

UNIVERSITY OF TORONTO
FACULTY OF ARTS & SCIENCE

Office of the Dean

**INDEPENDENT EXPERIENTIAL STUDY PROJECTS (398H/399Y)
PROJECT DESCRIPTIONS 2012**

Name and Title: Tania Li, Professor and Canada Research Chair
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Course title and weight (398H or 399Y): ANT399Y

Description of project and experiential component: Producing Wealth and Poverty in Indonesia's New Rural Economies

Professor Tania Li, Department of Anthropology, University of Toronto, and Dr Pujo Semedi, Department of Anthropology, Gadjah Mada University, Yogyakarta, Indonesia This research program examines the social relations through which rural people gain access to, or are excluded from, the benefits of high growth agriculture in Indonesia. The research focus this year is on the Dieng Plateau in Central Java, where farmers have converted their mixed land use to intensive, mono-cropped potato cultivation. The aim of the research is to map the social positions, relations and practices that shape who wins, and who loses, from this radical transformation of the rural economy.

Student Experience:

Undergraduate participants will receive intensive training in the Indonesian language as well as research skills, and undertake six weeks of field research together with other students working in small teams. The research of each team will involve interviewing workers, traders, community leaders, local officials, and activists concerned in some way with the vegetable production economy. It will also involve observation in naturalistic settings, such as spending a few days working alongside wage workers, or following traders on their rounds picking up produce.

Calendar, location and setting:

May 01 - June 15	Language learning and research preparation at Gadjah Mada University, Jogjakarta
June 15- July 31	Field research, Dieng Plateau, Central Java
August 1-31	Return to Canada to complete research paper and field notes for submission.

Location:

The students in 399Y will spend six weeks in May and June based at Gadjah Mada in Yogyakarta for their language training, and for planning meetings with members of the research team. For the intensive fieldwork

period in June-July, the undergraduate students will be based in a few neighbouring hamlets, where they will work in small sub-teams. Breakout into sub-teams is intended to help cover the range of topics and localities, and to avoid overwhelming the research subjects. The total number of undergraduate researchers involved in the project will be about 30 persons (20 Indonesian, 10 Canadian). Each team will comprise 3-6 members.

Supervision/ Safety:

Dr Tania Li and Dr Semedi will be the co-instructors for the course. Dr Semedi, who holds an appointment as visiting professor at the University of Toronto, will be present in Central Java for the entire 6 week period of the field research. Dr Li will be present for the first 4 weeks while the students are settling in and starting their work. During their 6 weeks of language training at Gadjah Mada University students will be under the general supervision of Dr Semedi. A doctoral student Hery Santoso, co-supervised by Li and Semedi, will assist in student supervision and will be the field co-ordinator. Santoso will by then have spent one year living in the village that is at the center of our research site, conducting his own field research (Sept 2011-August 2012). He will use his contacts and familiarity with the area to make suitable home-stay arrangements for the students. The instructors will institute a chain of responsible leadership to ensure the safety of students in the field. Students will attend training at the Safety Abroad office, and sign the Consent Form and Release from Liability for Off-Campus International Field Courses.

The conditions in the field research site that will be the focus of our research this year, the Dieng Plateau of Central Java, are less rugged than West Kalimantan (ANT 399 site for 2010 and 2011). The road and cell phone network are complete, making communication much easier. This means that the students can easily contact the field coordinators and instructors should a health or safety concern arise. Good hospitals are available in Jogjakarta, which is about 4 hours' drive from Dieng, and there are world-class facilities in Jakarta which can be reached within a day. The regional police office keeps a list of all the student researchers on our project, and is ready to assist in case of emergency.

Living Conditions:

Living conditions in rural Central Java will be basic. Normally, a few students will share a room in a villager's house; they will have access to well water for bathing; they need to use mosquito nets for sleeping; and they will eat local food with their host family. Local transport will be by bus or motorbike. These are standard conditions for ethnographic fieldwork in rural Indonesia, and a necessary part of learning about local livelihoods and ways of life. The most challenging aspect of daily living is constant immersion in the Indonesian language. We will mitigate the stress this can cause by pairing the Canadian students so that they can spend one or two hours together daily.

Evaluation procedures and marking scheme:

Students will attend all training and preparatory activities. They will keep detailed field notes typed daily and shared with the team in a format to be agreed. They will prepare an individual research report that uses field data to examine a topic of particular interest to them. The reports will be evaluated and receive feedback from Professors Li and Semedi. They will then be revised for publication as working papers on the research website.

Marking Scheme:	Attendance, participation and contributions to the team	40%
	Field notes	30%
	Research report	30%

Prerequisites, background preparation or specific abilities:

This Independent Experiential Study opportunity is intended for highly motivated students who are capable of working independently, taking initiatives, and conducting themselves in a mature fashion under working and living conditions that will be unfamiliar to most undergraduates in Canadian universities. Good organizational and social skills are essential. Academic preparation should include several courses in the social sciences. Places are limited, and selection will be based on transcript, CV and interview. Students must meet the normal criteria for admission to a 399Y course (completed a minimum of 8.5 and a maximum of 13.5 full course equivalents by April 2012). Students will undertake a set of required readings and attend several academic/ research orientation sessions in Toronto and in Jogjakarta to prepare them before their arrival in Central Java.

Number of Participants: 6

**INDEPENDENT EXPERIENTIAL STUDY PROJECTS (398H/399Y)
PROJECT DESCRIPTIONS 2012**

**Archaeology in Ancient South America: Urbanism, Ritual Performance, and
The Politics of Everyday Space in Jequetepeque, Peru**

Edward Swenson
416-946-5186
Assistant Professor
Department of Anthropology

Introduction and Background to the Project:

During the past five years, I have been directing archaeological research in the pre-Inka urban center of Cañoncillo located in the Jequetepeque Valley of Peru's North Coast. Research has concentrated on the earlier Gallinazo settlement of Jatanca (300-100 BC), with recent investigations focusing on the neighboring ceremonial center of Huaca Colorada (AD 500-800), located 2 km to the north and dating to the Late Moche Period (AD 500-800). Elaborate spectacles of ritual warfare and human sacrifice, performed by elite specialists and celebrated in a standardized iconographic corpus, constituted an overarching theme of Moche religious and political culture. This ideological complex appears to have transcended sociopolitical divisions differentiating Moche polities in the northern North Coast of Peru (including the region of Huaca Colorada) from the hypothesized multi-valley state based at Cerro Blanco in the Moche Valley to the south. In fact, archaeologists have argued that "Moche" as a term applies less to a unified ethnic or cultural group than to a politico-religious ideology adopted by elites and privileged social groups. Large urban centers, social stratification, and complex political economies based on irrigation agriculture are defining characteristics of Moche civilization. Students nominated for the Independent Experiential Study Project will learn archaeological field techniques at Huaca Colorada and will participate in the investigation of ancient urbanism, ritual practices, household activities, craft-production, and state-level political structures.

Our first three seasons of investigations at Huaca Colorada exceeded our expectations and confirmed that the Late Moche component of the greater Cañoncillo urban system represents one of the largest and most architecturally complex settlements in the Jequetepeque Valley. Excavations demonstrated that the elongated platform mound dominating the site did not serve simply as specialized religious or mortuary structure but anchored diversified social practices including high-status residence, craft production, conspicuous consumption, food preparation, exclusive ritual performances, feasting, exchange, and political administration. In fact, the rich and varied data obtained during the previous field seasons strongly suggest that Huaca Colorada served as the seat of a powerful and independent political community headed by specialized religious and economic elites. The discovery of artifacts related to copper production is especially intriguing; future research is required to test whether the authority of Huaca Colorada elites could have been based on the exchange of ore and its subsequent transformation into ideologically charged status items. Copper ore was obtained from the highlands, suggesting that Huaca Colorada represented an important node of long-distance exchange—a possibility also indicated by discovery of a high frequency of non-Moche ceramics from sierra-based polities at the site. The cross-cultural association of metallurgical production with ritual transformation is relevant to understanding the ceremonial and political context of copper production at Huaca Colorada, as indicated by our recent excavations.

Three seasons of field work benefited immeasurably from the participation of students enrolled in a 399Y program (now twelve in total), and the participants learned a great deal about archaeological field practice and Andean civilizations. Indeed, the experience has proved transformative for many of the students, a good number of which have expressed interest in pursuing a career in archaeology. The important discoveries made by our team has drawn the attention of the international media (including the *Independent* in the United Kingdom and *National Geographic*), and prospective students will have an unrivaled opportunity to work in an exceptional archaeological site.

Research Problem and Context of Experimental Learning:

The archaeological analysis of complex societies, most notably state and urban political structures, has been largely founded on the investigation of settlement patterns and architectural space. Internal site configurations, monumental designs, and prehistoric settlement systems have been literally read as texts that physically inscribed past social hierarchies, economic systems, and prevailing political ideologies. However, social scientists have more recently demonstrated that built environments do much more than passively mirror society; they actively shape and reproduce sociopolitical practices. At the same time, architectural form has been manipulated to empower agents in overcoming particular social and environmental constraints. Despite decades of fruitful research, archaeological analysis has most often been oriented toward reconstructing the formal and techno-economic determinants of space in order to interpret how built environments served as instruments of political control, surplus extraction, and ideological indoctrination. In contrast, the innovative research at the prehistoric site of Huaca Colorada in the Jequetepeque Valley of Peru (AD 300-800) is designed to more holistically examine the aesthetic, experiential, and contested meanings of ancient landscapes by focusing on the architectural prescription of ritual performance and everyday domestic activities. This research plan is being implemented through a comparative archaeological study of the main temple complex and the sizeable residential and production zones of this important Moche centre. This research has been supplemented by the architectural analysis and excavation of two smaller rural sites neighboring Huaca Colorada. Gauging how everyday domestic activities reinforced or possibly contradicted public ceremonial programs is critical for the investigation of local ideological strategies, authority structures, gender roles, identity politics, and the varied engagement of diverse communities with an imagined Moche worldview.

The core of the site of Huaca Colorada consists of an elevated platform mound built on a natural hill. Our excavations confirm that that the summit of the platform (100 x 85 m square in area) consists of a series of elaborate and superimposed rectilinear buildings and ceremonial chambers constructed of adobe brick (Figure 1). Corridors, internal patios, burial platforms, storage areas, kitchens, and large chambers characterize its final construction phases (Figure 2). Excavations have revealed the remnants of colorful wall murals and ancient engravings depicting Moche religious iconography (Figure 3). We also recovered a large number of decorated feasting jars and high-status copper ornaments (Figures 4 and 5). The discovery of offerings and sacrificial victims interred in the proximity to ceremonial platforms or within decommissioned residences reveals the complex use history of Huaca Colorada's monumental architecture (Figures 6 and 7). In fact, five ceremonial platforms dating to different time periods have been discovered at the site during the course of the last two campaigns. These likely functioned as stages of ritual performance and feasting events (Figure 7). In fact, the history of architectural renovation and human sacrifice at Huaca Colorada seems to have directly paralleled and symbolically reinforced two of the most important activities defining the site—commensal rites (feasting) and copper production. More than 10 phases of major reconstruction distinguish the monumental core, and four of these phases are accurately described as rituals of “architectural termination and re-dedication.” In other words, renovation was conceived as an inherently religious act, as indicated by the “offertory” nature of architectural reconstruction. Ceremonial precincts and their platforms were carefully decommissioned and buried in tons of sand as a prerequisite to the construction (“creation,” “birth,” etc.) of new platform-complexes and associated features. Indeed, stratigraphic and total station analyses indicate that no more than one or possibly two platforms were in use at any given time. Ritualized architectural renovation at

Huaca Colorada mirrors both the destructive-recreation of ore into metal and the “transubstantiation” of maize into corn beer. At the same time, it parallels the sacrifice of human victims, whose death likely served to ensure rebirth and the continuation of life, a key tenet of Moche religious cosmology. Perhaps major junctures in the production and festive cycle (possibly involving the inauguration of new tribute rounds) coincided with the “sacrifice” and renovation (rebirth) of sacred space at Huaca Colorada, just as a new harvest of maize was processed into beer for fermentation.

Evidently, Huaca Colorada was an important ceremonial and political centre in Jequetepeque, and it represents the largest settlement in the south bank of the valley dating to the Late Moche Period. The southern sector of the site is comprised of a sizeable domestic zone for lower-status residents or possibly pilgrims and artisans that resided temporarily at the site. Stone and adobe dwelling structures are extant on the surface of this zone. In 2009, two additional residential and production areas were identified surrounding the principal mound on the lower pampa. In 2010 and 2011, block excavations in these expansive sectors confirmed the presence of a large and diversified residential district. Excavations will be expanded here and in the higher monumental nucleus of the site during the 2012 campaign. Moreover, in 2011, excavations proved that Sector A to the north constituted another important residential zone associated with elaborate platforms, burials, and production loci. In 2012, we plan to expand excavations in this zone in order to chart the extent of the formal cemetery and to determine whether copper objects were also manufactured in this sector of the site.



Figure 1. 399Y students excavating a ceremonial chamber at Huaca Colorada.



Figure 2. Kitchen precinct, Huaca Colorada.



Figure 3. Wall murals and engravings, Huaca Colorada.

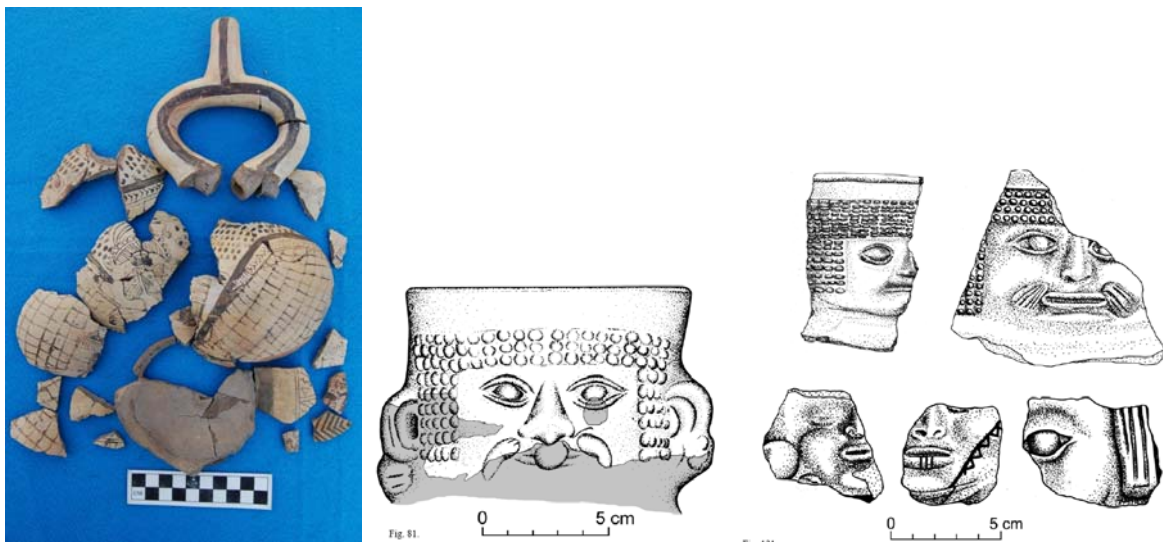


Figure 4. Feasting vessels recovered from the monumental sector of Huaca Colorada.





Figure 5. Copper artefacts recovered from Huaca Colorada during the 2010 and 2011 campaigns.



Figure 6. Human and dog offerings excavated during the 2010 and 2011 expeditions.



Figure 7. Depiction of feasting platform in Moche iconography and comparable structures discovered at Huaca Colorada.

Student Learning Opportunities, Experimental Component, and Course of Study:

In the 2012 campaign, students will participate in the mapping, surveying, and block excavation of the site's temple area and two principal domestic zones (July 25-September 1). The comparative spatial analysis of public ceremony with quotidian activities will aid interpretation of the changing rhythms of political centralization defining this particular urban complex from the Gallinazo to Moche Periods. Such an approach will further illuminate the ideological strategies of different communities as a means to interpret how diverse agents promoted, contested, or identified with prevailing sociopolitical arrangements. The field experience will not only familiarize students with the fundamentals of archaeological research but will provide a rare opportunity to engage in the meaningful interpretation of the material record ("interpretation at the edge of the trowel"). Students will receive instruction in total station mapping, excavation, stratigraphic analysis, surface survey, mural conservation, flotation, and ceramic analysis. Field trips to nearby archaeological sites and lectures on Andean prehistory will also constitute important components of the program.

The 2009, 2010, and 2011 399Y seminars in Peru were a resounding success, and I am confident that the upcoming season will provide an equally stimulating and productive learning opportunity for participants. Last year's students gained experience in excavating complex architecture, burials, middens, and copper artifacts, and they received instruction in the analysis and technical drawing of ceramics, lithics, and metallurgical implements. Field trips and weekend tutorials also permitted students to wed their training in practical field methods with overarching themes in the theory and culture history of Andean archaeology (Figure 9).



Figure 8. Elaborate architecture, Sector B.



Figure 9. 399Y Student participates in exorcism ceremony at Huaca Colorada (2010). 399Y student conducts excavations in Sector C of the settlement (2011).

Calendar, Logistics, and Setting:

Four students will travel with the supervisor (Dr. Edward Swenson) to Lima at the end of July (projected dates **July 26-September 1**). The team will then travel by bus 500 km north to the Jequetepeque Valley. The bus is modern, safe, and comfortable. The project team will reside in a quaint, clean hotel (*hostal*) on the Pacific Ocean in the town of Pacasmayo. The accommodations are equipped with internet access and three computers for student use, as well as evening guard service. The archaeological laboratory is housed adjacent to the hostel. Field work is conducted from Mondays to Fridays, with laboratory research scheduled for Saturday mornings. Saturday afternoons will be reserved for field trips, lectures, or free time, while Sunday will be a day of rest.

This independent study conforms to a “Y” series course.

Prerequisites, background preparation, or specific abilities:

There are no prerequisites, but students who have completed courses in archaeology are encouraged to enroll.

Evaluation of Students:

- 25% Field research—mastery of basic excavation, survey, and curation techniques
- 20% Archaeological field notebook / quality and accuracy of analysis forms
- 20% Laboratory work
- 35% Final report summarizing experience and demonstrating understanding of broader archaeological contexts

Number of Participants: 4

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Name and Title: Antje Budde, Associate Professor
T. Nikki Cesare-Schotzko, Assistant Professor
Department: University College Drama Program
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Off-campus location of course: Berlin, Germany

Course title and weight (398H or 399Y): 399Y Montage Collage Fragmentation
Performing in the Age of globalization and digital reproduction – Tracing Benjamin's
Aura in Berlin

Description of project and experiential component:

The crowd was the veil from behind which the familiar city as phantasmagoria beckoned to the *flâneur*. In it, the city was now landscape, now a room. And both of these went into the construction of the department store, which made use of *flânerie* itself in order to sell goods. The department store was the *flâneur*'s final coup. As *flâneurs*, the intelligentsia came into the market place.

Walter Benjamin *Charles Baudelaire: A Lyric Poet in the Era of High Capitalism*
Verso, London 1935/38

In this one-year course, including a 12-day international trip, twelve students between their second and third years will critically explore the concept of aura, authenticity and originality as performed in the city of Berlin, the birth place of the Jewish-German writer and visionary Walter Benjamin. Students will have completed *Concepts of 20th-century theatre* (DRM230Y), and will have also completed or be in the process of completing *Playwriting* (DRM328H1), *World Theatre* (DRM362H1), *The Avant-Garde* (DRM342H2), *Stage and Costume Design* (DRM354Y) and *Performance I* (DRM300Y)

Through the eyes of contemporary *Flâneurs*, both in the real and the cyber world, our students will learn about and reflect on the performativity of urban life in Berlin, a city of economic contradictions, historical disaster, violent conflict, internationally marketed tourism, political awareness and postdramatic avant-garde creativity in the age of globalization. Department stores, streets, walls, public parks, abandoned factories now used for cultural production, museums, memorial sites of the Holocaust, political performance, dance theatre and modern revue – all these



fragments filled with history and dreams will serve as spaces for performative investigations to be translated into individually and collectively created text, image, noise, performative acts and audio-visual processes both for a real and a virtual audience (realized in live staged and web presentations).

The emergence of the *Flâneur* as an iconic figure of Western modernity was of major interest to the Berlin-born Walter Benjamin who wrote extensively on the famous French *Flâneur* Baudelaire. Benjamin's interest in the flâneur, however, can be traced to his enthusiastic embrace of Franz Hessel's book "Spazierengehen in Berlin" (On Foot in Berlin), which engages deeper levels of memory while describing a city from the perspective of a Berlin-born *Flâneur*. It will be an exciting experience for students to discover, both intellectually and sensually, the intersections between their perception of Berlin and of Toronto, while reflecting on the history of modernity and the current age of globalization. This inherently comparative approach (critically discovering the Other through the lens of the Own) will enable students to understand concepts and esthetics of trans-urban modernity and connect to them on a much deeper and applicable level as these concepts and practices still shape our understanding of the human condition in a now globalizing and digitalizing world. Students will collect fragments of memory and dream images (Benjamin) in Berlin and later perform these for their Toronto audiences and fellow students in the way of multi-media collage and montage performance that will draw into dialogue urban experiences across two major Western cities.

The students' explorations will be informed by close and creative readings of Benjamin's major works on modern culture, both mainly written in Berlin 1930-33: *The Arcades Project* and *The Work of Art in the Age of Mechanical Reproduction*. The first text will introduce the art of seeing/hearing/imagining, and the second will elaborate upon the art of reproduction of the *Flâneur's* experience by means of fragmentation, collage, citation, speculation, jokes and virtual debate. These texts are essential readings on modernity and post-modernity in the humanities, and have greatly informed European and North American ways of thinking on the urban, public space and performance. Additional readings regarding cyber urbanism, digital performance, post-dramatic theatre and contemporary reflections on the historical avant-garde (i.e. Dadaism, Expressionism, Theatre of the scientific age/Piscator and Brecht) will guide students as to how to apply Benjamin's historical philosophy in the Here and Now. Furthermore, creative and practical assignments, including site-specific short projects in Fall 2012 performed around the University of Toronto during Toronto's Nuit Blanche (October 2012), followed by a longer final project devised by the students and instructors and performed at the Helen Gardiner Phelan Playhouse (March 2013), will allow students to integrate their academic and artistic learning experience through an interdisciplinary methodology—one of the major pillars of the teaching philosophy at UC Drama.

Details of calendar, location and setting:

(Please include information about difficult living or working conditions if any.)

Calendar/ Course breakdown (24 sessions/ 3hrs)

Summer 2012 (May) International trip/ Berlin	equivalent of 6 sessions
Fall term 2012/ Toronto	9 sessions (seminars, tutorials, experimental rehearsals)
Winter term 2013/ Toronto	9 sessions (project development and performance)

Berlin

- **Location**

Students will live and work at Theaterhaus Mitte Berlin, the central production venue of independent theatre, performance art, cross-cultural theatre and dance both for local artists and from around the world. Rehearsal space (indoors and outdoors) and workshops with trans-culturally working artists based in Berlin will be provided at very affordable prices.

- **Calendar**

Second half of May. A more concrete itinerary of organized activities will be available after Reading Week 2012 that incorporate the sites outlined below.

- **Setting**

Students will explore the “aura” of the city in environmentally friendly ways on foot, on bike and by using the public transport system. In groups and individually, guided by organized events and self-determined discovery, students will collect fragments of experience and knowledge that will form the foundation for the performances that they create upon their return to Toronto. Theaterhaus Mitte will serve as base camp where daily activities will start, will be discussed and where initial ideas can be tried out. Here we will meet with artists and take part in workshops.

Students’ activities will be organized around two major themes:

1. **The city as performance**

- **Urban sightSEEING**

- **Scheunenviertel and Spandauer Vorstadt**

- <http://travel.nationalgeographic.com/travel/city-guides/berlin-walking-tour-3/>

- **Checkpoint Charly**

- <http://www.berlin.de/orte/sehenswuerdigkeiten/checkpoint-charlie/index.en.php>

- **The Brandenburg Gate**

- <http://www.berlin.de/orte/sehenswuerdigkeiten/brandenburger-tor/index.en.php>

- **Arcades**

- **KaDeWe**

- <http://www.berlin.de/orte/sehenswuerdigkeiten/kadewe/index.en.php>

- **Underworld tour (bunkers and tunnels)**

- <http://berliner-unterwelten.de/home.1.1.html>

- **Open Air memorial sites**

- **Topography of Terror**

- <http://www.topographie.de/en/topography-of-terror/nc/1/>

- **Silent Heroes Memorial Centre (The German Resistance Memorial Centre)**

- <http://www.gedenkstaette-stille-helden.de/english.html>

- **The Berlin Wall Memorial**

- <http://www.berliner-mauer-gedenkstaette.de/en/>

- **The Walter Benjamin Archive, Academy of the Arts, Berlin**

- http://www.adk.de/de/archiv/archivbestand/literatur/kuenstler/informationen_walter_benjamin_archiv.htm

Art

- **East Side Gallery**

<http://www.berlin.de/orte/sehenswuerdigkeiten/east-side-gallery/index.en.php>

“The East Side Gallery is a 1.3 km-long painted stretch of the former Berlin Wall along the Mühlenstrasse in former East Berlin. It is the largest open-air gallery in the world with over one hundred original mural paintings.”

- **Hamburger Bahnhof** (Museum of the Contemporary)

<http://www.hamburgerbahnhof.de/text.php?id=98&lang=en>

2. Performance in the city

Students will be able to attend as a group cutting edge postmodern performances as well as entertainment shows that are deeply rooted in modern urban traditions, which started during the Weimar Republic (1919-1933).

Entertainment (either of these venues depending on program)

Friedrichstadt Palast

<http://www.show-palace.eu/en/shows/yma/>

Tipi am Kanzleramt/ Bar Jeder Vernunft

<http://www.bar-jeder-vernunft.de/en/home/>

Variété - Wintergarten Berlin

<http://www.wintergarten-berlin.de/de/programm/kommende-shows/funky-town.html>

Theatre shows, meetings with local artists and backstage visits of theatre venues

TBA

University of Toronto

- **Location**

Ideally the sessions during the Fall and Winter term will take place in the Performance Studio (UC Union building) because UC Drama will be able to provide the course with the necessary infrastructure and technical equipment. Based on close collaborative ties but depending on availability we could alternatively use the Studio Theatre or the Robert Gill Theatre, both are learning venues at the University of Toronto's Centre for Drama, Theatre and Performance Studies.

- **Calendar**

There will be three 3-hour sessions each month between September 2012 and March 2013. Exact day and time TBA.

- **Setting**

Fall term 2012: 9 sessions (seminars, tutorials, experimental rehearsals)

Winter term 2013: 9 sessions (project development and performance)

The course will culminate with a preliminary 10-min. student-devised multi-media performance project in Toronto (Oct. Nuit Blanche 2012) and a 30-min. follow-up performance project in the Helen Gardiner Playhouse (March 2013), based on their experiences of their *Flâneur* tour and *dream images* (Benjamin) in Toronto and Berlin.

NOTE: For the international trip the use of personal laptops and/or other such equipment (iPods, cell phone, digital cameras) will be helpful though not required.

Difficult conditions: During the international trip students regardless of gender will stay in one big room and need to bring sleeping bags and mattresses. However, more individual accommodation is possible but the budget will have to be adjusted accordingly.

Course breakdown (24 sessions/ 3hrs)

Summer 2012 (May)

International trip/ Berlin equivalent of 6 sessions

Fall term 2012/ Toronto 9 sessions (seminars, tutorials, experimental rehearsals)

Winter term 2013/ Toronto 9 sessions (project development)

Ideally the sessions during the Fall and Winter term will take place in the Performance Studio (UC Union building) because UC Drama will be able to provide the course with the necessary infrastructure and technical equipment.

Evaluation procedures and marking scheme:

Students will be evaluated on their participation, both in the sense of attending all group meetings and participating enthusiastically in the discussion of material and the creation of projects; regular written responses to the reading material as well as to their hands-on experiences as *Flâneurs* in both Berlin and, upon their return, Toronto; and on their creative and practical projects. While students' final marks will be determined by Profs. Budde and Cesare-Schotzko, to recognize the collaborative process that underscores this devised theatre, we will also be including a small but influential element of peer evaluation; students are not only responsible for devising work but also for evaluating their peers' contributions to creative and practical projects. (Evaluation, for better or for worse and in no small way, remains one of the motivating factors in students' investment and achievement, and, as we are sharing the responsibilities of creation, we believe that students should also participate in the responsibilities of its subsequent evaluation.)

Preliminary marking scheme:

Participation

20%

Attendance of Berlin-based activities and participation in Toronto

Written work

25%

- daily entries in an online diary during Summer 2012 international trip to Berlin
- weekly responses during meetings during Fall 2012 and Winter 2013
- two performance proposals: two 3000-word conceptual paper/proposals (the first due in September for the October performance; the second due in January for the March performance). The proposals will be based upon course readings, the Berlin experiences and personal reflections and will include both a conceptual and a practical components, the latter

outlining technical and other requirements students will need to produce an artistic piece based on their ideas.

Site-specific performance (Fall 2012) 20%

(including peer evaluation/online review 5% / 20%)

Collaboratively devised performance (Winter 2012) 35%

(including peer evaluation/ online review 10% / 35%)

Prerequisites, background preparation or specific abilities:

Prerequisites

The course is designed for undergraduate students who have both an academic and practical background in theatre studies at UC Drama. Eligible students will have successfully (B+ and above) finished DRM230Y, and who have either successfully taken or are in the process of completing a complementary course, such as *Playwriting* (DRM328H1), *World Theatre* (DRM362H1), *The Avant-Garde* (DRM342H2), *Stage and Costume Design* (DRM354Y) or *Performance I* (DRM300Y).. (For the practical courses this involves a successful audition and admission to those courses.) Essentially, the proposed 399Y course will enable students to apply the interdisciplinary methodology that they have developed in their other Drama coursework, which involves working on complex problem across two or more disciplines, to their own creative process. Hence it is necessary that students have the knowledge (or are about to obtain it) of a combination of courses (history, theory, divers professional practices) that provide students with the practical and analytical skills needed for this course.

Background preparation

Before the course starts students will participate in two obligatory introductory sessions (2x2hrs) that will instruct them as to how to prepare readings, and provide background on their research tasks and creative process in preparation of the international trip. Organizational matters will also be discussed.

Specific abilities

- Time management and organizational skills, reliable commitment to group work and deadlines
- Operating digital equipment skills will be helpful (internet, computer, digital recording devices)
- Editing software skills are welcome (video, sound, photo), but are not required

Number of Student Participants: 9

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**INDEPENDENT EXPERIENTIAL STUDY PROJECTS (398H/399Y)
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Name and Title: David Evans, Assistant Professor
Department: Ecology and Evolutionary Biology
Address: 100 Queen's Park, Toronto, ON, M5S 2C6
Phone Number: 416-586-5753 (ext 1) **Email:** d.evans@utoronto.ca

Off-campus location of course: Manyberries, Alberta; Royal Ontario Museum, Palaeontology lab

Course title and weight (398H or 399Y): EEB 398H: Field and Laboratory Techniques in Vertebrate Palaeontology

Description of project and experiential component:

The geology and paleontology of the Late Cretaceous of Alberta has been intensely studied, but directed in large part toward regions with large amounts of easily accessible fossiliferous rock strata. The region of Dinosaur Provincial Park has been particularly well sampled, with over 400 articulated or associated dinosaur skeletons having been collected from this locality in approximately 100 years. Recent high-resolution biostratigraphic and detailed systematic work have revealed a non-random pattern of distribution of taxa within the formation. Although non-overlapping temporal ranges and close phylogenetic relationships of taxa do not reject a phyletic interpretation in some cases, faunal replacement due to environmental change (habitat-tracking) is of particular interest in light of the transgressive nature of the Dinosaur Park Formation and associated environmental changes through the section (as indicated by geology, invertebrates, and vertebrate microfossil assemblages). Immigration or climatic change not directly related to sea level change may also account for faunal turnover. Further fieldwork is required to determine the nature of the faunal shifts within the Belly River Group.

A habitat-tracking model makes a number of testable predictions regarding the distributions of individual dinosaur genera and species that are testable through field collection of specimens from geographically disparate localities in southern Alberta and interpreting their occurrence within region-specific chronostratigraphic and paleoenvironmental frameworks. Taxa in the upper part of the Dinosaur Park Formation at Dinosaur Provincial Park can be hypothesized to be more common in more coastally-influenced lower coastal plain sediments, whereas those taxa found lower in the formation are expected to be more common in more inland, upper coastal plain settings (e.g., temporal equivalent parts of the Oldman Formation).

Paleobiogeographic ranges of dinosaur taxa in relation to paleoenvironmental gradients are largely unknown on a regional scale due to relatively poor sampling outside of Dinosaur Provincial Park. Significant amounts of Belly River Group outcrop occur along the Milk and South Saskatchewan rivers. Fossiliferous strata are particularly

well exposed adjacent to the Milk River, over 125km southeast of Dinosaur Provincial Park. This area contains some of the oldest Late Cretaceous dinosaur-bearing sediments in Alberta (Milk River Formation), as well as significant outcrop of the Belly River Group that pre-date and are time-equivalent to the section exposed at Dinosaur Provincial Park. Importantly, the lower, regressive half of the Belly River wedge mirrors the transgressive Dinosaur Park Formation in its succession of environments and vertebrate microfossil assemblage composition. I initiated a multi-year fieldwork project in 2005 that aims to execute a thorough paleontological survey of this area focusing on large dinosaur remains, and has two main goals:

- 1) To collect new vertebrate fossil material and re-locate at least two-dozen historic quarry sites associated with previously collected specimens in order to compile a detailed biostratigraphic framework for the Milk River region that can be compared directly to the biostratigraphic datum now in place for the Dinosaur Provincial Park locality.
- 2) To sample the lower (regressive) half of the Belly River Group (Foremost and lower Oldman formations). These strata are particularly poorly known, and correspond to a significant gap in the North American fossil record that spans the lower half of the Campanian stage (approximately 76-80 million years ago).

As a part of this project, fieldwork in 2012 will build upon and extend our knowledge of dinosaur biostratigraphy and biogeography in this relatively poorly known region of Alberta, and will ultimately will lead to a better understanding of the nature of dinosaur faunal shifts within the Belly River Group.

Student Experience

Laboratory setting: Students will prepare (clean and stabilize) fossils that were collected during the fieldwork component of this project in 2012. When preparation is complete, the students will work together to identify the fossils as precisely as possible, which will require access to the primary scientific literature and comparison to material in the ROM research collections. The students will fill out standardized specimen datasheets for museum purposes, and then will assist in cataloguing the material into a museum collection. Students will contribute to the digital database of the field area for research purposes. Data for each fossil they prepare will be entered into a Microsoft Excel database. Each specimen will be digitally photographed and entered into a digital image database, which will include photographs taken in the field and scanned quarry maps, which will be linked to the master database.

Field setting: Students will actively participate in paleontological field research in southern Alberta, the region from which the fossils they prepared during the lab component were collected the previous year. They will take part in the excavation and collection of new fossil specimens, and learn standard field research techniques in vertebrate paleontological studies. Students will learn how to systematically excavate a fossil deposit in order to preserve the maximum amount of taphonomic and provenance data. They will learn to record in situ data for all fossils uncovered during the course excavation, which will include quarry-mapping techniques accurate to at least the decimeter-scale using a grid system. Students will document fossils as found, as they are being excavated with GPS-equipped digital cameras. Students will also learn principles of stratigraphy and geology, and how to carry

out a paleontological field survey. Students will use a mapping handheld GPS to record locality data for collected specimens, and their stratigraphic position will be recorded as precisely as possible in the field.

Calendar, location and setting:

The course will consist of a 4-week laboratory component in the vertebrate paleontology laboratory at the Royal Ontario Museum in June 2012. This will be followed by a 2-week field component that will take place in the badlands of southern Alberta from July 10-July 20, 2012. The field component of the course is set in relatively primitive setting. Students will camp out in tents with the rest of the field crew. Washroom facilities in camp consist of port-o-potties. Students are expected to help with camp chores, including cooking and cleaning. The nearest major town is Medicine Hat, which is a 1-hour drive North of the field camp.

The course will take place over an eight-week duration, and is therefore classified as a 398H.

Evaluation procedures and marking scheme:

Laboratory setting (50% of final grade): Each student will be responsible for preparation of at least 5 fossil specimens. They will keep a detailed preparation journal to document the process, as well as fill out standardized preparation sheets for each specimen that will be incorporated into the main museum collections database. Preparation techniques will be monitored and graded based on performance. Each student will be responsible for producing a digital database of the fossils they prepared, including production of locality maps using GPS data and digital mapping software. Each student will submit their preparation journal, and they will work together to completed a specimen database, including cross-referenced and hyperlinked digital photographs, locality maps, and scanned quarry maps.

Breakdown (50/100):

Preparation Journal (25): Students will keep a detailed journal documenting the process. Materials used, start-finish dates, and hours will be logged for each specimen. The quality and completeness of this journal will be graded.

Participation (15): Students will be graded on their participation, attention to detail, and time spent in the lab. Preparation techniques will be monitored and graded based on performance.

Preparation Sheets (10): Students will fill out standardized preparation sheets for each specimen that will be incorporated into the main museum collections database. The official museum paper records and digital database entries will be graded for completeness.

Field setting (50% of final grade): Students will be required to take detailed field notes, which will be graded. Students will work together to map and record in situ data during the course of a fossil excavation; each student will be directly responsible for mapping and recording two square meters of this excavation, that will contribute to the finished quarry map and associated taphonomic data. The professor will also grade the students on their participation, teamwork, and performance in the field setting.

Breakdown (50/100):

Field notes (20): Students will be required to take detailed field notes, which will be graded. Journal entries are expected for each day spent in the field.

Quarry Mapping and GPS (15): Each student will be directly responsible for mapping and recording two square meters of this excavation, that will contribute to the finished quarry map and associated taphonomic data. A basic GPS tutorial will be accompanied by a graded exercise.

Participation (15): The professor will also grade the students on their participation, teamwork, and performance in the field setting.

Prerequisites, background preparation or specific abilities:

Since this project requires working directly with fragile fossils, patience, concentration and manual dexterity are important prerequisite skills. The students will be given a field guide specific to this project, and will be expected to read this before entering the field. Students are also required to be comfortable in a camping/tenting setting.

Number of Students Participant: 2

**INDEPENDENT EXPERIENTIAL STUDY PROJECTS (398H/399Y)
PROJECT DESCRIPTIONS 2012**

Name and Title: Tim Dickinson, Assoc. Prof. (and Senior Curator, Natural History, ROM)
Department: Ecology & Evolutionary Biology
Address: Department of Natural History, Royal Ontario Museum
Phone Number: 416 586 8032 **Email:** tim.dickinson@utoronto.ca

Off-campus location of course: Western United States

Course title and weight (398H or 399Y): EEB399Y:

Does hawthorn flower and leaf morphology in the western United States co-vary with climate?

Description of project and experiential component:

Introduction – The western North American black-fruited hawthorns (*Crataegus* section *Douglasianae*) provide a model system with which to understand evolution in the taxonomically complex genus *Crataegus*. The genus is considered challenging by taxonomists because the lines between species recognized in the past are unclear as a result of frequent asexual formation of seeds and the occurrence of hybridization. In addition, studying the genus requires having specimens of both the flowering and fruiting stages (typically, these occur 8-12 or more weeks apart) in order to confidently make an identification of any one individual. Nevertheless, molecular phylogenetic studies of *Crataegus* in my lab have resolved monophyletic groups corresponding to many of the subgeneric groups, including section *Douglasianae*, that were recognized earlier on the basis of morphology alone (Lo, Stefanović et al. 2009). Two of the three taxonomic series that make up section *Douglasianae* provide examples of these complexities. Series *Cerrones* (central Rocky Mountains) comprises diploid *C. saligna*, tetraploid *C. rivularis*, and the tetraploid, putatively hybrid, *C. erythropoda*. Series *Douglasianae* (Pacific Northwest and adjacent Rocky Mountains) is a little larger, comprising diploid and polyploid segregates of *C. suksdorfii*, tetraploid *C. douglasii*, and the tetraploid, likely hybrid, segregates of *C. douglasii*: *C. okennonii*, *C. castlegarensis*, and *C. shuswapensis*. In both series, as in the genus as a whole as we know it, diploids reproduce sexually, whereas polyploids produce most of their seeds asexually while still maintaining the ability to produce at least some of their offspring sexually (i.e. by crossing with other hawthorns, not necessarily of the same species). In both series *Cerrones* and series *Douglasianae* there is some indication that polyploidization has been associated not only with changes in breeding system, but also with changes in habitat. The project described below will attempt to document both of these processes. Results from this project will be interpreted in the light of phylogenetic relationships within *C.* section *Douglasianae* that are currently being elucidated by a post-doc in my lab, Dr. M. Zarrei.

Brief project description – Two students will begin the project by familiarizing themselves with the black-fruited hawthorns of western North America (both series *Cerrones* and *Douglasianae*) using research vouchers in the ROM Green Plant Herbarium, online databases, and the relevant scientific literature. The specimens will be used to collect data on variation in leaf and flower architecture, as described below. In mid-May or early June we will leave Toronto for a 10-15 day field trip to Colorado, Utah, and adjoining states in order to collect flowering specimens, mainly of *C.* section *Douglasianae* series *Cerrones*. Students will use this opportunity not only to collect herbarium vouchers and tissue samples (for ploidy level determinations and DNA analyses by members of my lab) but also to document the habitats in which the three species in series *Cerrones* occur. On our return to Toronto the students will continue working at the ROM to process their collections, continue with their data collection, and begin data analyses. In mid- or late-August we will return to the field for a trip of similar duration, this time collecting fruiting vouchers not only from the individuals collected in the spring, but also from section *Douglasianae* individuals in Montana and Idaho also being studied in my lab for which these specimens are lacking.

Sampling – Students will have two samples to work with, one each from series *Cerrones* and *Douglasianae*. Both samples will comprise diploids and (a selection of) polyploids. The first will be drawn from existing specimens in the ROM Green Plant Herbarium belonging to series *Douglasianae*, while the second will be drawn, mainly, from specimens collected by the students in the field. We already know that diploid and polyploid *Douglasianae* occur in habitats that can be markedly different in temperature and precipitation regimes. This training sample should alert students to the possible differences to be found in flower and leaf architecture between markedly contrasting habitats. In studying a sample largely of their own collecting (mainly series *Cerrones*) the students will have a chance to discover whether similar differences exist, even when it may be difficult to detect whether there are marked differences between habitat. Every attempt will be made to obtain data from large and roughly equal sample sizes for ploidy levels and species, even if this means reducing the number of comparisons possible (e.g. by omitting species likely to be of hybrid origin).

Data collection – Collecting locations will be documented (latitude, longitude, elevation) using topographic maps and a GPS. Variation in breeding system will be documented by recording stamen and style numbers, pollen stainability, and seed set. Counting floral parts can be done in the field, although it may be more cost effective to do this back in the lab, using specimens. Seed set can be scored in the field. Pollen stainability has to be done back in the lab. Variation in relation to habitat will be documented from leaf cross-sectional anatomy, visualized in hand sections of rehydrated leaves from herbarium specimens, and from the pattern of venation, visualized in cleared leaves (Price, Symonova et al. 2011). Sections and cleared leaves will be recorded as digital photographs. Time permitting, stomatal size and density can be measured in cleared leaves. In addition to qualitative comparisons of habitats based on field observations of

topography and vegetation, detailed quantitative climate data can be obtained online for each collecting locality.

Data analysis – Data from the two samples will be analyzed in the same ways. Univariate summaries (boxplots) will provide an indication of the extent to which individual measurements vary between habitats, ploidy levels, and species. Multivariate summaries (ordination biplots, clustering) will be used to determine overall patterns of measurement covariation. Depending on the sample sizes available, appropriate uni- and multivariate statistical tests will be employed (ANOVA, MANOVA, Fourth Corner method; Legendre and Legendre 1998).

Details of calendar, location and setting:

Hawthorns flower in mid May to early June, the exact date dependent on the advance of spring as it varies with latitude, altitude, and from year to year. As a result there might be a premium on leaving as early as possible, or there might be a delay until the end of May before we leave on the first trip. We will fly to Denver CO and rent a car there. Because 3 people will be traveling together and carrying collecting supplies, space for personal effects will be at a premium. Similarly, it may be impractical to carry camping gear, and thus necessary to stay at motels (students will be asked to share accommodation with each other if feasible). Working days in the field will be long, because of the distances to be covered and the time needed to observe, collect, and process specimens. Labwork for this project will take place in Toronto in the Botany Section of the ROM Department of Natural History. Labwork will be scheduled as flexibly as possible, consistent with completing data collection and analysis by midsummer. The second trip, needed in order to complete documentation of the individuals studied, and to obtain seed-set data, will take place in the latter half of August. Preparation of the report and oral presentation must be completed before classes begin in September.

Evaluation procedures and marking scheme:

Specimens (mounting/databasing/labeling):	15%
Field and lab notebooks; participation:	25%
Report:	40%
Oral presentation (to the rest of the lab):	20%

Prerequisites, background preparation or specific abilities:

Students should ideally have a background in organismic biology. A reading list will be provided prior to departure, and students must be prepared to familiarize themselves with the *basics* of hawthorn biology and systematics, flowering plant reproduction, polyploidization, and the geography of western North America. Students should be interested in field biology and have outdoor experience (camping, field courses) or be willing to gain this experience on the fly under strenuous, but not necessarily primitive, conditions. The ability to get along well with others is essential, especially under conditions of enforced proximity and limited time off while in the

field. Labwork requires care and attention to detail, and the ability to use museum specimens and scientific equipment (microscopes, cameras, computers) according to directions. Standard lab (and field) safety practices must be followed (students will be required to complete WHMIS training at the ROM if they have not already done so at the University of Toronto).

Students *must* have valid travel documents enabling them to use commercial carriers to enter the United States and to return to Canada. *At least one of the students should have a valid driver's license.*

Number of Participants: 2 students

References

- Legendre, L. and P. Legendre (1998). *Numerical Ecology*. Developments in Environmental Modelling. S. E. Jorgensen. Amsterdam, Elsevier Scientific Publishing Company. 3: 419.
- Lo, E. Y. Y., S. Stefanović, K. I. Christensen and T. A. Dickinson. (2009). Evidence for genetic association between East Asian and Western North American *Crataegus* L. (Rosaceae) and rapid divergence of the Eastern North American lineages based on multiple DNA sequences. *Molecular Phylogenetics & Evolution* 51: 157-168.
- Price, C.A., O. Symonova, Y. Mileyko, T. Hilley and J.S. Weitz (2011). "Leaf Extraction and Analysis Framework Graphical User Interface: Segmenting and Analyzing the Structure of Leaf Veins and Areoles." *Plant Physiology* 155(1): 236-245.

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FACULTY OF ARTS & SCIENCE

Office of the Dean

**INDEPENDENT EXPERIENTIAL STUDY PROJECTS (398H/399Y)
PROJECT DESCRIPTIONS 2012**

Name and Title: Prof. Megan Frederickson

Department: Ecology & Evolutionary Biology

Phone Number: (416) 978-7252

Email: m.frederickson@utoronto.ca

Off-campus location of course: Los Amigos Research Center, Madre de Dios, Peru

Course title and weight (398H or 399Y): EEB399Y: **Species Interactions in a Tropical Forest**

Description of project and experiential component:

Nearly everyone who sets foot in a tropical rainforest notices the great number of ants. Because of their tremendous abundance and the diversity of their nesting habits, diets, and lifestyles, ants have an impact on the ecology of tropical rainforests that is out of proportion to their small size. In this project, we will investigate the consumptive and non-consumptive effects of ants on other species, especially species of plants, fungi, and other insects, in a rainforest in the Peruvian Amazon.

We will focus on several species of arboreal ants that nest in the hollow stems of a common Amazonian tree, *Cordia nodosa* (Boraginaceae), namely *Allomerus octoarticulatus* (Myrmicinae), *Myrmelachista schumanni* (Formicinae), and several species in the genus *Azteca* (Dolichoderinae). These ants protect *C. nodosa* against herbivores, either by chasing away insects or, sometimes, by eating them. They actively patrol young leaves and collect tiny plant-produced food bodies. They also feed on honeydew exuded by scale insects, which they tend inside the plant's hollow stems. This type of association between ants and plants is very common in the tropics—hundreds of tropical plant species produce rewards in the form of food or housing to attract ants that defend them against herbivores or other enemies. More than a century ago, Wallace summed up these interactions by saying that the ants “are in fact a standing army kept for the protection of the plant!”

Students will spend six weeks at a remote biological station in the Peruvian Amazon (see more below), where they will participate in several field experiments and help with taking and recording field measurements and with collecting and preparing samples for subsequent chemical and genetic analysis in the lab. Working alongside Prof. Frederickson and the graduate students already involved in this project, students will learn standard techniques in field ecology, including how to 1) collect field data, 2) identify common plants and insects, 3) preserve plant, fungal, and insect specimens, and 4) design an ecological experiment.

Details of calendar, location and setting:

This project will last five consecutive weeks, from early July until mid August, 2012. Field work will take place at the Los Amigos Research Center in southeastern Peru. Surrounding the research center is the Los Amigos

Conservation Concession, which comprises 146,000 hectares of primary tropical rainforest on a mixture of upland terraces and floodplains. We will work along the concession's extensive trail system, meaning that students should expect to walk several kilometers through the rainforest every day. Although the Andes are visible from Los Amigos on a clear day, the station itself is a mere 270 m above sea level and the terrain is mostly flat except for the occasional hill or ravine. Even in the dry season (June-August), it rains frequently at Los Amigos and the trails are often muddy or flooded. The weather is usually very warm, except when cold spells called *friajes* blow in from the south; mean monthly temperatures range from 21 to 26 °C, although temperatures as high as 39 °C and as low as 8 °C have been recorded.

The research center is located at the confluence of the Los Amigos and Madre de Dios rivers and is accessible only by boat. To reach Los Amigos, students will fly from Toronto to Puerto Maldonado via Lima, and then travel by car (1 hour) and boat (5 hours) to the station. The research center is very remote and students should be physically and mentally prepared to spend six weeks with little access to telephones, stores, and laundry services and absolutely no access to restaurants, movie theatres, etc. The field station has wireless internet via satellite, but it can be very slow. There is also a shortwave radio in case of emergencies. There are no telephones; the nearest phone is a 15-minute boat ride away and the service is unreliable. During the day, electricity at the field station is provided by solar panels and thus depends on the weather; from 6-9:30pm, a generator provides electricity to the dorm, dining hall, cabins, and lab building.

Students will stay in the dormitory at the field station. Rooms are shared between 2 or more people, and each room has its own bathroom with running water. There is no hot water, so everyone has to make do with cold showers. The field station has several cooks who serve three hot meals a day to the staff and researchers; they can accommodate vegetarians, but other dietary restrictions need to be coordinated well in advance with the field station staff. The Los Amigos Research Center is used by a diverse group of scientists from all over the world and students must be courteous and respectful to the staff and other researchers at all times. Los Amigos is run by the Amazon Conservation Association and their Peruvian counterpart, la Asociación para la Conservación de la Cuenca Amazónica (ACCA). More information about these organizations and the Los Amigos Research Center can be found at www.amazonconservation.org (English) and www.acca.org.pe (Spanish).

Evaluation procedures and marking scheme:

Students will be given precise guidelines for how to collect data and prepare samples. Each student will be responsible for analyzing the field data on one aspect of the project, presenting the results of this aspect of the project in a short talk at the field station, and writing a final report describing the collection, analysis, and interpretation of the field data from this aspect of the project. Students will be graded on the following basis:

Participation	25%
Quality/accuracy of field data collected and samples prepared	35%
Oral presentation	20%
Final report	20%

Prerequisites, background preparation or specific abilities:

Students should be highly motivated. Previous field experience, such as having participated in a field research project or field course, or significant outdoor/wilderness experience (camping, hiking, etc.) is desirable, as is speaking Spanish.

Number of Participants: 2

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**INDEPENDENT EXPERIENTIAL STUDY PROJECTS (398H/399Y)
PROJECT DESCRIPTIONS 2012**

Name and Title: Professor Arthur E. Weis
Department: Ecology and Evolutionary Biology
Address: Koffler Scientific Reserve at Jokers Hill, 17000 Dufferin Street
King City, ON L7B 1K5
Phone Number: 905-727-3333 **Email:** arthur.weis@utoronto.ca

Course title and weight (398H or 399Y): Plant-Insect Interactions: The role of pollinators and seed predators in the adaptive evolution of plant life histories. 399Y

Description of project and experiential component:

Research projects at the Koffler Scientific Reserve offer outstanding summer opportunities for up to **3** students with interest in plant ecology and evolution.

This summer, we are seeking to improve our understanding of the evolution of control systems for the timing of plant reproduction. Undergraduate projects will bring the ecological selection pressures on flowering time into focus and examine the genetic basis for evolutionary change in this trait. We will build upon work by previous 399 students and tie in to work at the Koffler Scientific Reserve that is probing the effects of climate change on plant evolutionary rates. As temperatures rise, plant genotypes suited to a longer growing season should be favored, and this implies that the switching date between vegetative growth and reproduction (i.e., flowering time) will be under selection in many species. However, the composition of the pollinator community shifts over the course of the season. In addition seed predators, such as birds and weevils, are active at their own specific times of the year. Thus a plant's evolutionary adjustment in flowering time that best suits the shifting temperature regime may not suit the plants interaction with its animal mutualists and enemies.

Research will involve Field Mustard (*Brassica rapa*) and Partridge Pea (*Chamaecrista fasciculata*). Methods will include standard quantitative genetics and may involve molecular genetic fingerprinting using microsatellite markers. Components of one project will be performed in the Experimental Climate Warming Array, which imposes the expected 2050 temperature regime on plots under otherwise natural field conditions.

399Y students will be associated with one general project, where they will assist in plant care, data collection and analysis. They will also have lead responsibility in a sub-project. Participation in the weekly lab meeting, including two lab meeting presentation over the Summer is required. Occasional weekend work is expected.

There will be opportunities for some 399 students to build upon their summer experience by doing the 499 research course in the Weis Lab during the 2012-13 academic year.

For more information on the lab, see <http://labs.eeb.utoronto.ca/weis/>. Information about KSR can be seen at <http://ksr.utoronto.ca/>.

Calendar, location and setting:

Projects start as early as May, 2012, and continue through August. Koffler Scientific Reserve is located 50 km north of campus, near Newmarket. Students will be housed in the Hilltop or Echo Valley residences (double occupancy rooms). Students provide their own linens and meals (house kitchens are fully equipped).

Experiments are mainly out of doors, and student will, when needed, be called upon to work in the rain and heat. Students will be expected to supply their own insect repellent, rain gear (including boots). There will also be research conducted in a new laboratory facility at KSR, including molecular genetic work.

Students are responsible for their own transportation. KSR is not directly serviced by public transit, but shuttle to and from the Newmarket GO station may be available with advanced notice.

Evaluation procedures and marking scheme:

Student participation and quality of work	60%
Lab Note book (reviewed bi-weekly)	10%
Lab meeting Presentations	30%

Prerequisites, background preparation or specific abilities:

Successful course work in Genetics, Evolution and/or Ecology beyond the 100 level

Course work in Statistics is desirable.

Students will be interviewed to assess suitability.

Number of Participants: 3

UNIVERSITY OF TORONTO
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**398/399 RESEARCH COURSE
PROJECT DESCRIPTIONS 2012**

Name and Title: Charly Bank, senior lecturer
Department: Geology
Phone Number: 416 978-4381 **Email:** charly.bank@utoronto.ca

Off-campus location of course: Palaikastro, Crete

Course title and weight (398H or 399Y): 399Y Archaeological geophysics at Bronze-age Palaikastro, Crete

Description of project and experiential component:

Crete is famous for large Bronze-age palaces like Knossos and Malia that were built by the Minoan civilization and were excavated more than a century ago. Current archaeological excavations and surveys in Crete focus on sites of various sizes, but while each excavation will increase our understanding of this culture none of them will be able to answer questions related to the emergence, development, and decline of a Minoan palatial society. Carl Knappett, an associate professor at the U of T Department of Art, is starting a 5-year project at Palaikastro, because it fulfills “the critical combination of a recently excavated palace, with a recently excavated sizeable town occupied over a long period, and unspoilt environs in the hinterland of palace and town” spanning different spatial scales within an insular setting.

2012 marks the beginning of a new 5-year project at Palaikastro. The archaeologists aim to establish control points for GPS and GIS-based mapping of new and previous excavations, surveys, landscape analysis, and palaeoenvironmental data. We, the geophysics team, will contribute to the project by using magnetometry (a GEM-Systems GSM19-GW roving magnetometer and Geometrics G-856AX base magnetometer), ground-penetrating radar (GSSI SIR-3000 radar with 400 MHz antenna) and electrical resistivity tomography (IRIS Syscal Junior Switch-48) to produce non-invasive images of the subsurface in key areas identified by the archaeologists. If our results are promising, the archaeologists may try to start excavating this summer.

Students will be involved in all aspects of the archaeogeophysical work. They will read about the various methods before heading out, decide on acquisition parameters (spacing between measurements or lines, equipment settings), run the surveys (magnetics, GPR, resistivity, total station), do preliminary data analysis and compose a preliminary report while in Crete, and in fall 2012 continue with data analysis, produce a final report and present their results. Students’ work thus contributes to all stages of doing science.

Details of calendar, location and setting:

Students should be prepared to work in rocky terrain and hot weather. We will be sharing rooms. Fieldwork dates are not fixed, but fieldwork is most likely to occur between June 20 and July 15.

Evaluation procedures and marking scheme:

35% July: field notes and initial report (questions, methods, data acquisition, preliminary analysis)

35% end of Fall 2012 term: final report

10% March 2013: poster for UofT research conference

20% throughout project duration: collaboration, reflection

Prerequisites, background preparation or specific abilities:

This project is interdisciplinary, as it applies Earth science to an archaeological problem; it should thus be of interest to students majoring in either discipline. Students should have taken an introductory earth science (e.g., GLG216) and/or archaeology course (e.g., ANT200), and prior fieldwork or an interest in outdoors activities is an asset.

Number of Participants: 5

STORIES FROM THE NORTH: A GRASSROOTS PERSPECTIVE ON HISTORY, CULTURE AND LANGUAGE IN ONTARIO

Name and title: Professor Sali A Tagliamonte
Department: Linguistics **Address:** 4077 Sid Smith Hall
Phone Number: 416 946 8024 **Email:** sali.tagliamonte@utoronto.ca

Course title and weight (398H or 399y): 398H

Number of students: **2 or 3** (depending on quality of applicants)

Description of project and experiential component:

Stories From The North: A Grassroots Perspective On History, Culture And Language in Ontario

Why does language change and how? Sociolinguists have discovered that language change tends to start in urban centres and spread out to rural locales (e.g. Chambers & Trudgill, 1980). This means that changes underway in Toronto may not have yet reached outlying areas, particularly small Ontario towns that are far away. This project will undercover the roots of linguistic change in Toronto, by going back to the roots of Ontario English in the near north. We will venture 600 kilometers or more due north from Toronto¹ and find out what Canadian English is like in Ontario's North Country.

Background

Language change in Canada

The English language has been changing rapidly over the past century and the English spoken in Canada is no exception (Chambers, 2002:264). My recent research attests to dramatic patterns of receding and innovating features (Tagliamonte, 2005, 2008, 2009; Tagliamonte & D'Arcy, 2004; 2007a, 2007b, 2009; Tagliamonte & Denis, 2008).² At least some of these changes are progressing in a unique way in Canada (Tagliamonte & D'Arcy, 2007b; Tagliamonte, D'Arcy & Jankowski, under revision) — a finding which challenges the putative Americanization of Canadian English and world Englishes more generally. Although we have extensive information about changes underway in Southern Ontario; what is the nature of these developments in the north? A more informative picture of the origins and development of current change in Ontario requires the examination of a wider variety of communities, regions and social groups.

¹ This is a significant distance. Compare the distance between London, England and Glasgow, Scotland (644km) or the distance from Paris to Munich (688km) or Boston to New York City (305km).

² <http://individual.utoronto.ca/tagliamonte/index.html>

The North Country

The immense hinterland of Ontario's Near and Far North present a sociolinguistic situation antithetic to that of the south. First, from the beginning of the 19th century, immigrants from all over Europe were recruited into the mines and lumber camps making the population multi-ethnic from its founders rather than developing from Loyalist (British) migrants as in the South (Abel, 2006). Second, due to the rich natural resources (mining, lumber, pulp, and paper) the economic base has had a strikingly different trajectory. The early resource boom economy has developed serious challenges of sustainability in the 20th century (Woodrow, 2002). Third, the north evolved as a class-based social structure with considerable social problems (Abel, 2006). Fourth, the geographical distribution of the population is scattered. Most towns and small cities were built around rich mineral deposits or lumber mills and so the populations have remained self-contained to the present day. Importantly, there is a strong and distinct northern identity, perhaps instigated by the urban-centric industrial and affluent south (Zaslow, 1973). Indeed, the early 19th century perceptions of the north were of "a dangerously immoral, uncivilized place of vice" (Dubinsky, 1993). Given the well-known sociolinguistic tenet that "language encodes social relations" (Chambers, 2003:21), these factors together suggest that Northern Ontario can be expected to be linguistically distinct from that in Southern Ontario.

My own sociolinguistic work in Northern Ontario English, which began with a LIN398H course last spring is the first Sociolinguistic research project on Northern Ontario English. In the past year, I have had overwhelming support from the communities investigated so far (Timmins, Kirkland Lake, Temiskaming Shores and North Bay). Media support has been incredible as well. My research has been reported in the Toronto Star (front page! September 27, 2011 *Looking for true Canadian English, there? Go North*, by Laura Stone), the University of Toronto magazine, and most recently on CBC Radio's *Fresh Air* (January 15, 2012). The time is ripe for another trip north!

In sum, for academic as well as non-academic reasons, Ontario's 'North Country' presents an ideal context to explore Canada's dialects.

Calendar, location and setting:

- | | |
|-----------|--|
| May 1-15 | Training phase. Toronto. Sociolinguistics/Language Variation and Change Laboratory at the University of Toronto, Sid Smith Hall. |
| May 15-31 | Fieldwork phase. Trip to Northern Ontario. Two field sites: Cochrone and Englehart. The students and myself will conduct ethnographic and sociolinguistic fieldwork in the two locations. We will interview as many residents as possible within the two weeks trip. Our goal will be a sample of 12-18 people in each |

community. In addition, we will also visit local libraries, conduct archival research and engage in ethnographic observation.

June 1-30 Data processing phase. Sociolinguistics/Language Variation and Change Laboratory at the University of Toronto, Sid Smith Hall. Transcription and editing of the audio taped interviews.

Finally, we will create a database of ‘Northern Stories’ that will embody the history, cultural and language of the communities from a grass roots perspective (i.e. in the words of the people). We will hope to deposit the database of stories to the archives of the public libraries of each of the communities. Note: This will depend on being able to obtain permissions from the people interviewed.

Supervision:

In the field

I will accompany the students on the field work trip. We will be a three (of four)-person team for the entire time we are in the field. Our goal will be to conduct interviews with people born and raised in two communities in the north — Cochrone and Englehart. I grew up in the north so I am familiar with roads, places and the nature of the place.

In the lab

During the time period when the students are working in my lab, they will be supervised directly by myself and/or my Lab Coordinator (Bridget Jankowski).

Transportation and accommodation:

We will travel in a rental car and stay in a motels (or Bed and Breakfast) in Cochrone and Englehart. I have budgeted for two rooms in case the students are of different genders.

Evaluation procedures:

Students will spend 8 weeks training, working in the field and working in my lab. While in the field, they will likely be working longer than a typical day since we will be accommodating to the schedules of the locales. We will also be conducting as many interviews on site as possible during the time period.

Over the eight week period, students will learn how to conduct Sociolinguistic Interviews, write field notes, conduct interviews, compile field notes, transcribe language materials, follow a transcription protocol and organize linguistic data and metadata for analysis. The tangible goal will be to produce a database of stories from the north.

Marking scheme:

Attendance, participation and contributions to the team	20%
Fieldwork (interviews, field notes, etc.)	30%
Transcription, revision and processing of data	30%
Creation of story data base	20%

Pre-requisites, background preparation or specific abilities:

The Fieldwork Study opportunity is intended for highly motivated, extroverted students who are interested in language, are capable of working independently, taking initiatives and who are genuinely interested in hearing people's stories. They must be capable of working in a mature fashion in an unfamiliar context. Good organizational and social skills are essential. Academic preparation would ideally include a course in language or linguistics. Places are limited (N=2 or 3) and selection will be based on transcript, CV and importantly, a face to face interview.

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UNIVERSITY OF TORONTO
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**398/399 RESEARCH COURSE
PROJECT DESCRIPTIONS 2012**

Name and Title: Kenneth Burch Assistant Professor

Department: Physics

Phone Number: 416 978 5264

Email: kburch@physics.utoronto.ca

Off-campus location of course: Canadian Light Source

Course title and weight (398H or 399Y): PHY 399Y Optical Micro-Spectroscopy of Nanomaterials

Description of project and experiential component:

The students will participate in the production and study of nanomaterials via mechanical exfoliation (the same method used to produce graphene). We will focus on materials with novel and poorly understood physical properties useful for energy efficient devices. Specifically, during the first month the students will produce topological insulators ($\text{Bi}_2\text{Te}_{3-x}\text{Se}_x$), charge density wave materials (TiS_2), semiconductors (MoSe_2) and high temperature superconductors ($\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_8$) only a few atomic layers thick, but hundreds of microns in area. The next stage will involve measuring the optical and structural properties of these materials. Initially this will involve performing Raman experiments in the lab of Dr. Burch. Then the students will travel to the Canadian Light Source (CLS) to assist with temperature dependent optical transmission, reflection and photoconductivity measurements. For this part of the project the students will travel with Dr. Burch and his graduate students to the CLS to be trained on the use of the infrared optical microscope and cryogenic setup there. The students will then spend the next two months working with the IR Beamline Scientist (Dr. Ferenc Borondics) on setting up the photoconductivity measurements as well as performing optical spectroscopy measurements on the nanomaterials. For these measurements the student will work with a graduate student and/or the beamline scientist to operate the experiment via computer as well as design and implement any parts necessary for the measurement. The students may also write some custom computer code to automate the experiments. Initially the students will operate the optical microscope with Dr. Burch and his graduate student, but eventually will be expected to take data themselves. These experiments provide a wide range of critical information about the produced samples, including the atomic structure of the nanocrystals, vibrations of their atoms, mechanisms of electrical conductance, and their electronic structure. This information provides crucial feedback on the quality of the produced structures as well as novel changes in their properties due to confinement on the nanoscale. While these techniques are routinely applied to bulk crystals, they are very challenging in the nanocrystals in this project. Indeed these nanocrystals tend to be only a few atomic layers thick, and tens of microns in length. Taken together the students will have the unique experience of working at a user facility, making nano materials, studying novel materials at the forefront of condensed matter as well as designing and implementing a new and challenging experiment. Therefore the students will gain important skills for their academic and professional careers.

Details of calendar, location and setting:

Initially the work will take place in McLennan Physical Laboratories MP079. The student will be required to meet with Dr. Burch once a week, attend group meetings (1 per week) and give a presentation in the group meeting (1 during the summer). During these meetings students will be free to ask questions during the presentations of other students in the group and occasionally will be asked to report their progress. The students will travel to Saskatoon to visit the Canadian light source with Dr. Burch and his graduate students in late May and will remain there for approximately 2 months (exact dates will be assigned by CLS staff based on beamline availability), initially they will be under the supervision of Dr. Burch and his graduate students but will eventually work directly with the CLS staff. Accommodations at the CLS for the students will be provided by CLS. During the final month of the project, the student will then return to Toronto to finish the analysis and write a report in the group of Dr. Burch.

Evaluation procedures and marking scheme:

Meetings with advisor	15%
Meetings with CLS staff	15%
Lab Notebook	20%
Presentation, attendance and participation in Group meetings	10%
Quality of work (Neat, Accurate, Timely, thoughtful)	15%
Final Report	25%

Prerequisites, background preparation or specific abilities:

The student should be familiar with classical optics, electricity and magnetism and quantum mechanics. In addition familiarity with microscopes and data analysis software (excel, origin, matlab) are desired but not required.

Number of Participants: 2

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**398/399 RESEARCH COURSE
PROJECT DESCRIPTIONS 2012**

Name and Title: Young-June Kim, Associate Professor

Department: Department of Physics

Phone Number: 978-7868

Email: yjkim@physics.utoronto.ca

Off-campus location of course: Canadian Light Source, Saskatoon, Saskatchewan

Course title and weight (398H or 399Y): PHY399Y Quantum materials research with a very bright photon source

Description of project and experiential component:

Background:

Since the discovery of x-rays by Röntgen more than 100 years ago, x-ray diffraction has been one of the most important scientific tools for elucidating crystal structure of materials. This is evident in more than a dozen Nobel prizes awarded to the works using x-rays. Over the past three decades, extremely bright x-rays produced at the new generation of synchrotron sources have made a huge impact on various scientific disciplines ranging from biology to materials science. In synchrotrons, electrons are accelerated up to 99.9999985% of the speed of light, which produce a highly collimated beam of x-ray photons over a wide wavelength range. Currently there are more than 40 synchrotrons in the world in which researchers use x-rays to help design new drugs, build more powerful computer chips, and develop new materials for more efficient batteries. Canadian Light Source (CLS) is one of such synchrotron facilities. Initial CLS construction was completed in 2004, and its experimental hall is being filled with state-of-the-art experimental facilities that enable world-class research for Canadian scientists (see <http://www.lightsource.ca>).

A beamline is the instrumentation that carries beams of synchrotron radiation to an experimental end station, and consists of many complex optical elements such as monochromators, mirrors, slits, and shutters all in ultra-high vacuum environment, all controlled by computers. The measurements are carried out using specialized end stations. Two examples of such beamlines are Hard X-ray Micro Analysis (HXMA) beamline, and Very Sensitive Elemental and Structural Probe Employing Radiation from a Synchrotron (VESPERS) beamline. Using these beamlines and endstations, Prof. Kim's group investigates magnetic, structural, and chemical properties of various quantum materials, including high-temperature superconductors and iridium based topological insulating materials.

Scope of the project: The initial stage of the project is to familiarize with the subject of x-ray diffraction and instrumentation. Students will be introduced to the subject through background reading, and also hands-on

experiments using the x-ray diffractometer in Prof. Kim's laboratory in McLennan Physical Laboratories (MP074). In the next stage, students will travel to the CLS in Saskatoon, Saskatchewan, to join a group of researchers, including Prof. Kim's group (postdoctoral fellows and graduate students), and local beamline scientists and science associates to help design and implement special end station instrumentations and carry out experiments. Specific tasks will involve learning about synchrotron instrumentation, designing beamline elements to be used in Prof. Kim's experiment, and writing computer programs to operate the beamline elements designed. In the final stage, students will be back in Toronto to analyze the data obtained from their measurements and prepare the final report.

Details of calendar, location and setting:

Tentative calendar

May (UofT):

- Reading background materials in x-ray diffraction and physics of quantum materials.
- Becoming familiar with x-ray instrumentation, including four-circle diffractometer and the operating software.
- Preparing samples for measurements

June-July (CLS, duration of this is flexible 4-8 weeks):

- Participating in x-ray diffraction experiments of Prof. Kim's group.
- Designing and testing beamline elements, some examples include
 - Higher harmonics-rejection mirror setup test
 - Design and construction of beam defining slit assembly
 - Installation and test of variable-temperature sample stage
- Becoming familiar with synchrotron instrumentation

August (UofT):

- Data analysis and final report writing.

Location: Canadian Light Source (CLS) is located on the University of Saskatchewan campus in Saskatoon. During the summer, many students from across Canada come to CLS to participate in various research activities. Accommodations and meals will be provided by the CLS.

Evaluation procedures and marking scheme:

- | | |
|---|-----|
| • Student participation and quality of work | 60% |
| • Oral presentation | 20% |
| • Final report | 20% |

Prerequisites, background preparation or specific abilities:

Students should be highly motivated and capable of working in collaboration with other people. Good organizational and social skills are important. Since the work requires good knowledge of electronic equipments

and computing, good computer skills, such as programming skills, are essential. Useful academic background includes quantum mechanics, statistical mechanics, thermal physics, and inorganic chemistry.

Number of Participants: 2