



## Travel and Learn with IHO

Ian Gilby was the featured speaker at IHO's annual event in New York City at the Metropolitan Club

He spoke about his research with chimpanzees at the Gombe Stream Research Center, using over 55 years of long-term data and his own observations of this iconic population to gain insight into how the human lineage has changed since diverging from the rest of the great apes.

The talk was a peek into what travelers might expect if they join Gilby in IHO's next **travel opportunity to Tanzania and Rwanda** in search of chimpanzees and mountain gorillas. This is a **once-in-a-lifetime** opportunity to join a leading scientist in chimpanzee research in the field to see and learn about chimpanzees.

Travel with Gilby June 8 through 20, 2018—  
learn more at [iho.asu.edu/primates-and-paleo](http://iho.asu.edu/primates-and-paleo)

### Awards and recognition

Each year, the National Science Foundation surveys U.S. institutions of higher learning on separately accounted for research expenditures. In the just-released Higher Education Research and Development (HERD) Survey for 2016, **ASU's anthropology program ranked number one!**

In addition, the anthropology program was ranked **number one in the United States** and **number four in the world** by the Center for World University Rankings (CWUR). IHO scientists are the core faculty in the School of Human Evolution and Social Change's (SHESC) evolutionary anthropology program and bring the highest level of research and teaching to the school's excellent reputation. IHO is honored to be a part of this recognition for excellence, along with our colleagues in SHESC.

**Rob Boyd**, along with his longtime coauthor Peter Richerson, was recognized for groundbreaking theories in the evolution of

human cooperation and honored with the **2017 Lifetime Achievement Award** from the Human Behavior and Evolution Society.

The Archaeological Institute of America awarded **Curtis Marean the 2017 Pomerance Award for Scientific Contributions to Archaeology**. The award recognizes Marean for his groundbreaking work at Pinnacle Point, South Africa, which "has become one of the world's most important localities for the study of modern human origins."

**Alexandra Norwood** joined IHO as a student worker at the beginning of her junior year and was instrumental in building the Ask An Anthropologist website. **She graduated with honors in 2017** with a double major in Anthropology and Geology, receiving a double Dean's medal from both the School of Human Evolution and Social Change and the School of Earth and Space Exploration. Alexandra is pursuing her graduate degree in Anthropology at the University of Michigan.

**Kaye Reed** accepted the position as **Director of the ASU School of Human Evolution and Social Change (SHESC)** early this year. Reed is balancing her work in the field and in leading the school, and continues to encourage and inspire undergraduate and graduate students.

### Do you want more Human Origins News?

Visit our website at [iho.asu.edu](http://iho.asu.edu) for the latest publications, features, and discoveries.

### During the past year, five IHO-affiliated students received their PhDs

- **Hallie Edmonds**, advised by Kaye Reed. Dissertation: The functional morphology of the primate zygomatic arch in relation to diet
- **Halszka Glowacka**, advised by Gary Schwartz. Dissertation: Biomechanical constraints on molar emergence in primates
- **Genevieve Housman**, advised by Anne Stone. Dissertation: Primate skeletal epigenetics: Evolutionary implications of DNA methylation patterns in the skeletal tissues of human and nonhuman primates
- **Maria Nieves-Colón**, advised by Anne Stone. Dissertation: The population history of the Caribbean: Perspectives from ancient and modern DNA analysis
- **Simen Oestmo**, advised by Curtis Marean. Dissertation: A formal modeling approach to understanding stone tool raw material selection in the South African Middle Stone Age: A case study from Pinnacle Point, South Africa

# Community Outreach

### Learn more about IHO and get involved!

**Come to ASU's Open Door event on Saturday, February 24, 2018.**

See the "Lucy" skeleton cast and learn about paleoanthropology from IHO-affiliated graduate students.

### Visit our online education resources

**Ask An Anthropologist**  
[askananthropologist.asu.edu](http://askananthropologist.asu.edu)

**Becoming Human**  
[becominghuman.org](http://becominghuman.org)

**Lucy's Story**  
[iho.asu.edu/lucy](http://iho.asu.edu/lucy)

### Subscribe to our e-newsletter

Visit [iho.asu.edu/subscribe](http://iho.asu.edu/subscribe) to stay up-to-date on all the latest human origins news!

Lucy is reaching out to the stars! While most NASA missions are acronyms, Harold Levinson of the Southwest Research Center decided to **name his mission for the Lucy fossil**. The mission will focus on the first planetary building blocks, which may help reveal our most distant planetary origins. Lucy discoverer and IHO Founding Director Donald Johanson was thrilled to hear about the mission. This added to news in 2016 that an **asteroid was named for Johanson—52246Donaldjohanson** asteroid. The Lucy mission satellite will launch in October 2021 and may fly by the Donald Johanson asteroid between 2025 and 2033.

For three days this summer, middle and high school teachers across the country were able to ask Don Johanson questions online about human evolution and his discovery of "Lucy" in 1974.

The teachers are part of the **Big History Project**, a joint effort between teachers, scholars, scientists, and their supporters to bring a multidisciplinary approach to lifelong learners around the world. Questions ranged from the effect of climate on human evolution, to why some human ancestor species became extinct, to whether Neanderthals had language.

Johanson continues to teach an online **Human Origins class through ASU's partnership with edX**. Over 21,000 students from 57 different countries have enrolled in the course since launching in 2015. The course may be taken for credit or for free! To learn more, go to [edx.org](http://edx.org) and [search for human origins](#).



Give online at [asufoundation.org/IHO](http://asufoundation.org/IHO) using the appeal code **M0418**  
Thank you in advance for your generous gift!

**ASU** Institute of Human Origins  
Arizona State University

A research center of the College of Liberal Arts and Sciences



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### 2017 HIGHLIGHTS

# Institute of Human Origins

### Dear Friend of the Institute of Human Origins,

It's hard to believe, but this year marked the **20th anniversary of IHO's joining Arizona State University**, in the hot, hot Phoenix summer of 1997! If you have followed our progress over the past two decades, you will have seen incredible growth and maturation of our organization and our science. Today, we number 15 resident scientists, 8 international affiliates, and 35 PhD students, with field projects around the globe. We have embraced a broad research agenda, from the fossil and archaeological evidence of our origins to the social behavior and genetics of our great ape relatives. And, since 2002, the IHO-affiliated faculty have mentored 26 PhD graduates—17 of them women—who are pursuing their own careers in human origins science, carrying with them the IHO brand of excellence in research and public outreach.

IHO's success is tied to our message that **scientific knowledge about human origins is some of the most important knowledge we possess** and is particularly relevant in the divisive times we live in. The science of our past shows that our species, *Homo sapiens*, is linked by common ancestry to all the other species on the Tree of Life; we are not separate from the natural world, we are *of it*. We are all descended from the same ancestral population that lived in Africa some 200,000 years ago—all groups of people on the planet today are equally related, and none is superior to any other. I find these facts about our origin incredibly exciting—and humbling. The bottom line of IHO's research agenda is making sure that the significance of our science can be understood by non-scientists: school children, university students, and a broad swath of the general public.

**We are grateful to everyone who has helped support IHO's programs through annual gifts to our operating fund, direct support of our research, investment in our long-term success through endowment gifts and bequests, or participation in one of our wonderful international tour programs.** It is the broad support from many sources that enables IHO researchers to push forward on the fundamental question about our origin—How did we become human?

While we continue to have the backing of ASU for our faculty and facilities, our research, training, and outreach programs rely more than ever on the generosity of donors whose passion for human origins creates the strong "public-private partnership" we enjoy with the university.

**Please consider the opportunities that your end-of-the-year gift will provide for future research and discovery and join the quest for our origins by supporting IHO with your generous charitable gift.** Enclosed you'll find the Gift/Pledge Form for your convenience. Or, give securely online at [iho.asu.edu/support-iho](http://iho.asu.edu/support-iho).

We expect to report exciting new findings from the IHO research teams in 2018. Update your contact information so you don't miss any announcements in our latest e-newsletter.

I thank you in advance for your support and look forward to hearing from you.

Best wishes for the New Year,

**William H. Kimbel, PhD**

Director  
Virginia M. Ullman Professor of Natural History and the Environment

20 Years at  
On the Edge of Dis

**ASU** Institute of Human Origins  
Arizona State University

A large banner celebrating IHO's 20 years at ASU welcomed visitors to the ASU Fulton Center in April

# Science

## In the Field and Lab

When, where, and how did the unique human capacities for complex cognition, cumulative culture, and large-scale cooperation emerge? The three-year \$4.9 million **John Templeton Foundation** grant that ended in August supported 11 projects whose goal was to use collaborative science to begin to understand where answers to this question may lie. In April 2017, the project researchers, led by IHO Director William Kimbel, presented their preliminary findings at a **day-long symposium, Evolutionary Foundations of Human Uniqueness**, moderated by IHO Founding Director Donald Johanson, which can be viewed online at [vimeo.com/216078716](https://vimeo.com/216078716).

William Kimbel is a founding member of the **African Rift Valley Research Consortium** (ARVRC), a group of some 30 scientists, including IHO-ASU researchers Kaye Reed, Chris Campisano, and Ramon Arrowsmith. ARVRC scientists are working across an array of disciplines to enhance communication, cooperation, and collaboration among field projects in eastern Africa. The ARVRC agenda focuses on pressing questions about early hominin populations and their relationship to changing African environments.

IHO Research Associate Chris Campisano is co-leader of the **Hominin Sites Paleolakes Drilling Project** (HSPDP), a multinational collaboration documenting how changing environments affected ancient hominin populations of east Africa across more than three million years of geological time. More than 30,000 samples from the HSPDP drill cores in ancient lake beds are currently under study, with preliminary results beginning to emerge.

Research building on the landmark 2013 discovery of the 2.8 million-year-old *Homo* jaw in Ethiopia's lower Awash Valley continues. IHO Research Associate Kaye Reed co-leads the **Ledi-Geraru research project**, along with Chris Campisano. ASU researchers published an article this year in the journal *Nature: Ecology & Evolution*, which offers the first comprehensive assessment of the ecological contexts of the transition from *Australopithecus* (to which the fossil "Lucy" belongs) to *Homo*. The research team aims to return to Ethiopia in February 2018 to follow up on their groundbreaking discovery.

IHO Associate Director Curtis Marean and his colleagues have founded a new research consortium appropriately called **HOMER—Human Origins, Migration, and Evolution Research**. Marean is building an integrated network of field projects, all collaborating on a primary set of research questions on the archaeological evidence for the emergence of human cooperation. The consortium projects, led by field directors of projects located in South Africa, Italy, and Morocco, use the same state-of-the-art field methods to assure data comparability. HOMER is supported by a multi-year investment by the Hyde Family Foundations and the ASU Strategic Initiative Fund.

Marean's research investigating the origins of modern humans on the southern Africa coast continues with further explorations into **ancient regional climate patterns using the U.S. supercomputing XSEDE facility**, ongoing excavations in cave sites at Mossel Bay, and expanded research with IHO Assistant Research Scientist Erich Fisher to the eastern coast of South Africa.

IHO Research Associate Kim Hill has expanded his long-term research with modern hunter-gatherers of the **Ache community of Paraguay** to the **Samal people in the Philippines** and the **Hadza foragers in Africa**. His detailed observations provide information about the "profitability" of hunting and meat-sharing in terrestrial versus marine/coastal settings. This research has provided critical new information for the understanding of ancient South African landscapes at the Pinnacle Point sites, where Curtis Marean's team conducts archeological investigations of earliest modern human behavior.

IHO Research Associate Gary Schwartz is working on a range of projects related to dental evolution across a wide range of African great ape and fossil hominin populations. One of these projects, a collaboration with IHO International Affiliate Jay Kelley, **sheds light on the relationship among life history, ecology, and the pace and pattern of skeletal growth**. Along with IHO Postdoctoral Researcher Alejandra Ortiz, Schwartz uses the analytical toolkit of evolutionary developmental biology ("evo-devo") to answer questions about the **causes of changes in tooth size and shape** across more than 15 million years of great ape and human evolution.



Joan Silk studies social bonds among female baboons, which can help illuminate the link between us and nonhuman primates.



Kim Hill is studying terrestrial vs. coastal hunting and foraging. This image shows children playing while fishing nets are laid out along the beach.



IHO's **expanded research agenda** encompasses three tracks—how our nonhuman primate cousins interact with one another in social groups, the evolution of human cooperation through the study of modern hunter-gatherer populations, and ancient DNA and primate population genetics. Each of these topics link IHO's historical strength in paleoanthropology to the diverse fields concerned with the evolutionary processes by which we became human.

Working on two sides of this research, IHO Research Affiliate Joan Silk studies **social bonds among baboons**, asking questions that explicitly link nonhuman primates to humans. She conducts experimental work with chimpanzees and with children that focus on **development of prosocial preferences**. During 2017, with IHO Postdoctoral Researcher Bailey House, she collected data on how children from seven different cultures around the world react to sharing cues.

Leading research at two important **long-term chimpanzee research sites** are IHO Research Affiliates Ian Gilby and Kevin Langergraber. Gilby is the codirector of the **Gombe Chimpanzee Database**, a repository of over 50 years of detailed demographic and behavioral data on chimpanzees. The Gombe Stream Research Center was started by Jane Goodall in 1965.

This year, Gilby began a pilot program for tablet data collection for streamlining long-term data collection by field assistants

Kevin Langergraber codirects the **Ngogo Chimpanzee Project** in Kibale National Park, Uganda. The Ngogo population is the largest wild chimpanzee community under observation, with over 200 individuals. Langergraber was lead author on a *PNAS* article that shows how chimpanzees cooperate in defense of territories: males bear the short-term costs of patrolling—even when they have little to gain in the short term—because patrolling enhances group size and increases their chances of future reproduction.

Langergraber was a featured researcher in the film, *Rise of the Warrior Apes*, which won the **2017 Jackson Hole Wildlife Film Festival award for Best Animal Behavior Film**. IHO will screen the film at the ASU Marsten Theater on February 15, 2018.

IHO Research Affiliate Sarah Mathew investigates **why humans**, unlike other animals, **cooperate in groups comprising large numbers of unrelated individuals** and how the evolution of this unique form of cooperation is tied to the origins of moral sentiments, cultural norms, and warfare. Her field project is in Kenya among the Turkana people, who are a politically uncentralized pastoral society.



Sarah Mathew studies the evolution of human cooperation among the Turkana people in Kenya.

With IHO Postdoctoral Researcher Matthew Zefferman, they are investigating the origins of **Post-Traumatic Stress Disorder and Moral Injury** among Turkana men and women who have experienced combat, assessing the evolved psychological mechanisms that deter them from danger, moral or actual.

Mathew is also working with IHO Postdoctoral Researcher Carla Handley and IHO Research Affiliate Anne Stone to test **cultural group selection theory**—do people cooperate only with others to whom they are genetically related or do they cooperate with those who share their cultural values and beliefs? They have collected DNA samples and measured a variety of the cultural traits and cooperation norms from hundreds of members of north Kenyan tribal communities to tackle this question.

Anthropological geneticist Anne Stone is leading research testing calculus on teeth to examine the oral microbiome and diet of chimpanzees at Gombe. The research examines how the oral microbiome has

changed over time at Gombe and whether there are pathogens related to tooth decay or SIV infection. The research uses **genomic analyses to assess how genetic variation** at Gombe has changed over time as the national park has been increasingly surrounded by farms, potentially cutting off gene flow with other populations.



In his new book, *A Different Kind of Animal: How Culture Transformed Our Species*, IHO Research Affiliate Rob Boyd posits that humans have evolved to become the most dominant species on Earth through a **unique combination of cultural adaptation and large-scale cooperation**.

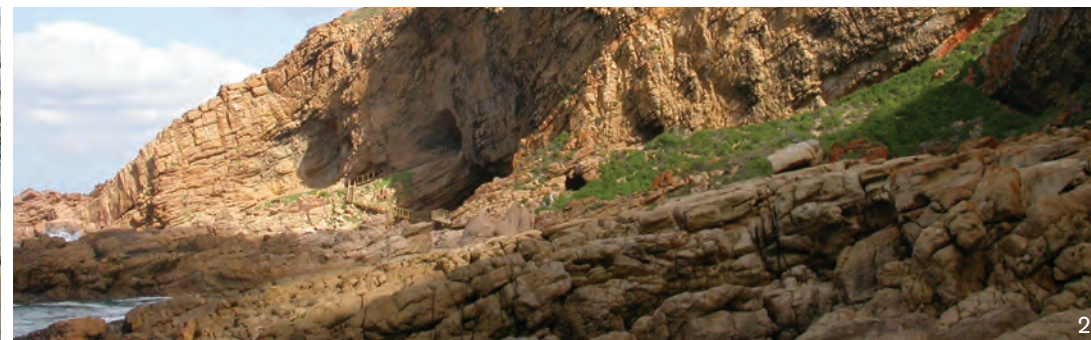
IHO's newest researcher, Research Affiliate Tom Morgan, works closely with Rob Boyd on exciting new studies on the **evolution of behavior and cognition**. Morgan is part of a \$4.5 million U.S. Defense Advanced Research Projects Agency (DARPA) grant that uses large-scale online game-playing experiments to track cultural dynamics. The project, called "Culture on a chip computing" has 3,000 participants. ■

↑ The Hominin Sites and Paleolakes Drilling Project drilled at five sites in Kenya and Ethiopia. Credit: Jennifer Clark

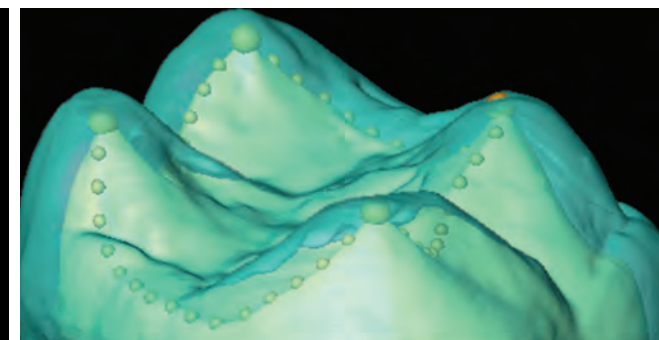
→ Chris Campisano and Dominique Garello work on one of the core samples.



Research sites like Pinnacle Point in South Africa serve as important teaching labs where students receive hands-on field experience and training from IHO scientists. →



Using techniques borrowed from the world of GIS (geographic information systems), Gary Schwartz applies the tools of dental topographic analyses to evaluate how mountain gorilla molars wear down with age. →



View the award-winning film, *Rise of the Warrior Apes*, at the ASU Marsten Theater on February 15, 2018.

Visit [asuevents.asu.edu/content/rise-warrior-apes-film-screening](https://asuevents.asu.edu/content/rise-warrior-apes-film-screening) for more details. →

