Paleoanthropology Research Center at Lehman College (PARC-LC)

RESOLVED, that the Paleoanthropology Research Center be established at Lehman College in accordance with the Policy Guidelines on Research Centers and Institutes set forth by the Board of Trustees.

EXPLANATION: The purpose of the proposed Center is to advance research in the interdisciplinary realm of paleoanthropology, or human evolutionary studies, including paleontology, archaeology, genomics and geochronology, by providing a focus for faculty and student efforts in these fields. The Center will sponsor workshops, public lectures, independent student research projects and serve as a base for grant proposals to funding agencies, receiving any indirect cost recovery otherwise provided to a department and individual faculty. The Center will involve faculty from Anthropology as well as Biological Sciences, Earth, Environmental & Geospatial Sciences, Mathematics & Computer Science, Philosophy and other departments at Lehman and will be a potential focus for paleoanthropological research across CUNY.
The City University of New York

Proposal for the
Paleoanthropology Research Center
at Lehman College

Lehman College
DATE, 2011
Paleoanthropology Research Center
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Overview

The proposed Paleoanthropology Research Center at Lehman College represents a focused initiative that faculty and administrators have been developing for the past few years. The mission of the Center is to provide a focus for College-based research in human evolution, broadly viewed, including paleontology, archaeology, genomics and geochronology, as well as to advance the training of Lehman students in these areas through independent projects supervised by Center faculty. The Center will also sponsor both public lectures and scholarly meetings to expand research efforts in paleoanthropology, at Lehman, across CUNY and throughout New York City.

Background

The Center builds on Lehman College's strong faculty presence in paleoanthropology. Prof. Eric Delson, who has worked at Lehman for nearly 40 years, is a world-recognized leader in this interdisciplinary field. Two junior faculty members in Anthropology, Asst. Profs. Ryan Raaum and William Harcourt-Smith, are active researchers in distinct areas of paleoanthropology. All are (Co)-PIs on major research grants. Profs. Delson and Harcourt-Smith are also Research Associates in Paleontology at the American Museum of Natural History.

The Center and Lehman College will benefit from our faculty’s close connections to graduate training programs in paleoanthropology. In 2009, Prof. Delson submitted a grant proposal to the National Science Foundation to renew funding for the NYCEP graduate training program. NYCEP, the New York Consortium in Evolutionary Primatology, combines faculty and students in physical anthropology and related areas from CUNY, NYU, Columbia, the American Museum of Natural History and the Wildlife Conservation Society, home of the Bronx Zoo. NYCEP had received three training awards from NSF, in 1991, 1996 and 2003, all based at the CUNY Graduate School with subcontracts to the collaborating institutions. In 2009, it was decided that the grant base would move to Lehman, where President Fernández generously offered to provide significant complementary financial support for Ph. D. students who would be partly funded by the IGERT renewal award. Part of the new approach to graduate training proposed to NSF for this renewal was the emphasis on two fields of science, conservation biology and paleoanthropology. As a result, President Fernández wrote in his September 10th, 2009 supporting letter to NSF:

I have asked Professor Delson, therefore, to develop the Paleoanthropology Research Center at Lehman College (PARC-LC) to serve as a focus for interdisciplinary studies in this area across CUNY. One new faculty member in Anthropology (Dr. Ryan Raaum) joined Lehman last year, a specialist in human paleontology (Dr. William Harcourt-Smith) is beginning this month, and a new search for a researcher in Paleolithic archaeology is under discussion for the future. These core researchers will be additionally supported by anthropology faculty already on staff and by others in the Departments of Biological Science; Environmental, Geographical and Geological Sciences; and Mathematics and Computer Science. The new Center will complement a similar unit at NYU and provide facilities for advanced research and training initiatives.
The acronym for the new Center has a special meaning, in that the Palo Alto Research Center of Xerox Corporation (Xerox-PARC), founded in 1970, was the site of development of many now familiar features of technology, such as the computer mouse. This new incarnation of PARC is expected to foster equivalent developments in paleoanthropology at Lehman.

Paleoanthropology (see diagram on next page) is a broad and highly integrative area of research, and the Lehman Department of Anthropology and other College departments include faculty whose specialties span most of these topics. It is worth noting that anthropology in the US consists of four major areas or subfields:
1) physical (=biological) anthropology, the study of human biology and evolution (including paleontology and genetics), plus the evolution, paleontology, comparative morphology, natural history, behavior and genetics of our close relatives, the primates;
2) archaeology, the study of lifeways and material culture of the past, from the earliest humans to the historic present – Paleolithic archaeologists study stone tools, intentional burials, the evidence of human hunting from prey fossils and modes of formation of human sites; plus 3-4) cultural anthropology and anthropological linguistics, which are less directly connected to the goals of PARC-LC.

Anthropology truly lies at the intersection of the Natural and Social Sciences, as reflected in the existence of separate programs at the National Science Foundation for each of the subfields.

**Thematic Areas** of the Paleoanthropology Research Center reflect faculty expertise and interests:

**CORE areas and faculty:**

**Paleontology of Humans and other Primates:** This is the primary research focus for Profs. Eric Delson and William Harcourt-Smith. Prof. Delson is a world expert on Old World monkey paleontology, systematics and biogeography and has also conducted considerable research on human evolution, often using three-dimensional quantitative approaches. He is Director of NYCEP (the New York Consortium in Evolutionary Primatology), which is a nationally and internationally renowned graduate training program in human and non-human primate evolutionary biology. Prof. Harcourt-Smith is an expert on the locomotion of early hominins, and is currently working on testing hypotheses relating to potentially different types of upright walking in different fossil human lineages. He also works on the evolution of the earliest apes, with a particular emphasis on field-based paleoanthropology at his externally funded field site in western Kenya.

**Genomics and Population Genetics of Human Origins:** Prof. Ryan Raaum’s research is directed towards understanding the roles of migration, behavioral patterns, and local adaptation in human and primate evolution using genetic/genomic data. In order to gain insight into the – currently poorly characterized – migratory patterns of early humans, he has an active externally-funded research project examining the genetic consequences of prehistoric and early historic human migration through trading networks in the Indian Ocean Basin. In addition, a pending grant application proposes to study the role of hybridization during speciation in order to evaluate the recently proposed hypothesis of reticulating hybridization between the early human and chimpanzee lineages.
Paleolithic Archaeology: There is currently no faculty member at Lehman, or in fact anywhere at CUNY, who concentrates on the archaeology of modern humans or their predecessors earlier than about 10,000 years ago. As indicated in President Fernández' letter to NSF, we hope that such a position might be created at Lehman in the future, to expand the offerings in the Anthropology Department and bring more full-time instruction to our students, as well as provide another Core faculty member and primary leader of PARC-LC.

The interdisciplinary field of paleoanthropology combines research in three major areas: Biological Science, Geological Science and Anthropology-Archaeology. This diagram illustrates the interactions among those fields and their numerous subfields, almost all of which will be represented in the work of the Paleoanthropology Research Center at Lehman College.

Proposed RESOURCE Areas and Faculty:

**Skeletal Biology:** Prof. Vincent Stefan, Chair of Anthropology, is a specialist on the human skeleton and teaches courses in skeletal biology and its forensic applications. He would be a primary resource for students and faculty dealing with human skeletal remains.

**Archaeology, Geoarchaeology and Palynology:** Two current faculty members in Anthropology, Profs. Louis Flam and Cameron McNeil, specialize in the archaeology of early civilizations of the Old and New Worlds, respectively. Prof. Flam also brings expertise in geoarchaeology, the interpretation of landforms in archaeological sites, while Prof. McNeil’s work on the analysis of pollen and other plant remains in archaeological sites, is an important complement to research on sites of all ages. They do not currently teach classes in these areas but might do so with the increased student interest expected from the development of PARC-LC.

**Systematic Biology:** The analysis of relationships among organisms (phylogeny) is a major goal of paleoanthropological research. Prof. Joe Rachlin (Biological Sciences) is a systematist who teaches courses on this subject and who would therefore be an excellent resource for PARC-LC. Prof. Katherine St. John (Mathematics & Computer Science) is an expert on computer programs which analyze phylogeny as well as computer visualization of evolution; she is a long-time collaborator of Profs. Delson and Harcourt-Smith and would be a wonderful PARC-LC resource
faculty. Prof. Massimo Pigliucci, Chair of Philosophy, is widely known for his work on the philosophy and history of science, especially evolutionary biology; he also would be a great resource for PARC.

**Geology and GIS:** A major aspect of paleoanthropology relates to the geological background and context of sites yielding fossils and archaeological remains. Prof. Heather Sloan (Earth, Environmental & Geospatial Sciences) is a structural geologist whose expertise would be valuable to PARC-LC faculty and students. The importance of GIS (Geographic Information Systems) in mapping and visualizing data such as site locations and paleoenvironmental reconstructions has grown significantly in recent years. Profs. Juliana Maantay and Yuri Gokhorovich (Earth, Environmental & Geospatial Sciences) are GIS specialists who could be of great help in analyzing and illustrating the paleoanthropological data collected by other PARC-LC faculty and students; Dr. Gokhorovich also brings expertise in Pleistocene geology, geomorphology and geoarchaeology.

**Collaboration and Outreach**
The Center will collaborate with paleoanthropologists and interested parties within the CUNY system as well as with local, regional, national and international universities, museums and other colleagues and professional organizations. They will arrange periodic lectures on current areas of interest in human evolution. These will be open to all members of the Lehman community, and in selected cases, members of the public.

The Center will make use of the vast technical capabilities offered by the new Media Center at Lehman College. The Center will disseminate all public events via live feed and archived podcasts, making them accessible to anyone with access to the internet. The Lehman College Media Relations Office will be asked to assist in publicizing events and educational opportunities in paleoanthropology to the greater Bronx community and New York Region.

The Center will also maintain an up-to-date website, where forthcoming events will be posted and important paleoanthropological news highlighted.

**Justification for the Center**
There are a small number of paleoanthropology-related institutes and centers affiliated with universities throughout the country. Universities with such centers include Arizona State University, Case Western Reserve University, New York University, Rutgers, Stony Brook University, and the University of California Berkeley. The missions of these centers are quite varied. Some have been developed to organize and support research projects at a single important paleoanthropological field site, such as the Turkana Basin Institute affiliated with Stony Brook University. Others are organized around a graduate training program, such as the M.A. in human skeletal biology associated with the Center for the Study of Human Origins at New York University.

Our Center will differ from the aforementioned programs by filling an empty niche focused on integrative workshops and public lectures which intersect and are supported by our faculty’s research. The proposed Paleoanthropology Research Center would be the only such institute situated in a primarily undergraduate institution, and our students will benefit from much closer integration with the activities of the Center than they would have opportunities for at any of the
other paleoanthropology-related institutes and centers across the country. The Center will build on the unique and central role of New York City in the history of paleoanthropology; from 1946-1951, there were six “Summer Seminars” held in New York City that set the foundations for the then-new discipline of physical anthropology; in the early 1970s, the American Museum of Natural History was the source of ferment and proselytizing about the concepts of phylogenetic systematics, which soon became the major approach to phylogeny-building across biology, including paleoanthropology; in 1984, the Museum sponsored the exhibition "Ancestors: Four Million Years of Humanity" featuring the display of original human fossils from around the world, a success never duplicated to the same degree. Professor Delson was instrumental in both of the latter ventures.

Organization and Staffing

The proposed Paleoanthropology Research Center will be guided by an elected Steering Committee of Lehman College Faculty. The Steering Committee will provide general guidance and foster support for the Center. Steering Committee activities will be divided among Working committees as needed. A Director, nominated by the Steering Committee and approved by the Provost and President, will oversee the Center’s operations and budget. A Deputy Director, elected by the Steering Committee, will assist the Director in administering the Center and organizing sponsored activities.

The Center will have three classes of voting membership, plus nonvoting Associates. Core faculty members are those whose research focus is in paleoanthropology. Resource faculty members are those whose expertise in allied fields can complement and aid Core faculty and student members. Student members are those who work with Core and Resource faculty members on paleoanthropological projects sponsored by PARC; their membership must be approved by the Steering Committee on an annual basis. Associates will include faculty, staff, students and others (donors, members of the public) who wish to be involved in Center activities and who request Associate status in writing to the Director.

Governing Structure

PARC-LC Steering Committee: The governing body of the Center shall be the Steering Committee. The Interim Steering Committee serves as the Steering Committee until the first annual meeting of the Center. The Steering Committee shall consist of five Lehman College faculty members. The Director shall be an ex officio member of the Steering Committee with a vote and shall also serve as Chairperson of the Steering Committee. Other members of the Steering Committee shall include two Core and two Resource faculty members of the Center. No more than four Steering Committee members shall come from the same Department.

An Organizational Meeting was held on May 19, 2011 with 9 faculty members present. An Interim Steering Committee of 5 members was elected: Eric Delson (nominated as Interim Director), Ryan Raaum (Deputy Director, core faculty, Anthropology), William Harcourt-Smith (core faculty, Anthropology), Cameron McNeil (resource faculty, Anthropology) and Joseph Rachlin (resource faculty, Biological Sciences). Other resource faculty members in attendance included: Yuri Gorokhovich (Earth, Environmental & Geospatial Sciences), Heather Sloan (Earth, Environmental & Geospatial Sciences), Vincent Stefan (Anthropology), and Katherine St. John
(Mathematics & Computer Science). Professors Flam (Anthropology), Maantay (Earth, Environmental & Geospatial Sciences) and Pigliucci (Philosophy) were unable to attend the meeting.

**PARC-LC Director:** The Director of the Center shall be a member of the Lehman College faculty and a Core member of the Center. The Director shall be nominated by the Steering Committee and appointed by the President of Lehman College for a term of three years. The Director may be re-nominated and re-appointed. The Director shall be the chief executive officer of the Center as well as the official representative of the Center and an ex officio voting member of all committees. S/he shall be responsible for (1) the administrative work of the Center, (2) the assignment of tasks to committees, (3) the arrangement of the Center’s programs, (4) the general supervision of the Center, (5) the preparation of the Center’s annual budget, and (6) the preparation of the Center’s annual report, which will be reviewed by the Steering Committee and the Provost before presentation at the Center’s annual meeting. The Steering Committee may delegate additional authorities and responsibilities to the Director. The Director shall report to the Steering Committee and the Provost.

Dr. Eric Delson, Professor of Anthropology, was nominated as Director of the Center by the Interim Steering Committee on May 19, 2011. Prof. Delson is a paleoanthropologist with special interest in the evolution of humans and Old World monkeys. His studies have clarified the phylogenetic relationships of fossil and extant monkeys and employed them in biochronological dating of African fossil sites. His *Evolutionary History of the Primates* (1979) remains a classic reference, while *Ancestors: The Hard Evidence* (1985) benchmarked paleoanthropology during the unique exhibition of original human fossils which he co-developed. In 1986, he and Peter Andrews reorganized the moribund *Journal of Human Evolution*, making it the leading journal in paleoanthropology. In 1988, he co-edited the *Encyclopedia of Human Evolution and Prehistory*, which brought together information about primate and human evolution, Paleolithic archaeology, Cenozoic geology and geochronology. A second edition (2000) remains a standard reference for general readers. In 2004, he founded the Springer book series *Vertebrate Paleobiology & Paleoanthropology* to provide a much-needed outlet for symposium volumes and monographs, co-editing it with Ross MacPhee and now Eric Sargis. He has (co)written or edited 8 books and monographs (with 4 more in progress or planning) and over 200 articles, chapters and encyclopedia entries. In recent years, he has promoted the development of 3D geometric morphometrics and computer visualization in the study of primate (including human) cranial and postcranial evolution, training several graduate students in this area. With French colleagues, he directed a 6-year collaborative project to reopen the famous Senèze fossil mammal site and obtain new material for modern analyses of age, paleoenvironment, taphonomy and paleobiology.

Eric Delson has been a faculty member in Anthropology at Lehman College since 1973, Professor since 1980, and Chair from 1999-2009. He has been the Coordinator of the Physical Anthropology section of the CUNY Ph. D. Program in Anthropology since 1998 (and much of the time since 1978). He founded and has directed the NSF-funded NYCEP (New York Consortium in Evolutionary Primatology) graduate training program which unites physical anthropology at CUNY, Columbia and NYU with links to the American Museum of Natural History and the Wildlife Conservation Society (home of the Bronx Zoo) since its inception in 1991 (current NSF funding extends to at least 2015). He is a founding member of the Paleoanthropology Society and has served as its Secretary since officers were first elected in 1999. He developed the public-
access online database PRIMO (PRImate Morphology Online, http://primo.nycep.org) to make available caliper and 3D data (and eventually scan datasets) collected by him, students and colleagues in the NYCEP Morphometrics Group.

Eric Delson attended Harvard College and received the B. A. in Physics; he moved to Columbia University where in 1973 he received a Ph. D. in Geology, with specialization in Vertebrate Paleontology. He was named a member of the Paleoanthropology Delegation to the People's Republic of China in 1975 (sponsored by the US National Academy of Sciences), the first contact in this discipline since 1945 with a nation rich in the evidence for human and primate evolution. Since 1975, he has been an elected Research Associate in Vertebrate Paleontology at the American Museum of Natural History. He served as Visiting Professor of Anthropology at Yale University in 1980. He was awarded a John Simon Guggenheim Memorial Fellowship in 1981, was elected to Fellowship in the American Association for the Advancement of Science in 2002 and in 2005 was named the First recipient of the Lehman College Award for Excellence in Research, Scholarship & Creative Works in the Sciences.

Grants

**Shape Differences in the Biological Sciences.** This project aims to compare and analyze biological shapes (such as human skulls) in three dimensions, using a new shape metric proposed by PI Nina Amenta (University of California/Davis). The Lehman College team includes local PI Eric Delson, Co-PIs Will Harcourt-Smith and Katherine St. John, and colleagues at the American Museum of Natural History. Total amount requested: $499,339 ($70,017 at Lehman).

**Status:** Awarded. **Project period is 2011-2012 at Lehman.**

**Decoding the Swahili: An Integrated Archaeological and Genetic Study of the Swahili of East Africa.** This NSF-funded project aims to understand the origin and biological composition of the towns and city-states that developed on the East African coast in the late first millennium CE. This is a collaborative project with the genetic analysis of contemporary populations based at Lehman College (Prof. Ryan Raaum), archaeological excavations in Kenya directed by Dr. Chapurukha Kusimba (The Field Museum), analysis of skeletal remains directed by Prof. Janet Monge (University of Pennsylvania), and study of ancient DNA directed by Prof. Sloan Williams (University of Illinois-Chicago). Total amount: $273,108 ($84,994 at Lehman).

**Status:** Awarded. **Project period is 2010-2012.**

**Advancing Primate Population Genomics Offers Insight into Speciation.** This project proposes an innovative method for collecting genome-wide sequence data from any anthropoid primate species and will use these data to evaluate open questions on the importance of hybridization and gene flow during the process of speciation. The project is based in Prof. Ryan Raaum’s laboratory at Lehman College and includes significant funding for undergraduate student participation. Total amount requested: $583,506.

**Status:** Pending (submitted January 2011)

**Collaborative Research: Paleobiology of Early Miocene Fauna from Rusinga and Mfangano Islands, Kenya.** This NSF-funded project aims to investigate the relationship between ancient environments and the radiation of the first ape species in eastern Africa. The project is based partially at the Early Miocene paleontological sites of Rusinga and Mfangano in west Kenya, dated to between 16 and 19 million years ago. Work is also conducted at museum collections...
around the world, with particular emphasis on the National Museum of Kenya, in Nairobi. Total amount: $181,003.

**Status: Awarded. Project period is 2009-2012.**

**Digitization TCN: Collaborative Research: Fossil Primate Scan Network (FPSN)--A 3D Digital Library and Workspace for Our Origins in Deep Time.** A proposal to NSF in collaboration with the American Museum of Natural History, Brooklyn College/CUNY, Duke University and other institutions is being finalized in October 2011. It goal is to obtain CT or surface scans of a wide range of fossil primates (and some comparative modern material), including holotypes, some long series of important taxa, and as many important specimens as possible from the world-renowned localities of the Fayum Depression (Egypt), many of which were collected by teams from Duke University. These scans would all be made freely available to researchers, students and the general public at different levels of access, from viewing onscreen to download of full datasets, with development of new tools to assist in the process. We are working with colleagues at institutions across the US to build a digital library of scans of many hundreds (perhaps thousands) of individual specimens, all of which will have detailed collection data linked to them, with tools for geographical and temporal mapping. Total amount: ca. $2,000,000 (ca. $500,000 at Lehman).

**Status: not yet submitted; project period would be 2012-2016.**

**Future Grant Plans**
The Center will develop proposals to support its various activities and submit these proposals to the following funders: NSF (the National Science Foundation), the Wenner-Gren Foundation for Anthropological Research, and the Leakey Foundation, among others. A first goal is to develop a grant proposal to obtain funds for a workshop that would bring together field-based paleoanthropological researchers with knowledge of the current status of fossil hominin specimens and Paleolithic archaeological assemblages with laboratory-based researchers involved with the analysis of the Neanderthal and Denisova hominins. To date, there has been no significant interaction amongst these communities and integration of these separate lines of evidence is crucial to understanding the origins of modern humans.