



PALAEO-RESEARCH  
INSTITUTE



# 14th Conference of the Worked Bone Research Group

Funded by the Palaeontological Scientific Trust



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## 14TH MEETING OF THE WORKED BONE RESEARCH GROUP

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Conference Programme  
&  
Book of Abstracts



30 AUGUST – 3 SEPTEMBER

2021

University of Johannesburg



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## **Local Organising Committee**

Justin Bradfield ( <a href="mailto:wbrg2021@uj.ac.za">wbrg2021@uj.ac.za</a> )	Organising secretary
Dipuo Kgotleng ( <a href="mailto:dkgotleng@uj.ac.za">dkgotleng@uj.ac.za</a> )	Director
Marlize Lombard ( <a href="mailto:mlombard@uj.ac.za">mlombard@uj.ac.za</a> )	Scientific advisor
Matt Lotter ( <a href="mailto:mmatt@uj.ac.za">mmatt@uj.ac.za</a> )	Logistical support
Stephane Baker ( <a href="mailto:stephanieb@uj.ac.za">stephanieb@uj.ac.za</a> )	Logistical support
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Nonny Vilakazi ( <a href="mailto:nvilakazi@uj.ac.za">nvilakazi@uj.ac.za</a> )	Logistical support

## **Conference prize adjudication panel**

Assoc. Prof. Justin Bradfield  
Professor Rob Blumenschine  
Dr Dipuo Kgotleng  
Dr Nonhlanhla Vilakazi  
Dr Matt Lotter

## **WELCOME**

It is our pleasure to welcome you to the 14<sup>th</sup> meeting of the Worked Bone Research Group, hosted by the Palaeo-Research Institute at the University of Johannesburg. This is the first time the conference is hosted by an African institution and the first time by a country in the Southern Hemisphere!

It is appropriate that the 14<sup>th</sup> meeting is hosted by an African institution as it is in Africa that the oldest and one of the richest records of worked bone technology in the world exists. Archaic hominins knapped bone tools in East Africa as early as 2.1 million years ago and were using bone tools to forage for termites in the Cradle of Humankind 1.8 million years ago. Some of the earliest evidence for complex technology and symbolic behaviour is found in various parts of Africa, expressed through the medium of bone. We are therefore excited to showcase the research of the largest number of Africanist scholars in the conference's history.

It is also the first time that the conference is hosted online. This online forum allows the conference to reach a much larger audience than would have been possible otherwise. We are pleased to welcome 38 presenters representing 51 institutions from 24 countries. Although we would have liked to welcome you to our shores in person, the spirit of a conference is not in its physical location, but in the meeting of peoples to share their ideas, discuss common challenges and to advance the field of research and praxis. To this end, we thank all of our presenters from around the world for contributing to make this conference a success.

The papers presented in the four sessions cover almost two million years of bone tool research from all corners of the world. We hope you will enjoy the diverse offering of research papers that has come to be a hallmark of the WBRG.

Justin Bradfield  
Organising secretary



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**The Future  
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# THE FUTURE REIMAGINED

The Fourth Industrial Revolution (4IR) is transforming the world faster than the speed of life. While its promises are limitless in possibility, it also has the potential to leave people behind. As we have learnt from the previous three industrial revolutions, the future belongs to those who embrace change (however uncomfortable) and equip themselves with the necessary knowledge and skill to emerge stronger, more relevant and sought-after.

At UJ we fully recognise the paradigm-shifting significance of 4IR in Africa and instil it into our vision for attaining global excellence and stature. This philosophy makes us more qualified than most to enhance the academic prowess of our students and faculty, intensify their learning experience and pioneer new forms of teaching. In so doing, we can optimally prepare graduates, post-graduates and lecturers to thrive in this brave new world, to the benefit of all.

**Because at UJ, we believe the future belongs to those who reimagine it.**



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A woman with dark hair, wearing a yellow ribbed sweater, is shown in profile, looking upwards and to the left. She is holding a tablet computer in her left hand and reaching out with her right hand to interact with a complex, futuristic digital interface. The interface features a large globe on the left, surrounded by various data visualizations, charts, and icons. The background is dark with a grid of light blue lines and dots, creating a sense of depth and connectivity.

The Future  
Reimagined

## Origins Centre Museum, Wits University, Johannesburg, South Africa

'We are who we are because of who we were'



origins centre



The Origins Centre museum provides visitors with a unique experience of Africa's rich, complex heritage. The exhibits take visitors on an extraordinary journey of discovery, which begins with the origins of humankind in Africa and then moves through the development of technology, art, culture and symbolism. The journey continues with an exploration of the diverse southern African rock art traditions. These ancient masterworks, and the artists, are illustrated through contemporary art installations by well-known South African artists.

We now also offer a unique augmented reality experience through the (free) OriginsCentreAR app, available on IOS and Android. The animals depicted in the beautiful rock engravings curated in the museum come to life through the app – just use the app to scan the rock engraving label. So, download the app and get a teaser in the comfort of your home by scanning the picture below.



Come and enjoy the Origins experience, interact with Africa's amazing past and indulge in the specialist Africana bookshop and locally-made crafts.

Website: [www.wits.ac.za/origins](http://www.wits.ac.za/origins)

Contact: [tammy.hodgskiss@wits.ac.za](mailto:tammy.hodgskiss@wits.ac.za); [bookings.origins@wits.ac.za](mailto:bookings.origins@wits.ac.za); 011 717 4700.

Follow the museum on social media to find out more (facebook and twitter: @originscentre, Instagram: @originscentre\_wits).

Hours: Monday – Friday 09h00 – 17h00; Saturday and public holidays 09h00 – 16h00

Tickets: Tickets sold on webtickets

(<https://www.webtickets.co.za/v2/EventCategories.aspx?itemid=1458362651>)

Adult R81; Child R40; Wits student/staff and pensioners R66







# THE UJ PALAEO- RESEARCH INSTITUTE

## An Afro-centric approach to Palaeo research

**The Palaeo-Research Institute @ UJ is a multi-disciplinary, inter-faculty group with an extensive international training and research collaborative network which represents a holistic approach to human evolution in sub-Saharan Africa covering the past 3 million years, with research endeavours that include:**

- The physiological evolution of hominins and other animals who shared their landscape (fossil research)
- The genetic evolution of Homo sapiens and the reconstruction of the African population history (ancient and living DNA research)
- The cognitive evolution of hominins since our split from non-human primates (neuro-archaeology, palaeo-neurology, cognitive archaeology)
- The evolution of indigenous knowledge systems (techno-behavioural studies associated with hominins and early humans),
- The development of novel, state-of-the-art approaches to the dating of fossil records in Africa

**Contact details:**

**The Director: Dr Dipuo Winnie Kgotleng**

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Bunting Road Campus | University of Johannesburg | Gauteng | South Africa



# Executive Summary of PAST

## Palaeontological Scientific Trust



### Mission and Vision

Africa is the birthplace of humankind and the storehouse of a fossil record for our origins found nowhere else in the world. PAST is a Johannesburg-based public benefit organization that since 1994 has used the scientific evidence of our shared origins in Africa to benefit humankind's future.

PAST aims to develop global leadership by African origin scientists and to inspire scientific curiosity among Africa's youth. PAST also uses the sciences related to our origins as a powerful tool for building African dignity and for promoting racial harmony, social cohesion and nature conservation.

PAST pursues its mission by bringing together scientists, business, and government to raise and distribute support for research, education and public awareness in the origin sciences. Having been founded in 1994 to raise funds for research at the world-renowned South African fossil hominid site of Sterkfontein, PAST has become the largest independent, African-based supporter of the African origin sciences, spanning the full history of life and humankind across the continent.

### Programmes

Support for origin sciences researchers and students at African institutions lies at the core of PAST's activities. PAST funds fossil exploration, discovery, excavation and laboratory analysis. PAST also provides bursaries to postgraduate students, technical training and capacity grants, support for early-career African scientists, and funding for publications and conferences. All funding proposals are vetted by PAST's Scientific Advisory Committee for final approval by its Board of Trustees.

PAST's award-winning Walking Tall Educational Theatre Project offers workshops for secondary school students and teachers that increase scientific literacy through an understanding of the origins of life and humankind. A professional physical theatre production takes the audience on a 4.6 billion-year journey from the origins of the Earth to present day. A subsequent science session explains basic principles of evolution and explores issues such as the biology of skin colour differences in humans. The project is complemented by a Tools4Schools digital initiative on PAST's website that provides curriculum-based resource materials. The educational effectiveness of Walking Tall is demonstrated through a rigorous monitoring and evaluation system. Since 2002, Walking Tall has reached 1.4 million students, teachers and community members across Africa. A planned digital version of the production will expand the project's reach considerably.

PAST's public understanding programme features the *All from One* campaign. Launched in 2015, *All from One* uses the science of the shared origins of humankind to promote respect for diversity and social cohesion. It also uses the shared origins of all living things to promote the conservation of natural environments and biodiversity. The campaign aims to reach a global audience through a multi-faceted digital campaign supplemented by the *All from One* exhibition, transformation and sustainability workshops for professional audiences featuring a digitised theatre production entitled *I See You*, and an emerging ad campaign that will transform All from One into a global movement.

### Governance and Accountability

PAST is registered in South Africa as a Trust with section 18a tax status. PAST can also receive tax-deductible donations in the U.S., U.K. and many European countries. PAST has maintained long-term partnerships with major corporate, government and individual donors, and has produced unqualified audits since its inception.

PAST's Executive team has a combined 62 years of experience conducting research and educational projects throughout Africa and in interacting with the continent's origin sciences stakeholders. PAST's Board of Trustees comprises prominent African business leaders, government representatives and scientists. PAST also maintains international advisory committees in the U.S. and the U.K.



## Conference schedule

Please note that all Zooms rooms will open 15 minutes before the time indicated. Links to the Zoom sessions will be sent to registered participants the day before the session.

Monday 30 August		
12:00–14:00 SAST (GMT+2)		
Session chairs: Justin Bradfield, Dipuo Kgotleng, Stephanie Baker		
12:00-12:10	Justin Bradfield	Opening of the conference
12:10-12:20	Professor Saurabh Sinha Deputy Vice-Chancellor	Official welcome to the University of Johannesburg
12:20-12:30	Dr Dipuo Kgotleng Director: Palaeo-Research Institute	Official welcome to the Palaeo-Research Institute
12:30-12:45	Tammy Hogskiss-Reynard	Introduction to the Origins Centre
12:45-13:05	Christian Gates St-Pierre	Where do we come from? What are we? Where are we going? A summary portrait of the WBRG members
13:05-13:20	Ms Andrea Leenen, CEO; Prof. Rob Blumenschine, Chief Scientist and Ms Thabiso Parirenyatwa, Programmes Officer	Palaeontological Scientific Trust (PAST)
13:20-13:50	PAST	Theatrical production
13:50-14:00	Justin Bradfield	

Tuesday 31 August		
14:00–17:00 SAST (GMT+2)		
Session chairs: Justin Bradfield, Stephanie Baker, Matt Lotter		
Time	Presenter	Topic
14:00-14:20	Joshua Kumbani	Aerophones or pendants? Four Holocene artefacts from Matjes River site
14:20-14:40	Victoria Gordon	One and the same: An experimental study of the effects of trampling on bone flakes
14:40-15:00	Énio Tembe	A techno-typological analysis of the Middle to Later Stone Age stone and bone assemblages at Daimane Rock Shelter, Maputo Province
15:00-15:20	Annie Antonites	Characterising Limpopo Valley forager and farmer worked bone assemblages (South Africa)

15:20-15:40	Kathryn Croll	Informal bone tools from Ratho Kroonkop, a rain-control site in the Shashe-Limpopo Confluence Area, Limpopo Province, South Africa
15:40-16:00	Natacha Buc	Bone technology in the northern Argentina
16:00-16:20	Aleksa Alaica	Community interactions and processing agricultural staples: Insights from worked scapulae from Ak'awillay, Cusco, Peru
16:20-16:30	Michael Pante	Bone tools from Beds II-IV, Olduvai Gorge, Tanzania, and implications for the origins and evolution of bone technology
16:30-16:50	Erika Ebel	Ivory, Antler, and Bone as Raw Materials in Northern Greenland

### Wednesday 1 September

11:00–14:00 SAST (GMT+2)

Session chairs: Justin Bradfield, Matt Lotter, Matt Caruana

Time	Presenter	Topic
11:00-11:20	Konstantinos Chondros	Bone artifacts from Thessaloniki Toumba in Northern Greece at the end of the 2nd mil. BCE: Tracing variations in raw materials and manufacturing techniques
11:20-11:40	Sarah Skytte Qvistgaard	In the production of Viking combs, the shape and style have a match with raw material and regionality
11:40-12:00	Ágnes Font	Details of the medieval manufacturing processes and techniques: knife handles from Buda
12:00-12:20	Erika Gál	Evidence for a workshop in the late medieval archbishopric palace at Esztergom (Northern Hungary)
12:20-12:40	Marta Blasco Martín	Birds of prey, sharks and other fishes: Unusual worked bones in the Iberian Iron Age.
12:40-13:00	María Fernanda Martínez-Polanco	The white-tailed deer bone industry at Cerro Mangote, a Late Preceramic site in central Pacific Panama
13:00-13:20	Hildegard Müller	Learning by doing: experimental archaeology and microwear analysis on Roman bone artefacts
13:20-13:40	Manuel Altamirano García	Animals as a remarkable source of raw material: Osseous objects in 2nd millennium BC, Southern Iberia
13:40-14:00	Marloes Rijkelijhuizen	Osseous and keratinous artefacts from the Netherlands

### Thursday 2 September

09:00–12:00 SAST (GMT+2)

Session chairs: Justin Bradfield, Matt Caruana, Nonny Vilakazi

Time	Presenter	Topic
09:00-09:20	Rhiannon C. Stammers	Technology or taphonomy? A study of the world's oldest bone tools
09:20-09:40	Eva F. Martellotta	From bone to wood: first evidence of retouch-induced marks on hardwood boomerangs



09:40-09:50	Yajie Yang	The reuse of several worked bones from the Ma Zhuang site, a late Neolithic site in Northern Henan province, China
09:50-10:10	Sharada Channarayapatna	Analysing the commonalities and uniqueness of Dholavira worked bone assemblage in the context of contemporary Chalcolithic and Bronze Age culture sites of the Indian subcontinent
10:10--10:30	Vinayak	Anthropomorphic osseous objects from Early Iron Age sites of the Upper Gangetic Plain
10:30-10:50	María Borao	The Solutrean antler-working in Hort de Cortés-Volcán del Faro (Valencia, Spain): a preliminary study)
10:50-11:10	Marlize Lombard	The tip cross-sectional areas of poisoned bone arrowheads from southern Africa
11:10-11:30	Alice Choyke	Mobility in the Late Chalcolithic of the Southern Caucasus: What the bone industry of Ovçular Tepesi, Nakhichevan (Azerbaijan) can tell us
11:30-11:50	Predrag Popović	Perforated elk incisor from the Gravettian layer of the cave Velika Pećina (Žagubica, Serbia)
11:50-12:00	Christoforos Arampatzis	Neolithic bone industries from Greece: a typological overview

Friday 3 September		
11:00–14:00 SAST (GMT+2)		
Session chairs: Justin Bradfield, Nonny Vilakazi, Dipuo Kgotleng		
Time	Presenter	Topic
11:00-11:20	Mihaela Savu	From hook design to angling technique: A preliminary analysis of bone and antler hooks from the Late Neolithic site at Șoimus-La Avicola (Romania)
11:20-11:40	Markus Wild	Skeleton in the cupboard. Search for the Palaeolithic in Southern Scandinavia
11:40-12:00	Justyna Orłowska	Upper Palaeolithic osseous hunting equipment from the Mamutowa Cave in Poland. First results of the traceological studies
12:00-12:20	Grzegorz Osipowicz	Towards the understanding the technology and function of the Bronze Age Bruszczewo-type bone “knives”
12:20-12:40	Selena Vitezović	Bone technology at the Late Neolithic site of Vinča-Belo Brdo (Serbia)
12:40-12:50	Nemanja Marković	The Late Neolithic animal raw materials exploitation and bone industry from Jablanica, the central Balkans (Serbia)
12:50-13:00	Carlos Boavida	Lost and found: Early modern bone and ivory artefacts found in Lisbon (Portugal)
13:00-13:10	Martina Lázníčková-Galetová	Aurignacian necklace: “perforated” animal teeth from Mladeč (Moravia, Czech Republic)
13:10-13:20	Zlatko Kovancaliev	Hellenistic bone seal boxes from the House of the Collector at Gortynia, Macedonia
13:20-13:30	Marianne Christensen	1 <sup>st</sup> Bid for 2023
13:30-13:40	Ayça Gerçek	2 <sup>nd</sup> Bid for 2023
13:40-13:50	Justin Bradfield	Details of conference proceedings. Closing and note of thanks

Selena Vitezović ([selenavitezovic@gmail.com](mailto:selenavitezovic@gmail.com))

*Institute of Archaeology, Serbia*

### **Bone technology at the Late Neolithic site of Vinča-Belo Brdo (Serbia)**

The site of Vinča-Belo Brdo is the eponymous site for the Vinča culture, phenomenon that marked Late Neolithic in the south-eastern Europe. The site was discovered in early 20th century and excavated intensively through several research campaigns. The researches carried out in the period before the World War II by Miloje Vasić revealed over 9 m thick cultural layer and impressive architectural remains and portable material. Vinča is in every aspect unusual Vinča culture site – it has the longest stratigraphic sequence, and portable finds include numerous unique objects, such as zoomorphic vessels, figurines, significant number of objects made from exotic and rare raw materials, etc. Excavations carried out in the first half of the 20th century also yielded very rich assemblage of osseous artefacts, up today the largest assemblage collected from any Vinča culture site, comprising approximately 1000 items. Although sample bias is present (highly fragmented tools are missing, most likely they were not collected at all), this assemblage provided important information on technology of production, typological repertoire, as well as regarding diachronic aspects – traditions and innovations. While some of the techno-types were widespread on other Vinča culture sites, some seem to be specific for Vinča-Belo Brdo, suggesting specific traits of the economy of the communities that inhabited this site during the Late Neolithic.

Markus Wild<sup>1</sup> ([wildmarkus@gmx.de](mailto:wildmarkus@gmx.de)) and Morten Fischer Mortensen<sup>2</sup>

<sup>1</sup>*Centre for Baltic and Scandinavian Archaeology, Germany;* <sup>2</sup>*Danish National Museum, Denmark*

### **Skeleton in the cupboard. Search for the Palaeolithic in Southern Scandinavia**

In Southern Scandinavia worked reindeer remains have been unearthed during peat cutting and clay and sand exploitation since more than 170 years. Different archaeological and zoological syntheses of this material have been published during the first half of the 20<sup>th</sup> century. However, a modern assessment and analysis of these finds is a desideratum. This is even more surprising as only a handful of dated Palaeolithic sites are known and the understudied stray finds can add to our knowledge of the Palaeolithic in Southern Scandinavia. Here we report about a recent project on this important heritage.

Yajie Yang ([yangyajie0105@gmail.com](mailto:yangyajie0105@gmail.com))

*Capital Normal University, China*

### **The reuse of several worked bones from the Ma Zhuang site, a late Neolithic site in Northern Henan province, China**

After being manufactured and used, the use life of bone tools can be extended by resharpening, repairing, reworking into other kinds of tools, or simply reused in different task without reworking. The reuse analysis among bone tools is an important issue which has been studied by previous researchers (Russell 2001; Griffiths 2005). However, such studies in China have not been conducted for the reason that scholars are more interesting about the bone manufacture. Several tip broken