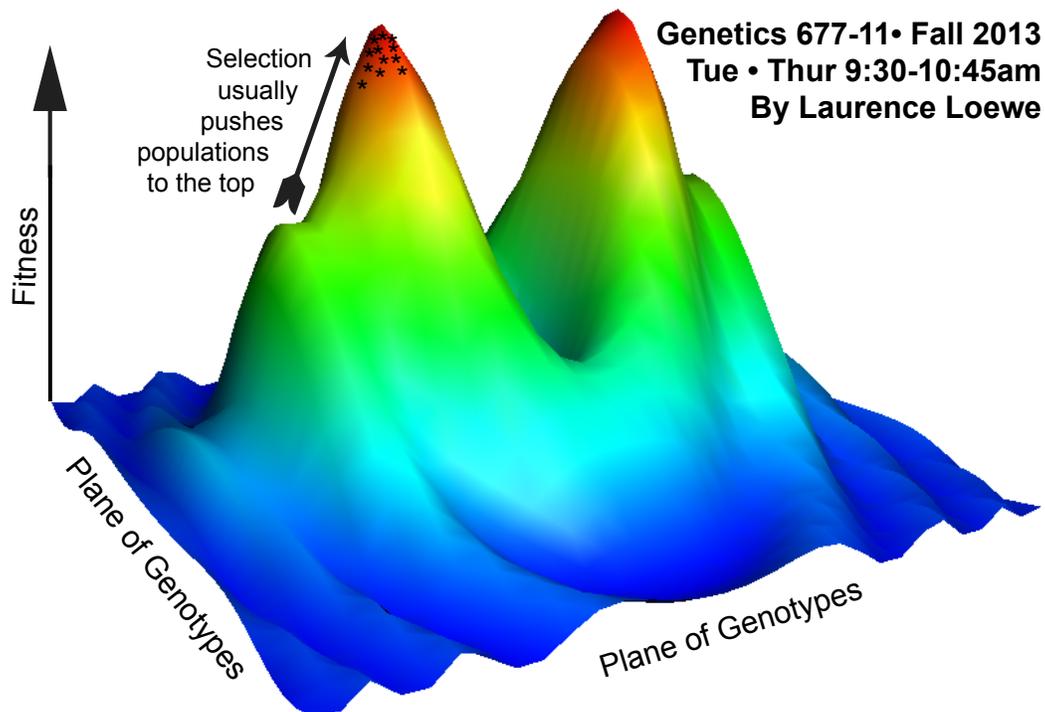


# Evolutionary Systems Biology



Fitness landscapes determine how populations evolve over time. Understanding them could help solve practical problems from reducing rates of antibiotics resistance evolution to anticipating how species evolve in dynamic ecosystems. But how can we move from massively oversimplified cartoons like above to deeper understanding? The new field of evolutionary systems biology builds bridges between molecular systems biology and population genetics to advance both. In this course you will get a series of starting points to jumpstart your own research.

## Are you a pioneer? Do you like a challenge?

**This course** is designed to give you a taste for what real researchers do. Not for the faint of heart. But cool. You will venture out into the unknown and who knows what you will find? In the safe limits of the course and with coaching, you will step into the role of a scientist working in an interdisciplinary team with your peers, facing the same dizzying challenges scientists face every day.

**How?** You will pick questions you are interested in, learn how to collaborate, think on your own, maintain a weekly blog, review the work of your peers, edit reviewer comments and with your team repeatedly revise your final research proposal that will then be treated like a real one. You can work on any research question you like as long as it contributes to the broad scope of evolutionary systems biology or includes you building a model with tools you learn about in the course.

**After** the course you will step back out of your role and return to your previous life. If you want to try out the life of a scientist without committing, this course is for you.

**Informal prerequisites:** curiosity, a strong will to engage in real research, some background in your field and an interest to collaborate with people from other fields to arrive at a more complete picture. Your field could be any bio or engineering discipline, math, computer science, physics, chemistry or any other field that might help understand fitness landscapes.

**You will write a lot and think a lot** in this course. This will help you to develop your writing skills and make you more discerning in your thinking.

More about this course can be found at:  
<http://evolution.ws/people/loewe/teaching>

**Target audience:** Advanced undergraduates and graduate students who have found their field.

**Prerequisites:** Admission after instructor approval (please email Laurence Loewe (loewe at wisc dot edu) and put "EvoSysBio Course" in the subject). This is a 3 credit course that will require about 9 hours of work per week outside of class.