



UNIVERSITY OF TORONTO
FACULTY OF ARTS & SCIENCE

398 Y Research Excursion Program
Summer 2019

In an effort to provide as many opportunities as possible, priority will be given to those who have not already received funding for a Faculty of Arts & Science international opportunity including 398 REP, ICM, CFHU or DIIF – (Some exceptions may apply, please inquire for details). All proposals involving undergraduate student travel must include the full participation of a faculty member with a continuous undergraduate appointment to the Faculty of Arts & Science (St. George). All student participants must be current Arts & Science (St. George) undergraduate students in good standing and be enrolled in an academic program at the time the proposed activity takes place.

PART I

Last Name: **WEIS**

First Name: **Arthur**

Sponsoring department or program:
Ecology and Evolutionary Biology

UTOR Email Address:
athur.weis@utoronto.ca

Part II – Project Summary

Project title and a brief description of your proposed project: Estimating Potential Plant Evolutionary Response to Climate Warming:

EEB 398Y0Y L0401

Shifting climate will expand the growing season and impose thermal stress on native plant species. This will generate new selective pressures. It is an open question if plant populations harbor enough genetic variation to keep up with these shifting pressures. Students will participate in an on-going experiment using the Experimental Climate Warming Array at the Koffler Scientific Reserves. The experiment tests the survivorship, growth performance and reproductive fitness of genotypes drawn from natural populations. Students will work as part of a team to gather the principle data. They will also develop an independent research project that ‘piggy backs’ onto the main experiment.

MARKING SCHEME

Participation in daily	35
Oral Presentations	20
Field Note Book	10
Written Report	35
Total	100

Notes--

Participation: Students will be evaluated for the quality of work they contribute on the day-to-day operation of the main research project.

This includes:

- Reliable and prompt attendance at appointed times.
- Attention to detail.
- Rapid notification of problems or ambiguities operating procedures.
- Consistency in executing procedures and logging of data.

- Participation in discussion during lab meetings and tutorials.

Oral Presentation: Students will make two oral presentations at lab meetings. The first will concern the background and planned procedures for the independent project (5 marks). The second will be a presentation of independent project results (15 marks).

Field Note Book: A daily log of research progress is required. The notebook should record observations made about both the main and the independent projects, the data collected, and thoughts on interpretation of results. The notebook will be reviewed several times over the summer and feedback given.

Written Report: This will be concern the independent project. It should be prepared in the format of a scientific paper, with sections entitled Abstract, Introduction, Methods, Results, Discussion, and References. It should also include figures and tables that summarize the findings. The report will be due in early October.

Total number of undergraduate students participating: 2

Location of activity (city and country): Koffler Scientific Reserve, King City, Ontario

Dates of activity: 1 May to 15 August, 2019

Role of faculty supervisor:

Professor Weis will be involved on a daily basis with all aspects of the student's experience.

PART III – Details of Proposed Activity

Description of proposed activity:

Shifting climate will expand the growing season and impose thermals stress on native plant species. This will generate new selective pressures. It is an open question if plant populations harbor enough genetic variation to keep up with these shifting pressures. Students will participate in an on-going experiment using the **Experimental Climate Warming Array** at the Koffler Scientific Reserves. The experiment tests the relative growth performance and reproductive fitness of genotypes drawn for natural populations. You will work as part of team to gather the principle data. In addition, we will help you develop and perform your own independent research project. This can be a project that 'piggy backs' onto the main experiment, or, it can be one inspired by observation you have made in the natural habitats of KSR. Free housing at one of KSR residences and a food allowance included.

Planned academic outcomes:

How does this project relate to the academic goals of the applicant, unit and Faculty?

Like FAS in general, EEB highly values the experiential learning, as demonstrated by our field courses, our high levels of research participation. Many of our undergraduate students, including those from the Weis lab. become authors and co-authors of journal articles arising from their work. Research experience has become essential for admission into the top graduate programs in Ecology and Evolution, and this research excursion can provide it.

How will students be selected to participate in the proposed project?

Please list any prerequisites, specific conditions or other relevant information.

Students must be willing to work long hours out-of-doors, rain or shine. They must have completed BIO120, BIO220. A course in statistics is highly recommended. Strong preference will be given to individuals with career interests in scientific research or environmental protection. Applicants should contact Dr. Weis directly to arrange an interview.

Indigenous Consultation: N/A

For proposals involving Indigenous communities, explain your process of engaging with Indigenous partners. If you have questions regarding consultation, please contact Brenda Wastasecoot: brenda.wastasecoot@utoronto.ca.

How does this project meet the requirements of the REP Program?

This course contributes to experiential learning at KSR, which is quickly becoming Canada's premiere research facility in terrestrial environmental biology. Undergraduates in the project will interact with their peers involved in as many as 20 other projects at the reserve. They will have daily contact, not only with Dr. Weis, but with graduate students and post-doctoral scholars from around the world. Global climate change is, after all, global: the opportunity to contribute to research on its environmental effects can have impacts far beyond Canada.

Does this project require ethics approval? no

All undergraduate students, graduate students, and faculty taking part in international opportunities must meet the UofT Safety Aboard guidelines as noted on the Safety Abroad website: <http://www.studentlife.utoronto.ca/cie/safety-abroad> in order to participate. Support will be provided by the Professional and International Programs (PIP) office at Woodsworth College to ensure safety abroad requirements are met.

PART IV – Itinerary

Dates	Location	Activity
<i>May 6</i>	<i>Koffler Scientific Reserve</i>	<i>Arrive and take up residence</i>
<i>August 15</i>	<i>Koffler Scientific Reserve</i>	<i>Return</i>