

AAI

Associazione Antropologica Italiana

with the contribution of



XXIII Conference

Padova, 4-6 September 2019

**Anthropology:
what are the
next questions?**

Scientific Committee:

Luca Sineo (President), Carla Calo', Luigi Capasso, David Caramelli, Emanuela Gualdi, Giorgio Manzi, Margherita Micheletti, Jacopo Moggi Cecchi, Luca Pagani, Davide Pettener.

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Venues:

4th September - Palazzo Bo (via VIII Febbraio 2, city centre) ; 5th and 6th September- Edificio Fiore di Botta (Via del Pescarotto 8), Padova

Padova, 4th September 2019

Welcome to the bi-annual meeting of the Italian Anthropological Association, aimed at bringing together the various streams of Biological Anthropology in a three-day long international conference.

In recent years a number of ground breaking discoveries have been made possible by several technological advances in the fields of ancient and modern genomics, isotopic analysis and virtual anthropology. Also, new developments in the field of applied anthropology have changed our approach to the study of living and past human populations. All these, and other topics, will be distilled in this year' conference, in search of what will be the next relevant research questions. In addition, a joint symposium with SIBE (the Italian Society of Evolutionary Biology) will promote a dialogue on "what is a population" and will explore the state of the art of "science communication".

The conference is structured in **four main sessions**, harboring contributions from all fields of Biological Anthropology:

- 1) **Hominids and Palaeolithic humans** - covering all subjects up to the Palaeolithic
- 2) **From prehistory to history** - from the Neolithic and Bronze Age cultural revolutions and demographic expansions all the way to contemporary populations
- 3) **Contemporary human populations** - mostly based on living populations, with support from ancient data
- 4) **Applied Anthropology** - including biomechanics, biomedical, forensic and all other branches of applied Anthropology.

The conference will be introduced by a talk by Prof. Montgomery Slatkin, who has been awarded the first Luca Cavalli Sforza prize.

I hope you will enjoy the conference, making the most out of your Padova experience!

Regards,
Luca Pagani,

Conference Organizer
On behalf of the Organizing and Scientific committees





Conference Programme

| Time | 4th September - AAI/SIBE Joint symposium Venue: Palazzo Bo, Aula Magna, Via VIII Febbraio, Padova |
|-------------|--|
| 8:30-9:00 | Arrival/Registration |
| | SIBE/AAI Joint session: Population genetics and population genomics (Chairs: Giorgio Bertorelle, Luca Pagani) |
| 9:00-9:40 | Keynote: Montgomery Slatkin "Genetic effects of range expansions" |
| 9:40-9:55 | Kun Huang <i>"Highly-resolved strain-level population dynamics of Wolbachia from large-scale metagenomes"</i> |
| 9:55-10:10 | Siliva Ghirotto <i>"Distinguishing among complex evolutionary models using unphased whole-genome data through Approximate Bayesian"</i> |
| 10:10-10:25 | Emiliano Trucchi <i>"Ancient genomes reveal early farmers selected common beans while preserving diversity"</i> |
| 10:25-10:40 | Eugenia D'Atanasio <i>"Phenotype prediction from ancient low-coverage genomes"</i> |
| 10:40-11:00 | Coffee |
| 11:00-11:15 | Guido Alberto Gneccchi Ruscone <i>"Polygenic adaptation to high altitude: insights from Tibetan and Sherpa genomes"</i> |
| 11:15-11:30 | Claudia Ojeda-Granados <i>"Unravelling genetic adaptations of Mexican populations to their ancestral environments and the potential dis-adaptive loci influencing their present-day disease risk"</i> |
| 11:30-13:00 | Cavalli Sforza Prize to Montgomery Slatkin and Lecture (open to the public) with Francesco Cavalli Sforza |
| 13:00-14:00 | Lunch (offered by NaturaSi) |
| | SIBE/AAI Joint session: What is a population? (Chairs: Giorgio Bertorelle, Luca Pagani) |
| 14:00-15:00 | Invited Talk: Garrett Hellenthal "Defining contemporary "populations", and inferring their ancestral histories, using genome-wide DNA" |
| 15:00-15:30 | Coffee |
| 15:30-16:30 | Invited Talk: Cosimo Posth "Paleolithic interactions: hunter-gatherer genetic history across European geo-temporal transects" |
| 16:30-18:00 | Round table on Science Communication (Francesco Cavalli Sforza, Michele Bellone, Marco Ferrari, Francesco Frati, Giorgio Manzi, Silvia Paolucci - coordinated by Telmo Pievani) |
| 18:00 | Early Bird Aperitivo at Caffé Pedrocchi |

| Time | 5th September - Contributed Sessions 1,2 and 3 Venue: Edificio Fiore di Botta, Via Del Pescarotto 8, Padova |
|-------------|--|
| | 1st Session: Hominids and Palaeolithic humans (Chairs: Jacopo Moggi Cecchi; Natascia Rinaldo) |
| 9:30-10:30 | Keynote: Aurelien Mounier "Taxonomy and phylogeny of the Homo genus: Modelling the phenotypic evolution of our genus" |
| 10:30-11:00 | Coffee |
| 11:00-11:15 | Alessandro Riga <i>"First data on the dentition and the oral cavity of the Neandertal from Altamura"</i> |
| 11:15-11:30 | Gregorio Oxilia <i>"Earliest evidence of Focal Cemento-Osseous Dysplasia in the Late Upper Palaeolithic"</i> |
| 11:30-11:45 | Marco Peresani <i>"Neanderthal and sapiens in the North of Italy 50-40 ky BP: A view on the ecological and cultural dynamics"</i> |
| 11:45-12:00 | Maria Giovanna Belcastro <i>"How much musculoskeletal variability did Neandertals accumulate? The study of the lower limbs entheses of the Neandertal sample from El Sidrón, Asturias, Spain"</i> |
| 12:00-12:15 | Marina Lari <i>"New genomic data from two Upper Paleolithic burials of Paglicci and Arene Candide: exploring more in depth the genetic relationships between Italian hunter-gatherers"</i> |
| 12:15-12:25 | Mini Talks: Gabriele Scorrano; Luca Sineo |
| 12:25-12:45 | Discussion |
| 12:45-14:15 | Lunch and Poster Sessions 1+2 |

Programme

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| | 2nd Session: From prehistory to history (Chairs: David Caramelli; Paolo Anagnostou) |
| 14:15-14:30 | Barbara Bramanti <i>"Genomics, anthropology and ecology of the historical plagues: rethinking their modalities of spread and transmission"</i> |
| 14:30-14:45 | Toomas Kivisild <i>"Genetic relatedness among individuals buried together and apart"</i> |
| 14:45-15:00 | Flavio De Angelis <i>"Age of the Empire: biomolecular evaluation of Ancient Romans"</i> |
| 15:00-15:15 | Mini Talks: Eugenio Bortolini, Claudio Ottoni, Roberto Micciché |
| 15:15-15:30 | Discussion |
| 15:30-16:00 | Coffee |
| | 3rd Session: Contemporary human populations (Chairs: Davide Pettener; Martina Lari) |
| 16:00-16:15 | Cristina Giuliani <i>"Genomic and epigenomic analysis of two populations of Gran Chaco in Argentina: Wichí and Criollos"</i> |
| 16:15-16:30 | Ludovica Molinaro <i>"Characterizing ancient genomes embedded into modern human populations"</i> |
| 16:30-16:45 | Linda Ongaro <i>"The genomic impact of European colonization of the Americas"</i> |
| 16:45-17:00 | Rita Sorrentino <i>"The modern human talus affected by cultural and behavioral factors"</i> |
| 17:00-17:15 | Mini Talks: Nicola Carrara; Ruggero D'Anastasio; Federica Pierini |
| 17:15-17:30 | Discussion |
| 17:30-18:30 | AAI Society Meeting / Outreach exhibit: "Sinestesia Evolutive" |
| 20:30 | Social Dinner (Restaurant: Il Tinello, Via Ognissanti 29, Padova) |

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| | 6th September - Contributed Session 4 and panel discussion Venue: Edificio Fiore di Botta, Via Del Pescarotto 8, Padova |
| | 4th Session: Applied Anthropology (in memory of late Prof. Andrea Drusini) (Chairs: Emanuela Gualdi-Russo; Eugenio Bortolini) |
| 9:30-10:30 | Keynote: Laura Fortunato <i>"Evolution and the human family"</i> |
| 10:30-11:00 | Coffee |
| 11:00-11:15 | Paolo Lussu <i>"Cloud-Based Ultra Close-Range Digital Photogrammetry: An Unexplored and Effective Approach for the Virtual Reconstruction of"</i> |
| 11:15-11:30 | Myosotis Massidda <i>"The polygenic profile of muscle injuries in football players"</i> |
| 11:30-11:45 | Margherita Micheletti-Cremasco <i>"Applied Anthropometry in the design of workplaces and equipment: interdisciplinary researches in Industry 4.0"</i> |
| 11:45-12:00 | Stefania Toselli <i>"Type 2 diabetes in immigrants and native Italians: differences in lifestyle, socio-demographic and anthropometric characteristics"</i> |
| 12:00-12:30 | Mini Talks: Valentina Giacometti; Ivan Norscia; Alba Pasini; Natascia Rinaldo; Silvia Stagi, Nicoletta Zedda |
| 12:30-13:30 | Round Table: "Antropologia e beni culturali: stato dell'arte e prospettive" Chair: Giorgio Manzi |
| 13:30-14:30 | Lunch and Poster Sessions 3+4 |
| 14:30-15:30 | Panel Discussion: Anthropology in 2023 |
| 15:30-16:00 | Coffee |
| 16:00-17:30 | AAI Work Group Presentations and Awards |
| 17:30 | Conference ends |

Color code: **Session Titles**; **Talks**; **General Events**; **Food**

The modern human talus affected by cultural and behavioral factors.

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The primate talus is known to have a shape that varies according to differences in locomotion and substrate use^{1,2}. While the human (*Homo sapiens*) talus is morphologically specialized for bipedal walking, relatively little is known how its morphology varies in relation to cultural and behavioral differences across time³. Here, we investigate differences in external and internal structure of 142 tali belonging to modern human populations with different levels of mobility (e.g., sedentary vs. nomadic), shoes (e.g., unshod/minimally shod vs. stiff footwear) and substrate use (e.g., asphalt vs. rough terrain).

External talar morphology was investigated through 3D landmark-based geometric morphometric methods⁴. Individuals were Procrustes superimposed (GPA) and then Procrustes coordinates were subject to Principal Component Analysis based on the group mean covariance. ANOVA Post Hoc test was carried out to identify group differences while Procrustes ANOVA was performed to assess effects of shape variation due to footwear,

Session 3 - Talks

substrate and levels of mobility. Moreover, a subsample was selected for whole bone trabecular analysis for evaluating bone volume fraction (BV/TV), degree of anisotropy (DA) and elastic modulus (E).

Our results show significant differences in both external and internal talar morphology between more sedentary groups (farmers and post-industrial individuals) and highly mobile hunter-gatherers. Morphological traits suggest that hunter-gatherers exhibit a more “flexible” talar shape providing broad range of joint motion while walking barefoot, or wearing minimalistic footwear, along uneven ground. Contrary, post-industrial people/farmers show a more “stable” profile reducing extensive foot motion by remaining constricted by the shoe. Differences in trabecular density and elastic modulus reflect a gracilization in sedentary people likely due to a decrease in daily physical activity, while talar robusticity in hunter-gatherers reflect highly mobility and distances travelled.

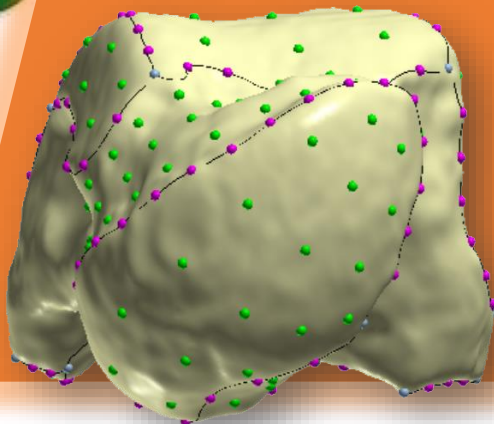
This study points out that the modern human talus varies according to differences in mobility strategy.

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THE MODERN HUMAN TALUS AFFECTED BY CULTURAL AND BEHAVIORAL FACTORS



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