

THE TURKANA BASIN INSTITUTE

ORIGINS FIELD SCHOOL



Study Abroad in Kenya!

- Full semester & summer programs available
- Open to all majors
- Explore the rich prehistory of Kenya's Lake Turkana region
- Courses in Ecology, Geology, Paleontology, Human Evolution & Archaeology



EMBARK ON THE ACADEMIC ADVENTURE OF A LIFETIME

Do you want to visit Africa? Are you interested in science and nature? Want to explore the prehistory of Kenya's Lake Turkana region for yourself?

The Turkana Basin Institute (TBI) and Stony Brook University are pleased to offer unique Study Abroad programs held every Fall, Spring, and Summer term: the **Origins Field School**.

For over five decades, scientific exploration in the Lake Turkana Basin by the Leakey family and their colleagues has unearthed much of the existing fossil evidence for our earliest evolutionary origins.

TBI's Origins Field School explores the place that humans occupy in the natural world and how we came to occupy that place. Participants will gain hands-on experience in archaeological and paleontological field survey and excavation methods, paleoenvironmental reconstruction, taphonomy, and explore important paleontological and archaeological sites, diverse ecological settings, and remarkable geological features throughout the Turkana Basin.

The Origins Field School is offered as two distinct yet integrative programs: the **Semester Abroad Program**, offered in both the Fall and Spring, and the **Summer Program**. You can attend either or both, as the material covered is complementary rather than duplicative. Each offers the academic adventure of a lifetime as you earn upper-division credits studying at TBI's campuses in northern Kenya. Courses are taught in English by top scientists in their fields.

The Origins Field School is offered in the following curriculum options:

SEMESTER ABROAD PROGRAM — EARN 15* CREDITS!

This full-semester program is comprised of five, 3-credit courses at the upper-division or graduate level, and is offered each fall and spring semester. Participants will earn at least 15 upper-division credits while they explore and learn in the very place where the Leakey family and their colleagues have made, and continue to make, unprecedented discoveries into our origins.

SUMMER PROGRAM — EARN 9* CREDITS!

Our new summer program is comprised of three, 3-credit courses at the upper-division or graduate level, and is offered every summer. Participants earn at least nine upper-division credits and will work directly with leading scientists at active hominin fossil localities and archaeological excavations, such as Lomekwi 3 (the oldest stone tool site in the world).

COMBINED CURRICULUM — EARN 24* CREDITS!

The Semester Abroad and Summer Programs are designed so that students may participate in both for one integrated experience, maximizing their time in Kenya and immersion in the Turkana Basin.

*** Students in either program may apply to enroll in Independent Study (ANP/ANT 487 or ANT 610) for additional credits to perform research projects.**

The Origins Field School runs every Fall, Spring, and Summer term. Please check the TBI Study Abroad website for detailed program dates, application deadlines and other info at www.kenyastudyabroad.org.



ORIGINS FIELD SCHOOL:

SEMESTER ABROAD PROGRAM

- Five courses
- Earn at least 15 upper-division credits
- Offered every Fall and Spring term

An in-depth examination of how humans came to occupy our place in the natural world ▶

Course 01: ANP 304/ANT 504

Ecology: Linking People & Nature

This course introduces students to the fundamental principles and techniques of field ecology and evolutionary biology in the context of the modern East African Lake Turkana environment. The course includes a mixture of fieldwork, lectures, independent research projects and readings.

Students conduct fieldwork as part of long-term ecological monitoring of plant and insect communities, while learning fundamental research skills such as proposing, designing and carrying out a scientific project. The course is taught at both the wildlife-rich Mpala Research Centre in central Kenya and at TBI's Ileret campus, facilitating hands-on exploration of a diverse set of environments including savannas, riverine forests, deltas, dryland grasslands, freshwater habitats, and lacustrine islands.

The course is divided into four broad areas:

- General African Dryland and Grassland Ecology
- Freshwater Ecology and Biodiversity of Lake Turkana
- Life on the edge: Coping with heat and drought stress
- People and Nature: Ecosystem Services and the Biology of Vectors



Course 2: GEO 303/GEO 504

Sedimentary Geology & Geochronology

This course introduces current perspectives on the origins and evolution of the Turkana Basin. Students are trained in geology field methods and learn how to apply geological concepts to sediments and rock units to provide a foundation for the chronology and context of recorded events in human evolution. Emphasis is given to sedimentation, stratigraphy, volcanism, and tectonics, as they apply to local geology.

Modern terrestrial processes and landscape evolution are examined using features present in the Turkana Basin. Consideration is also given to broader geologic events spanning the Oligocene to the present. Geologic concepts are linked to modern and ancient environments, archaeology, and paleoanthropology in northern Kenya. It is a field-based course involving visits to important geological and fossil sites. Graded work includes fieldwork assignments, quizzes, and a final exam.

Images from top: exploring a local cave; collecting a tuff sample; field school students on a geology field trip.



Course 3: ANP 305/ANT 505

Earth & Life Through Time

Vertebrate fossils are important sources of information about the appearance, evolution, and extinction of major organisms. As such, they provide a valuable window into climate change, selection pressures, and organisms' diverse adaptive responses to these changes. They are also significant in placing hominid discoveries within a relative local chronology, and helping to reconstruct environments associated with hominid finds.

This course acquaints students with laboratory and field methods of vertebrate paleontology employed in different chronological contexts of the Turkana Basin, used to solve diverse theoretical questions.

Images from top: sieving for fossil fragments at an excavation site; a student discovers a fossil crocodile skull; cleaning fossil vertebrae in the lab.

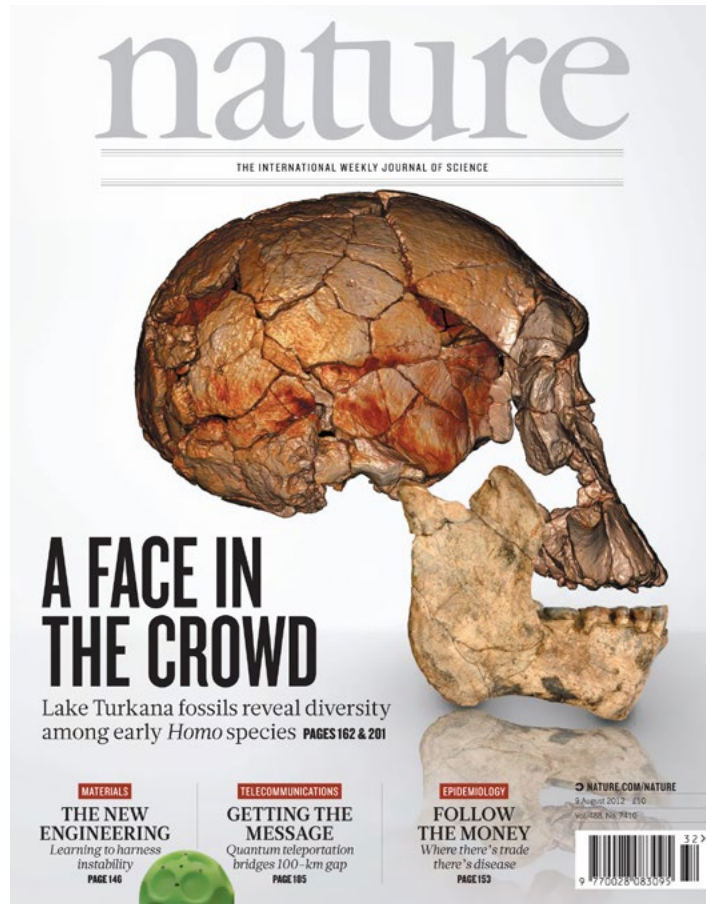


Course 4: ANP 306/ANT 506

Human Evolution

The Turkana Basin is home to an astounding array of fossil hominin discoveries that have fundamentally reshaped our ideas about human evolution. Important finds from the Turkana Basin, including ER 1470, WT 15000 (“Turkana Boy”) and WT 17000 (the “Black Skull”) will be highlighted in lecture, lab and field activities, and their relevance to the larger picture of human evolution will be explored. In addition to highlighting the key role that Turkana Basin fossils have played in telling the story of human evolution, lectures, seminars, and labs will cover the complete span of our evolutionary history from Miocene apes and the earliest putative hominins to the evolution of modern humans. Field trips to discovery locations will provide students with the opportunity to understand the geological context of important fossils of the Turkana Basin.

Images from top: discovery site of a major hominin; discoveries from the Turkana Basin have made the cover of Nature magazine twelve times to date (image © Nature Publishing Group); a collection of casts of important hominid fossils available for study in TBI's labs.



Course 5: ANT 307/ANT 507

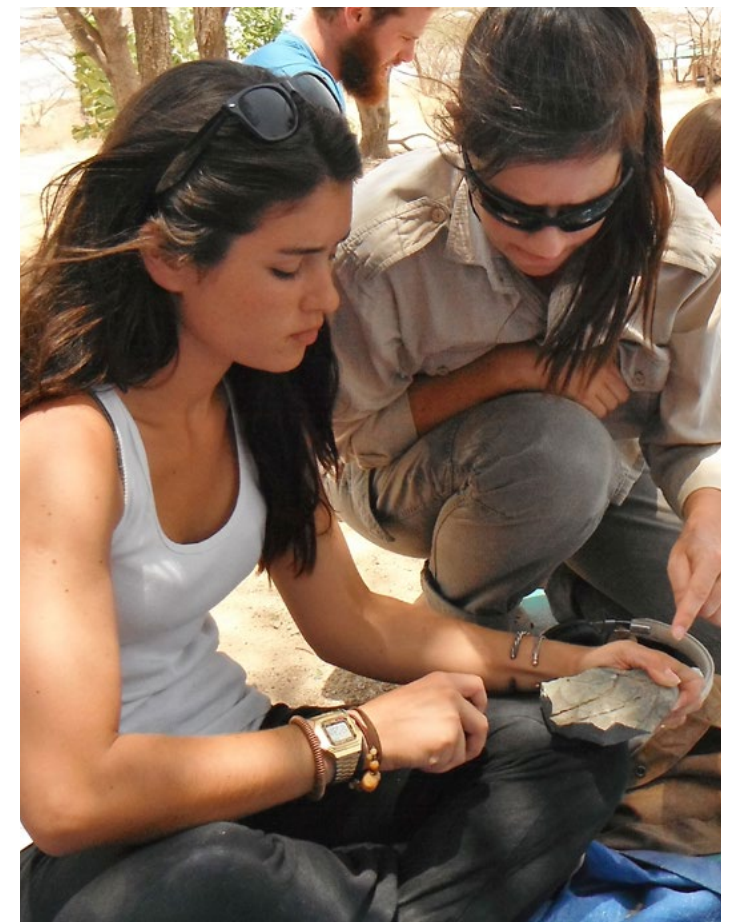
Prehistoric Archaeology of Africa

This course familiarizes students with African Stone Age archaeology through class lectures, labs, and field exercises. Students learn how archaeologists document the behavioral characteristics of early humans through the study of material cultural evidence. During field excursions, they learn diverse methods of survey and excavation techniques appropriate for different sites and contexts.

Primary areas of discussion throughout the coursework include the question of the cognitive status of early humans implied by their technologies and the evolution of human adaptation from an evolutionary perspective, exploring the relationships between stone tool technology, paleoenvironments, hominin species and cognitive evolution.

Students visit archaeological sites of various ages, some very rich in stone tools and pottery, and learn how to make and use stone tools.

Images from top: The Turkana Basin is world-famous for its archaeological wealth (image © Nature Publishing Group); a field school student tries her hand at making stone tools, guided by Professor Sonia Harmand.



ORIGINS FIELD SCHOOL:

SUMMER PROGRAM

- Three courses
- Earn at least nine upper-division credits
- Offered every Summer

**Immersive, practical training
in field techniques at active
hominin fossil localities &
archaeological excavations ▶**

Course 01: ANP 310/ANT 510

Environments, Ecosystems & Evolution

This course serves as an introduction to the ways scientists use the fossil and archaeological records to learn about past changes in Earth's climate and environment, and how humanity's ancestors responded to those changes physiologically and technologically. Interdisciplinary lectures will show evidence from the Turkana Basin's paleoenvironmental, fossil and archaeological records of the dynamic interactions among climate, environment, local food webs, and ancient human populations. This background will prepare students for training in paleoanthropological and archaeological field methods.

Images from top: studying the hydrology of the Turkwel river; a Grévy's zebra (largest wild equine) with foal; hiking amongst rock kopjes at the wildlife-rich Mpala Research Centre. Opposite: students on a field trip to Central Island, a national park and important bird and reptile breeding ground in the middle of Lake Turkana.

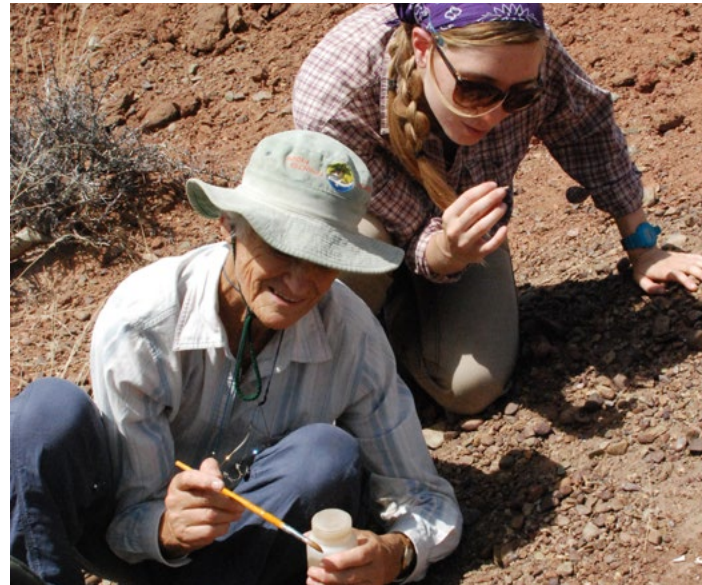


Course 02: ANP 308/ANT 508

Paleoanthropological Field Methods

This course is an opportunity to experience all aspects of a paleoanthropological research project, focusing on vertebrate paleontology, geology, zooarchaeology and taphonomy. Students are trained in field reconnaissance, fossil survey, plotting, preservation, collection, analysis and interpretation. Hands-on examination of fossils from Plio-Pleistocene or Holocene sites around Lake Turkana will teach students how human ancestors and other animals adapted to the environments around them. Experts from TBI, Stony Brook, and other institutions provide instruction in lectures, labs, and via fieldwork within the context of on-going projects.

Images from top: Surveying the landscape for fossils; a field school student learns fossil collection techniques from Meave Leakey; a collection of casts of important primate fossils.



Course 03: ANT 321/527

Archaeological Field Methods

This course focuses on archaeological survey, excavation, artifact recovery and analysis. Students are trained in excavation, recording, artifact retrieval, surveying, field sorting techniques, and interpretation. Hands-on examination of prehistoric artifacts from Plio-Pleistocene and Holocene sites around Lake Turkana will teach students how human ancestors adapted culturally and technologically to the environments around them. Experts from TBI, Stony Brook, and other institutions provide instruction in lectures, labs, and practical experience within the context of on-going field projects.

Images from top: excavation of the Lomekwi 3 site, which has produced the world's oldest stone tools (credit: WTAP-MPK); the archaeological site of Namoratunga; a field school student uncovers a bone harpoon tip.



TBI'S FACILITIES

Origins Field School programs are based at TBI's Ileret and Turkwel campuses, built respectively on the east and west sides of beautiful Lake Turkana. Students live in comfortable, safe, dormitory-style quarters. Clean water, showers, flushing toilets and electricity are provided, as are mosquito nets, towels and bedding. Internet and cell phone service is available.

Meals served are fresh and varied, and very healthy. Vegetarian options are made available.

The Ileret campus is situated on the northeastern shore of Lake Turkana, and provides access to the fossil collection areas where Richard and Meave Leakey launched their groundbreaking hominin research in the 1960s and 70s. In this region live the pastoral Dassanatch people, often seen herding their goats around the lake, who are employed locally as lab technicians and essential camp staff.

The Turkwel campus is located southwest of the lake, overlooking the picturesque Turkwel River, and is a relatively short drive away from important fossil and archaeological sites such as Lothagam, South Turkwel, and Nariokotome, where the famous Turkana Boy skeleton was discovered. This is the land of the Turkana people, after whom the lake was named. Like the Dassanatch, they are seen regularly herding their camels nearby, and are indispensable around camp as skilled specialists and support staff.

Image: a view of the Turkwel campus. Opposite, clockwise from top: osteology lab with professor Fred Grine; dormitory quarters; laboratory at the Ileret campus; Mikael Fortelius leads a discussion on mammals.



SCIENTIFIC IMPORTANCE OF THE TURKANA BASIN

The Turkana Basin region is the source of unparalleled fossil and archaeological evidence for all major stages of human evolution. This is the place where our story is written. Every human being alive today shares DNA inherited from a common ancestral population that we currently believe lived in, or within a few hundred miles of, the Turkana Basin, about 60-70,000 years ago.

It holds an extraordinary window into the past. Within its 7,000 square miles of area, rich fossil layers encapsulate major evolutionary events from the Mesozoic era to the present. To the northwest, in exposures throughout the Labor mountain range, a diverse collection of dinosaur and other reptilian vertebrate fossils has been discovered, including carnivorous theropods, herbivorous sauropods, and flying pterosaurs. Early Miocene sites on the northeast and west side of the lake document the evolution of elephants, rhinoceroses, carnivores, giraffes, pigs, and, notably, the ancestors of old world monkeys and apes shortly after the two

diverged, and have yielded a trove of fossils that have proven critical to understanding the evolution of our own ape ancestors.

It was on the east side of the lake, in the Koobi Fora area, that Richard and Meave Leakey and their colleagues launched their incredible series of hominin discoveries that have provided much of the evidence we have for human evolution. Expansion of their work to sites on the west side of the lake yielded *Kenyanthropus platyops* and *Australopithecus anamensis*, the oldest-known hominin to date. Archaeological expeditions in the Turkana Basin have yielded the world's oldest stone tools. And in more recent sites throughout the region we see the emergence of modern *Homo sapiens*. Truly, the potential for new, important scientific discoveries in the Turkana Basin is as vast as the region itself.



Background: the potential for new, important scientific discoveries in the Turkana Basin is as vast as the region itself. Photo credit: Mike Hettwer.

Inset: a few of the Nature covers featuring discoveries from the Turkana Basin.

Magazine covers © Nature Publishing Group

RESEARCH & EXPLORATION



Meave and Louise Leakey sieve for fossil fragments with the help of their team. The Koobi Fora Research Project is now in its fifth decade, and continues to uncover new and exciting evidence of our earliest ancestors.

Photo credit: Mike Hettwer.

Opposite: Richard Leakey excavates a Homo sapiens skull in the 1970s. Image credit: Bob Campbell.

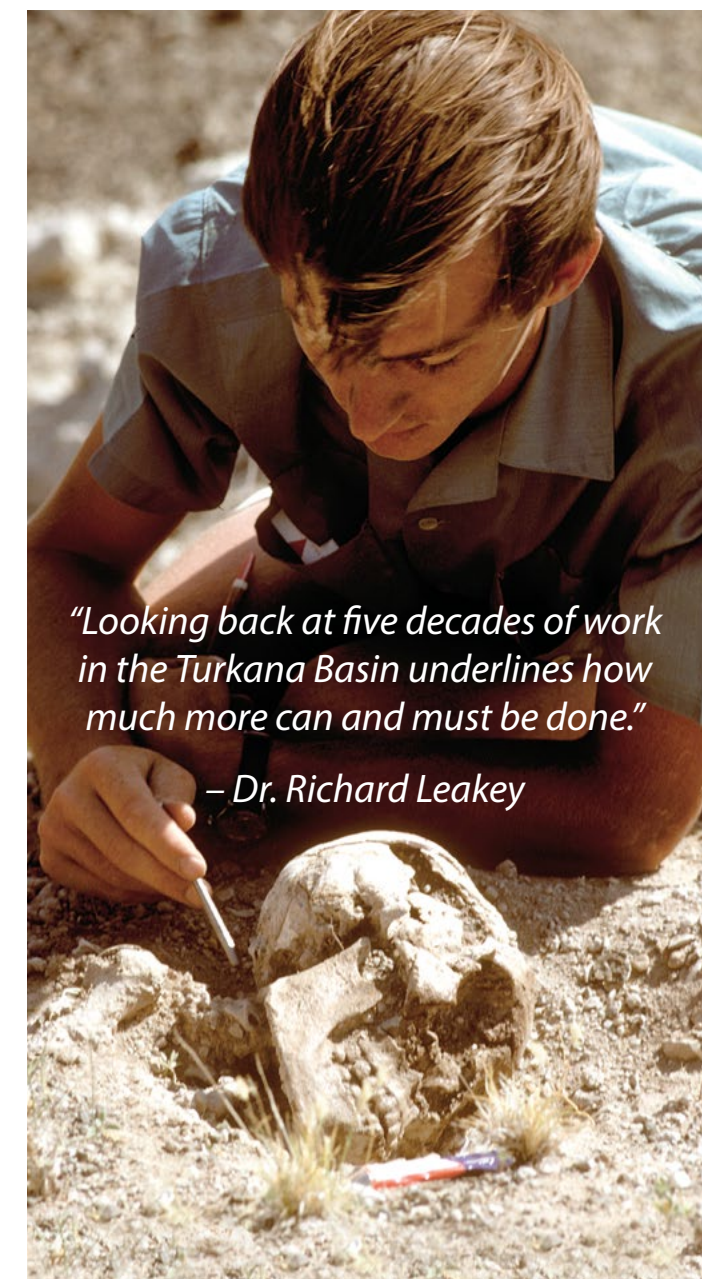
While the primary focus of research projects facilitated by TBI is human prehistory, research in the Turkana Basin has expanded to include areas of sustainability, climate change, and modern human culture and diversity. Further, new advances in technology such as DNA testing, remote sensing, GIS applications, and high-resolution aerial photography have opened new doorways in the sciences of archaeology, paleontology, and biological evolution, leading to an unprecedented wealth of new data.

Currently, research projects in the Basin are investigating a wide range of questions about the ancient inhabitants in and around Lake Turkana, including Cretaceous period vertebrates such as dinosaurs and crocodylians; the origins of modern African megafauna; the evolution of Miocene apes; the ancestry of the hominid lineage in Africa; the origins of our own genus *Homo*; the diversification and spread of modern humans in the last 250,000 years; and the transition to pastoralism, fishing, and agriculture.

Long considered the likely place of humankind's biological origins, the recent discovery of the world's oldest stone tools on the west side of the lake suggests the region may be a good candidate for human cultural and technological origins as well. Researchers are examining the emergence of material culture here, and the implications for the cognitive evolution of Early Stone Age hominins are intriguing. Other scientists are exploring the origin of economic strategies, such as fishing, hunting and gathering, in modern humans over the last few thousand years, and how the development of these strategies may have contributed significantly to human survival at the onset of huge climatic changes at the beginning of the Holocene period.

Indeed, the Turkana Basin has proved an ideal laboratory to study climate change over time. Ongoing projects examine the paleoenvironmental

context for human evolution and cultural development, reconstructing ancient rivers and lakes, dating geological formations, and attempting to understand the role that climate change had in producing new species and stone-tool cultures. Entomology projects are looking at bee diversity, an issue critical to world food supply; others study insect vectors of diseases, with implications for worldwide health. Data currently being collected about the impact on Lake Turkana's food web and fisheries from hydroelectric and agriculture projects may prove vital to a growing global population whose fresh water sources have become increasingly taxed.



"Looking back at five decades of work in the Turkana Basin underlines how much more can and must be done."

– Dr. Richard Leakey



For more information about the Origins Field School,
or to apply to a program, please contact:

Turkana Basin Institute
Stony Brook University
turkanabasin@stonybrook.edu
Telephone: +1 631.632.5800
 or visit
www.KenyaStudyAbroad.org



All content © Turkana Basin Institute
unless otherwise noted.