

Collaborations in Paleoanthropology and Landscape Evolution (Spain)
2017 Faculty Grants for International Connections Proposal

David Anastasio, Department of Earth & Environmental Sciences
Cameron B. Wesson, Department of Sociology & Anthropology

Proposed Activity

Environmental change is among the most pressing issues we face as humans. Almost daily a new study is published that presents a new aspect of our present environmental condition and its potential impacts on local plant and animal communities. In addition, changes in sea level threaten to reshape continents, inundate low-lying islands, and lead to innumerable challenges for policy makers. Although most of these scenarios are dire, they do not represent the first instance in which humans have confronted environmental change on a global scale.

Roughly 1-2 million years ago, the earliest members of our bipedal family (hominins) began to migrate out of their East African homelands as local environments changed. At the same time, armed with an increased ability to produce a range of simple tools, these hominins were able to prosper in ever new environments. In modern Spain, several areas that have yielded important clues to the earliest hominin migration into Southern Europe. One such area is in Northern Spain, at the UNESCO World Heritage site of Atapuerca. This site contains among the earliest and best-preserved hominin remains in Western Europe as well as an array of non-human faunal remains that permit broad environmental reconstructions to be made. In addition to Atapuerca, a presently under-examined region of Southern Spain, near Orce, has yielded tantalizing evidence of an even earlier hominin presence in Western Europe, with several recent studies suggesting these remains may predate those at Atapuerca by more than half a million years. Like Atapuerca, Orce holds evidence of massive environmental and geological changes since hominins first arrived in the region, approximately 1.4-1.5 million years ago. However, much additional research is warranted at both Atapuerca and Orce to better understand: (1) the timing of the earliest hominin arrival in Western Europe; (2) the nature of the local environments encountered by these hominins; and (3) behavioral adaptations made by hominins as they moved into new environments.

The purpose of the international travel proposal is to develop a research collaboration both within Lehigh and with Spanish researchers working on these issues and within these regions. At Lehigh, Professors David Anastasio (Earth and Environmental Sciences) and Professor Cameron Wesson (Sociology and Anthropology) seek to develop new initiatives in Geoarcheology and Paleoanthropology, to establish new lines of core research for each of us, and new interdisciplinary internships and research experiences for future Lehigh and U.S. students (NSF requires 2/3 of students to non-Lehigh if they support the REU program). The proposed venue for travel is Spain, where there is evidence of migration and occupation by the earliest European hominins at numerous archeological sites. Following a successful trip, the PIs will submit more competitive REU and core program proposals to the NSF and a proposal to the Leakey Foundation, described below. Interactions with our international hosts will occur in and near different cities (Madrid, Burgos, Granada) so that we can visit appropriate field sites (Atapuerca and Orce) and administrative offices to discuss MOUs between Lehigh University and government institutions, universities, and anthropological sites. In order to develop effective programs for undergraduate students, we will evaluate logistics associated with student accommodation, laboratory access and costs, in-country travel, and risk management for various scenarios. Our proposed schedule is tightly choreographed to ensure we can achieve our goals (see Appendix) in the shortest time. Each project is briefly described, followed by an Appendix that include letters of invitation, a proposed itinerary, contact information, trip budget, and expected proposals to external funding agencies.

1. The Earliest Europeans: Paleoanthropological and Paleoenvironmental Perspectives (REU)

Anastasio and Wesson to meet with representatives at Atapuerca and Orce to develop an undergraduate research experience addressing the botanical, hydrological, and environmental changes impacting both

regions over the past 1.5 million years. Students would also be included in paleoanthropological survey and excavation, as well as laboratory processing and museum curation standards. NSF requires 2/3 of undergraduates participating to be non-Lehigh students, expanding our institution's research connections and intellectual footprint not only in Europe, but within the United States as well.

2. Quaternary environmental changes recorded in Guadix-Baza Lake sediments during hominin migration. Meet with Prof. Viseras, Departamento de Estratigrafía y Paleontología, University of Granada and Dr. Parés, Geologic Manager, CENIEH, field trip to Orce. To add value to nascent research between Anastasio and Parés to determine chronologies in the Guadix-Baza Lake sediments, we propose to expand the study to include environmental changes preserved in lake sedimentary rocks and to seek support from the Leakey Foundation for project expansion. Lithologic studies (Anstasio-Lehigh) paleoecology and paleoclimatic studies (Yu-Lehigh), and isotopic studies (Bebout-Lehigh) will be proposed. Lake expansion and contraction driven by hydrologic changes are preserved in the rocks that will be investigated to recover ancient climate change, and paleoecology during hominin migration to explore why, when, and how often the corridor was used by early human ancestors moving to Europe and Asia from the African continent. The trip will include the site diggings and the Orce museum to introduce Prof. Wesson to the archeological site. The area was the site of the last connection between the Atlantic Ocean and Mediterranean Sea before the modern connection at Gibraltar. Retreat of the seaway resulted in the largest lake in Europe and grassland environments evolved into a savannah landscape with abundant game. Did our ancestors merely follow the herd?

3. Exogenic vs autogenic drivers of drainage divide migration in an active mountain belt, Betic Cordillera, Spain. Anastasio to meet with Profs. Azañón and Soto, Department of Geodynamics, University of Granada, Granada Spain. This is new research for Anastasio. Contacts at the university will facilitate future field logistics, provide access to theses and dissertations, and develop future funding proposals. The Betics are an excellent natural laboratory to study landscape evolution in a tectonically active region. The research seeks to explore how rivers migrate to integrate adjacent watersheds during mountain range uplift and therefore, how river deposits record tectonics. The process-based research will take advantage of prior work completed at the University of Granada. Advanced laboratories to numerically date rocks, available at Lehigh University, and Utah State University, and the Scripps Institute of Oceanography where Anastasio has collaborators in laboratories that are largely unavailable in to Spanish Earth scientists.

Budget

Travel

Anastasio and Wesson—2 RT Philadelphia, PA -Madrid, Spain: @\$1200=	\$2400
Airport transfers, tolls, and parking:	\$ 125
Parés one way bus, Burgos-Madrid —1 RT:	\$ 50
Rental car, insurance, gas:	\$ 700

Per diem

1d x 2 travel days @\$200:	\$ 400
8d x 3 at field locations days @\$100:	\$2400
Burgos and Granada parking \$100:	\$ 100

Total	\$6175
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Request to OIA in this proposal \$5000

Cost share from Lehigh Index #608022, Anastasio Research Incentive Fund, includes all costs related to Dr. Parés, CENIEH essential to meet project objectives.

Appendix

Proposed Itinerary

Day 1: Arrive to Madrid. Josep meets at airport. Drive to Granada.
Day 2: Dave meets with Azañón and Soto relative to tectonic geomorphology project. Wesson and Parés to meet with U. of Granada officials to investigate student accommodations, laboratory access, and REU logistics.
Day 3: Field trip to Guadix-Baza Basin led by Viseras.
Day 4: Meeting with Jiménez and Viseras and (University of Granada).
Day 5: Drive to Burgos (8 hours).
Day 6: Meeting with Rodriguez (Fundacion Atapuerca). Visit the archeological sites.
Day 7: Visit the Museum of Human Evolution and CENIEH. Begin drafting REU proposal plan.
Day 8: Work on MOU and proposals in Burgos; trip to Segovia to explore Roman ruins.
Day 9 Fly to USA (Anastasio, Wesson), bus to Burgos (Parés).

Expected Proposals

International Research Experience For Students-Deadline August 15, 2017

https://nsf.gov/funding/pgm_summ.jsp?pims_id=12831

Research Experience for Undergraduates-August 28, 2017

https://nsf.gov/funding/pgm_summ.jsp?pims_id=5517

The Leakey Foundation-Deadline July 15, 2017, January 10, 2018

<https://leakeyfoundation.org/>

Earth Sciences

Geomorphology and Land Use Dynamics Program-rolling deadline

https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=13690&org=EAR&from=home

Contacts

Lead contact

Dr. Josep M. Parés Casanova (letter of invitation)
Research Director Geochronology
Centro Nacional de Investigación sobre la Evolución Humana (CENIEH)
Po. Sierra de Atapuerca s/n
09002 Burgos ESPANA
Telephone Office: 947040800 (ext: 4301)
Mobil Phone:
FAX: 947040810
Email: josep.pares@cenieh.es
Web: <http://www.cenieh.es/>
SKYPE me at JosepMPUniversity of Granada

At Atapuerca

Atape Jose M. Rodríguez-Ponga (letter of invitation)
(Secretario del Patronato)
and
Eudald Carbonell
(Director General)
Fundación Atapuerca
Carretera de Logroño 44
09198 Ibeas de Juarros (Burgos)

At Orce

Prof. Juan M. Jiménez (letter of invitation)
Depto. de Prehistoria y Arqueología
Campus de Cartuja s/n 18071 Granada
Instituto Universitario de la Paz y los Conflictos Calle Rector López
Argüeta s/n 18071 Granada and Prof. César Viseras Departamento de
Estratigrafía y Paleontología Facultad de Ciencias, Campus de
Fuentenueva Universidad de Granada 18071-Granada Spain

Prof. César Viseras
Departamento de Estratigrafía y Paleontología
Facultad de Ciencias,
Campus de Fuentenueva
Universidad de Granada 18071-Granada Spain

Betic Cordillera Researchers

Jose Miguel Azañón Hernández (letter of invitation)
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Juan I. Soto
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SKYPE me at jsoto_ugr



C E N I E H
centro nacional de investigación sobre la evolución humana

Professor Dave Anastasio
Dep. of Earth and Environmental Sciences
Lehigh University
1 West Packer Ave.
Bethlehem, PA 18015-3677
USA

Josep M. Pares
Program Coordinator
CENIEH
Paseo Sierra de Atapuerca 3
09002 Burgos
Spain

Burgos, 30 January 2017

Dear Dave,

I wish to extend a formal invitation to you to visit the National Research Center for Human Evolution (CENIEH), in order to discuss the framework for a collaborative project between our institutions. The CENIEH is an institute devoted to the study of human origins through multidisciplinary research, and carries out and oversees research in a number of archaeological sites in Spain. As the Geology Coordinator at the Archaeological Site of Atapuerca, I would like to discuss possibilities for undergraduate students from your institution to get them involved and actively participate in the archaeological activities, including both field work and research in the laboratory. The visit will allow Prof. Bermúdez de Castro (co-director of the archaeological site), José M. Ponga (Fundación Atapuerca), and myself to work with you in the development of a proposal for research experiences for undergraduates. I will personally accompany you to the field area and show you the local geology and archaeological context. Also, I will facilitate a meeting with Prof. J.M. Jiménez (University of Granada) in order to also access to the Guadix Basin archaeological sites, in South Spain. Both sites, in Atapuerca and in Guadix, hold the oldest remains of human presence so far in Europe, and are key to better understand hominid expansion outside the African continent in the Pliocene. Meetings with the respective directors of both excavation areas will be organized, possibly in Granada, Madrid and Burgos, in order to prepare a memorandum of understanding as far as undergraduate participation in the research carried out in these two important sites in Spain.

I look forward a fruitful collaboration and fully support your proposal.

Josep M. Pares
Program Coordinator, CENIEH

From: Dave Anastasio dja2@lehigh.edu
Subject: Re: reunion
Date: January 30, 2017 at 11:34 AM
To: Josep M. Pares josep.pares@cenieh.es



On Jan 30, 2017, at 8:04 AM, Josep M. Pares <josep.pares@cenieh.es> wrote:

Dave,
Hope this email will work. The Fundacion Atapuerca welcomes our proposal and is inviting us to have a meeting to discuss details. By the way, he is inviting us for a meeting in Madrid.

De: jose ponga [joseponga@hotmail.com]
Enviado el: viernes, 27 de enero de 2017 20:25
Para: Josep M. Pares
CC: JMBdeC; Eudald Carbonell; Secretario FA
Asunto: Re: reunion

Dr. D. José María Parés

CENIEH

Estimado Jose María,

Entiendo que la Fundación Atapuerca está en posición, si así lo deciden los Vicepresidentes de su Patronato, de concertar una colaboración con la Lehigh University basada como precedente en el acuerdo entre la FA y el University College London.

En ese marco sería planteable que estudiantes de la Lehigh University pudieran participar en las excavaciones en los yacimientos de Atapuerca. Para comentar los detalles de este tema en una de las fechas que indicas (13 a 17 de marzo) con un jefe de departamento de esa universidad, solo podría ofrecerte vernos en Madrid por la mañana del 15 o del 16 de marzo: las demás fechas no las tengo disponibles, y no podría ir a Burgos. No obstante, si en esas fechas estuviera Eudald Carbonell en Burgos podríais reunirnos con José M^a Bermúdez de Castro y con él, y el día 22 (en que yo estaré en Burgos) nos podríamos reunir tú y yo para dar forma a lo que hubierais podido acordar.

Seguiremos en contacto.
Un abrazo,
Pepe

[<cid:image001.jpg@01D278AA.EA223710>]

De: Josep M. Pares [<mailto:josep.pares@cenieh.es>]
Enviado el: jueves, 26 de enero de 2017 19:26
Para: secretario@fundacionatapuerca.es<<mailto:secretario@fundacionatapuerca.es>>
CC: José María Bermúdez de Castro <josemaria.bermudezdecastro@cenieh.es<<mailto:josemaria.bermudezdecastro@cenieh.es>>>; 'Eudald Carbonell' <eudald.carbonell@gmail.com<<mailto:eudald.carbonell@gmail.com>>>>
Asunto: reunion

Estimado José M.,

Te escribo con el fin de explorar una posible vía de colaboración entre la Fundación Atapuerca (FA) y la Lehigh University, EEUU. Desde hace años mantengo un estrecho vínculo con miembros de dicha universidad, materializado a través de estancias temporales, proyectos de investigación conjuntos y artículos científicos. Con otros dos profesores estamos contemplando un programa de la National Science Foundation, conocido como "Research Experiences for Undergraduates (REU)". Dicho programa contempla la participación activa de estudiantes en la investigación, en cualquiera de las áreas financiadas por la NSF, como es el estudio de los orígenes humanos. La participación de los estudiantes podría incluir, entre otros, su intervención en las excavaciones en los yacimientos de Atapuerca, tema que precisamente nos gustaría discutir. Entiendo que la FA, en cuanto a que tiene por objeto el apoyo a las investigaciones y campañas de excavación en Atapuerca, debería ser el socio natural e interlocutor en esta posible experiencia. Nos gustaría poder comentarte los detalles de este tema y me preguntaba si sería posible organizar una reunión en marzo (13-17), aprovechando una visita del jefe del departamento en dicha universidad.

Muchas gracias de antemano y quedo a la espera de tus noticias. Pongo en copia a Eudald y a José M., en cuanto a vicepresidente y co-directores de las excavaciones en Trinchera.

Un cordial saludo,

Josep M. Parés

https://www.researchgate.net/profile/Josep_Pares2

Josep M Parés (Centro de Investigación sobre la Evolución ...<https://www.researchgate.net/profile/Josep_Pares2>

www.researchgate.net<<http://www.researchgate.net>>

Josep M Parés of Centro de Investigación sobre la Evolución Humana, Burgos with expertise in Geology is on ResearchGate. Read 271 publications, and contact Josep M ...

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José María Rodríguez-Ponga
Secretario del Patronato
Board Secretary
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www.fundacionatapuerca.es

From: Josep M. Pares josep.pares@cenieh.es
Subject: RV: Proyecto Orce
Date: January 30, 2017 at 8:08 AM
To: dja2@lehigh.edu

JM

And this is the Orce/Granada invitaion:

De: Juan M. Jiménez Arenas [jumajia@ugr.es]
Enviado el: viernes, 27 de enero de 2017 15:17
Para: Josep M. Pares
Asunto: RE: Proyecto Orce

Querido Josep María:

Sí, eso esperamos, que vaya bien. De momento se ha entregado y está en fase de evaluación. Esperemos que no se demoren demasiado.

Perfecto, me parece genial. Por supuesto que nos emplazamos para el 13 de marzo y hablamos sobre las propuestas que comentas. Ya vamos concretando conforme se acerque la fecha.

Un abrazo,

Juanma

El 25-01-2017 08:34, Josep M. Pares escribió:

Juanma,
Espero que el tema del proyecto marche bien. Si requieres información adicional no dudes en ponerte en contacto conmigo.
Luego, comentarte que con un colega mío, profesor en EEUU, queríamos hablar explorar posibilidades para estudiantes norteamericanos en la excavación. Estaremos unos días en Granada la tercera semana de marzo- estarías disponible el lunes 13 quizás para hablar un rato sobre el tema y comentarte detalles?
Quedo a la espera de tus noticias,
Un saludo
Josep M: Parés

-----Mensaje original-----

De: Juan M. Jiménez Arenas [mailto:jumajia@ugr.es]
Enviado el: jueves, 03 de noviembre de 2016 12:38
Para: Josep M. Pares
Asunto: Proyecto Orce

Estimado Josep María:

Me pongo en contacto contigo en relación al futuro Proyecto de Orce. Posiblemente conocerás que la elaboración del mismo ha recaído en la Universidad de Granada, la cual me ha encargado, al margen de la parte científica, la coordinación administrativa e institucional del mismo. Si no, aprovecho para transmitírtelo y, sobre todo, para invitarte a continuar formando parte del Proyecto como responsable del Área de Geocronología, y con unos términos muy similares a los actuales.

Por ello, si aceptas continuar colaborando en el Proyecto, es necesario que, por favor, me envíes, a la mayor brevedad posible, y no después del 11 de noviembre, una relación de los objetivos que tu área puede aportar (ordenados jerárquicamente), la metodología, las personas que van a componer tu equipo de trabajo y un presupuesto de los gastos derivados de la aportación de tu área. Disculpa la premura de tiempo pero diferentes circunstancias han concurrido para que esta solicitud sea tan urgente.

Por supuesto, estoy a tu entera disposición para resolver cualquier aspecto que estimes oportuno, bien por email, bien por teléfono.

después que podamos oportuno, bien por email, bien por teléfono
(620218869).

Muchas gracias por tu colaboración.

Recibe un cordial abrazo,

Juanma

--

Juan Manuel Jiménez Arenas
Depto. de Prehistoria y Arqueología
Campus de Cartuja s/n 18071 Granada
Instituto Universitario de la Paz y los Conflictos Calle Rector López
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UNIVERSIDAD DE GRANADA
DEPARTAMENTO DE GEODINÁMICA

*David Anastasio, PhD, PG
Professor and Chair
Department of Earth and Environmental Sciences
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1 West Packer Avenue
Bethlehem, PA 18015-3001
U.S.A*

Dear Dr. David Anastasio,

On behalf of the University of Granada, and as Head of the Department, I invite you to the Department of Geodynamic in order to participate as expert scientist in the new research works on the Baza Basin (Granada, Spain). Meeting and field trip is scheduled to the first and second weeks of next March.



Granada, Spain January 30th, 2017

José Miguel Azañón Hernández
Professor of Active Tectonics and Relief,
Head of Department of Geodynamics
University of Granada
Spain